

The West Midlands Rail Freight Interchange Order 201X  
Technical Appendix 10.1 - Baseline Ecology Report  
Regulations 5(2)(a), 5(2)(l)(i) and 5(2)(l)(ii)  
Ramboll - March 2018



**West Midlands**  
Interchange

**Four Ashes Ltd**

Intended for  
**Four Ashes Limited (FAL)**



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# **WEST MIDLANDS INTERCHANGE TECHNICAL APPENDIX 10.1 - BASELINE ECOLOGY REPORT**

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## 1. EXECUTIVE SUMMARY

- 1.0.1 This report forms an appendix to the Ecology and Nature Conservation chapter in the West Midlands Interchange EIA and should be read in conjunction with the chapter. A comprehensive suite of habitat and species surveys have been undertaken in 2016 and 2017 to inform the ecological baseline used for impact assessment and these surveys and their findings are described in this report. A summary is provided in the following paragraphs.

### 1.1 Habitats

- 1.1.1 The majority of the Site is occupied by agricultural fields that are a mixture of arable and grazed pastures. Several of the fields in the north-east portion of the Site are subject to ongoing quarrying activity. A number of broad-leaved and mixed woodlands are scattered across the Site, the largest of which is located in the centre of the Site (Calf Heath Wood). Calf Heath Wood is used for the release of game birds for shooting. The fields are surrounded by a network of interconnecting hedgerows and drainage ditches. Numerous mature trees, as well as ponds are located along the lengths of hedgerows. The western portion of the Site is bisected by a railway line and the Staffordshire and Worcestershire Canal, both of which run approximately north-south through the Site. The habitats recorded on-site in approximate descending order of size include:
- i. Arable;
  - ii. Improved grassland;
  - iii. Quarry;
  - iv. Poor semi-improved grassland;
  - v. Mixed plantation woodland;
  - vi. Semi-improved grassland;
  - vii. Broad-leaved plantation woodland;
  - viii. Broad-leaved semi-natural woodland;
  - ix. Hedgerows;
  - x. Individual trees;
  - xi. Standing water;
  - xii. Running water;
  - xiii. Scrub; and
  - xiv. Buildings and hardstanding.
- 1.1.2 The Phase 1 Habitat Survey identified the presence of Japanese knotweed (*Fallopia japonica*) on the railway embankments immediately north and south of the A5 and Himalayan balsam (*Impatiens glandulifera*) was observed on the site boundary in the approximate location of the Site boundary by a ditch running along the south of the wet woodland adjacent Straight Mile.



- 1.1.3 *Rhododendron* was present extensively through Calf Heath Wood and dominated the understorey.
- 1.1.4 The above mentioned plants are non-native species listed on Schedule 9 (Part 2) of the Wildlife and Countryside Act 1981 (as amended).
- 1.1.5 A summary of the geographic value and whether a given habitat is considered an 'Important' or 'Other' Ecological Feature is provided in Table 1.1 below. This evaluation is in relation to intrinsic habitat value; these habitats support protected and notable species and those species/groups are of value in their own right.

**Table 1.1: Summary of Habitat Valuations**

Habitat	Geographic Value	'Important' or 'Other' Ecological Feature
Arable	Site	Other Ecological Feature
Improved grassland	Site	Other Ecological Feature
Poor semi-improved grassland	Site	Other Ecological Feature
Semi-improved grassland	Local	Important Ecological Feature
Hedgerows	Local	Important Ecological Feature
Woodland (including mixed plantation, broad-leaved plantation woodland and broad-leaved semi-natural woodland)	Local	Important Ecological Feature
Individual trees	Local	Important Ecological Feature
Standing water	Local	Important Ecological Feature
Running water	Site	Other Ecological Feature
Scrub	Site	Other Ecological Feature
Buildings	Site	Other Ecological Feature
Quarry	Negligible	Other Ecological Feature
Invasive vegetation	Negligible	Other Ecological Feature

## 1.2 Species

- 1.2.1 A small population of the specially protected great crested newt were identified as present breeding in an off-site pond to the south of the Site beyond Station Road. No great crested newt were recorded during a suite of traditional surveys of on-site ponds despite ten of these ponds testing positive for e-DNA suggesting that individuals of this species are present in the landscape but in low numbers, undetectable by traditional techniques.

Common toad (a species of principal importance), common frog and smooth newt were also identified as present.

- 1.2.2 No reptile species were recorded during the survey, and these species are presumed to be absent from the Site.
- 1.2.3 Records of white-clawed crayfish (*Austropotamobius pallipes*) exist for the River Penk and Watershed Brook (1.4 km south-west of the Site) and Saredon Brook (750 m south of the Site). Habitats on-site were considered sub-optimal for this species. Although the canal has good connectivity to the wider landscape, it is not hydrologically linked to rivers and the habitat suitability for crayfish refuges is considered to be low due to the lack of refuge features and the presence of hard, engineered banks along much of the canal. Precautionary methods of working will be employed to ensure biosecurity and protection of unanticipated individuals present.
- 1.2.4 Sixty-two species of birds were recorded in the breeding bird survey, of which there were 12 UKBAP/s41 species of principal importance, 10 Red List species (all of which except mistle thrush are listed in s41) and 12 Amber List species. There are eight Staffordshire BAP species of which five form part of the Action Plan for Farmland Seed Eating Birds. The only species on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) recorded were hobby and barn owl which are considered to be breeding off site. The breeding bird assemblage on the site includes the s41/Red List/LBAP farmland birds (lapwing, skylark, yellow wagtail, linnet, yellowhammer and reed bunting) reflecting the agricultural landscape present.
- 1.2.5 Calf Heath Reservoir supports a range of breeding waterbirds, notably mallard, great crested grebe and coot which were confirmed breeding.
- 1.2.6 A kingfisher (Schedule 1) was seen on two occasions in the western side of Calf Heath reservoir. This species may nest at this location, although the habitat is not ideal. The Amber List lesser-black backed gull, black-headed gull and common tern were recorded on or over the reservoir. Other waterbirds recorded in the survey were feral/hybrid mallard, cormorant, moorhen and tufted duck.
- 1.2.7 The Gailey Reservoirs LWS (including Calf Heath Reservoir) support wintering bird assemblages consistent with their designation at the county scale. Records of note include a flock of pink-footed geese on Gailey Lower Reservoir on one date and Canada goose, greylag goose, mallard and large numbers of tufted duck on both Gailey Reservoirs. Four records of the Schedule 1 kingfisher were made on Gailey Reservoirs. Farmland birds present in the winter correspond broadly with those breeding on the Site, although yellowhammer was not recorded on the Site, this species presumably flocking elsewhere. No notable concentrations of lapwing or skylark were noted and wading birds (snipe, oystercatcher) seem to use the Site on occasion only. Several flocks of wintering thrushes (fieldfare and

redwing) were recorded, although these were typical of the size of flocks of both species recorded across the West Midlands<sup>26</sup>.

- 1.2.8 A total of 420 species were recorded during the invertebrate surveys. Of the total 420 species recorded, 133 invertebrate species from target groups of biodiversity interest were recorded in Calf Heath Wood, 90 species were recorded from the quarry, 172 species were recorded across the wider Calf Heath landscape and 179 species were recorded in the Land south of Vicarage Road. The habitat diversity is broadly poor in terms of invertebrate assemblage types. Eight species/groups of importance were identified, seven Nationally Scarce (NS) or s41 species and one group of species that are of county, Staffordshire importance. The habitats identified are largely populated by common and localised species indicative of a broad suite of preferences rather than a specialised set of habitat criteria. The habitats present on-site are well represented in the local area.
- 1.2.9 Ten species of bat were confirmed to be present in the survey area. As an assemblage of bats this is considered significant as there are 12 species recorded in Staffordshire (SER, 2016) and the Site supports to a greater or lesser extent the majority of these species. Species recorded on-site include common pipistrelle, soprano pipistrelle, nathusius pipistrelle, noctule, Daubenton's, whiskered, Brandt's, serotine, brown long-eared and natterer's.
- 1.2.10 A total of twenty-two roosts were identified. Nine bat roosts were identified in 2016 and 13 bat roosts were identified in 2017 via a combination of survey methods. Six of the roosts were on-site and sixteen were off-site. Of the sixteen off-site roosts, seven are within 100 m of the Site boundary. Nine tree roosts and thirteen building roosts were identified. The roosts identified are summarised below in Table 1.2.

**Table 1.2: Confirmed Bat Roosts**

Roost Name	Distance and Orientation from Site	Species	Roost Classification
Gailey Magazine	On-site	Common pipistrelle Soprano pipistrelle	Day roost
Woodside Barn	On-site	Natterer's Common pipistrelle Soprano pipistrelle Brown long-eared	Day roost Night roost Probable feeding perch
Mile End Cottage	On-site	Common pipistrelle	Day roost
Croft House	On-site	Common pipistrelle	Day roost
Heath Farm – Main Farmhouse	On-site	Brown long-eared	Day roost
T97 – Oak	On-site	Soprano pipistrelle	Day roost
Calf Heath Wood Birch 2 Roost 2	Approximately 20 m west	Daubenton's	Day roost

Roost Name	Distance and Orientation from Site	Species	Roost Classification
Woodview Cottage Roost 3	20 m south	Brown long-eared	Maternity roost or satellite roost
Stable Lane Building Roost 13	25 m east	Brown long-eared	Day roost
Tree Roost 15	40 m south	Noctule	Maternity roost
Tree Roost 10	45 m south	Whiskered/brandt's	Night roost
Calf Heath Wood Birch 1 Roost 1	Approximately 80 m west	Daubenton's	Day roost
Tree Roost 9	90 m south	Daubenton's	Day roost
Bungalow – Stable Lane Roost 7	120 m east	Brown long-eared	Day roost
Stable Lane Building Roost 11	200 m east	Whiskered/brandt's	Day roost
Standeford Barn Conversion Roost 8	1000 m south	Natterer's	Maternity roost
Somerford Grange Farm Roost 4	1250 m west	Natterer's	Day roost
Quarry Tree Roost 16	1300 m south east	Daubenton's	Maternity roost
Somerford Tree Roost 14	1400 m west	Noctule	Maternity roost
Woodland north of Laches Wood Outdoor Education Centre – Birch. Roost 6	1500 m south west	Whiskered/brandt's	Day roost
Slade Heath Building Roost 12	2100 m south west	Whiskered/brandt's	Day roost / Possible maternity roost
House – Old Stafford Road Roost 5	2350 m south west	Whiskered/brandt's	Day roost

1.2.11 Bat activity was recorded across the Site; however, key commuting and foraging areas were noted including:

- i. Staffordshire and Worcestershire Canal;
- ii. Calf Heath Wood (Interior and woodland edge);
- iii. Ditch / hedgerow past Gailey Magazine linking the Staffordshire and Worcestershire Canal and Calf Heath Wood;
- iv. Access track past Woodside Farm leading into the wayleave/track running north west – south east in Calf Heath Wood;
- v. Hedgerow running east to west in centre of Transect 4 including Point Count 4.11;
- vi. Hedge / tree line running southwest to northeast between Calf Heath Woodland and Reservoir;
- vii. Hedgerow running north-west to south-east between Vicarage Road and Straight Mile;
- viii. Hedgerow / bund running north to south in the far south west of the Site between the canal and Straight Mile;

- ix. Hedge / treeline in location of Pond 24;
  - x. Wet woodland in south of the Site adjacent Straight Mile and the tree line extending north from this to the wooded copse off Woodlands Lane; and
  - xi. The canal and woodland habitats in the south of the Site have been shown to support foraging, commuting and roost sites for a range of species.
- 1.2.12 Four ditches and ponds present across the Site, and the length of the Staffordshire and Worcestershire Canal intersecting the Site were surveyed for water vole field signs. Three of the four ditches were during some surveys found to hold shallow depths of water (<5cm), and the remaining ditch was adjacent to a layby and was observed to be heavily influenced by human disturbance, litter and pollution. Although field signs and direct observations of other mammal species (including brown rat (*Rattus norvegicus*), bank vole (*Myodes glareolus*) and field vole (*Microtus agrestis*) were noted, no water vole field signs were noted within the ditches, ponds or the canal during surveys. Water vole are presumed to be absent from the Site.
- 1.2.13 No otter holts were identified during the Phase 1 Habitat Survey of the Site or in any further targeted species surveys undertaken. Inspections of the Gravelly Way road bridge and the Gravelly way footbridge were undertaken monthly from May to October 2016 (following bat activity transects) and identified staining possibly caused by aged otter spraint in May, with no fresh signs for the following months. An otter footprint was observed in the very north of the Site during the badger survey in March 2017; it was by the ditch south of the A5, approximately 100 m east of the Staffordshire and Worcestershire canal. There are known records of otter within and around the Site from the last ten years<sup>1</sup> and consultation comments from the Canal and River Trust confirm that the Staffordshire and Worcestershire Canal provides important habitat for otter<sup>2</sup>. Therefore, it is considered the canal forms part of an otter territory, and otters are likely to use the stretch of canal that passes through the Site, using the terrestrial parts of the Site on occasion.
- 1.2.14 Comprehensive badger bait marking surveys were undertaken. The results of these are provided in Confidential Technical Appendix 10.2.
- 1.2.15 No brown hares (s41 Priority Species and LBAP) were recorded on-site; no specific surveys for this species have been carried out, but this species is large and often conspicuous. Brown hare is likely to be absent from the Site.
- 1.2.16 A polecat (Protected under Conservation of Habitats and Species Regulations 2017, WCA, 1981 and s41 Priority Species) (or possible polecat-ferret) was encountered approximately 200 m northeast of the Site in June 2016; it was

<sup>1</sup> Staffordshire Ecological Record (2016) Data Search: Four Ashes (revised boundary) 2km buffer. Ref: SER/16/392, 11 August 2016

<sup>2</sup> The Planning Inspectorate (2016) Scoping Opinion: Proposed West Midlands Interchange. Ref TR050005, October 2016

seen crossing the A5 near its junction with the M6 motorway. It is likely that at least one polecat (or polecat-ferret) territory overlaps with the Site, specifically the northeast section.

- 1.2.17 Four hedgehog (s41 Priority Species) sightings were made across the Site in total during the 2016 and 2017 surveys. Two hedgehog sightings were made within the central-northern section of the site on 16 and 17 May 2016. The two remaining hedgehog sightings were made via infra-red cameras deployed in the small woodland in the very southeast of the Site (by Straight Mile) in August 2017.
- 1.2.18 Harvest mice (s41 Priority Species) are assumed to be present on-site given the habitats present, although no surveys for this species have been conducted and no animals or evidence of this species have been recorded.
- 1.2.19 A summary of the geographic value and whether a given species is considered an 'Important' or 'Other' Ecological Feature is provided in Table 1.3 below.

**Table 1.3: Summary of Species Valuations**

Species	Geographic Value	'Important' or 'Other' Ecological Feature
Amphibians – GCN	Local	Important Ecological Feature
Amphibians – Common Toad	Local	Important Ecological Feature
Amphibians – Smooth Newt	Site	Other Ecological Feature
Amphibians – Common Frog	Site	Other Ecological Feature
Reptiles	Absent	Not considered further in this assessment
Other Aquatic Species – White Clawed Crayfish	County	Other Ecological Feature (Outside of zone of influence)
Other Aquatic Species - Fish	Negligible	Other Ecological Feature
Birds	County	Important Ecological Feature
Invertebrates	Local	Important Ecological Feature
Bats	District	Important Ecological Feature
Badger	Local	Important Ecological Feature
Water Vole	Absent	Not considered further in this assessment
Otter	District	Important Ecological Feature
Other Mammals – Brown hare	Absent	Not considered further in this assessment
Other Mammals – Polecat	Local	Important Ecological Feature
Other Mammals – Hedgehog	Local	Important Ecological Feature

Species	Geographic Value	'Important' or 'Other' Ecological Feature
Other Mammals – Harvest mice	Local	Important Ecological Feature

## 2. INTRODUCTION

- 2.0.1 This Baseline Ecology Report Technical Appendix has been produced by Ramboll Environment and Health UK (Ramboll) to support the Environmental Impact Assessment (EIA) for the West Midlands Interchange (WMI), 'the Proposed Development'. This report should be read with reference to Chapter 10 of the Environmental Statement (ES) where assessment methodology is described e.g. valuation of receptors and definitions as to what constitutes 'Important' or 'Other' Ecological Features.
- 2.0.2 The aim of the report is to provide details of the ecological baseline with respect to habitats and species identified via desk study and field surveys. Details are provided as follows where relevant:
- Legislation;
  - Guidance and industry standards;
  - Methodology;
  - Limitations;
  - Desk study findings;
  - Results of field surveys; and
  - Valuation of receptor – geographic scale and 'Important' or 'Other' Ecological Feature.

### 2.1 Site Context

- 2.1.1 The Site comprises an area of approximately 297 ha and is located in the Shropshire, Cheshire and Staffordshire Plain National Character Area (NCA), as defined by Natural England<sup>3</sup>. The NCA is characterised by an expanse of flat or gently undulating, lush, pastoral farmland.
- 2.1.2 The Site's immediate surroundings largely reflect the wider NCA and comprise a mixed farming landscape, albeit with several roads, rail and scattered settlements spread through the area. The surrounding area supports several small woodlands, as well as standing waterbodies. The Site is large and has an irregularly shaped boundary. It is bounded to the north by the A5 dual carriageway (several small light industrial units and commercial properties are located along the A5, including a petrol filling station and a garden centre). Calf Heath Reservoir is also situated at the northern boundary of the Site. The M6 motorway passes the Site at its north-

<sup>3</sup> Publications.naturalengland.org.uk. (2016). *Natural England Natural Character Area Profile 61: Shropshire, Cheshire and Staffordshire Plain*. [online] Available at: <http://publications.naturalengland.org.uk/file/6497812007092224> [Accessed 15/12/16]

east corner. Vicarage Road and Straight Mile Road dissect the southern portion of the Site. The Site is bounded to the South by the Staffordshire and Worcestershire Canal. Four Ashes Industrial Estate is partly surrounded by the Site, situated within the central area of the southern boundary. The A449 (Stafford Road) forms the western Site boundary. The Site is shown in Figure 10.1.001.

## 2.2 Desk Study Methods

- 2.2.1 The purpose of the desk study was to collect existing baseline data about the Site and the surrounding area, such as the location of designated sites or other natural features of potential ecological importance (e.g. woodland and ponds). The following Zone of Influence (Zoi) has been considered:
- i. All statutory internationally designated sites up to 10 km from the Site, including Special Areas of Conservation (SAC), Special Protection Areas (SPA) and RAMSAR sites;
  - ii. All statutory nationally designated sites up to 2km from the Site including National Nature Reserves (NNR) and Sites of Special Scientific Interest (SSSI);
  - iii. Statutory locally designated sites – Local Nature Reserves (LNR) within 2km of the Site;
  - iv. Non-statutory designated sites: Local Wildlife Sites (LWS) up to 2 km from the Site;
  - v. Special Areas of Conservation (SAC) or Sites of Special Scientific Interest (SSSI) designated for bats within a 10 km radius of the Site; and
  - vi. Records of notable and protected species up to 2 km of the Site.
- 2.2.2 Staffordshire Ecological Records Centre (SERC) was contacted to provide details of non-statutory designated sites and protected species within 2 km of the Site. The SERC report is provided in Annex 10.1.1 and relevant records are summarised in the appropriate sections.
- 2.2.3 The Multi Agency Geographic Information for the Countryside (MAGIC) website<sup>4</sup> was searched for information on statutory designated sites. Supplementary information on the Site and its surroundings were obtained from Ordnance Survey maps, as well as aerial images available from Google™ Earth Pro.
- 2.2.4 This report was written by Christopher Hodsman MSc BSc (Hons) MCIEEM of Ramboll.

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<sup>4</sup> MAGIC. (2016). *Magic Interactive Map*. [online] Available at: <http://www.magic.gov.uk> [Accessed 04/11/16]



## 3. HABITATS

### 3.1 Legislation

- 3.1.1 The Hedgerow Regulations 1997 set out the properties that make a hedgerow 'important' and therefore afforded protection under the legislation. In summary, a hedgerow is considered important if it is more than 30 years old and meets one or more of the following criteria:

#### *Archaeology and history*

- Marks part or all of the boundary of a historic parish or township that existed before 1850;
- Incorporates an archaeological feature (or is associated with one) included in the schedule of monuments compiled by the Secretary of State under section 1 (schedule of monuments) of the Ancient Monuments and Archaeological Areas Act 1979 or recorded in a Sites and Monuments Record (dating from 27 March 1997);
- Marks the boundary of a pre-1600 AD estate or manor (or visibly associated with one) and is listed in a Sites and Monuments Record or other such document held at a Records Office since 27 March 1997;
- Forms an integral part of a field system predating the Inclosure Acts;

#### *Wildlife and landscape*

- Contains species listed in part I of Schedule 1 (birds), 5 (animals) or 8 (plants) of the Wildlife and Countryside Act 1981 (as amended), or species considered to be "declining breeders, endangered, extinct, rare or vulnerable" in UK Red Data Books; and
- Includes at least a) 7 woody species, b) 6 woody species plus 3 associated features, c) 6 woody species including a black poplar; large-leaved lime, small-leaved lime or wild service tree, d) 5 woody species and 4 associated features or e) is adjacent to a public right of way (byway open to all traffic) and supports at least 4 woody species in addition to 2 associated features.

- 3.1.2 Associated features include:

- (a) a bank or wall which supports the hedgerow along at least one half of its length;
- (b) gaps which in aggregate do not exceed 10% of the length of the hedgerow;
- (c) where the length of the hedgerow does not exceed 50 metres, at least one standard tree;

- (d) where the length of the hedgerow exceeds 50 metres but does not exceed 100 metres, at least 2 standard trees;
- (e) where the length of the hedgerow exceeds 100 metres, such number of standard trees (within any part of its length) as would when averaged over its total length amount to at least one for each 50 metres;
- (f) at least 3 woodland species within one metre, in any direction, of the outermost edges of the hedgerow;
- (g) a ditch along at least one half of the length of the hedgerow;
- (h) connections scoring 4 points or more in accordance with subparagraph (5); and
- (i) a parallel hedge within 15 metres of the hedgerow.

## 3.2 Methodology

- 3.2.1 An extended Phase 1 Habitat Survey of the Site was undertaken by Matt Neale MCIEEM on 23 and 24 November 2015 and 24 and 25 February 2016. A further survey was undertaken by Chris Hodsman MCIEEM and Emily McVean ACIEEM on 4 July 2016, and further areas were surveyed by Emily McVean ACIEEM and James Fraser on 13 September 2017. Targeted botanical surveys were undertaken by Malcolm Robertson CEnv MCIEEM on 18 May 2017 of areas of interest as identified during the Phase 1 Habitat Survey. The initial surveys (November and February) were not undertaken within the appropriate season (April to September). The later verification survey was therefore required and undertaken in July and observations were made throughout the optimum period whilst undertaking further targeted protected species surveys as detailed in Section 4 of this report. The areas surveyed in September 2017 comprised roadside habitats where road or junction improvements may be required, these were surveyed during the optimum period for habitat surveys. Matt is a Chartered Ecologist, holds a BSc in Environmental Science and an MSc in Coastal Conservation Management and has worked professionally as an ecological consultant since 2004. He holds Natural England survey licenses for dormouse (*Muscardinus avellanarius*) and great crested newt (*Triturus cristatus*). Chris and Emily both hold a BSc in Environmental Science, and Chris holds an MSc in Environmental Monitoring and Assessment, as well as Natural England survey licenses for bats and great crested newts. James holds a BSc in Environmental Management and Planning. Chris, Emily and James have eight, six and three years' experience in environmental consultancy respectively. Malcolm Robertson is a Chartered Environmentalist and holds a BSc in Geography/Biology and has worked as a professional ecological consultant for 16 years. He holds a Natural England survey license for great crested newt.

3.2.2 The extended Phase 1 Habitat Survey involved a Site walkover and preliminary assessment of key habitats, land use and ecological features. The main habitats present were recorded using standard Phase 1 Habitat Survey methodology as described in the Handbook for Phase 1 Habitat Survey (JNCC, 2010)<sup>5</sup>. The following Site description should be read in conjunction with the Phase 1 Habitat Plan, provided in Figure 10.1.002. Target notes were used to record habitats and features of particular interest; these are provided in Annex 10.1.2 and are referenced where appropriate within Sections 3 and 4 of this report. In addition to general habitat classification, a list was compiled of observed plant species (using the nomenclature of Stace, 2010<sup>6</sup>, with common and Latin names referred to in the first instance after which only the common names are used). The abundance of each species was estimated for each habitat respectively using standard 'DAFOR' codes:

- i. D = Dominant
- ii. A = Abundant
- iii. F = Frequent
- iv. O = Occasional
- v. R = Rare

3.2.3 The Site was inspected for signs of any invasive plant species subject to legal controls. The Site was assessed for its potential to support protected and notable species such as reptiles, great crested newt and bats. This assessment, in addition to consultation with relevant stakeholders identified the scope of survey requirements as presented in Section 4 of this report.

3.2.4 Dedicated hedgerow surveys were undertaken at the Site between 21 and 22 June 2016 and on 12th July 2017 and hedgerows were assessed using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997. The 2016 surveys covered all land within the Site north of Vicarage Road. Surveys of hedgerows south of Vicarage Road took place in 2017 with hedgerows being assessed using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997 and the Hedgerow Evaluation and Grading System (HEGS). The hedgerow survey reports are provided in Annex 10.1.3 of this document. The findings for 2016 and 2017 are summarised in Section 3.7.

3.2.5 An ecological walkover was undertaken of off-site land identified to help provide mitigation for impacts on farmland birds. The survey was undertaken by Malcolm Robertson and James Fraser on 8<sup>th</sup> November 2017 and sought to identify habitats present and suitability of the site for enhancement for the benefit of farmland birds. The land surveyed is shown in Figure 10.004 of the ES.

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<sup>5</sup> Handbook for phase 1 habitat survey a technique for environmental audit. (2010). 1st ed. Peterborough [England]: JNCC

<sup>6</sup> Stace C. (2010). *New flora of the British Isles*. 1st ed. Cambridge: Cambridge University Press

### 3.3 Habitat Descriptions – Arable

- 3.3.1 The majority of fields on the Site are utilised for arable cultivation. At the time of the initial extended Phase 1 Habitat Survey, these had been mostly harvested, leaving stubble and bare earth, or had been recently sown. Crops observed as planted subsequently in the year included potatoes, rapeseed, cereal crops and corn. The cropped area was noted to extend close to the surrounding hedgerows, leaving very narrow field margins in most instances (less than one metre wide). The narrow field margins are vegetated and contain a sward of tall grasses and herbaceous species with coarse grasses including Yorkshire fog (*Holcus lanatus*), false oat-grass (*Arrhenatherum elatius*) and cock's-foot (*Dactylis glomerata*) which were widely dominant. Further locally dominant common herbs recorded included common nettle (*Urtica dioica*), broad-leaved dock (*Rumex obtusifolius*), broad-leaved willowherb (*Epilobium montanum*), redshank (*Persicaria maculosa*), scentless mayweed (*Tripleurospermum inodorum*) hogweed (*Heracleum sphondylium*), lesser knapweed (*Centaurea nigra*), rosebay willowherb (*Chamerion angustifolium*), teasel (*Dipsacus fullonum*), creeping thistle (*Cirsium arvense*) and bracken (*Pteridium aquilinum*).
- 3.3.2 Target Note 34 is an arable margin south of Vicarage Road, species recorded in this location differ and include; wild oat (*Avena* sp.) and barley (*Hordeum vulgare*), rosebay willowherb, scentless mayweed, scarlet pimpernel (*Anagallis arvensis*), broad-leaved dock, common nettle, common vetch (*Vicia sativa*), fumitory (*Fumaria officinalis*), timothy (*Phleum pratense*) and redshank. Hedgerows demarcate the majority of arable field margins. Further species present are provided in the hedgerow section (3.5) detailing the ground flora which would in many cases can also be applicable to the description above for arable field margins.
- 3.3.3 Areas of arable set aside (TN 60) were noted to the north of Calf Heath Wood in the Phase 1 Habitat Verification Survey, species present included poppy (*Papaver rhoeas*), field pansy (*Viola arvensis*), groundsel (*Senecio vulgaris*), common nettle and rosebay willowherb. This area was noted to be back in production in 2017. A further area of set aside is shown as TN62; this area was seasonally wet with an associated shallow ditch, and had a high proportion of dock, thistle and rush (*Juncus* sp.).
- 3.3.4 Arable habitats on-site are considered to be of value at the Site scale and are to be considered as an 'Other Ecological Feature' within the EIA.

### 3.4 Habitat Descriptions – Improved Grassland

- 3.4.1 One field in the east of the Site north of Vicarage Road (TN78) was recorded as improved grassland in addition to several fields to the south east of Vicarage Road (TN25 and TN33) (see Figure 10.1.002). This habitat type

generally comprises homogenous grassland of low species diversity, which appears to be managed for hay production or forage.

- 3.4.2 The improved fields at TN 25 to the south of Straight Mile were dominated by perennial rye-grass and Yorkshire fog. Further species recorded, generally at the margins were common bent (*Agrostis capillaris*), cock's-foot, annual meadow grass (*Poa annua*), scentless mayweed, common thistle, common nettle, broad-leaved dock, ragwort (*Senecio jacobaea*), red clover (*Trifolium pratense*), and rosebay willowherb.
- 3.4.3 Improved grassland at TN33 was noted to be of similar to composition as observed at TN25. Additional occasionally occurring species present included bird's-foot-trefoil (*Lotus corniculatus*), creeping buttercup (*Ranunculus repens*), broad-leaved plantain (*Plantago major*), spear thistle (*Cirsium vulgare*), redshank, chickweed (*Stellaria media*), self heal (*Prunella vulgaris*), wood rush (*Luzula campestris*), meadow foxtail (*Alopecurus pratensis*) and forget-me-not (*Myosotis* sp.).
- 3.4.4 A field to the south off of Straight Mile (TN52) was noted to be heavily grazed and perennial rye-grass was dominant. Red clover and common nettle were frequently observed. The southern extent of this field adjacent the woodland was noted to offer a greater diversity and be subject to less grazing pressure. Additional species recorded in this location included hedge bedstraw (*Galium mollugo*), bird's-foot-trefoil and four marsh orchids (*Dactylorhiza praetermissa*).
- 3.4.5 Improved grassland habitats on-site are considered to be of value at the Site scale and are to be considered as an 'Other Ecological Feature' within the EIA.

### 3.5 Habitat Descriptions – Poor Semi-Improved Grassland

- 3.5.1 Ten fields and smaller areas of grassland in the Site north of Vicarage Road were identified as containing grassland of poor species diversity and are typically grazed (TN79). The dominant species were false oat-grass, cock's-foot, Yorkshire fog and perennial rye-grass was also present frequently. The herbaceous component in these locations is sparse and includes occasional creeping thistle, broad-leaved dock and common nettle.

An area comprising poor semi-improved grassland is present on the Site south of Vicarage Road (TN 23). Species recorded included Yorkshire fog, annual meadow grass, red clover, white clover (*Trifolium repens*), yarrow (*Achillea millefolium*), ribwort plantain (*Plantago lanceolata*), willowherb (*Epilobium* sp.), cock's-foot, common nettle and creeping buttercup.

- 3.5.2 Poor semi-improved grassland habitats on-site are considered to be of value at the Site scale and are to be considered as an 'Other Ecological Feature' within the EIA.

### 3.6 Habitat Descriptions – Semi-Improved Grassland

- 3.6.1 Six fields and elements of marginal habitats present on the Site contain semi-improved grassland. This habitat appears to be relatively unmanaged and has a rank appearance, often with tussocks of grasses including cock's-foot and Yorkshire fog as well as false oat-grass, smooth meadow-grass (*Poa pratensis*) and sporadic hard rush (*Juncus inflexus*). Frequently, herbs are present within the sward including creeping buttercup, creeping thistle, cleavers (*Galium aparine*), dandelion (*Taraxacum officinale* agg), common ragwort, yarrow, ribwort plantain and broad-leaved willowherb.
- 3.6.2 Areas of semi-improved grassland of particular note include the following which were subject to targeted flora surveys.
- 3.6.3 The large field south of Straight Mile and north of the canal (TN57) was divided with temporary fences in place for grazing horses. The main field within the fenced areas was heavily grazed and species recorded included perennial rye-grass, broadleaf dock, creeping buttercup, *Epilobium* sp., soft rush, common nettle, spear thistle and cock's-foot. Semi-improved grassland (not grazed recently) around the margins included the species above and also included southern marsh orchid, common spotted orchid (*Dactylorhiza fuchsii*), red clover, hogweed, ribwort plantain, yarrow, false-oat grass, *Geranium* sp., common vetch, bird's-foot-trefoil, hedge bedstraw, ladies smock (*Cardamine pratensis*) and ragged robin (*Lychnis flos-cuculi*).
- 3.6.4 The field south of Fir Tree Cottage in the west of the Site (TN80) was noted to include pignut (*Conopodium majus*) amongst the typical composition of species described in paragraph 3.6.1. This species is present across the field suggesting a long history without having been ploughed or improved significantly. The presence of pignut suggested an area with greater floristic diversity; however, further targeted surveys did not identify any other noteworthy species in this location.
- 3.6.5 The semi-improved grassland shown on Figure 10.1.002 as TN39 between Vicarage Road and Straight Mile was found to include abundant sweet vernal grass (*Anthoxanthum odoratum*) and creeping bent (*Agrostis stolonifera*). Frequent species included; creeping buttercup, meadow foxtail, Yorkshire fog, common sorrel (*Rumex acetosa*), white clover and meadow buttercup (*Ranunculus acris*) (locally abundant). Occasional species included; mouse-ear chickweed (*Cerastium fontanum*), broad-leaved dock, perennial ryegrass, red fescue (locally abundant) (*Festuca rubra*), soft rush (*Juncus effusus*) and marsh foxtail (*Alopecurus geniculatus*). Rare species recorded included; cow parsley (*Anthriscus sylvestris*), soft brome (*Bromus hordeaceus*), ragwort,

common nettle, creeping thistle, hogweed, spear thistle, hairy tare (*Vicia hirsuta*), flax (*Linum* sp.), thyme leaved speedwell (*Veronica serpyllifolia*) southern marsh orchid and common spotted orchid. The orchids were rare but locally frequent. Some limited areas of bare ground were recorded.

- 3.6.6 The species composition of the southern margin of the semi-improved grassland described in TN39 above varied and was less diverse. This area has a larger proportion of bare ground. Frequently recorded species included; dandelion, cow parsley and soft brome. Occasional species recorded included; mouse-ear chickweed, creeping buttercup, meadow foxtail (locally frequent), sweet vernal grass and perennial ryegrass. Rare species recorded included broad leaved dock, ragwort, common nettle, common sorrel, cock's-foot, creeping bent and spear thistle.
- 3.6.7 During targeted surveys marsh orchids were also identified in the semi-improved grassland field in the south of the Site adjacent the Bericote development (TN 61).
- 3.6.8 Semi-improved grassland habitats on-site are considered to be of value at the Local scale due to botanical species present and are to be considered as an 'Important Ecological Feature' within the EIA.

### 3.7 Habitat Descriptions – Hedgerows and Hedgerows with Trees

#### ***2016 North of Vicarage Road***

- 3.7.1 The majority of the field boundaries are formed by hedgerows, which are intact and stock proof. Only a few small sections of hedgerow are defunct and have wide gaps. Many of the hedges incorporate retained trees many of which are mature. The majority of hedgerows appear to be regularly trimmed and as a result are quite compact and of a fairly uniform shape. Unmanaged 'leggy' hedgerows were also observed some of which were subject to under grazing by livestock. Many of the hedgerows occur in association with shallow drainage ditches (approximately 0.5 m deep and 1 m wide), which were predominantly dry during the survey.
- 3.7.2 Hawthorn (*Crataegus monogyna*) is the dominant hedgerow species. Further species recorded include blackthorn (*Prunus spinosa*), ash (*Fraxinus excelsior*), elder (*Sambucus nigra*), lime (*Tilia* sp), dog rose (*Rosa canina* agg.), holly (*Ilex aquifolium*), pedunculate oak (*Quercus robur*), hazel (*Corylus avellana*), sycamore (*Acer pseudoplatanus*), silver birch (*Betula pendula*), rowan (*Sorbus aucuparia*) and honeysuckle (*Lonicera* spp) along with the occasional field maple (*Acer campestre*) and goat willow (*Salix caprea*).

- 3.7.3 The majority of hedgerows contain mature trees at regular intervals along their lengths; usually pedunculate oak and ash, with occasional grey poplar (*Populus x canescens*), silver birch and alder (*Alnus glutinosa*).
- 3.7.4 Ground flora within each hedgerow is typically quite poor. Site wide the following species were observed in the understory of hedgerows and in immediate adjacent field margins. Grass species included; red fescue, false oat-grass, brown bent (*Agrostis vinealis*), sweet vernal-grass, rough meadow-grass (*Poa trivialis*), wavy hair-grass (*Deschampsia flexuosa*) and common couch (*Elymus repens*).
- 3.7.5 Further species recorded included; common nettle, foxglove (*Digitalis purpurea*), bracken, lesser stitchwort (*Stellaria graminea*), bramble (*Rubus fruticosus* agg), rosebay willowherb, ladies bedstraw (*Galium verum*), common bird's-foot-trefoil, common hogweed, cow parsley, red campion (*Silene dioica*), meadow vetchling (*Lathyrus pratensis*), marsh horsetail (*Equisetum palustre*), great willowherb (*Epilobium hirsutum*), creeping thistle, bittersweet (*Solanum dulcamara*) and ivy (*Hedera helix*).
- 3.7.6 Hedgerows 9 and 10 in the north of the Site were observed to support ground flora indicative of acidic conditions including sheep's sorrel (*Rumex acetosella*), foxglove and bracken.
- 3.7.7 Of the 97 hedgerows surveyed in 2016, 11 were considered 'important' under the Hedgerow Regulations 1997 on ecological grounds. A further six were considered borderline, as a result of failing to reach the requisite number of associated features for consideration as 'important' by one. The majority of hedgerows surveyed in 2016 did not meet the criteria. An assessment of the value of the hedgerows in terms of heritage is provided in Chapter 9 of the ES.

### 2017 South of Vicarage Road

- 3.7.8 The character of the hedgerows south of Vicarage Road varied throughout the study area from intensively managed roadside hedgerows to unmanaged 'leggy' field boundaries and mature trees. In some places hedgerows were newly planted, and in others it formed an outgrown hedgerow/treeline. Some sections of hedgerow sampled were fragmented.
- 3.7.9 The vast majority of hedgerows within the study area were considered to be species-poor. Hawthorn was the dominant woody species. No rare or notable species were identified during the site visit. Unusual woody species not normally found in hedgerows included: grey alder (*Alnus incana*), Swedish whitebeam (*Sorbus intermedia*) and a common lime (*Tilia x europaea*).
- 3.7.10 Using the Hedgerow Regulations 1997 criteria of assessment, none of the 31 recorded hedgerows surveyed in 2017 were considered 'important'. Following



comments received during consultation, the hedgerows surveyed in 2017 were also assessed using the Hedgerow Evaluation and Grading System (HEGS).

- 3.7.11 Using HEGS, 15 of the 31 hedgerows assessed were evaluated as *Moderately high* to *High* value. Of these 15 hedgerows B26 (TN81) and B27 (TN40) were evaluated as being in the upper end of the scale (2+). These two hedgerows are located in the south-west of the study area and are made up of unmanaged hedgerows with frequent trees. The rest of the hedgerows evaluated were *Low* or *Moderate* value. The results of the HEGS Evaluation are summarised in Table 3.1.

**Table 3.1: HEGS Evaluation Scores**

ID	Structural	Connectivity	Diversity	Features	HEGS Grade	HEGS evaluation
B1	6	6	3	-	4-	Low value
B2	3	4	6	-	3-	Moderate value
B3	12	5	3	-	3	Moderate value
B4	7	6	3	-	3+	Moderate value
B5	8	6	3	-	3+	Moderate value
B6	9	7	3	-	2-	Mod high / High value
B7	10	7	3	2	2-	Mod high / High value
B8	9	8	3	4	2-	Mod high / High value
B9	13	4	4	4	2-	Mod high / High value
B10	10	3	4	2	3-	Moderate value
B11	7	8	4	4	2-	Mod high / High value
B12	8	5	3	-	3	Moderate value
B13	5	3	3	-	4-	Low value
B14	9	7	3	6	2-	Mod high / High value
B15	8	8	3	3	2-	Mod high / High value
B16	8	8	3	-	2-	Mod high / High value
B17	12	4	3	-	3	Moderate value
B18	6	8	3	-	3-	Moderate value
B19	9	7	3	-	2-	Mod high / High value
B20	8	6	3	-	3+	Moderate value
B21	9	7	3	-	2-	Mod high / High value
B22	8	8	3	-	2-	Mod high / High value
B23	11	7	3	4	2-	Mod high / High value
B24	6	6	3	-	4+	Low value
B25	8	8	3	-	2-	Mod high / High value
B26	15	7	3	4	2+	Mod high / High value
B27	13	7	4	2	2+	Mod high / High value
B28	12	6	3	-	3+	Moderate value
B29	9	6	3	-	3+	Moderate value
B30	6	6	3	-	4+	Low value
B31	8	6	3	-	3+	Moderate value

### Hedgerows Summary

- 3.7.12 Of the 128 hedgerows recorded in total, 11 were considered 'important' under the Hedgerow Regulations 1997 on ecological grounds. These are shown on Figure 10.1.005. A further six were considered borderline, as a result of failing to reach the requisite number of associated features for

consideration as 'important' by one. These are shown on Figure 10.1.005. The majority of hedgerows did not meet the criteria. Consideration of importance under heritage aspects is included in chapter 9 of the ES.

- 3.7.13 Using HEGS for hedgerows south of Vicarage Road, 15 of the 31 hedgerows assessed were evaluated as *Moderately high* to *High* value.
- 3.7.14 Hedgerows are considered a habitat of principal importance and form an extensive network across the Site. As such, hedgerows are considered of value at the Local scale and are to be considered as an 'Important Ecological Feature' within the EIA.

### 3.8 Habitat Descriptions – Mixed Plantation Woodland

- 3.8.1 The centre of the Site is occupied by a large section of mixed plantation woodland (Calf Heath Wood, see TN 65). The woodland comprises semi-mature silver birch interspersed by blocks of early mature Austrian pine (*Pinus nigra* ssp. *Nigra*) and Scots pine (*Pinus sylvestris*). The shrub layer in much of the woodland is formed by dense rhododendron (*Rhododendron* sp.), bramble, bracken or laurel (*Prunus Laurocerasus*). Occasional mature pedunculate oak, Turkey oak (*Quercus cerris*), elder, holly and rowan are located within the woodland. Several more open areas are situated in the centre of the plantation woodland. These areas are dominated by bracken and scattered silver birch. The woodland is managed for game and a large game pen is located in the centre of the woodland. Two linear open areas are also formed by wayleaves for overhead powerlines.
- 3.8.2 According to MAGIC<sup>7</sup>, Calf Heath Wood is not on the Ancient Woodland Inventory (i.e. not ancient semi-natural woodland (ASNW) or plantation on an ancient woodland site (PAWS)). On the 1884 Ordnance Survey map, it appears that the woodland was a mixed conifer and broadleaved plantation at that time and given the name, this suggests that it is an early forestry plantation on a former heath.
- 3.8.3 A smaller area of mixed plantation woodland broadly triangular in shape is situated towards the west of the Site (TN82) dominated by pine, including Austrian pine and Scots pine (*Pinus sylvestris*). Other species present include elder, hawthorn and alder. The understory is predominantly bare with pine needles with areas of dense bramble scrub.
- 3.8.4 Mixed plantation woodland habitats on-site are considered to be of value at the Local scale and are to be considered as an 'Important Ecological Feature' within the EIA.

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<sup>7</sup> MAGIC. (2016). *Magic Interactive Map*. [online] Available at: <http://www.magic.gov.uk> [Accessed 04/03/2016]

### 3.9 Habitat Descriptions – Broad-Leaved Plantation Woodland

- 3.9.1 An area of broad-leaved plantation woodland in the east of the Site extends off-site onto an embankment formed by the M6 motorway (TN86). Internal areas of the woodland contain semi-mature and early mature silver birch, alder, oak, beech, sweet chestnut and holly. Trees are more mature towards the west of the woodland and many of the trees closest to the adjoining field are late mature and showing signs of extensive die-back. These form the field boundary. The shrub layer contains scattered bramble, gorse (*Ulex europaeus*) and elder amongst a field layer of hard rush and grasses, which extend into the woodland from the adjoining semi-improved grassland habitat.
- 3.9.2 A small area of broad-leaved plantation woodland is located in the south of the Site beside the access road to Woodside Farm House (TN87). The woodland contains a mix of early mature pedunculate oak, silver birch, elder, sycamore, aspen (*Populus tremula*) and hornbeam (*Carpinus betulus*).
- 3.9.3 Broad-leaved plantation woodland habitats on-site are considered to be of value at the Local scale and are to be considered as an 'Important Ecological Feature' within the EIA.

### 3.10 Habitat Descriptions – Broad-Leaved Semi-Natural Woodland

- 3.10.1 There are several areas of broad-leaved semi-natural woodland on the Site. A small area of broad-leaved woodland is located in the northeast corner of the Site, adjacent to Calf Heath Reservoir (see TN 69). The woodland predominantly comprises a dense stand of early mature silver birch of uniform size and age and occasional semi-mature alder. Marginal areas of the woodland are occupied by scattered mature pedunculate oak and Austrian and scots pine. The field layer is predominantly bracken with locally dominant bramble and the occasional hard rush and broad buckler fern (*Dryopteris dilatata*).
- 3.10.2 One of the largest areas adjoins the mixed plantation woodland within Calf Heath Wood (TN70). The woodland is mature and dominated by silver birch and pedunculate oak, ranging from small saplings to large late mature specimens. Occasional mature alder and horse chestnut (*Aesculus hippocastanum*) are also present. The understorey comprises locally dominant stands of bramble or rhododendron, which largely obscure the sparse field layer.
- 3.10.3 A further area of broad-leaved semi-natural woodland is located in the north-west portion of the Site off the A449 (TN85). The woodland contains several large mature pedunculate oak and Lombardy poplar (*Populus nigra 'Italica'*), as well as the occasional ash, Norway maple (*Acer platanoides*) and hornbeam. The shrub layer consists of elder, hawthorn and goat willow, with

occasional bramble. The field layer contains lesser celandine (*Ranunculus ficaria*), lords and ladies (*Arum maculatum*) and common ivy. Parts of the woodland are quite damp and a pond is located in this woodland.

- 3.10.4 A small area of broad-leaved semi-natural woodland is located towards the south-west of the Site adjacent the railway line (TN83). The woodland contains early mature sycamore, elder, pedunculate oak, sweet chestnut (*Castanea sativa*), Austrian Pine and Scots Pine (Less than 30%). The canopy in part of the woodland is quite open and the ground flora in these areas is dominated by common nettle and grasses. Bramble is more abundant in areas of the woodland where the canopy is closed.
- 3.10.5 A small area of woodland is present at the southernmost extent of the Site adjacent the canal (TN 55). Species present include oak, silver birch, elder, beech, hawthorn, horse chestnut, holly and rowan. The understorey comprises bramble, soft rush, common nettle, willowherb sp., bracken and wood avens (*Geum urbanum*).
- 3.10.6 A further mature broad-leaved woodland block is present adjacent Woodlands Lane (TN 47) in the south east of the Site. Species present include sessile oak (*Quercus petraea*), hawthorn, sycamore, holly, grey poplar (*Populus x canescens*), yew (*Taxus baccata*), rowan, silver birch and, false acacia. The understorey is dominated by bramble and common nettle. Also present is creeping bent, cock's-foot and ivy. The woodland is protected from adjacent grazing by a stock proof fence.
- 3.10.7 An area of broad-leaved woodland is located beside the canal in the centre of the Site (north of TN 84). The woodland is mature and predominantly occupied by pedunculate oak and alder with abundant silver birch and the occasional horse chestnut. Small numbers of rowan are also present. The shrub layer predominantly comprises holly. Parts of the woodland appear to be quite wet and three seasonally connected small shallow ponds are located in low lying depressions.
- 3.10.8 A small area of broad-leaved wet woodland is situated in the south of the Site (TN49). This area was dry in July 2016 but wet in winter and spring. The woodland is dominated by semi-mature alder with occasional oak, silver birch, *Salix* sp, holly and sycamore. It appears to be regenerating naturally. The shrub layer includes scattered bramble scrub, soft rush, *Carex* sp, creeping buttercup and common nettle.
- 3.10.9 Some areas of woodland on site are represented on the 1884 OS maps (1:2,500); however, the ground flora was not found to be representative of ancient woodland. Broad-leaved semi-natural woodland habitats on-site are considered to be of value at the Local scale and are to be considered as an 'Important Ecological Feature' within the EIA.

### 3.11 Habitat Descriptions – Individual Trees

- 3.11.1 A comprehensive tree survey has been undertaken and includes a schedule of all trees within the Site (Technical Appendix 12.7 of the ES). The majority of individual trees are located within the Site's hedgerows and are predominately late mature ash and pedunculate oak trees. Occasionally grey poplars have been planted at regular intervals amongst the hedgerows. A small number of trees, predominantly mature oak, are located away from the hedgerows within the fields themselves. A line of early mature cherry (*Prunus* sp.), silver birch and alder are located to the side of the railway line in the southwest of the Site. A line of mature trees are present on the access way leading south from Heath Farm (TN27); these trees comprise pedunculate oak and Turkey oak predominantly with cherry also present. Several of the individual mature trees throughout the Site are showing signs of die-back or have fissures within the trunk.
- 3.11.2 Eleven veteran trees have been identified as present on-site, all of which are pedunculate oak (T153, T159, T166, T168, T169, T175, T178, T222, T276 and T279) with the exception of a single sweet chestnut (T167). These trees are shown on the Phase 1 Habitat Survey Drawing as TN58 and are shown on Figure 10.1.005. A further 25 trees (all pedunculate oak) that have stem diameters in excess of 1000 mm were identified and can be considered future or transitional veteran trees.
- 3.11.3 One tree specimen recorded on-site (T102) on the current approach haul road to the quarry off the A5 has been confirmed as a native black poplar (*Populus nigra* – a protected species) via DNA testing (TN88).
- 3.11.4 An assessment of the suitability of trees for protected species is provided in Section 4.5 of this report (Bats).

3.11.5 Individual trees on-site are considered to be of value at the Local scale and are to be considered as an 'Important Ecological Feature' within the EIA. The native black poplar is considered important at the County scale and is dealt with separately as an 'Important Ecological Feature' within the EIA.

### 3.12 Habitat Descriptions – Standing Water

3.12.1 Seventeen ponds were identified from maps and during the walkover within the Site (Ponds 4, 5, 6, 8, 14, 18, 20, 21, 22, 23, 24, 25, 27, 29, 30, 31 and 32) with a further 18 ponds identified within the surrounding 500 m. A description of the ponds on-site is provided below in Table 3.2. The locations of ponds on-site and within 500 m of the Site are shown in Figure 10.1.004. The ponds were all considered to be of limited ecological value and were not particularly diverse in terms of their aquatic flora.

**Table 3.2: Pond Descriptions**

Pond Number	Pond Description	Photograph
4	Pond within woodland in the east of the Site. Considered likely to dry annually as such was not considered to support fish populations. There was no aquatic vegetation present, the pond basin being dominated by leaf litter from the woodland. Bramble scrub was encroaching on the margins.	
5	Pond in woodland near to the canal which was observed to dry annually and not support fish species. There was no aquatic vegetation present, the pond basin being dominated by leaf litter from the woodland.	

6 Shallow interconnecting pond (To Pond 5) in woodland near to the canal which was observed to dry annually and not support fish species. The pond was dominated by flote grass (*Glyceria* sp.).



8 Pond in the centre of the plantation woodland on Site (Calf Heath Wood), surrounded by dense rhododendron. Water quality was moderately poor and the pond very turbid. No aquatic vegetation was visible.






14 Pond in south-west of the Site near the A449. Typha present to the southern bank but little other aquatic vegetation present. Pond was noted initially to have moderate water quality but this deteriorated and the pond had a persistent sheen on subsequent visits. The pond has potential to support fish.









18 Pond in north of the Site adjacent the A5. This was dry during the Phase 1 habitat survey but was later established to be holding water. No aquatic vegetation was present, terrestrial vegetation is present which is seasonally inundated. *Juncus* noted as present in this area.



<p>20</p>	<p>Pond to the south east of Calf Heath Wood. Small and considered likely to dry frequently. Very little macrophyte cover. Some turbidity noted (pond is located adjacent active quarry operations on 3 sides.</p>	
<p>21</p>	<p>Situated amongst trees in farm land 80 m south of Vicarage Road.</p> <p>Most of the pond is covered with a thick matt of emergent vegetation, and had a strong sulphurous smell, which may indicate anoxic conditions. Water quality was poor.</p> <p>Aquatic/marginal vegetation included bulrush (<i>Typha</i> sp.), water lillies (<i>Nymphaeaceae</i> sp.), yellow flag iris (<i>Iris pseudacorus</i>), <i>Carex</i> sp., great willowherb (<i>Epilobium hirsutum</i>) and common nettle.</p>	
<p>22</p>	<p>Situated within a hedgerow 260 m south beyond Vicarage Road. This is a shallow depression in the edge of the field. Dry at the time of the July 2016 survey, but is known to be seasonally wet and wet following heavy rain. Vegetation present is consistent with the adjacent improved grassland.</p>	



<p>23</p>	<p>Situated amongst trees in farm land 60 m south beyond Vicarage Road. Approximately 30 by 30 m surrounded and shaded by dense scrub and overhanging vegetation. Waterfowl were present within the pond, as well as small amounts of aquatic vegetation suitable for newt egg laying.</p>	
<p>24</p>	<p>Situated within a hedgerow 290 m south beyond Vicarage Road. Approximately 20 by 40 m, there is evidence of poaching by horses on the western side where it extends below the fencing during wetter times of year. Water fowl were present in the pond. Extremely limited submerged vegetation, lots of leaf litter from surrounding trees shading pond.</p>	
<p>25</p>	<p>Dry pond in woodland. Bare earth and leaf litter. No vegetation.</p>	<p><b>No photograph.</b></p>
<p>27</p>	<p>Shallow pool area within a drainage ditch in the south of the Site. Margins of the pond are heavily encroached by dense bramble scrub. Some limited flote grass (<i>Glyceria</i> sp.).</p>	

<p>29</p>	<p>Ephemeral pond beside woodland towards the south east of the Site. Limited number and extent of submerged plants. Generally the pond basin was full of leaf litter from the surrounding woodland. No fish were noted as present.</p>	
<p>30</p>	<p>Broadly horseshoe shaped depression in woodland adjacent the canal. Pond considered to dry seasonally and did not support any fish. The pond basin did not include any emergent or floating aquatic vegetation and was full of leaf litter from the surrounding woodland. Vegetation surrounding the pond included bramble, <i>Carex</i> sp. and bracken.</p>	
<p>31</p>	<p>Small circular pond basin within wet woodland. The pond was heavily shaded and had significant amounts of leaf litter within the basin. No aquatic vegetation was present. Pond was noted to dry annually.</p>	<p><b>No photograph.</b></p>
<p>32</p>	<p>Small circular pond basin within woodland adjacent the canal. The pond was heavily shaded and had significant amounts of leaf litter and woody debris within the basin. Pond was noted to dry annually.</p>	

3.12.2 The Staffordshire and Worcestershire Canal runs through the Site in a roughly north-south orientation in the main and west to east along the southern boundary of the Site. The banks are predominantly hard engineered sheet pile with no marginal or emergent vegetation. A towpath comprising amenity grassland is present on the western and southern margins of the

canal. Species present include perennial ryegrass, greater plantain, ribwort plantain, dandelion, red clover, common nettle, cow parsley, creeping buttercup, vetch, daisy, great willowherb and bramble. The eastern bank comprises overhanging vegetation from the adjacent field margins and site boundaries including trees and grasses. A number of mature trees, predominantly oak are present along the canal.

- 3.12.3 There are large areas of standing water associated with quarrying operations in the east of the Site. These areas are not colonised by vegetation owing to the regular and recent disturbance in these habitats.
- 3.12.4 Calf Heath Reservoir lies directly adjacent to the Site to the northeast. This reservoir forms part of the Gailey Reservoirs Local Wildlife Site. As such, consideration of Calf Heath Reservoir will be undertaken as part of a review of designated sites in the ES.
- 3.12.5 An assessment of the suitability of standing water bodies mentioned above for protected species is provided in Section 4 of this report.
- 3.12.6 Standing water habitats, namely the ponds and the canal are considered to be of value at the Local scale and are to be considered as an 'Important Ecological Feature' within the EIA. The ponds on site are not considered to meet the criteria for classification as a UK BAP priority habitat due to their poor structure, lack of aquatic and emergent vegetation, shading, containing high levels of leaf litter and apparent poor water quality.

### **3.13 Habitat Descriptions – Running Water**

- 3.13.1 Running water on the Site is confined to three slow flowing drainage ditches (TN6, TN7 and TN8). TN6 comprises a ditch with 1 m high banks. Water flows towards the northern boundary of the Site. The water level is shallow and the banks are predominantly shaded by trees, although short sections of the ditch are open with grassy banks. Emergent vegetation is absent. This ditch was noted to dry during extended period of settled weather. TN7 is a ditch beside the Site's northern boundary and is approximately 3 m wide. The ditches banks are approximately 1 m high and vegetated with rank grasses and bramble. Vegetation within the ditch is predominantly duckweed (*Lemna* sp). The depth of the ditch is not known. TN8 is located in the centre of the Site and marks a short section of shallow water in a narrow ditch. The ditch banks are approximately 1 m high and vegetated with grasses. Emergent vegetation was largely absent.

- 3.13.2 Several of the other drainage ditches are located adjacent to hedgerows but these were dry at the time of the survey and appear to rarely hold water, because of an absence of wetland vegetation. These are mapped on Figure 10.1.002 as dry ditches.
- 3.13.3 Running water habitats, namely the ditches are considered to be of value at the Site scale and are to be considered as an 'Other Ecological Feature' within the EIA.

### **3.14 Habitat Descriptions – Scrub**

- 3.14.1 Parts of the Site beside the canal and quarry are occupied by scattered scrub. Scrub predominantly comprises bramble and hawthorn. Ash and oak saplings, as well as and gorse are also occasionally present.
- 3.14.2 Scrub habitats are considered to be of value at the Site scale due to their small extent and are to be considered as an 'Other Ecological Feature' within the EIA.

### **3.15 Habitat Descriptions – Buildings**

- 3.15.1 There are several buildings on the Site including a group of three small derelict utility buildings (TN3) in the centre of the Site, a cluster of buildings at Gravelly Way Farm (TN5) near to the canal, a farmhouse and barns at Woodside Farm in the south of the Site (TN 9), a cottage and barn at Firtree cottage in the southwest of the Site (TN12), Clovelly in the north of the site adjacent the A5 (TN89) and group of buildings in the south of the site, comprising Heath Farmhouse and neighbouring homes and barns/outbuildings (TN13 to TN19). Five further properties are located where Vicarage Road and Straight Mile converge in the south of the site, these properties are; Mile End Cottage, Stoney Brook Cottage, Stoney Brook Cottage Annex, Ash House and a modern bungalow off Vicarage Road.
- 3.15.2 Further details of each building and an assessment of the buildings' suitability for protected species is provided in Section 4 of this report. Detailed building descriptions are provided in Annex 10.1.6 (A to O) alongside an assessment of their potential to support roosting bats.
- 3.15.3 Buildings are considered to be of value at the Site scale and are to be considered as an 'Other Ecological Feature' within the EIA other than when they support roosting bats, in which case they are considered in the bats section.

### **3.16 Habitat Descriptions – Quarry**

- 3.16.1 Seven fields in the northeast of the Site are currently subject to quarrying. The quarrying is taking place in the central portion of the fields but the

surrounding hedgerows are largely intact. The quarrying has stripped and removed the topsoil to access the underlying sand and gravel, which has been quarried to a depth of several metres. Vegetation is absent in these areas and standing water is common.

- 3.16.2 The quarry is considered to be of negligible value and is to be considered as an 'Other Ecological Feature' within the EIA.

### **3.17 Habitat Descriptions – Invasive Vegetation**

- 3.17.1 Several invasive plant species were recorded. The locations of the observations are shown on Figure 10.1.003.
- 3.17.2 Japanese knotweed (*Fallopia japonica*) was identified on the railway embankments immediately north and south of the A5 (TNs 75 and 76) and Himalayan balsam (*Impatiens glandulifera*) was observed by a ditch running along the south of the wet woodland adjacent Straight Mile (TN 77). This was also noted to be prevalent in the wet woodland off-site on the opposite side of Straight Mile.
- 3.17.3 Rhododendron was present extensively through Calf Heath Wood and dominated the understorey.
- 3.17.4 The above mentioned plants are non-native species listed on Schedule 9 (Part 2) of the Wildlife and Countryside Act 1981 (as amended).
- 3.17.5 Invasive vegetation is considered to be of negligible value and is to be considered as an 'Other Ecological Feature' within the EIA. Consideration will however be made to potential effects from invasive weeds on other receptors as a result in of the redevelopment in the impact assessment, and to mitigation to ensure works are carried out in the correct manner to ensure the spread of these plants is avoided.

### **3.18 Habitat Descriptions – Off-site Mitigation Land**

- 3.18.1 The off-site mitigation land is dominated by two arable fields one north of the other, which at time of survey were intensively managed and sown with a winter cereal crop. The field headlands were narrow or in many places the fields were cultivated up to the field boundary.
- 3.18.2 The field margins were either fences (for instance to the adjacent railway line to the east) or hedges (with trees along the western boundary and along the road separating the two fields).
- 3.18.3 Two smaller areas of habitat are present in the northern part of the off-site mitigation land. A small area of habitat best classified as semi-improved grassland is present leading from the eastern boundary into the northern field.

This area also had dense and scattered scrub present and supports a rabbit warren.

- 3.18.4 An area to the north east of the northern field and extending parallel to its northern boundary is tall ruderal habitat dominated by willowherbs with scattered scrub and includes a wet ditch running northwards to the site boundary and is lined by mature trees for half its length. The Saredon Brook forms the northern boundary of the site and is also lined with mature trees.

### 3.19 Summary of Habitat Valuation

- 3.19.1 Table 3.3 below provides a summary of the valuations of habitats identified as present on Site.

**Table 3.3: Summary of Habitat Valuations**

Habitat	Geographic Value	'Important' or 'Other' Ecological Feature
Arable	Site	Other Ecological Feature
Improved Grassland	Site	Other Ecological Feature
Poor Semi-Improved Grassland	Site	Other Ecological Feature
Semi-Improved Grassland	Local	Important Ecological Feature
Hedgerows	Local	Important Ecological Feature
Woodland (including Mixed Plantation, Broad-Leaved Plantation Woodland and Broad-Leaved Semi-Natural Woodland)	Local	Important Ecological Feature
Individual trees	Local	Important Ecological Feature
Individual Tree – Native black poplar	County	Important Ecological Feature
Standing Water	Local	Important Ecological Feature
Running Water	Site	Other Ecological Feature
Scrub	Site	Other Ecological Feature
Buildings	Site	Other Ecological Feature
Quarry	Negligible	Other Ecological Feature
Invasive Vegetation	Negligible	Other Ecological Feature

## 4. SPECIES

### 4.1 Amphibians

#### Legislation

- 4.1.1 All European Protected Species (EPS) are protected under the Wildlife and Countryside Act (WCA) 1981 and the Conservation of Habitats and Species Regulations 2017, the 'Habitat Regulations'. Under this legislation it is illegal to:
- i. Intentionally or deliberately capture, kill or injure listed species;
  - ii. Intentionally deliberately or recklessly damage, destroy or obstruct access to any place used for shelter or protection including resting and breeding places, whether occupied or not; and
  - iii. Deliberately, intentionally or recklessly disturb listed species when in a place of shelter (and elsewhere for EPS).
- 4.1.2 Great crested newts (GCN) (*Triturus cristatus*) are protected under this legislation.

#### Section 41/UK BAP Amphibian Species

- 4.1.3 Furthermore, several amphibian species are listed under Section 41 (s41) of the 2006 Natural Environment and Rural Communities (NERC) Act as species of principal importance for the purpose of conserving biodiversity (also known as UK Biodiversity Action Plan (BAP) priority species). These include common toad (*Bufo bufo*), natterjack toad (*Epidalea calamita*), pool frog (*Pelophylax lessonae*) and great crested newt.
- 4.1.4 Pool frog and natterjack toad have a restricted distribution in the UK. Pool frog have been reintroduced in Norfolk and are not present in Staffordshire<sup>8</sup>. Natterjack toad has a highly restricted distribution in England but small and isolated populations are found in Staffordshire at Cannock Chase<sup>9</sup>.

#### Staffordshire BAP Species

- 4.1.5 In addition to the Section 41/UK BAP species, the Staffordshire BAP also lists natterjack toad and great crested newt as the amphibian species that are included in their biodiversity action plan.

<sup>8</sup> Froglife (2016). Pool Frog. [Online] Available at: <http://www.froglife.org/amphibians-and-reptiles/pool-frog/> Accessed 19/12/2016

<sup>9</sup> Staffordshire Biodiversity Action Plan (2016) Available at: <http://sbap.org.uk/actionplan/species/index.php?id=36> Accessed 19/12/2016

## Guidance Notes and Industry Standards

- 4.1.6 Survey works have been undertaken in line with English Nature's (Natural England) Great Crested Newt Mitigation Guidelines<sup>10</sup>, the Herpetofauna Worker's Manual<sup>11</sup> and with regard to ARG UK Advice Note 4 'Amphibian disease precautions'<sup>12</sup>. The Great Crested Newt Mitigation Guidelines recommend that ponds within 500 m of GCN ponds should be taken into account where it is thought likely that GCN populations centred on these ponds would be affected. 500 m from GCN ponds has been used as a threshold for consideration in choosing which ponds to survey for amphibians.
- 4.1.7 The environmental DNA (e-DNA) elements of the amphibian survey were carried out in line with the Department for Environment, Food and Rural Affairs (DEFRA) Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA.

## Methodology

- 4.1.8 A total of 35 ponds on or within 500 m of the Site were assessed for their potential to support GCN due to the specially protected nature of this species of principal importance. The location of the 35 ponds considered is shown in Figure 10.1.004.
- 4.1.9 Where water bodies were present (and accessible) on-site or within 500 m of the Site and were not subject to any prohibitive constraints such as there being a major physical barrier between the pond and Site, a Habitat Suitability Index (HSI) assessment was undertaken using the methodology set out in ARG UK Advice Note 5<sup>13</sup>. Based on the waterbodies physical attributes, its setting, the presence of some bird, fish and invertebrate species a score was calculated to give an estimation of a water bodies potential to support GCN. HSI assessments were carried out on all qualifying ponds with the exception of Ponds 15 and 17 where an HSI Assessment was not carried out because these ponds were considered as a pond complex with Pond 16. Please note that Ponds 5 and 6 form a pond complex and were surveyed as one pond, Pond 6, during the amphibian presence/absence surveys.
- 4.1.10 The ponds within 500 m of the Site not adjudged to be separated by a significant barrier to movement were tested for e-DNA. e-DNA testing was carried out on 17 ponds on and within 500 m of the Site boundary. The samples were taken by suitably licensed Ramboll surveyors during April 2016

<sup>10</sup> Hayes C and Whitehurst J. (2001). *Great crested newt mitigation guidelines*. 1st ed. Peterborough, U.K.: English Nature

<sup>11</sup> Gent T and Gibson S. (1998). *Herpetofauna worker's manual*. 1st ed. Peterborough: JNCC

<sup>12</sup> Amphibian and Reptile Groups of the United Kingdom (2008) ARG UK Advice Note 4: Amphibian disease precautions: A guide for fieldworkers. Unpublished. Online. Available from: [www.arguk.org/index.php?option=com\\_docman&task=doc\\_download&gid=8&Itemid=17](http://www.arguk.org/index.php?option=com_docman&task=doc_download&gid=8&Itemid=17)

<sup>13</sup> Amphibian and Reptile Groups of the United Kingdom (2010) ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. Unpublished. Online. Available from: [www.arguk.org/index.php?option=com\\_docman&task=doc\\_download&gid=9&Itemid=17](http://www.arguk.org/index.php?option=com_docman&task=doc_download&gid=9&Itemid=17)



and a further single pond was sampled in June 2016. The ponds which returned negative e-DNA results in 2016 were tested again via e-DNA in April 2017. Samples were taken following best practice methods as set out in the section below.

- 4.1.11 The e-DNA method involved taking 20 water samples from each pond identified and then sending them to a laboratory for analysis. The water samples from each pond were collected in a bag and gently shaken to homogenise the sample. Samples were taken with a ladle from as deep as possible into the ponds, without disturbing sediment on the pond bottom. Once the samples had been taken, six vials containing a pre-filled control DNA solution were filled using a pipette and labelled. The six samples for each pond were sent to the laboratory for analysis to determine the presence or absence of GCN DNA. At no time was the water entered and new sterile gloves were used at each pond to avoid any potential cross-contamination between water bodies. The surveyed pond locations can be seen on Figure 10.1.004.
- 4.1.12 The presence/likely absence survey for GCN, adopted the methods recommended in the Great Crested Newt Mitigation Guidelines and the Herpetofauna Worker's Manual for detecting the presence of GCN. Ten ponds were identified as requiring population estimate surveys following the HSI assessments and e-DNA testing. A further four ponds were surveyed using traditional methods in 2017 to establish presence/likely absence. At least three of the four standard survey techniques were deployed on the fourteen ponds by suitably licensed surveyors. The surveys were led at various times of the survey season by GCN License holders Chris Hodsman (License no. 2015-17342-CLS-CLS), Chris Day (License no. 2015-17852-CLS-CLS) and Malcolm Robertson (License No. 2015-16910-CLS-CLS) and were supported by Emily McVean, James Fraser, Carl Bailey and Timothy Cathery, all of whom have experience of carrying out GCN surveys. The techniques from which three were used are described below:
- i. Bottle trapping – During each survey, bottle traps were set at approximately 2 m intervals, along accessible and suitable margins of the ponds. Partly submerged bottles with an air bubble retained, were held firmly in place with a cane inserted into the substrate, to prevent tilting, and loss of the air bubble. Bottles were left overnight, and checked/removed early the following morning.
  - ii. Torchlight counts – After dark, all accessible areas of open water within each of the ponds were slowly walked around, and scanned with a powerful 1-million candle power beam. Any amphibians observed during a circuit of the ponds were identified, and recorded. Additional, non-target species (including invertebrates and fish) were also recorded to provide a context to the results.

iii. Egg search – GCN eggs were searched for on submerged and floating aquatic vegetation, and suitable debris within the pond. This method is considered to be very effective at detecting GCN (Gent and Gibson, 1998) and can be used to confirm breeding behaviour within the ponds.

iv. Hand Netting – Areas of open water, and suitable submerged vegetation, were searched using a D-net for approximately 15 to 20 minutes. Non-target species such as invertebrates and fish were also recorded for context.

4.1.13 Environmental data, such as air temperature, weather conditions, vegetation density and water turbidity was also recorded for each pond survey. This can help determine the validity of survey, and how robust the data gathered is. Incidental records of other amphibian species seen in the survey were made.

### Limitations

4.1.14 Limitations were mainly related to the changing seasonal conditions over the course of the survey programme. Limitations encountered included significant fluctuations in the water levels of the surveyed ponds due to sustained periods of wet or dry weather and the underlying geology. This was notable between the end of May and mid-June. Surveys undertaken in late-May/early June showed significant drying of the ponds whereas water levels increased appreciably for surveys undertaken later in June, particularly those carried out on 15 June 2016. The drying of ponds meant water levels dropped so low as to make it difficult to get bottle traps fully submerged under the water or reducing the number of traps it was possible to deploy in reduced size ponds. Pond 22 dried up completely for the fourth and fifth surveys and so no survey was possible at these times.

4.1.15 The fluctuating water level also impacted on egg searches at Ponds 23 and 29 where the vegetation where amphibian eggs had previously been found became deeply submerged and so were not possible to search further. In these instances, all accessible vegetation was searched.

- 4.1.16 The condition of the water bodies was at times a limitation to the surveys. Turbidity of the water was a factor that made torching of the ponds (or areas of the ponds) difficult at times. The turbidity changed according to local conditions and tended to be worse after rainfall. Light to moderate rainfall (showers) were encountered on surveys undertaken on 10 May 2016 and 12 May 2016 and whilst making torching more difficult due to the water being disturbed this was not considered to be a significant constraint to the survey. Other limitations included large amounts of debris and detritus such as leaves in and on the surface of the some of the ponds making torching less effective. Visibility was also reduced by a film of pollen, areas of flote grass and thick algal blooms in certain ponds at various times of the year.
- 4.1.17 Safe access to ponds was a limitation on some surveys, particularly when the water level rose significantly due to heavy rainfall and when increases in vegetation growth over the season decreased safe access to some of the bank areas. This was particularly the case at Pond 14 on the first and fifth visits (3 May 2016 and 7 June 2016 respectively) and Pond 21 on the first visit (4 May 2016). Some ponds had limited or difficult access throughout the surveys. This was particularly evident at Pond 8 where 90% of the margin was surrounded by dense rhododendron preventing access. This reduced the ability to spread out bottle traps and thoroughly search the pond by torch. No safe access was possible for surveyors to undertake an egg search. As such, only two survey methods were employed on this pond. It should be noted that despite this particular limitation at Pond 8, smooth newts were found on four out of six surveys.
- 4.1.18 Bottle trapping and egg searches at Pond 21 were on occasion partially constrained due to deep sediment and associated thick vegetation which prevented safe access to all areas of the pond. Bottle traps were deployed and egg searches undertaken in all areas which were safely accessible.
- 4.1.19 The first and second bottle trapping survey visits (3 May 2016 to 4 May 2016 and 4 May 2016 to 5 May 2016) were constrained in that overnight the temperatures dropped below the recommended guidelines for surveys i.e. below 5 °C. Temperatures in the mornings of these surveys were recorded as 1 °C and 4 °C respectively. On both instances the bottle traps were set within the recommended temperature guidelines and at the right time of year and the temperature forecast was not predicted to drop below 5 °C. Both surveys caught newts in bottle traps and no welfare issues were found with any of the animals trapped.

- 4.1.20 Net surveys were not carried out in 2016 as it was considered that net surveys would disturb habitat, including any eggs present, and further increase the turbidity of the water. Restrictions for access to banks noted above also applied to netting. Surveys undertaken in 2017 utilised netting as no limitations were noted with respect to turbidity and there was a relative lack of suitable vegetation for egg laying to search for the presence of eggs.
- 4.1.21 Despite the constraints listed, newts (smooth newt) were found at every survey pond apart from Pond 22 and the results of constrained surveys were comparable to unconstrained ones. The constraints encountered are not considered to have had a major impact on the overall findings of the surveys and so the results can be considered to be valid.

### Desk Study

- 4.1.22 The SERC returned 19 records of GCN in the vicinity of the Site. The closest records are approximately 987 m to the south of the Site recorded in 2007. The other records are also to the south of the Site and range from 2109 m to 2733 m away from the centre of the Site (approximately 1600 m to 2300 m from the closest point to the Site). The dates of these records range from 1985 to 2015 and the majority are from the Laches Wood area, the location of the Laches Wood Outdoor Education Area.

### Results

- 4.1.23 A total of 35 static waterbodies were identified on the Site and within a 500 m buffer of the Site boundary. The 35 ponds can be seen on Figure 10.1.004. Twenty-nine of these ponds were considered in surveys undertaken in 2016 and a further 6 ponds were considered in 2017.

Of the off-site ponds within 500 m of the Site, Ponds 1, 2, 3, 10, 11, 12, 13 and 28 were not considered for further survey as there was a physical barrier to amphibian movement between them and the Site. Pond 33 and 34 returned a Poor HSI score and were heavily stocked with fish and impacted by wildfowl and were not surveyed further.

- 4.1.24 Pond numbers 7, 9 and 25 were found to be dry. Pond 26 was on private property where access was not permitted; as such this was not surveyed.
- 4.1.25 The remaining ponds (either on the Site or within 500 m of Site) were considered to have the potential to support GCN and all were categorised under an HSI assessment and tested for GCN DNA using the e-DNA technique or were surveyed using traditional survey methods. The ponds which returned negative e-DNA results in 2016 were tested again via e-DNA in 2017. All ponds tested negative again (4, 15, 20 and 27) with the exception of pond 17 which tested positive. Ponds 15, 16 and 17 were treated as a complex of ponds and pond 16 was already confirmed to support

low numbers of GCN in 2016. A summary table of the findings of the GCN surveys is below in Table 4.1.

**Table 4.1: Summary of GCN Survey Results**

Pond Reference	Habitat Suitability Index Score	GCN Suitability	2016 e-DNA Results	2017 e-DNA Results	Traditional Survey Results
Pond 1	Barrier to movement – A449.				
Pond 2	Barrier to movement – A5.				
Pond 3	Barrier to movement – A5.				
Pond 4	0.57	Below average	Negative	Negative	N/A
Pond 5	0.56	Below average	Negative	N/A	Surveyed with Pond 6 – Assumed absent
Pond 6	0.61	Average	Positive	N/A	Surveyed with Pond 5 – Assumed absent
Pond 7	DRY	Not Suitable	N/A	N/A	N/A
Pond 8	0.75	Good	Positive	N/A	Assumed absent
Pond 9	DRY	Not Suitable	N/A	N/A	N/A
Pond 10	Barrier to movement – A449.				
Pond 11	Barrier to movement – A449.				
Pond 12	Barrier to movement – A449.				
Pond 13	Barrier to movement – A449.				
Pond 14	0.74	Good	Positive	N/A	Assumed absent
Pond 15	0.75	Good	Negative	Negative	Pond part of complex with 16 & 17
Pond 16	0.78	Good	Positive	N/A	Low Population
Pond 17	0.61	Average	Negative	Positive	Pond part of complex with 15 & 16
Pond 18	0.67	Average	Positive	N/A	Assumed absent
Pond 19	0.70	Good	Negative	N/A	N/A
Pond 20	0.48	Poor	Negative	Negative	N/A
Pond 21	0.59	Below Average	Positive	N/A	Assumed absent
Pond 22	0.51	Below Average	Positive	N/A	Assumed absent
Pond 23	0.75	Good	Positive	N/A	Assumed absent

Pond Reference	Habitat Suitability Index Score	GCN Suitability	2016 e-DNA Results	2017 e-DNA Results	Traditional Survey Results
Pond 24	0.75	Good	Positive	N/A	Assumed absent
Pond 25	DRY	Not Suitable	N/A	N/A	N/A
Pond 26	No Access – Private property.				
Pond 27	0.49	Poor	Negative	Negative	N/A
Pond 28	Barrier to movement - Staffordshire and Worcestershire Canal.				
Pond 29	0.71	Good	Positive	N/A	Assumed absent
Pond 30	0.50	Below Average	N/A	N/A	Assumed absent
Pond 31	0.62	Average	N/A	N/A	Assumed absent
Pond 32	0.55	Below Average	N/A	N/A	Assumed absent
Pond 33	0.31	Poor - heavily stocked with fish and impacted by wildfowl	N/A	N/A	N/A
Pond 34	0.31	Poor - heavily stocked with fish and impacted by wildfowl	N/A	N/A	N/A
Pond 45 SL	0.64	Average	N/A	N/A	Assumed absent

4.1.26 A population estimate survey using traditional techniques was carried out using standard techniques over six visits in 2016. A presence/likely absence survey using traditional techniques was carried out using standard techniques over four visits in 2017. The following table (Table 4.2) displays the weather conditions for each of the six GCN surveys carried out in 2016 and the four additional surveys carried out on four ponds in 2017.

**Table 4.2: Dates and Weather Conditions for GCN Surveys**

Date	Air Temperature at Survey Start °C	Minimum Overnight Air Temperature °C	Conditions
03/05/2016 – 04/05/2016	6	1	No rain; light wind; 33-66% cloud cover
04/05/2016 – 05/05/2016	5	4	No rain; light wind; 0-33% cloud cover
10/05/2016 – 11/05/2016	17	12	Moderate rain; light wind; 66-100% cloud cover
11/05/2016 – 12/05/2016	20	12	Light rain; light wind; 66-100% cloud cover
16/05/2016 –	7	7	No rain; light wind; 0-33% cloud cover

Date	Air Temperature at Survey Start °C	Minimum Overnight Air Temperature °C	Conditions
17/05/2016			
17/05/2016 – 18/05/2016	12	7	No rain; light wind; 33-66% cloud cover
18/05/2016 - 19/05/2016	12	10	No rain; light wind; 0-33% cloud cover
24/05/2016 – 25/05/2016	10	8	No rain; light wind; 0-33% cloud cover
25/05/2016 – 26/05/2016	10	7	No rain; light wind; 66-100% cloud cover
06/06/2016 – 07/06/2016	14	10	No rain; no wind; 0-33% cloud cover
07/06/2016 – 08/06/2016	14	13	No rain; light wind; 33-66% cloud cover
14/06/2016 – 15/06/2016	13	11	No rain; light wind; 66-100% cloud cover
15/06/2016 – 16/06/2016	13	13	No rain; no wind; 33-66% cloud cover
30/03/2017 – 31/03/2017	12	12	No rain; no wind; 0-33% cloud cover
05/04/2017 – 06/04/2017	6	4	No rain; light wind; 33-66% cloud cover
12/04/2017 – 13/04/2017	9	6	No rain; light wind; 66-100% cloud cover
04/05/2017 – 05/05/2017	11	6	No rain; light wind; 0-33% cloud cover

4.1.27 The following tables (Table 4.3 to Table 4.16) show the survey methods used during each of the visits and the results.

**Table 4.3: Pond 6 GCN Survey Results**

Survey Date	Smooth Newt			GCN			Other Observations
	Torch	Bottle	Egg Search	Torch	Bottle	Egg Search	
03/05/2016 – 04/05/2016	0	0	0	0	0	0	Turbidity <sup>1</sup> – 4; Vegetation cover <sup>2</sup> - 3
10/05/2016 – 11/05/2016	1	0	0	0	0	0	Turbidity <sup>1</sup> - 3; Vegetation cover <sup>2</sup> - 2 (dense in patches)
17/05/2016 – 18/05/2016	0	0	0	0	0	0	Turbidity <sup>1</sup> – 3; Vegetation cover <sup>2</sup> - 2
24/05/2016 – 25/05/2016	0	1	0	0	0	0	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> - 2
07/06/2016 – 08/06/2016	0	0	0	0	0	0	Turbidity <sup>1</sup> – 3; Vegetation cover <sup>2</sup> - 2
15/06/2016 – 16/06/2016	0	0	0	0	0	0	Turbidity <sup>1</sup> – 1; Vegetation cover <sup>2</sup> - 2

1 Turbidity of water (0- completely clear to 5- very turbid)

2 Vegetation cover (0- no vegetation obscuring survey to 5- water completely obscured by vegetation)

**Table 4.4: Pond 8 GCN Survey Results**

Survey Date	Smooth Newt			GCN			Other Observations
	Torch	Bottle	Egg Search	Torch	Bottle	Egg Search	
04/05/2016 – 05/05/2016	0	1	No safe access	0	0	No safe access	Turbidity <sup>1</sup> – 4; Vegetation cover <sup>2</sup> - 0
11/05/2016 – 12/05/2016	0	0	No safe access	0	0	No safe access	Turbidity <sup>1</sup> – 4; Vegetation cover <sup>2</sup> - 0
16/05/2016 – 17/05/2016	0	4	No safe access	0	0	No safe access	Turbidity <sup>1</sup> – 1; Vegetation cover <sup>2</sup> - 0
25/05/2016 – 26/05/2016	0	2	No safe access	0	0	No safe access	Turbidity <sup>1</sup> – 2/3; Vegetation cover <sup>2</sup> - 1
07/06/2016 – 08/06/2016	0	14	No safe access	0	0	No safe access	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> - 1
15/06/2016 – 16/06/2016	0	4	No safe access	0	0	No safe access	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> - 1

<sup>1</sup> Turbidity of water (0- completely clear to 5- very turbid)

<sup>2</sup> Vegetation cover (0- no vegetation obscuring survey to 5- water completely obscured by vegetation)

**Table 4.5: Pond 14 GCN Survey Results**

Survey Date	Smooth Newt			GCN			Other Observations
	Torch	Bottle	Egg Search	Torch	Bottle	Egg Search	
03/05/2016 – 04/05/2016	0	1	0	0	0	0	Turbidity <sup>1</sup> – 5; Vegetation cover <sup>2</sup> - 3
10/05/2016 – 11/05/2016	4	0	0	0	0	0	Turbidity <sup>1</sup> – 3/4; Vegetation cover <sup>2</sup> – 3/4
18/05/2016 – 19/05/2016	0	2	0	0	0	0	Turbidity <sup>1</sup> – 3/4; Vegetation cover <sup>2</sup> - 1
25/05/2016 – 26/05/2016	4	4	0	0	0	0	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> - 1
07/06/2016 – 08/06/2016	0	2	0	0	0	0	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> - 1
14/06/2016 – 15/06/2016	1	1	0	0	0	0	Turbidity <sup>1</sup> – 3; Vegetation cover <sup>2</sup> - 1

<sup>1</sup> Turbidity of water (0- completely clear to 5- very turbid)

<sup>2</sup> Vegetation cover (0- no vegetation obscuring survey to 5- water completely obscured by vegetation)

**Table 4.6: Pond 16 GCN Survey Results**

Survey Date	Smooth Newt			GCN			Other Observations
	Torch	Bottle	Egg Search	Torch	Bottle	Egg Search	
03/05/2016 – 04/05/2016	0	0	0	0	0	0	Turbidity <sup>1</sup> – 5; Vegetation cover <sup>2</sup> - 1
10/05/2016 – 11/05/2016	0	0	0	0	0	0	Turbidity <sup>1</sup> – 4; Vegetation cover <sup>2</sup> - 1
17/05/2016 – 18/05/2016	6	1	0	<b>1 (tail flash)</b>	0	0	Turbidity <sup>1</sup> – 5; Vegetation cover <sup>2</sup> - 1
24/05/2016- 25/06/2016	2	2	0	0	0	0	Turbidity <sup>1</sup> – 4; Vegetation cover <sup>2</sup> - 1
06/06/2016 – 07/06/2016	10	0	0	0	<b>1 (gravid)</b>	0	Turbidity <sup>1</sup> – 3; Vegetation cover <sup>2</sup> - 1



14/06/2016 – 15/06/2016	5	2	0	<b>1 (tail flash)</b>	2	0	Turbidity <sup>1</sup> – 2/3; Vegetation cover <sup>2</sup> -1
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1 Turbidity of water (0- completely clear to 5- very turbid)

2 Vegetation cover (0- no vegetation obscuring survey to 5- water completely obscured by vegetation)

**Table 4.7: Pond 18 GCN Survey Results**

Survey Date	Smooth Newt			GCN			Other Observations
	Torch	Bottle	Egg Search	Torch	Bottle	Egg Search	
03/05/2016 – 04/05/2016	0	0	0	0	0	0	Turbidity <sup>1</sup> – 3; Vegetation cover <sup>2</sup> - 3
10/05/2016 – 11/05/2015	0	7	0	0	0	0	Turbidity <sup>1</sup> – 3; Vegetation cover <sup>2</sup> - 4
16/05/2016 – 17/05/2016	0	1	0	0	0	0	Turbidity <sup>1</sup> – 3; Vegetation cover <sup>2</sup> - 4
24/05/2016 – 25/05/2016	0	0	0	0	0	0	Turbidity <sup>1</sup> – 3; Vegetation cover <sup>2</sup> - 2
07/06/2016 – 08/06/2016	1	0	0	0	0	0	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> - 3
14/06/2016 – 15/06/2016	0	2	0	0	0	0	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> – 2

1 Turbidity of water (0- completely clear to 5- very turbid)

2 Vegetation cover (0- no vegetation obscuring survey to 5- water completely obscured by vegetation)

**Table 4.8: Pond 21 GCN Survey Results**

Survey Date	Smooth Newt			GCN			Other Observations
	Torch	Bottle	Egg Search	Torch	Bottle	Egg Search	
04/05/2016 – 05/05/2016	0	0	0	0	0	0	<b>Turbidity<sup>1</sup> – 2; Vegetation cover<sup>2</sup> - 4</b>
11/05/2016 – 12/05/2016	0	0	0	0	0	0	<b>Turbidity<sup>1</sup> – 3; Vegetation cover<sup>2</sup> – 3/4</b>
16/05/2016 – 17/05/2016	0	0	0	0	0	0	<b>Turbidity<sup>1</sup> – 2; Vegetation cover<sup>2</sup> - 3</b>
24/05/2016 – 25/05/2016	0	2	0	0	0	0	<b>Turbidity<sup>1</sup> – 3; Vegetation cover<sup>2</sup> - 4</b>
06/06/2016 – 07/06/2016	0	0	0	0	0	0	<b>Turbidity<sup>1</sup> – 2; Vegetation cover<sup>2</sup> - 3</b>
14/06/2016 – 15/06/2016	0	0	0	0	0	0	<b>Turbidity<sup>1</sup> – 3; Vegetation cover<sup>2</sup> - 3</b>

1 Turbidity of water (0- completely clear to 5- very turbid)

2 Vegetation cover (0- no vegetation obscuring survey to 5- water completely obscured by vegetation)

**Table 4.9: Pond 22 GCN Survey Results**

Survey Date	Smooth Newt			GCN			Other Observations
	Torch	Bottle	Egg Search	Torch	Bottle	Egg Search	
04/05/2016 – 05/05/2016	0	0	0	0	0	0	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> - 2
11/05/2016 – 12/05/2016	0	0	0	0	0	0	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> - 2
16/05/2016 – 17/05/2016	0	0	0	0	0	0	Turbidity <sup>1</sup> – 1; Vegetation cover <sup>2</sup> - 1
24/05/2016 – 25/05/2016	N/A – Pond dry	N/A – Pond dry	N/A – Pond dry	N/A – Pond dry	N/A – Pond dry	N/A – Pond dry	Turbidity <sup>1</sup> – N/A; Vegetation cover <sup>2</sup> – N/A
06/06/2016 – 07/06/2016	N/A – Pond dry	N/A – Pond dry	N/A – Pond dry	N/A – Pond dry	N/A – Pond dry	N/A – Pond dry	Turbidity <sup>1</sup> – N/A; Vegetation cover <sup>2</sup> – N/A
14/06/2016 – 15/06/2016	0	0	0	0	0	0	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> - 1

1 Turbidity of water (0- completely clear to 5- very turbid)

2 Vegetation cover (0- no vegetation obscuring survey to 5- water completely obscured by vegetation)

**Table 4.10: Pond 23 GCN Survey Results**

Survey Date	Smooth Newt			GCN			Other Observations
	Torch	Bottle	Egg Search	Torch	Bottle	Egg Search	
04/05/2016 – 05/05/2016	6	0	0	0	0	0	Turbidity <sup>1</sup> – 3; Vegetation cover <sup>2</sup> - 2
11/05/2016 – 12/05/2016	2	4	0	0	0	0	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> - 1
16/05/2016 – 17/05/2016	2	0	Present	0	0	0	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> - 1
25/05/2016 – 26/05/2016	0	0	Present	0	0	0	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> - 1
06/06/2016 – 07/06/2016	2	0	Present	0	0	0	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> - 1
15/06/2016 – 15/06/2016	0	0	Water too deep	0	0	0	Turbidity <sup>1</sup> – 2/3; Vegetation cover <sup>2</sup> - 1

1 Turbidity of water (0- completely clear to 5- very turbid)

2 Vegetation cover (0- no vegetation obscuring survey to 5- water completely obscured by vegetation)

**Table 4.11: Pond 24 GCN Survey Results**

Survey Date	Smooth Newt			GCN			Other Observations
	Torch	Bottle	Egg Search	Torch	Bottle	Egg Search	
04/05/2016 – 05/05/2016	12	4	0	0	0	0	Turbidity <sup>1</sup> – 4; Vegetation cover <sup>2</sup> - 1
11/05/2016 – 12/05/2016	0	4	0	0	0	0	Turbidity <sup>1</sup> – 1; Vegetation cover <sup>2</sup> - 1
16/05/2016 – 17/05/2016	5	0	0	0	0	0	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> - 1
24/05/2016 – 25/05/2016	0	3	0	0	0	0	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> - 1

06/06/2016 – 07/06/2016	1	2	0	0	0	0	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> - 1
14/06/2016 – 15/06/2016	4	2	0	0	0	0	Turbidity <sup>1</sup> – 1; Vegetation cover <sup>2</sup> - 1

1 Turbidity of water (0- completely clear to 5- very turbid)

2 Vegetation cover (0- no vegetation obscuring survey to 5- water completely obscured by vegetation)

**Table 4.12: Pond 29 GCN Survey Results**

Survey Date	Smooth Newt			GCN			Other Observations
	Torch	Bottle	Egg Search	Torch	Bottle	Egg Search	
04/05/2016 – 05/05/2016	0	6	0	0	0	0	Turbidity <sup>1</sup> – 5; Vegetation cover <sup>2</sup> - 1
11/05/2016 – 12/05/2016	12	7	0	0	0	0	Turbidity <sup>1</sup> – 1; Vegetation cover <sup>2</sup> - 1
16/05/2016 – 17/05/2016	1	4	Present	0	0	0	Turbidity <sup>1</sup> – 1; Vegetation cover <sup>2</sup> - 1
24/05/2016 – 25/05/2016	2	3	Present	0	0	0	Turbidity <sup>1</sup> – 3; Vegetation cover <sup>2</sup> - 1
06/06/2016 – 07/06/2016	1	0	Present	0	0	0	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> – ½ NB – pond largely dry
15/06/2016 – 16/06/2016	2	0	Water too deep	0	0	0	Turbidity <sup>1</sup> – 4; Vegetation cover <sup>2</sup> - 2

1 Turbidity of water (0- completely clear to 5- very turbid)

2 Vegetation cover (0- no vegetation obscuring survey to 5- water completely obscured by vegetation)

**Table 4.13: Pond 30 GCN Survey Results**

Survey Date	Smooth Newt			GCN			Other Observations
	Torch	Bottle	Egg Search/ Netting	Torch	Bottle	Egg Search/ Netting	
30/03/2017 – 31/03/2017	0	1	0 (Egg search)	0	0	0 (Egg search)	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> - 0
05/04/2017 – 06/04/2017	2	0	0 (Netting)	0	0	0 (Netting)	Turbidity <sup>1</sup> - 0; Vegetation cover <sup>2</sup> - 0
12/04/2017 – 13/04/2017	0	1	0 (Netting)	0	0	0 (Netting)	Turbidity <sup>1</sup> – 1; Vegetation cover <sup>2</sup> - 0
04/05/2017 – 05/05/2017	0	4	0 (Netting)	0	0	0 (Netting)	Turbidity <sup>1</sup> – 1; Vegetation cover <sup>2</sup> - 0

1 Turbidity of water (0- completely clear to 5- very turbid)

2 Vegetation cover (0- no vegetation obscuring survey to 5- water completely obscured by vegetation)

**Table 4.14: Pond 45 (SL) GCN Survey Results**

Survey Date	Smooth Newt			GCN			Other Observations
	Torch	Bottle	Egg Search/ Netting	Torch	Bottle	Egg Search/ Netting	
30/03/2017 – 31/03/2017	0	1	0 (Egg search)	0	0	0 (Egg search)	Turbidity <sup>1</sup> – 4; Vegetation cover <sup>2</sup> - 3
05/04/2017 – 06/04/2017	0	0	0 (Netting)	0	0	0 (Netting)	Turbidity <sup>1</sup> - 5; Vegetation cover <sup>2</sup> - 5
12/04/2017 – 13/04/2017	0	0	0 (Netting)	0	0	0 (Netting)	Turbidity <sup>1</sup> – 4; Vegetation cover <sup>2</sup> – 4

04/05/2017 – 05/05/2017	0	1	0 (Netting)	0	0	0 (Netting)	Turbidity <sup>1</sup> – 3; Vegetation cover <sup>2</sup> - 3
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1 Turbidity of water (0- completely clear to 5- very turbid)

2 Vegetation cover (0- no vegetation obscuring survey to 5- water completely obscured by vegetation)

**Table 4.15: Pond 31 GCN Survey Results**

Survey Date	Smooth Newt			GCN			Other Observations
	Torch	Bottle	Egg Search/ Netting	Torch	Bottle	Egg Search/ Netting	
30/03/2017 – 31/03/2017	0	0	0 (Egg search)	0	0	0 (Egg search)	Turbidity <sup>1</sup> – 0; Vegetation cover <sup>2</sup> - 1
05/04/2017 – 06/04/2017	0	0	0 (Netting)	0	0	0 (Netting)	Turbidity <sup>1</sup> - 1; Vegetation cover <sup>2</sup> - 1
12/04/2017 – 13/04/2017	0	0	0 (Egg search)	0	0	0 (Egg search)	Turbidity <sup>1</sup> – 1; Vegetation cover <sup>2</sup> - 3
04/05/2017 – 05/05/2017	1	0	0 (Egg search)	0	0	0 (Egg search)	Turbidity <sup>1</sup> – 1; Vegetation cover <sup>2</sup> – 3/4

1 Turbidity of water (0- completely clear to 5- very turbid)

2 Vegetation cover (0- no vegetation obscuring survey to 5- water completely obscured by vegetation)

**Table 4.16: Pond 32 GCN Survey Results**

Survey Date	Smooth Newt			GCN			Other Observations
	Torch	Bottle	Egg Search/ Netting	Torch	Bottle	Egg Search/ Netting	
30/03/2017 – 31/03/2017	0	0	0 (Egg search)	0	0	0 (Egg search)	Turbidity <sup>1</sup> – 2; Vegetation cover <sup>2</sup> - 0
05/04/2017 – 06/04/2017	0	0	0 (Netting)	0	0	0 (Netting)	Turbidity <sup>1</sup> - 3; Vegetation cover <sup>2</sup> - 0
12/04/2017 – 13/04/2017	0	0	0 (Egg search)	0	0	0 (Egg search)	Turbidity <sup>1</sup> – 3; Vegetation cover <sup>2</sup> - 1
04/05/2017 – 05/05/2017	1	0	0 (Egg search)	0	0	0 (Egg search)	Turbidity <sup>1</sup> – 1; Vegetation cover <sup>2</sup> - 2

1 Turbidity of water (0- completely clear to 5- very turbid)

2 Vegetation cover (0- no vegetation obscuring survey to 5- water completely obscured by vegetation)

- 4.1.28 The results in Tables 4.3 to 4.16 above show that of the fourteen ponds surveyed, GCN were confirmed as being present in one of the ponds, Pond 16 (which formed a complex with ponds 15 and 17). Results of the GCN Surveys are presented in Figure 10.1.101.
- 4.1.29 A maximum count of two (female) GCN were caught in bottle traps on survey 6 in Pond 16 carried out on 14 June 2016 to 15 June 2016 indicating a ‘small’ population i.e. a maximum count up to ten. One gravid female was caught in a bottle trap on survey 5.
- 4.1.30 Smooth newts (*Lissotriton vulgaris*) were present in thirteen out of the fourteen ponds surveyed, the exception being Pond 22. In addition to newts

observed, smooth newt eggs were found on three visits each at Pond 23 and Pond 29. Survey visit 6 (15/06/2016) at both Pond 23 and Pond 29 was constrained due to a significant rise in water levels submerging vegetation where eggs had been found on the previous three surveys at both ponds.

- 4.1.31 Other amphibian species (in addition to newts) were identified during the survey programme. This includes the common toad which is a Section 41/UK BAP species. The other amphibians identified are shown in Table 4.17 below.

**Table 4.17: Amphibian Survey Results**

Pond Reference	Survey Date	Amphibian Species Identified
Pond 6	17/05/2016 – 18/05/2016	Tadpoles – common frog
	24/05/2016 – 25/05/2016	Tadpoles – common frog Tadpoles – common toad
	07/06/2016 – 08/06/2016	Tadpoles – common frog
	15/06/2016 – 16/06/2016	Tadpoles – common frog
Pond 8	N/A	No other amphibian species identified
Pond 14	03/05/2016 – 04/05/2016	One common toad
	25/05/2016 – 26/05/2016	Tadpoles – common frog
Pond 16	17/05/2016 – 18/05/2016	Tadpole – common frog
	24/05/2016 – 25/06/2016	Tadpole – common frog
	14/06/2016 – 15/06/2016	Tadpole – common frog
Pond 18	N/A	No other amphibian species identified
Pond 21	11/05/2016 – 12/05/2016	Tadpole – common frog
	16/05/2016 – 17/05/2016	Tadpole – common frog
	24/05/2016 – 25/05/2016	Two common frog Tadpoles – common frog
	06/06/2016 – 07/06/2016	Common frog Tadpoles – common frog
	14/06/2016 – 15/06/2016	Tadpoles – common frog
Pond 22	n/a	No other amphibian species identified
Pond 23	25/05/2016 – 26/05/2016	Tadpoles – common frog
	06/06/2016 – 07/06/2016	Common frog Tadpoles – common frog
	15/06/2016 – 16/06/2016	Tadpoles – common frog
Pond 24	24/05/2016 – 25/05/2016	Tadpoles – common frog
	06/06/2016 – 07/06/2016	Common frog

Pond Reference	Survey Date	Amphibian Species Identified
	14/06/2016 – 15/06/2016	Tadpoles – common frog
Pond 29	11/05/2016 – 12/05/2016	Tadpoles – common frog
	16/05/2016 – 17/05/2016	Common toad Tadpoles – common frog
	24/05/2016 – 25/05/2016	Tadpoles – common frog
	15/06/2016 – 16/06/2016	Common frog (juvenile)
Pond 30	12/04/2017 – 13/04/2017	Tadpole – common frog
Pond 45 (SL)	N/A	No other amphibian species identified
Pond 31	30/03/2017 – 31/03/2017	Common toad
	04/05/2017 – 05/05/2017	Common frog
Pond 32	N/A	No other amphibian species identified

4.1.32 Table 4.17 above shows that three common toad were observed during the surveys, one in Pond 14, one in Pond 29 and one in Pond 31. Common toad tadpoles were also observed in Pond 6. In addition, a total of seven common frogs were observed in Ponds 21, 23, 24, 29 and 31 with common frog tadpoles observed in all ponds except Ponds 8, 18, 22, 45 and 32 where no other amphibians were observed at all.

4.1.33 Incidental records of amphibians were made during the reptile survey (see Section 4.2 for methods employed in that survey). Records included common toads recorded under reptile refugia on six out of seven reptile surveys in 2016 (not found on Survey 3) and four out of seven reptile surveys in 2017. A peak count of 18 toads were found on survey 7 in 2016. Over the seven reptile surveys a total of 56 toad records were made in 2016 and 6 in 2017. Toads were found in all areas of the Site where reptile refugia had been placed, with the exception of refugia 88-103 that were placed along the margin of arable fields and adjacent to the railway line in the western portion of the Site. Many of the toads recorded were juveniles. In addition, three common frogs were found under reptile refugia over the course of the surveys. See Figure 10.1.201 for the locations of the reptile refugia.

### Valuation Summary

4.1.34 A disparity exists between the GCN e-DNA results and the surveys undertaken utilising traditional survey methods whereby GCN were only physically confirmed as present through use of traditional techniques in one of the ten ponds that returned positive e-DNA results. Results gained via e-DNA tests do not provide a population size class assessment (i.e. newt

abundance). The positive e-DNA results indicate that GCN are present within the landscape. No GCN were found during surveys of four ponds undertaken in 2017 using traditional survey techniques. The surveys undertaken using traditional methods indicate that whilst present within the landscape they are present in low numbers (undetectable by traditional survey techniques) with the exception of Pond 16 off-site which is within 500m of the Site.

- 4.1.35 The newt population identified on the Site is in keeping with the Staffordshire population i.e. widespread and present across the county. As such, GCN (and common toad) are considered to be of value at the Local scale and are to be considered as an 'Important Ecological Feature' within the EIA.
- 4.1.36 Common frog and smooth newt are considered to be of value at the Site scale and are to be considered as an 'Other Ecological Feature' within the EIA.

## 4.2 Reptiles

### Legislation

- 4.2.1 All of the common reptile species native to Britain; grass snake (*Natrix natrix*), adder (*Vipera berus*), common lizard (*Zootoca vivipara*) and slow worm (*Anguis fragilis*) are protected under Sections 9(1) and 9(5) of the Wildlife and Countryside Act 1981 (as amended). This legislation makes it illegal to intentionally kill, injure, sell or advertise for sale a common reptile and also, to sell, barter, exchange or transport for sale these animals or parts of them. However, their habitat is not directly protected.
- 4.2.2 In addition, sand lizard and smooth snake are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of The Conservation of Habitats and Species Regulations 2017 making them European Protected Species. This legislation makes it illegal to carry out the following activities:
- i. Deliberately or recklessly disturb, capture or kill these animals;
  - ii. Deliberately or recklessly take or destroy eggs of these animals;
  - iii. Damage or destroy a breeding site or resting place of such a wild animal; and
  - iv. Keep, transport, sell or exchange, or offer for sale or exchange, any live or dead animal, or any part of, or anything derived from such a wild animal.

### Section 41/UK BAP Reptile Species

- 4.2.3 Furthermore, all UK reptile species are listed under Section 41 (s41) of the 2006 Natural Environment and Rural Communities (NERC) Act as species of

principal importance for the purpose of conserving biodiversity and UK Biodiversity Action Plan (BAP) priority species.

- 4.2.4 Sand lizard and smooth snake have a restricted distribution in the UK and neither species occurs in Staffordshire<sup>14</sup>.

### **Staffordshire BAP Species**

- 4.2.5 In addition to the Section 41/UK BAP species, the Staffordshire BAP also lists grass snake as a priority species.

### **Guidance Notes and Industry Standards**

- 4.2.6 This survey was undertaken following best practice guidance outlined in the Herpetofauna Workers' Manual<sup>15</sup> and Froglife Advice Sheet 10<sup>16</sup>.

### **Methodology**

- 4.2.7 Artificial refugia, each measuring approximately 0.5 m<sup>2</sup> were placed within areas of suitable reptile habitat, such as areas of coarse grass habitat and woodland edges that would be in direct sunlight, and left to bed-in for one week. A total of 132 refugia were placed across the Site in surveys carried out across 2016 and 2017. The location of the refugia is shown in Figure 10.1.201. Refugia were of bituminous roofing felt with four additional 1 m<sup>2</sup> coroline corrugated roofing tiles placed to supplement the felt refugia in an area thought to have the highest potential for snake species, notably adder, to be present. It was ensured that the survey was conducted in accordance with the recommended densities for refugia given in Froglife Advice Sheet 10.
- 4.2.8 Seven survey visits were undertaken to each of the refugia by suitably qualified and experienced Ramboll surveyors, following the best practice guidance described above and in accordance with the Herpetofauna Workers Manual. The refugia were checked at suitable times of day and in suitable weather conditions as far as was possible. Please see 'Limitations' below for any exceptions to this. The survey dates and conditions are shown in Table 4.18 below.

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<sup>14</sup> Forestry Commission, 2013. Guidance on managing woodlands with sand lizards and smooth snake in England. Online. Available from: [http://www.forestry.gov.uk/pdf/england-protectedspecies-snake.pdf/\\$FILE/england-protectedspecies-snake.pdf](http://www.forestry.gov.uk/pdf/england-protectedspecies-snake.pdf/$FILE/england-protectedspecies-snake.pdf)

<sup>15</sup> Gent A H, & Gibson S D, eds. 2003. Herpetofauna workers' manual. Peterborough, Joint Nature Conservation Committee

<sup>16</sup> Froglife (1999) Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife, Halesworth



**Table 4.18: Reptile Survey Dates and Weather Conditions**

Date	Start Time	Weather Conditions			
		Temp (°C)	% Cloud Cover	Wind Speed	Precipitation
<b>2016</b>					
27/05/2016	09:00	12	0-33	Light	None
21/06/2016	09:10	17	66-100	Light	None
04/08/2016	09:15	15	66-100	Moderate	None
11/08/2016	08:51	16	66-100	Light	None
17/08/2016	14:07	24	0-33	Light	None
26/08/2016	07:50	15	0-33	Light	None
12/09/2016	11:12	19	66-100	Moderate	None
<b>2017</b>					
12/04/2017	13:30	12	66-100	Moderate	None
05/05/2017	13:40	15	0-33	Moderate	None
16/05/2017	10:30	13	0-33	Light	None
24/05/2017	11:00	14	0-33	Light	None
19/06/2017	13:05	14	0-33	Light	None
13/09/2017	13:50	14	0-33	Light	None
14/09/2017	13:00	14	66-100	Moderate	None

4.2.9 Refugia were approached slowly and carefully in order to minimise disturbance to any reptiles on top, or beneath the refuge and maximise potential observations. In addition, visual searches were made of potential basking locations in other areas of suitable habitat within the Site. This ensured that all areas were represented in the survey, and that the survey was not biased towards those reptiles more likely to use refugia. Records of any reptile sightings from this method were recorded to the nearest refuge. Potential reptile refugia already present on the site such as discarded wooden boards and plastic sheets were also lifted to check for the presence of reptiles.

### Limitations

4.2.10 Several limitations were encountered during the reptile survey programme. Survey numbers 5, 6 and 7 (2016) and 1, 2, 5, 6 and 7 (2017) were undertaken outside of the recommended guidance set out in Froglife Advice

Sheet 10 i.e. for surveys to be carried out between 08:30 hrs and 11:00 or 16:00 and 18:30. Of these surveys, numbers 6 and 7 (2016) were carried out relatively close to the guidance times and while survey 6 began earlier than the guidance time, much of the survey was carried out after 08:30 due to the large size of the site. Though carried out outside of the guidance times, the results returned were comparable to the other surveys and so it is not thought that the time of day made a material difference to the result of the survey.

- 4.2.11 Surveys 5 and 7 (2016) were also outside of the Froglife Advice Sheet guidance for temperature of being between 9 °C and 18 °C. Both surveys were conducted in conditions hotter than 18 °C, though survey 7 was only marginally higher than 18 °C and so can be accepted as a valid survey. Survey 5 was carried out on a particularly hot day but the results of the survey were comparable to the other six survey results and so it is not thought that the temperature made a material difference to the result of the survey.
- 4.2.12 Over the course of the survey periods, vegetation in some areas of the site grew to become very dense and as a result several refugia could not be found to lift. The density and shade cast by the vegetation is likely to have precluded use by reptiles. This was particularly true in the Calf Heath Wood where continuous bracken became dominant.
- 4.2.13 Over the course of the 2016 survey several refugia that were placed in suitable habitat immediately adjacent the Site (on land associated with the Bericote development) were destroyed due to ground works being undertaken. Several further refugia were also damaged as a result of quarrying operations. In addition, three out of four coroline corrugated refugia had been moved so as to be inaccessible part way through the survey. The numbers of refugia destroyed or lost were relatively low and the areas in question retained enough refugia to provide adequate survey coverage relative to the area of the suitable habitat present.
- 4.2.14 Despite the above survey limitations, the large scale of the surveys and successful completion of the majority of surveys ensured enough data was gathered for the survey to be considered as a complete and reliable measure of the status of reptiles on site. The uniformity of returned results over the seven surveys and lack of incidental sighting during other survey work indicates the reliability of the surveys as a whole despite the limitations encountered.

### **Desk Study**

- 4.2.15 SERC returned one reptile record, a common lizard (*Zootoca vivipara*) located approximately 2350 m roughly north of the site.

- 4.2.16 A survey undertaken in 2015 for the Bericote development identified common lizard as present (peak count of 2). The habitat in this location was superior to that present on-site. In addition, personal communication received from HFM Pyrotechnics Ltd, who manage the Gailey Magazine area of the site, stated in an email of 3 May 2016 that adder have regularly been sighted by their staff in the area around Gailey Magazine during maintenance visits<sup>17</sup>.

## Results

- 4.2.17 The reptile survey programme, during both the 2016 and 2017 surveys, did not identify any reptiles on-site either under the refugia or by direct observation. No signs of reptiles such as sloughed skin were found and no reptiles were observed during the course of any of the other extensive ecological surveys that were carried out across the Site.
- 4.2.18 The results of the reptile survey suggest that reptiles are likely to be absent from the Site, or else with a low enough local population so as to be below detectable levels. This is thought to be for several reasons including a very high number of pheasants in the area which would be likely to predate reptile species. Large fluctuations in the local water table were also evident on site over the course of the surveys with the site being inundated with standing water at times. This would impact the potential for reptiles to live on site as they would ordinarily seek out areas with better drainage. Similarly, the habitats on site are not ideal for the majority of reptile species with large areas either being given over to arable fields or else being heavily shaded by trees and tall vegetation. The wider Staffordshire context shows that reptile populations in the area are generally low, as evidenced by the ecological data records received from SERC.
- 4.2.19 While no reptiles were found, several toads, a common frog and small mammals were found under the refugia over the course of the surveys. See section 4.1 for consideration of common toad records.

## Valuation Summary

- 4.2.20 Reptiles are considered to be absent and therefore not a receptor but due to records in the vicinity and anecdotal adder records, the mitigation section will consider the unlikely event that reptiles are discovered.

## 4.3 Other Aquatic Species

- 4.3.1 This section describes the baseline conditions for freshwater fish and crustaceans.

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<sup>17</sup> Personal communication, 03/05/2016. Email from HFM Pyrotechnics to Chris Hodsmen – Senior Ecologist, Ramboll

## Legislation

4.3.2 The white-clawed crayfish (*Austropotamobius pallipes*) is listed under the following legislation, policies and guidance:

- Bern Convention, Appendix 3;
- Habitats Directive, Annex 2 and Annex 5;
- Biodiversity Lists - England NERC s41;
- Global Red list status - Endangered;
- Biodiversity Action Plan UK list of priority species;
- Wildlife and Countryside Act 1981, Schedule 5 Section 9 (only in respect of section 9(1) so far as it relates to taking and in respect of section 9(5) on selling); and
- Staffordshire LBAP.

## Methodology

4.3.3 No focussed fish or shellfish surveys were undertaken. See section 4.1 for details of pond torching, egg searches and bottle trap surveys undertaken at ponds for amphibians.

## Limitations

4.3.4 Surveys suitable to determine the presence or likely absence of fish and crustaceans were not undertaken.

## Desk Study

4.3.5 The white-clawed crayfish is Britain's only native species of crayfish. It inhabits small streams, rivers, canals, lakes, reservoirs and quarry pools. SERC hold six records of white-clawed crayfish within the study area, ranging from 1991 to 2008. All SERC records were located more than 1.4 km southwest of the Site. The records relate to the River Penk and Watershed Brook, which have limited to no connectivity to the Site. Staffordshire Wildlife Trust shared an additional record from 22/05/2017 where white-clawed crayfish were confirmed as present on the Saredon Brook located approximately 750m to the south of the Site at its closest point. White-clawed crayfish are widely distributed in England and Wales, but have experienced significant decline since the 1970s, mostly due to the spread of non-native American signal crayfish (*Pacifastacus leniusculus*) and the crayfish plague (*Aphanomyces astaci*) that it often carries. Staffordshire reflects this decline.

4.3.6 No records of fish in the study area are held by SERC. Angling websites and forums have been consulted to understand the known fish species within the waterbodies that are open to angling; where approached, fishermen were also consulted during the bird survey to get an understanding of the use of the reservoirs by piscivorous birds. Searches of angling resources for

anecdotal records of crayfish by fishermen were also undertaken; however no information relevant to the Site was available. No formal consultation has been held with anglers as the Site does not include any commercial/leisure fishing resources. The Calf Heath Reservoir, directly northeast of the site is stocked with carp (*Cyprinus carpio*), bream (*Abramis brama*), perch (*Perca fluviatilis*), roach (*Rutilus rutilus*) and tench (*Tinca tinca*)<sup>18</sup>. The Staffordshire and Worcester Canal is also known to support carp, chub (*Squalius cephalus*), roach, perch, bream, barbel (*Buarbus* sp.), tench and pike (*Esox lucius*)<sup>19,20</sup>, as well as other coarse and game fish.

## Results

- 4.3.7 The ponds on site have little connectivity to the wider landscape. The canal provides a linear corridor that is directly connected to the wider landscape. The onsite waterbodies that remain wet throughout the year mainly comprise the canal and quarry pools. The quarry pools have turbid water with no visible features that may provide refuge for crayfish and are subject to short-term changes as mineral extraction progresses. Suitability surveys of canal banks were undertaken (note that visibility was impaired due to depth and turbidity, which contributes to lower suitability for crayfish). The majority of the banks of the canal adjacent the Site are steel sheet-piled or concrete walls for bank reinforcement which are unfavourable for this species. The surveys undertaken are not suitable to determine presence/likely absence of white-clawed crayfish; however, based on the low suitability of habitats within the canal, it is considered that precautionary working methods will be an appropriate approach to ensuring the protection of this species if present in the canal adjacent to Site.
- 4.3.8 Pond 5/6 and Pond 24, in the north and southeast of the Site respectively were found during amphibian surveys to support low density population of three-spined stickleback (*Gasterosteus gymnurus*). The fish were observed during all torch and bottle trap surveys. Other ponds within the site were not noted to have any fish species present; Ponds 4, 5, 18, 20, 22, 25 and 30 are not considered to hold enough water throughout the year to support fish. No conservation action has been targeted for this species (which is listed on the global red list of least concern status). Great diving beetle (*Dytiscus marginalis*) larvae and adults also found throughout the ponds on Site. These predators will feed on small newts and tadpoles.

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<sup>18</sup> Blackfords Progressive Angling Society (2012) Calfheath Reservoir. Available at: <http://blackfordsprogressiveanglingociety.co.uk/calfheath-resevoir-general/> [accessed 12/12/2016]

<sup>19</sup> Used Tackle Ltd (2013) Staffordshire and Worcester Canal, Stafford. Fish on Friday. [online] Available at: <http://www.fish-on-friday.com/2013/01/staffordshire-and-worcester-canal-stafford/> [accessed 12/12/2016]

<sup>20</sup> Visit Worcestershire (2016) Fishing at Staffordshire & Worcestershire Canal. [online] Available at: <http://www.visitworcestershire.org/thedms.aspx?dms=3&feature=1001&venue=1360020> [accessed 12/12/2016]

## Valuation Summary

- 4.3.9 The white-clawed crayfish recorded in Saredon Brook are considered to be of County value but outside the zone of influence and are therefore considered as an 'Other Ecological Feature' within the EIA.
- 4.3.10 Fish (Three-spined stickleback) are considered to be of negligible value and are to be considered as an 'Other Ecological Feature' within the EIA.

## 4.4 Birds

- 4.4.1 This section focusses on breeding birds on the Site, then considers breeding birds at the adjacent Calf Heath Reservoir and then considers wintering birds on the Site, Calf Heath and Gailey Reservoirs.

### Legislation

- 4.4.2 All wild birds in the UK are protected under the WCA 1981. This makes it illegal to:
- i. Kill, injure or take any wild bird;
  - ii. Take, damage or destroy the nest of any wild bird while it is being built or in use;
  - iii. Take or destroy the eggs of any wild bird; and
  - iv. Possess or control any wild bird egg unless obtained legally.
- 4.4.3 Some species, listed on Schedule 1 of the WCA 1981 receive a higher level of protection, making it illegal to intentionally or recklessly disturb any bird listed on Schedule 1 while nest building or at or near a nest containing eggs or young, or to disturb any of its dependent young.

### Methodology

#### *Breeding Birds*

- 4.4.4 In order to carry out a breeding bird survey five survey visits were undertaken in the early morning or evening of the site other than land south of Station Road in 2016. In 2017 the land south of Station Road was surveyed over three visits. Surveys were carried out by an experienced ecologist, Malcolm Robertson CEnv MCIEEM. The surveys were carried out on the dates described in Table 4.19; the table also sets out the weather conditions during the survey.

**Table 4.19: Bird Survey Dates and Weather Conditions**

Visit	Date	Survey Time	Weather Conditions
1(2016)	13/4/16	Morning (05:20-09:30)	Foggy at the start, becoming clearer through the survey
	14/4/16	Morning (05:30-09:00)	Dry, slight breeze, 7/8 cloud, light rain 06:00-06:45
2(2016)	18/5/16	Evening (19:30-22:15)	Breezy, cool, 1/8 cloud
	19/5/16	Morning (05:25-09:15)	Light breeze, 8/8 cloud
	20/5/16	Morning (05:00-08:45)	Light breeze, 8/8 cloud
3(2016)	15/6/16	Evening (19:55-22:30)	7/8 cloud, mild, dry and muggy. Drizzle from 22:15 onwards
	16/6/16	Morning (04:45-09:15)	Dry, warm, 8/8 cloud
	17/6/16	Morning (04:30-08:30)	Light rain at times, slight breeze, 8/8 cloud
4(2017)	15/3/17	Morning (05:45-08:00)	Light breeze, misty at times, 1/8 cloud
5(2017)	19/5/17	Morning (05:00-07:15)	Light rain, 8/8 cloud
6(2017)	21/6/17	Morning (05:00-06:50)	Still, dry and mild 8/8 cloud

- 4.4.5 The survey approach for the morning surveys was based on the Common Bird Census methodology<sup>21</sup>. The surveyor walked a repeated route across the survey area approaching to within 50 m of all points to ensure adequate coverage but at the same time being careful to avoid double counting birds. For most species, birds exhibiting breeding behaviour were considered to be holding different territories if they were separated by at least 100 m. On several occasions the surveyor was able to determine if birds were separate individuals and in these cases the records are shown appropriately on the maps.
- 4.4.6 A modified approach was followed on the evening visits carried out in 2016 due to health and safety considerations in limited light and the species being surveyed. The survey visits involved watching and listening from vantage points for crepuscular/nocturnal birds; during the survey the characteristic calls of nightjar and owls were listened for and birds were observed from the vantage points. Other species were recorded during the dusk survey and where appropriate this data was used to augment that from the dawn surveys and used in mapping territories. No evening surveys were carried out in 2017 in land south of Station Road because the survey in 2016 did not record any significant crepuscular birds or activity and no habitat particularly suitable for such species (for instance nightjar) is present in the land south of Vicarage Road.

<sup>21</sup> Gilbert G, Gibbons DW and Evans J (1998). Bird Monitoring Methods: A manual of techniques for key UK species. RSPB, Bedfordshire. - See more at: <http://www.cieem.net/birds#sthash.xahU0vYU.dpuf>

- 4.4.7 Calf Heath Reservoir was surveyed in 2017 on the same mornings as the breeding bird survey given in Table 4.19 (weather conditions were similar to those described). The survey involved counting all waterbirds on the reservoirs as well as birds noted in flight over the reservoir and in vegetation around the reservoir.
- 4.4.8 Bird registrations were recorded on field maps using British Trust for Ornithology (BTO) two-letter species codes and activity recording codes<sup>22</sup>. The field maps were used as a basis for drawing up visit maps of the bird records for each survey visit. Territories have not been accurately mapped as this would have required more data obtained from substantially more survey visits over the full breeding season. Nevertheless it is considered that the level of survey would have detected birds breeding on the site in the survey period and gives a representative indication of the distribution across the site for most species, and of the species breeding on the site. Based on field signs, behaviour and habitat association, birds were classified as 'confirmed', 'probable' or 'possible' breeding.

#### *Wintering Birds*

- 4.4.9 Birds seen during the Phase 1 Habitat Survey carried out on 23 and 24 November 2015 and 24 and 25 February 2016 were recorded.
- 4.4.10 In order to assess and understand the wintering bird species and resident bird species which remained overwinter, monthly visits to the Site were completed between November 2016 and March 2017.
- 4.4.11 Calf Heath Reservoir and the Upper and Lower Gailey reservoirs, situated immediately north-east of the Site, were visited each month in addition to the Site. This allowed for the identification of wildfowl populations which utilised these waterbodies over winter.
- 4.4.12 Each monthly visit comprised of two visits to each site over two days i.e. both reservoirs and the Site were visited once on day one then again on day two. This allowed for each location to be visited at different times each day, varying from month to month. Covering all times of day allowed for any diurnal patterns of species activity/ habitat usage to be identified. It also enabled for the presence of more crepuscular species such as tawny owl (*Strix aluco*) and barn owl (*Tyto alba*) to be identified, along with afternoon mass movements of species such as starlings (*Sturnus vulgaris*) or winter thrushes (*Turdus* sp.).
- 4.4.13 Surveys were completed by Elizabeth Butler BSc (Hons) on foot, using binoculars and a telescope. Results were recorded on paper maps using BTO

<sup>22</sup> British Trust for Ornithology. (2016). *BTO Species Codes*. [online] Available at: [http://www.bto.org/sites/default/files/u16/downloads/forms\\_instructions/bto\\_bird\\_species\\_codes.pdf](http://www.bto.org/sites/default/files/u16/downloads/forms_instructions/bto_bird_species_codes.pdf) [accessed 15/12/2016]



species and activity codes and then digitised using ArcMap GIS software. Dates and times of the survey are presented in Table 4.20 below.

**Table 4.20: Wintering Bird Survey Dates and Times**

Visit/ Date		Survey Locations/ Time of Visits **		
Month		Upper & Lower Gailey Reservoir	Calf Heath Reservoir	Site
<b>November 2016</b>	Tuesday 22 <sup>rd</sup>	DAY 14.00-15.00	DAY 13.00-14.00	DAY/DUSK 14.00-16.30
	Wednesday 23 <sup>rd</sup>	DAWN 7.30-8.10	DAWN/ DAY 8.20- 9.10	DAY 9.15-12.30
<b>December 2016</b>	Wednesday 7 <sup>th</sup>	DUSK 15.00-16.05	DAY 11.30-12.20	DAY/DUSK 12.20-17.00
	Thursday 8 <sup>th</sup>	DAWN 7.30-8.10	DAWN/DAY 8.20-9.00	DAY 9.10-12.30
<b>January 2017</b>	Monday 23 <sup>rd</sup>	DAY 12.20-13.30	DAY 11.20-12.00	DAY/DUSK 13.00-18.20
	Tuesday 24 <sup>th</sup>	DAWN 7.50-8.20	DAWN 8.30-9.20	DAY 9.20-11.50
<b>February 2017</b>	Monday 20 <sup>th</sup>	DAY 12.45-13.40	DAY 11.30-12.20	DAY/DUSK 14.40- 18.50
	Tuesday 21 <sup>st</sup>	DAY 9.45-10.20	DAWN 7.30-8.20	DAWN/DAY 7.20-12.30
<b>March 2017</b>	Monday 20 <sup>th</sup>	DAY 13.00-13.50	DUSK 17.50-18.30	DAY/DUSK 14.00-17.30
	Tuesday 21 <sup>st</sup>	DAWN 7.00-7.50	DAY 9.00-9.50	DAY 10.00-12.00

\*\* Overlap in times between Calf Heath Reservoir and Site visits occur as sections of the Site could be viewed from Calf Heath so records could be made in conjunction.

## Limitations

- 4.4.14 Due to the size of the Site it took two days for the surveyor to cover the parts of the Site surveyed in 2016 for the morning breeding bird surveys. Some birds were recorded in the evening surveys and then in the subsequent morning. It is possible that some birds were recorded twice as a result, but this is an inherent feature of the survey technique and number of territories has been estimated from clusters of records and so this is taken into account.
- 4.4.15 The breeding bird survey of the Site took place over two years and different parts of the site were surveyed each year. It is possible that birds breeding north of Station Road in 2016 were recorded there and then the same pair bred south of Station Road in 2017 and were recorded there. This may have led to an overestimation of number of pairs of birds present in the assessment. However, in both years birds were recorded outside the

boundaries of the land surveyed, in the other land forming part of the Site and so this is not a significant constraint to the findings or assessment.

- 4.4.16 The survey in 2016 did not cover late February or March and as a result species that display or sing early in the season may have been missed. In order to address this the first survey carried out in 2017 (15/03/17) included a transect walked around Calf Heath Wood (the most significant block of woodland on the Site) with the aim of looking/listening for early singing/calling woodland species such as lesser spotted woodpecker and willow tit.
- 4.4.17 The M6 motorway, A5, A449 and to a lesser degree the railway line through the site produce noise; the noisy conditions, particularly along the north and western boundaries of the Site and on the boundaries of Calf Heath and Gailey Reservoirs nearest the roads may have masked bird song.
- 4.4.18 Visibility during visit 1 in 2016 was restricted by fog and so this survey was carried out largely using bird song and calls; restricted visibility at this time may have also influenced bird behaviour and thus detectability. The rain experienced during the survey was not considered to represent a constraint to the survey.
- 4.4.19 The quarry fields in the east of the Site were not accessible for health and safety reasons but were observed from a safe location. As a result, the records from this part of the Site may be an underrepresentation of the birds present in that part of the site.

### Desk Study

- 4.4.20 SERC provided a long list of bird species records, although many of these relate to either vagrants or winter migrants unlikely to breed within habitats on-site. A full list of bird records provided by SERC is provided in Annex 10.1.4, along with an assessment of the likelihood that they may breed on-site.
- 4.4.21 According to Drivers Jonas<sup>23</sup> (2007), a breeding bird survey was completed in 2006 and 2007 within part of Calf Heath Wood, adjacent to the Site. The survey also included one field within the Site boundary, located to the south-west of Calf Heath Wood. A total of 29 species were recorded as either confirmed or probably breeding within the woodland area. Most of the species recorded are common and widespread, listed as green on Bird of Conservation Concern<sup>24</sup>. However, three red listed species were also recorded: mistle thrush (*Turdus viscivorus*), song thrush (*Turdus philomelos*) and willow tit (*Poecile montanus*). In addition, four amber listed birds were

<sup>23</sup> Drivers Jonas (2007) Warehouse Development at Four Ashes, South Staffordshire: Environmental Statement

<sup>24</sup> Eaton M, Aebischer N, Brown A, Hearn R, Lock L, Musgrove A, Noble D, Stroud D and Gregory R. 2015. Birds of Conservation Concern 4: the Red List for Birds. *British Birds* 108. 708 – 746

recorded: tawny owl, willow warbler (*Phylloscopus trochilus*), dunnoek (*Prunella modularis*) (also s41) and bullfinch (*Pyrrhula pyrrhula*) (also s41). In an adjacent field, and additional two Red List species, skylark (*Alauda arvensis*) and starling(both also s41) and an amber list species common kestrel (*Falco tinnunculus*) was recorded.

- 4.4.22 A breeding bird survey of the Bericote land to the west of Calf Heath Wood carried out by Ecology Solutions (Date unknown) found breeding or probable breeding for the Red List lapwing (*Vanellus vanellus*) (two pairs) and the Amber List snipe (*Gallinago gallinago*) (also LBAP), dunnoek (two pairs) and six other species of no specific conservation concern. Possible breeding was recorded for 13 further species including the Schedule 1 little ringed plover (*Charadrius dubius*), s41/Red List song thrush, reed bunting (*Emberiza schoeniclus* - two pairs of this s41/Amber List species) and the Amber List mistle thrush and willow warbler (Reference unknown – drawing only).
- 4.4.23 SERC provided a record of the amber list barn owl (*Tyto alba*), which was recorded in the north of the Site in 1999 and 2006.
- 4.4.24 WeBS data for the Gailey Pools core counts has been reviewed. This count covers the two Gailey Reservoirs (Upper and Lower), but not Calf Heath Reservoir. For all species combined the total numbers are presented in Table 4.21 below to illustrate the numbers of birds using the reservoirs.

**Table 4.21: Gailey Pools WeBS Site Mean counts of total waterbirds**

	Peak Monthly Total	Autumn Peak	Winter Peak	Spring Peak
Mean Count	791	1020	897	439

- 4.4.25 The data includes annual peak counts which are presented in Table 4.22 below for those species with mean peak counts of over 10 birds.

**Table 4.22: Gailey Pools WeBS Site Five year annual peak counts**

Species	2010/11	2011/12	2012/13	2013/14	2014/15	Mean Peak
Mute swan	24	25	11	8	13	18
Greylag goose	28	32	40	32	35	33
Canada goose	99	371	186	68	160	177
Gadwall	12	26	13	12	38	20
Mallard	64	105	41	109	81	80
Pochard	77	19	26	12	22	31
Tufted duck	159	140	119	165	138	144

Species	2010/11	2011/12	2012/13	2013/14	2014/15	Mean Peak
Little grebe	21	17	19	12	17	17
Great crested grebe	37	43	17	29	28	31
Cormorant	27	26	37	22	7	24
Grey heron	33	24	23	28	18	25
Coot	504	307	321	432	368	386
Lapwing	87	66	41	59	82	67
Black-headed gull	209	155	243	292	339	248
Lesser black-backed gull	2	69	16	4	4	23

## Results

### *Breeding Birds – West Midlands Interchange*

- 4.4.26 A full list of the BTO two letter codes of the bird species recorded, together with their Latin names and their breeding status on Site (including an assessment of breeding status and where possible an estimate of breeding pairs/territories) is provided in Annex 10.1.4. The list is based on a combination of the morning and evening surveys in 2016 and 2017. Figures 10.1.401 to 10.1.417 present species maps of the species of conservation concern / s41 and LBAP records.
- 4.4.27 Sixty-two species of birds were recorded in the breeding bird survey of the Site; a full list of the birds recorded during the survey is presented in Annex 10.1.4. The birds recorded included one Schedule 1 species ( see Paragraph 4.4.36), 12 UKBAP/s41 species of principal importance, 10 Red List species (all of which except mistle thrush are listed in s41) and 12 Amber List species. There are eight Staffordshire BAP species of which five form part of the Action Plan for Farmland Seed Eating Birds. Table 4.23 presents data on these species; further information on the breeding status of these species on site is provided in the following paragraphs.

**Table 4.23: Summary of Species of Conservation Concern**

Species	UK BAP/s41	LBAP	Red List	Amber List	Status on Site
Mallard				*	At least seven pairs, widespread across site.
Kestrel				*	Two birds seen at Woodside Farm in vicinity of suitable building (2016). Two birds flushed from open barns in Heath Farm (2017). Possible nester (1 or 2 pairs).
Lapwing	*	*	*		Five to six pairs, one west of railway, remainder in fields north and south of Vicarage Road
Snipe		*		*	One flushed from set aside on first visit. Likely late wintering bird.
Lesser black-backed gull				*	Birds in flight over site on all three 2016 visits, not nesting.
Stock dove				*	Display seen and pairs/small groups noted. At least six pairs.
Cuckoo	*		*		Two birds seen on one occasion in 2016 south of canal in centre of site, one calling off site in adjacent land on separate visit. Possible breeder, dunnoek most likely host.
Tawny owl				*	One bird near Woodside Farm (also seen/heard during bat work). Probable breeder, at least one pair.
Swift				*	Three records of single birds in flight. Unlikely to be nesting on site.
Skylark	*	*	*		At least 14 territories, largely west of the canal, in set aside north of Calf Heath Wood and in arable around Station Road.
Swallow				*	Four birds in and out of barns at Woodside Farm in 2016 (assumed nesting). Other birds associated with Avenue Cottages and Gailey Farm (2016) and seen entering/suspected of entering two buildings north of Straight Mile (2017) and probable breeders at these properties. Other birds in flight over site.
Yellow wagtail	*		*		Pair noted north of Gravelly Way on second 2016 visit, male plus possible other bird at Gailey on visit 3 2016. Probable breeder, 1-2 pairs.
Dunnock	*			*	Widespread although mostly in the west of the site and south of Station Road. At least twenty pairs.
Song thrush	*		*		c. 12 territories with several in Calf Heath Wood, although widespread across whole site. Seen carrying food into wood on one visit.
Mistle thrush				*	Three to four pairs; pair with two juvenile seen on northern boundary of Calf Heath Wood.
Willow warbler				*	Two clusters and one singing record suggests three pairs in land north of Station Road (2016). A further signing male south of Station Road in 2017.
Starling	*		*		At least two pairs likely breeding in buildings off site (2016); all 2016 records near Croft Lane including five with two juveniles on the second visit. 2017: flock on third visit close to southern boundary of the site, not suspected of breeding in land south of Station Road.
House sparrow	*	**	*		Seven locations/colonies recorded of which three probably involve nesting off site. Birds noted at Fir Tree Cottage

Species	UK BAP/s41	LBAP	Red List	Amber List	Status on Site
					and Woodside Farm (where seen to enter building, assumed to be visiting nest in 2016). Number of pairs involved is unknown, but no more than 5 pairs suspected north of Station Road. South of Station Road two locations with significant concentration at Heath Farm which has several nest boxes (2017).
Linnet	*	**	*		Four colony locations; at least seven pairs. Concentration of records in set aside fields north of Calf Heath Wood.
Bullfinch	*	**		*	Possible breeder in two locations (potentially off site).
Yellowhammer	*	**	*		At least 13 pairs, notable concentrations north of Calf Heath Wood and fields north of Vicarage Road (2016) and south of Station Road (2017).
Reed bunting	*	**		*	Singing birds in two locations on single dates, calling bird in third location. Probable breeder, two pairs.

\*\* Part of the Action Plan for Farmland Seed Eating Birds

- 4.4.28 The breeding bird assemblage on the Site includes s41/Red List/LBAP farmland birds: lapwing, skylark, yellow wagtail (*Motacilla flava*), linnet (*Carduelis cannabina*), yellowhammer (*Emberiza citrinella*) and reed bunting. This reflects the agricultural landscape and in particular the set aside farmland north of Calf Heath Wood and fields north and south of Vicarage Road were important areas for these species. Yellow wagtails were associated with wheat fields in the west of the Site.
- 4.4.29 Dunnock and song thrush (and mistle thrush and willow warbler) were associated with woodland or hedgerows across the Site, the former two being widespread and reasonably common on Site. Stock dove (*Columba oenas*) (Amber List) was found largely associated with woodland edges and the old trees in Calf Heath Wood and the fields to the north presumably form the focus of this species' breeding on site. Bullfinch was only recorded in two locations on the edge of the Site and may breed on the Site margins, but more likely off-site.
- 4.4.30 The hole nesting house sparrow (*Passer domesticus*), starling (both s41 and Red List) and swallow (*Hirundo rustica*) (Amber List) were found associated with buildings on and off-site, the number of suitable nesting sites probably influencing the numbers of these species. One pair of kestrel (Amber List) was recorded near a building in Woodside Farm and another was at Heath Farm; at least one pair is possibly nesting on site.
- 4.4.31 Tawny owl (Amber List) was recorded in one location although visits earlier in the year would have undoubtedly recorded this widespread species in

more locations. A single barn owl (Schedule 1 WCA) was recorded on two occasions (5<sup>th</sup> and 6<sup>th</sup> July 2017) hunting over a grass field south of Station Road by surveyors carrying out bat surveys. Barn owl is not suspected of breeding on site. No other crepuscular species were recorded on-site.

- 4.4.32 The flashy and periodically wet nature of the Site along with numerous ponds favours mallard (Amber List) and explains their presence across the Site. Geese species were recorded on site; Canada geese (*Branta canadensis*) were noted on open water in quarry workings and may have nested in the quarry. They were also noted in a field south of the A5 proximal to TN7.
- 4.4.33 It is hard to determine the breeding status of cuckoo (*Cuculus canorus*) (s41 and Red List) although two seen together suggests possible breeding and suitable host species (dunnock) are present on-site.
- 4.4.34 Of the widespread species there was evidence of nesting recorded, as presented in Table 4.24.

**Table 4.24: Evidence of Breeding Birds**

Species	Breeding Evidence Recorded
Unknown species	Old nest seen in hedge west of Woodside Farmhouse on boundary with Bericote land
Canada goose	Two adults with four juveniles on open water in flooded excavation in Calf Heath Quarry
Coot	Adult and two juveniles seen south of Vicarage Road in visit 3 2017
Sparrowhawk	Seen carrying prey into Calf Heath Wood, assumed nesting in the wood
Little owl	Adults and juveniles at Heath Farm in 2017 in association with large tree with hole in and seen leaving a barn. Probable breeder.
Swallow	Four birds in and out of barns at Woodside Farm in 2016 (assumed nesting). Other birds associated with Avenue Cottages and Gailey Farm (2016) and seen entering/suspected of entering two buildings north of Straight Mile (2017) and probable breeders at these properties. Other birds in flight over site.
Robin	Juvenile seen south of Gravelly Way in 2016 and juvenile and separate family group seen south of Station Road in 2017.
Blackbird	Juveniles seen, for instance east of the canal, south of the A5. Pair with juveniles in hedge north of Vicarage Road
Pied wagtail	Juvenile seen east of Firtree Cottage, west of railway line
Great tit	Bird seen entering a hole in a tree west of Gailey Magazine, east of the canal. Assumed nest site. Juveniles recorded nearby on subsequent visit and family groups recorded east of Gailey Wharf and in hedge north of Vicarage Road
Blue tit	2016: Bird seen entering a bird box on a building in Firtree Cottage property. Subsequently juvenile bird noted at same location. Family groups recorded in hedge around Police Station on A5, in hedge east of Gailey Wharf, in Reservoir Plantation, south of the quarry workings, two families south of the quarry entrance and three families at eastern-tip of Calf Heath Wood. 2017: Bird carrying food in Heath Farm and family party alongside canal on southern boundary of the site
Long-tailed tit	Family group seen in the centre of the land south of Station Road in 2017.

Species	Breeding Evidence Recorded
Chaffinch	Pair seen with nesting material by canal east of Gravelly Way Farm. Pair with juveniles in hedge north of Vicarage Road
House sparrow	Seven locations/colonies recorded of which three probably involve nesting off site. Birds noted at Fir Tree Cottage and Woodside Farm (where seen to enter building, assumed to be visiting nest in 2016). Number of pairs involved is unknown, but no more than 5 pairs suspected north of Station Road. South of Station Road two locations with significant concentration at Heath Farm which has several nest boxes.
Crow	Old nests recorded in several locations, medium size, assumed corvid nests for instance on boundary of railway line and in woodland north of Gravelly Way and east of the A449
Jackdaw	Three birds seen to enter a property north of A5 (off site) assumed nesting
Rook	Rookery in the eastern part of the site south of Station Road, with approximately 25 nests recorded in woodland there in 2017. Further nests in woodland south of Straight Mile (off site).
Magpie	Juvenile birds at Firtree Cottage

- 4.4.35 Further noteworthy birds recorded included raven (*Corvus corax*) with one pair probably breeding in Calf Heath Wood. A hobby (*Falco subbbuteo*) was seen hunting bats during a bat survey on the 6 September 2016 and another was seen heading north-east high over Calf Heath Reservoir on the third survey visit in 2017. These are the only records of this Schedule 1 species made during the fieldwork in support of this assessment and the bird is considered to be from a nest outside the Site. There were 73 records of this species received, one of which was of possible breeding from 2011 for the grid square southeast of the Site (with another record there in 2014); all of the other records were from Gailey Reservoirs which provide ideal habitat for hobby to hunt dragonflies and small birds.

#### Breeding Birds – Calf Heath Reservoir

- 4.4.36 Calf Heath Reservoir has a wall along its northern boundary and a concrete landing stage along much of its eastern boundary. For that reason, the other boundaries (i.e. those closest to the Site) provide better habitat for nesting waterbirds. Figures 10.1.418 to 10.1.421 present species maps of the species of conservation concern / s41 and LBAP records.
- 4.4.37 A kingfisher (Schedule 1) was seen on two occasions in the western side of the reservoir (where there are low earth banks that provide some limited nesting habitat). This species may nest at this location, although it is busy with anglers on occasion and the banks may not be sufficiently high to prevent predation of any nests attempted by mammal predators.
- 4.4.38 The reservoir is used by breeding waterbirds, notably mallard (16 males maximum and at least three pairs confirmed breeding) and great crested grebe (up to four pairs displaying and up to three family groups with chicks).



Coot was also confirmed breeding and the Amber List lesser-black backed gull, black-headed gull and common tern were recorded on or over the reservoir.

- 4.4.39 Other waterbirds recorded in the survey were feral/hybrid mallard, cormorant, moorhen and tufted duck.
- 4.4.40 Birds recorded around the margins of the reservoir and in woodland there did not include any species of conservation concern or additional to those recorded in the breeding bird survey for the Site.

#### Wintering Birds

- 4.4.41 During the habitat survey a group of ten lapwing was observed in the west of the Site and small groups of approximately 20 to 30 fieldfare (*Turdus pilaris*) were recorded during the survey. Small numbers of snipe, mistle thrush, house sparrow and starling were recorded in the arable habitats during the survey. Fieldfare is listed on Schedule 1 of the WCA 1981 but does not nest in the English Midlands and so no consideration of effects on nests of this species need be made.
- 4.4.42 Wintering bird surveys were carried out between November 2016 and March 2017 to determine the birds using the site over winter, and in particular whether there are any important concentrations of wintering birds present. This survey included Calf Heath Reservoir adjacent to the site, Gailey Reservoirs to the east and land south of Station Road not surveyed as part of the breeding bird survey in 2016.
- 4.4.43 Annex 10.1.4 presents the findings of the wintering bird survey and should be read in conjunction with Figures 10.1.422 to 10.1.470.
- 4.4.44 The reservoirs to the north-east of the Site held the expected waterbirds, notably a flock of pink-footed geese on Gailey Lower Reservoir on one date, Canada goose, greylag goose, mallard (also on the Site, for instance 16 mallard on flooded gravel workings) and large numbers of tufted duck on both Gailey Reservoirs. Species and numbers of birds recorded were consistent with WeBS counts for the Gailey Pools. Four records of the Schedule 1 kingfisher were made on Gailey Reservoirs and single oystercatcher records were made on the Site on three occasions.
- 4.4.45 In terms of farmland birds, a flock of 50 lapwings was recorded over the Gailey Reservoirs in the February 2017 visit, however the largest number recorded on the Site during the wintering bird survey was five (also February 2017). Forty lapwing were recorded in a field south of the A5 on the 11<sup>th</sup> October 2017 during bat survey fieldwork. There were no records of skylark flocks and no records of yellowhammer at all; a flock of 17 linnets was one of the four winter records of this species from the Site. Records of one or two

reed buntings were made from the main site with similar numbers from the Gailey Reservoir.

- 4.4.46 Wintering thrush flocks were recorded on the Site, for instance flocks of 100, 70 and several flocks of 30 or fewer fieldfare and up to 20 redwing (although a flock of 40 redwing was recorded to the east of the Site by the M6 motorway). Groups of up to three song thrushes were recorded on the Site.
- 4.4.47 Of the more commensal species, house sparrows were noted on the Site in flocks of up to 30, notably around Gailey Wharf, Four Ashes Industrial Estate and the houses south of Station Road. Starling flocks of between 10 and 20 birds were recorded in several places, notably around Gailey, Calf Heath Wood and close to Woodside Farm/Heath Farm.

#### Ecological Value – Breeding Birds

- 4.4.48 The assemblage of breeding birds includes several declining birds of farmland habitats listed on the Red List and s41 as well as birds listed on the local Biodiversity Action Plan for Farmland Seed Eating Birds (skylark, yellow wagtail, lapwing, yellowhammer, house sparrow, linnet, bullfinch and reed bunting). The status of these species in the Staffordshire context is discussed in the following paragraphs. Trends discussed come from Breeding Bird Survey data<sup>25</sup> and number of breeding pairs in a Staffordshire, Warwickshire, Worcestershire and West Midlands context comes from the West Midland Bird Club Annual Report<sup>26</sup>.
- 4.4.49 Skylark - at least 14 pairs breeding on-site. The West Midlands population has declined by 24% in the period 1995 to 2014 although the species is still abundant in the region (25,000+ pairs/50,000+ birds). The 12 pairs represent a very small proportion of this regional total.
- 4.4.50 Yellow wagtail - in 2013 there were 31 to 39 pairs of yellow wagtail in Staffordshire and on that basis one or two pairs of yellow wagtails breeding on-site equates to up to 6.5% of the county population; the population in England has declined by 42% in the period 1995 to 2014.
- 4.4.51 Lapwing – five to six pairs breeding on-site equates to up to 2.4% of the county population; the West Midlands population has declined by 18% in the period 1995 to 2014.
- 4.4.52 Yellowhammer - there are at least 13 pairs breeding on-site. The West Midlands population has declined by 44% in the period 1995 to 2014 and whilst the 2013 bird report lists the species as very common to abundant,

<sup>25</sup> Harris S J, Massimino D, Newson S E, Eaton M A, Marchant J H, Balmer D E, Noble DG, Gillings S, Procter D, Pearce-Higgins J W (2016) The Breeding Bird Survey 2015. BTO Research Report 687 British Trust for Ornithology, Thetford

<sup>26</sup> West Midland Bird Club (2016) The Birds of Staffordshire, Warwickshire, Worcestershire and the West Midlands 2013

the Staffordshire total that year was 45 breeding or probable breeding locations.

- 4.4.53 House sparrow - there are six on-site clusters of buildings supporting breeding colonies. The number of pairs present is not suspected of being more than 15 and in the context of the regional population of at least 25,000 this represents a very small proportion.
- 4.4.54 Linnet - at least seven pairs of this species are breeding on-site and in 2013 there were 136 recorded breeding territories in Staffordshire (making the site population up to 5% of the county total).
- 4.4.55 Bullfinch - this species is a possible breeder on-site with two pairs maximum. There are at least 2,500 pairs in the region and so the Site population if breeding represents a very small proportion of that total.
- 4.4.56 Reed bunting - one or two pairs is a small proportion of the Staffordshire population which is present at least 89 breeding sites (which hold more than one pair each on average, for instance 24 pairs at one site).
- 4.4.57 The birds of conservation concern more associated with woodland and scrub include dunnock which is abundant, song thrush (abundant), mistle thrush (common), willow warbler (very common to abundant) and stock dove which is very common in the region.
- 4.4.58 Of the birds recorded that nest in buildings, starling is very common to abundant, swallow is very common and kestrel is fairly common in the region.
- 4.4.59 Tawny owl is fairly common in the region and mallard is common and as a result the breeding birds present represent a very small proportion of these populations.
- 4.4.60 There were 11 confirmed and nine further probable/possible breeding pairs of raven in Staffordshire in 2013. The probable breeding pair in Calf Heath Wood represents 5% of the county total probable population.
- 4.4.61 The birds breeding on-site need to be considered in the context of the surrounding landscape which has similar habitats present to those on-site (i.e. areas of buildings, arable, pasture, woodland, watercourses, waterbodies and quarries). For this reason, the birds recorded on-site are not likely to be restricted to the Site and are likely to be present and breeding elsewhere in the vicinity. This has been demonstrated by records of breeding or probable breeding lapwing and snipe from adjacent land and from records of lapwing and singing skylark, song thrush and dunnock from land beyond the Site in the bird survey carried out by Ramboll.

- 4.4.62 Birds of conservation concern such as willow tit have been recorded breeding in the vicinity of the Site and a heronry is present east of the M6 at Gailey Reservoirs. All this demonstrates that whilst the birds on the Site are of ecological value, the habitats and birds present are not unique or particularly noteworthy in the local area.
- 4.4.63 The restoration of the quarry, were it to happen prior to development of Phases 1, 2 and 4 would improve the habitat quality for birds in these parts of the site, notably for farmland birds through creation of 10 m buffer strips that will be allowed to colonise naturally between reinstated arable fields and field margins (i.e. hedgerows).

#### *Ecological Value – Wintering Birds*

- 4.4.64 The Gailey Reservoirs LWS (including Calf Heath Reservoir) support wintering bird assemblages consistent with their designation at the county scale.
- 4.4.65 Farmland birds present in the winter correspond broadly with those breeding on the Site, although yellowhammer was not recorded on the Site, this species presumably flocking elsewhere. A flock of 40 lapwing on site in October 2017 is consistent with records locally (e.g. 50 off site recorded in the wintering bird survey to the east of the site) and unremarkable in the context of sixteen flocks of between 100 and 500 in winter 2013 in Staffordshire<sup>26</sup>. No notable concentrations of skylark were noted and wading birds (snipe, oystercatcher) seem to use the Site on occasion only.
- 4.4.66 Several flocks of wintering thrushes (fieldfare and redwing) were recorded, although these were typical of the size of flocks of both species recorded across the West Midlands<sup>26</sup>.
- 4.4.67 House sparrow and starling were recorded in winter in concentrations greater than during the breeding season, reflecting recruitment during the summer. Flocks of 30 house sparrow are not unusual in Staffordshire and the flocks of starling are not significant in a county context (and may have been roosting at Belvide Reservoir where up to 25,000 roosted in winter 2013)<sup>26</sup>.

### **Valuation Summary**

- 4.4.68 The farmland bird assemblage of birds of conservation concern/listed on s41 or forming part of the local BAP is of importance at the County scale (due to the significant proportion of the county population of yellow wagtails that breeds on-site). This value is largely due to the breeding bird assemblage; the birds using the Site in the winter do so in number unremarkable in a county context. The assemblage of other birds of conservation concern (including those nesting in buildings or associated with woodland and scrub) are of value at the Local scale, again as a result of the breeding birds present. These are therefore considered as Important Ecological Features.

The other birds are of importance at the site scale and thus considered as Other Ecological Features. As per the methods described in Chapter 10 of the EIA, the impact assessment considers potential effects on Important Ecological Features and therefore effects on Other Ecological Features species are not considered further in the EIA.

## 4.5 Invertebrates

- 4.5.1 Annex 10.1.5 presents the full invertebrate survey methodology, limitations and findings for the Site that were carried out between May and September 2016 and May to July 2017.
- 4.5.2 The methods utilised for the assessment are those recommended in the Natural England guidance document 'Surveying terrestrial and freshwater invertebrates for conservation evaluation' NERR005 (2007)<sup>27</sup>. Methods used included; sweep netting, spot sampling, grubbing and pitfall traps.
- 4.5.3 The target groups that formed the focus of the assessment are those that are widely used and accepted as of greatest value to site assessment and appraisal and the key indicator groups used in the Natural England Invertebrate assessment software programme ISIS (version 2010) and recommended by NERR005<sup>28</sup>. The principal groups are likely to include:
- Bees and wasps (early succession, bare ground, flowery habitats and structural variation);
  - Various fly families including hoverflies (range of habitats types, especially structural habitats);
  - Butterflies and day-flying moths (particularly early succession, short swards and woodland fringe);
  - Heteropteran bugs (range of habitats including bare ground, scrub fringe and grasslands);
  - Beetles including leaf beetles, ground beetles and water beetles (range of habitats including bare ground, structural habitats and flowering plants);
  - Orthoptera (grasshoppers and crickets); and
  - Odonata (dragonflies and damselflies).

## Legislation

- 4.5.4 Certain invertebrates are listed under the following legislation, policies and guidance:
- Bern Convention, Appendix 2 and 3;

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<sup>27</sup> Drake C M *et al.* (2007) NERR005. *Surveying terrestrial and freshwater invertebrates for conservation evaluation*. Natural England

<sup>28</sup> Lott D *et al.* (2007) ISIS. *Invertebrate Species-habitat Information System, 2010 build*. Natural England

- Habitats Directive, Annex 2a (designation of protected areas required within the natural range of the animal species listed), Annex 4a (special protection required for the native animal species listed) and Annex 5a (exploitation of listed animal species to be subject to management if necessary in order to maintain their favourable conservation status);
- The Conservation of Habitats and Species Regulations 2017, Schedule 2 (Lists those species of animals included in Annex IV(a) to the Habitats Directive that have a natural range that includes any area in Great Britain);
- Wildlife and Countryside Act 1981, invertebrate species listed on Schedule 5 may be protected under one, some or all of these parts:
  - Part 1 - intentional killing, injuring, taking;
  - Part 2 - possession or control (live or dead animal, part or derivative);
  - Part 4 (a) - intentional damage to or destruction of any structure or place used by a scheduled animal for shelter or protection;
  - Part 4 (b) - intentional disturbance of animal occupying such a structure or place;
  - Part 4 (c) - obstruction of access to any structure or place used for shelter or protection;
  - Part 5 (a) - selling, offering for sale, possessing or transporting for the purpose of sale (live or dead animal, part or derivative); and
  - Part 5 (b) - advertising for buying or selling live or dead animal, part or derivative;
- Biodiversity Lists - England NERC s41; and
- Staffordshire LBAP – four invertebrate species (not including white-clawed crayfish).

## Results

- 4.5.5 A summary of the results of the invertebrate surveys are provided below, full results and details of the surveys are provided in Annex 10.1.5.
- 4.5.6 A total of 420 species were recorded during the invertebrate surveys. Of the total 420 species recorded, 133 invertebrate species from the target groups were recorded in Calf Heath Wood, 90 species from the targeted groups were recorded from the quarry, 172 species from the targeted groups were recorded across the wider Calf Heath landscape and 179 species from the targeted groups were recorded in the Land south of Vicarage Road (Sample areas 4 and 5).
- 4.5.7 The habitat diversity is broadly poor in terms of invertebrate assemblage types. The principal assemblages relate to woodland, wood edge and trees,

bare ground and early succession and wetlands. The niches of value are few and not particularly well-developed. The report in Annex 10.1.5 refers to 'mire'; this is in relation to a particular community of invertebrates associated with wet features such as wet ditches and marshy grassland and does not indicate the presence of a mire habitat as defined in the Phase 1 methodology<sup>5</sup>.

4.5.8 Eight species of importance were identified as presented in Table 4.25 (seven Nationally Scarce (NS) or s41) and one group of species are of county, Staffordshire importance. The habitat is considered to be of low to moderate quality and lacking significant niche development. The habitats identified are largely populated by common and localised species indicative of a broad suite of preferences rather than a specialised set of habitat criteria. The habitats present on-site are replicated in the local area.

**Table 4.25: Invertebrate Species of Importance Identified**

Scientific Name	Vernacular Name	National Status	Habitat Preferences and Species Notes	Sample Location
<i>Bombus rupestris</i>	A cuckoo bumblebee	NS B	No specific habitat preferences. More common than status suggests	Calf Heath wood
<i>Chiasmia clathrata</i>	Latticed heath	s41	Dry grassland, brownfields and heaths with trefoils	Found across the landscape along sparse, fine-leaved grass track verges with trefoils.  Specifically along the edges of arable fields.
<i>Diogma glabrata</i>	A crane fly	NS	Damp woodlands	Calf Heath wood
<i>Rhamphomyia micropyga</i>	A dance fly	NS	Shaded woodland floor	Specific to sample area 4
<i>Rhaphium albomaculatum</i>	A doly fly	NS	Wetlands on peat	Specific to sample area 4
<i>Rhaphium lanceolatum</i>	A doly fly	NS	Wetlands on peat	Specific to sample area 4
<i>Tyria jacobaeae</i>	Cinnabar	s41	Open habitats where there is ragwort	Found across the landscape
<i>Aculeate hymenoptera</i>	Ground-nesting solitary bees and wasps	Staffordshire Biodiversity Action Plan (SBAP)	Bare ground and flowery swards  Structured sites	Quarry (19 sp – all common or local) and landscape (six sp– all common or local)

### Valuation Summary

4.5.9 The invertebrate assemblage is of value at a Local scale and will be assessed as an 'Important Ecological Feature' within the EIA.

## 4.6 Bats

### Legislation

- 4.6.1 All 18 British bat species are listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (the WCA 1981) and under Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (The Habitat Regulations) as European Protected Species (EPS).
- 4.6.2 All EPS are protected under the WCA 1981 and the Habitat Regulations. Under this legislation it is illegal to:
- i. Deliberately capture, injure or kill any bat;
  - ii. Deliberately disturb bats, in particular where it is likely to:
    - a. Impair their ability to breed or reproduce, or to rear or nurture their young;
    - b. Impair their ability to hibernate or migrate; or
    - c. Affect significantly the local distribution or abundance of bats.
  - iii. Intentionally or recklessly damage, destroy or obstruct the access to the place of shelter or protection; and
  - iv. Damage or destroy a bats breeding site or resting place.
- 4.6.3 Furthermore, several bat species are listed under Section 41 (s41) of the 2006 Natural Environment and Rural Communities (NERC) Act as species of principal importance for the purpose of conserving biodiversity. These include barbastelle (*Barbastella barbastellus*), bechstein's (*Myotis bechsteini*), noctule (*Nyctalus noctula*), soprano pipistrelle (*Pipistrellus pygmaeus*), brown long-eared (*Plecotus auritus*), greater horseshoe (*Rhinolophus ferrumequinum*) and lesser horseshoe (*Rhinolophus hipposideros*).
- 4.6.4 Noctule bats, common pipistrelles (*Pipistrellus pipistrellus*) and soprano pipistrelles are listed in the Staffordshire Biodiversity Action plan as priority species<sup>29</sup>.

### Guidance Notes and Industry Standards

- 4.6.5 Survey works have been undertaken in line with Bat Conservation Trust's Bat Surveys: Good Practice Guidelines, 3rd Edition (2016)<sup>30</sup> hereafter referred to as BCT Guidelines 2016.

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<sup>29</sup> Staffordshire Biodiversity Action Plan. Action Plan: Species. Available at: <http://sbap.org.uk/actionplan/species/index.php> [Accessed 14/12/2016]

<sup>30</sup> Bat Conservation Trust, 2016. Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd Edition



## Methodology

4.6.6 Bat surveys have been carried out in 2016 and 2017. Methodologies are presented for those works undertaken in this period.

### *Bat Survey – Preliminary Ecological Appraisal*

4.6.7 A Preliminary Ecological Appraisal (PEA) was undertaken including a desk study with data obtained from SERC and via fieldwork (an extended Phase 1 Habitat Survey). The findings of the PEA are presented in Ramboll report reference UK15-22306\_PEA.

4.6.8 The objectives of the PEA were to collate and review existing information about the Site and its surroundings to inform the design of subsequent bat surveys and inform the impact assessment for the project.

4.6.9 The PEA and Phase 1 Habitat Survey were undertaken by Matt Neale CEcol MCIEEM. The surveyor observed, assessed and recorded habitats suitable for bats to roost, commute and forage both on-site and in the surrounding area. A preliminary assessment of suitability of structures and habitats to support roosting or commuting and foraging bats was made in line with Table 4.26 of the BCT Guidelines 2016 as reproduced below. This assisted in defining the requirement for and scope of further bat surveys.

**Table 4.26: Considerations for Assessing the Potential Suitability of the Site for Bats**

Suitability	Roosting Habitats	Commuting and Foraging Habitats
Negligible	Negligible habitat features on-site likely to be used by roosting bats.	Negligible habitat features on-site likely to be used by commuting or foraging bats.
Low	<p>A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these 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.</p> <p>A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.</p>	<p>Habitat that could be used by small numbers of commuting bats such as gappy hedgerow or unvegetated stream, but isolated.</p> <p>Suitable but isolated habitat that could be used by small numbers of foraging bats such as a lone tree or a patch of scrub.</p>
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitats but unlikely to support a roost of high conservation status.	<p>Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.</p> <p>Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub grassland or water.</p>

Suitability	Roosting Habitats	Commuting and Foraging Habitats
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	<p>Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge.</p> <p>High quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree lined watercourses and grazed parkland.</p> <p>Site is close to and connected to known roosts.</p>

*Bat Survey – Roost Assessment of Structures*

4.6.10 The following building types and features are considered to be particularly suitable to support roosting bats:

- i. Buildings of pre 20th or early 20th century construction;
- ii. Agricultural buildings of brick, stone or timber construction;
- iii. Large and complicated roof voids with unobstructed flying spaces;
- iv. Large (>20 cm) roof timbers with mortise joints, cracks and holes;
- v. Entrances into buildings that bats could fly through;
- vi. Poorly maintained buildings such that they provide access points for bats into roofs, walls, bridges, but at the same time not being too cool and draughty;
- vii. Roofs that are warmed by the sun e.g. south-facing;
- viii. Weatherboarding and/or hanging tiles with gaps;
- ix. Undisturbed building roofs and structures;
- x. Buildings and built structures in proximity to each other providing a variety of roosting opportunities throughout the year; and
- xi. Buildings and built structures close to good foraging habitat e.g. mature trees, parkland, woodland or wetland.

4.6.11 External inspections of buildings on-site were undertaken during daylight hours on multiple dates as access was granted. The inspections were led by Chris Hodsman MCIEEM and supported by Emily McVean ACIEEM. Chris and Emily both hold a BSc in Environmental Science, and Chris holds an MSc in Environmental Monitoring and Assessment. Chris Hodsman holds a Natural England Level 2 licence (Class Licence Registration Number: 2016-22958-CLS-CLS) to survey bats using artificial light, endoscopes, by hand and handheld static nets.

4.6.12 The objectives of this survey were to identify if actual or potential roosts are present (where possible identifying species present), identify access points relative to roost (or potential roost) sites and infer likely numbers of bats

present. The findings relating to the primary objective are then sought to be placed in context by detailing the current arrangement of vegetation and lighting in the immediate vicinity.

- 4.6.13 The external inspections involved walking around the buildings and visually inspecting features, such as gaps around windows, roof tiles, eaves and areas of missing mortar, for any evidence of bat use. These same features were also assessed for their potential to provide crevices for roosting bats, or access points to other parts of the building which may also be used for roosting e.g. roof voids. The surveyor looked for bat droppings, staining by fur oils or urine, prey residues (e.g. moth and butterfly wings) as well as the bats themselves. In accordance with the guidance outlined in BCT Guidelines 2016 each building was assessed for its potential to support bats.
- 4.6.14 Where access was permitted and buildings were safe to enter, an internal inspection was carried out by Ramboll ecologist Chris Hodsman (Class Licence Registration Number: 2016-22958-CLS-CLS), assisted by Emily McVean or James Fraser. These inspections focussed on the roof voids where present, including internal crevices potentially suitable for roosting bats. The areas were systematically searched for signs of bats or bat use, using a high-powered torch. The orientation and construction materials of the buildings were also noted.
- 4.6.15 Bats are very mobile creatures and can occupy buildings at any given time; therefore, this survey does not take into account seasonal differences or the physical changes to a building after the survey date due to weathering, maintenance, deterioration or material replacements. The absence of a particular species cannot definitely be confirmed by a lack of field signs and only concludes that an indication of its presence was not located during the survey effort.

#### *Bat Survey – Preliminary Ground Level Roost Assessment of Trees*

- 4.6.16 A detailed inspection of trees, or groups of trees was undertaken in February 2017 by Chris Hodsman and Emily McVean when leaves were not present on the trees to assist identification of PRFs. The objectives of this survey were to determine the actual or potential presence of bats and the need for further survey and/or mitigation. These surveys covered all trees shown to be lost as a result of the Proposed Development with the exception of trees on the interior of Calf Heath Wood which is dominated by early mature pine. Mature broadleaved trees on the margins of Calf Heath Wood were surveyed. The inspection involved walking around the trees visually inspecting features, such as broken or dead tree limbs, woodpecker holes, lifted bark sections and crevices/scars in the branches or tree trunks for any evidence of bat use. The surveyors looked for bat droppings, staining by fur oils or urine, prey residues (e.g. moth and butterfly wings) as well as the bats themselves. Inspections were assisted by use of close focus binoculars and high powered

torches. In accordance with the BCT Guidelines 2016, each tree or group of trees was assessed for their potential to support bats and classified as negligible, low, moderate or high. Findings are cross referenced to the tree survey schedule (FPCR, 2016).

#### *Bat Survey –Potential Roost Feature Inspection Surveys of Trees*

- 4.6.17 The objective of these surveys was to reclassify PRFs identified in the ground level assessment on moderate and high potential trees and determine the presence or absence of bats at the time of the survey.
- 4.6.18 Trees with bat potential that are within areas to be felled in Phase 1 of the proposed development were climbed and inspected where safe to do so.
- 4.6.19 Trees identified as being due for removal as part of the proposed development proposals were assessed from the ground for potential to support roosting bats and where safe to do so were further inspected using rope access techniques by licensed/accredited bat ecologists holding City and Guilds certificates in tree climbing and aerial rescue.
- 4.6.20 Potential bat roosting sites in trees were examined visually with high powered torches and endoscopes to ascertain their potential to support bat roosts and whether any bats or their signs are present, such as bats themselves, bat droppings or audible noises made by bats.
- 4.6.21 A programme of tree climbing / survey is detailed in the EMMP to inspect trees to be felled in subsequent phases. It should be noted that the boundary of Phase 1 was enlarged following receipt of Stage 2 consultee comments to enable ecological corridors to be formed from the outset of the project to aid their establishment. As such, the following moderate and high potential trees have not been climbed to date but are scheduled to be climbed prior to any felling taking place; T171, T174, T175, T177, T178, T187, T188, T189, T321, T322, G97, G98 and G99 (D&E).

#### *Bat Survey – Presence/ Absence and Roost Characterisation*

- 4.6.22 Emergence and re-entry surveys were undertaken on buildings identified as having potential to support roosting bats (Results of the roost assessment of structures are presented in Annexes 10.1.6 (A – O)). The surveys were led by Chris Hodsman BSc MSc MCIEEM and supported by:
- i. Malcolm Robertson BSc MCIEEM CEnv;
  - ii. Emily McVean BSc ACIEEM;
  - iii. Carl Bailey BSc MCIWEM;
  - iv. James Fraser BSc; and
  - v. Mike Pantling MEnvSci PIEMA

4.6.23 The objective of these surveys was to assess the roosting status of the buildings. The dates and number of surveys undertaken for each building is presented below in Table 4.27. The survey effort employed was in line with the BCT Guidelines 2016.

**Table 4.27: Bat Survey Effort**

Building Number	Date	Survey Type	Weather	Surveyor Locations (Figure No)
Woodside Farm	26/05/2016	Dawn re-entry	8.5°C; 100% cloud cover; light breeze; no precipitation	10.1.601
	04/08/2016	Dusk emergence	15°C; 10% cloud cover; light breeze; no precipitation	
	07/09/2016*	Dawn re-entry	20°C; 100% cloud cover; calm; no precipitation	
Woodside Barn	25/05/2016	Dawn re-entry	8.5°C; 80% cloud cover; light breeze; no precipitation	10.1.602
	03/08/2016	Dusk emergence	15°C; 85% cloud cover; moderate breeze; no precipitation	
	06/09/2016	Dawn re-entry	18°C; 90% cloud cover; light breeze; no precipitation	
Fir Tree Cottage	24/05/2016	Dusk emergence	11°C; 10% cloud cover; light breeze; no precipitation	10.1.603
	26/08/2016	Dawn re-entry	15°C; 0% cloud cover; light breeze; no precipitation	
Gailey Magazine	26/05/2016	Dusk emergence	10°C; 10% cloud cover; calm; no precipitation	10.1.604
	05/07/2016	Dawn re-entry	14°C; 10% cloud cover; calm/light breeze; no precipitation	
The Barn (Gravelly Way)	17/08/2016	Dusk emergence	19°C; 20% cloud cover; calm; no precipitation	10.1.605
The Farmhouse (Gravelly Way)	25/05/2016	Dusk emergence	10°C; 100% cloud cover; light breeze; occasional rain/light drizzle	10.1.606
	19/08/2016	Dawn re-entry	15°C; 100% cloud cover; calm; no precipitation	
The Stables (Gravelly Way)	18/08/2016	Dusk emergence	19°C; 25% cloud cover; calm; no precipitation	10.1.607
Heath Farm – Main farmhouse	04/07/2017	Dawn re-entry	13°C; 5% cloud cover calm (F1); no precipitation	10.1.609
	25/07/2017	Dusk emergence	20°C; 50% cloud cover; calm (F1); no precipitation	
	14/09/2017	Dawn re-entry	8°C; 100% cloud cover; light breeze; light to moderate showers	
Heath Farm – Converted Outbuilding	21/06/2017	Dusk emergence	26°C; 10% cloud cover; calm (F1); no precipitation	10.1.610
	06/07/2017	Dawn re-entry	17°C; 6% cloud cover; light breeze (F2); no precipitation	
	24/07/2017	Dusk emergence	18°C; 20% cloud cover; light breeze (F2); no precipitation	

Building Number	Date	Survey Type	Weather	Surveyor Locations (Figure No)
Clovelly	04/07/2017	Dusk emergence	16°C; 40% cloud cover; light breeze (F2); no precipitation	10.1.613
	26/07/2017	Dawn re-entry	16°C; 40% cloud cover; light breeze (F2); no precipitation	
Ash House	18/05/2017	Dawn re-entry	13°C, no precipitation, partly cloudy, wind speed light (F2).	10.1.612
	06/07/2017	Dusk emergence	20°C; 75% cloud cover; light breeze (F2); no precipitation	
Stoney Brook Annex	20/06/2017	Dusk emergence	15°C; 100% cloud cover; light breeze (F2); no precipitation	10.1.615
	16/08/2017	Dawn re-entry	12°C; 80% cloud cover; calm (F1); no precipitation	
Stoney Brook Cottage	21/06/2017	Dawn re-entry	15°C; 100% cloud cover; light breeze (F2); no precipitation	10.1.614
	16/08/2017	Dusk emergence	18°C; 90% cloud cover; moderate breeze; no precipitation	
Croft House	19/06/2017	Dusk emergence	23°C; 30% cloud cover; light breeze (F2); no precipitation	10.1.608
	25/07/2017	Dawn re-entry	14°C; 90% cloud cover; light breeze (F2); no precipitation	
Mile End Cottage	22/06/2017	Dawn re-entry	21°C; 25% cloud cover; light breeze (F2); no precipitation	10.1.611
	26/07/2017	Dusk emergence	16°C; 40% cloud cover; moderate breeze (F3); no precipitation	

\*Extra survey undertaken to remove limitation of lights being on limiting surveyor's vision during previous dusk survey

- 4.6.24 Dawn re-entry surveys were carried out since they can be an efficient method of locating bat roost entrances. Towards dawn, many bat species "swarm" outside their roosts and as a result, this can be an effective means of detecting roosts in large and complex buildings or where there are several potential roosting areas within smaller roosts. A dawn re-entry survey typically begins 90 minutes to 120 minutes before dawn and continues until 15 minutes after sunrise.
- 4.6.25 Dusk emergence surveys typically started approximately 15 minutes before sunset and continued for around 90 minutes to 120 minutes after sunset. The methods are similar to that of the dawn survey; however, bats are slightly more difficult to see emerging from the roost as there is no indication of when they are going to do so. In general, activity levels are greater during dusk surveys, providing a more robust impression of roost size.
- 4.6.26 The equipment used by the surveyors included an Elekon BatloggerM, Wildlife Acoustics Echo Meter Touch and Touch 2 Pro (Used with iPad Minis), Wildlife Acoustics EM3's and supported with two Bat Box Duets. This enabled

surveyors to accurately record the bat echolocation data and to help compile an accurate species list of bats within the vicinity of the survey area. This recorded bat echolocation data was recorded as a .WAC file; converted to .ZCA using Kaleidoscope software and analysed using AnaLook or in the case of data from the Batlogger M analysed with Elekon BatExplorer software. A digital thermometer was also used to get an accurate temperature reading for the activity surveys.

#### *Bat Survey – Bat Activity Surveys*

- 4.6.27 According to the guidance set out in the BCT Guidelines 2016, the Site is considered to offer a mixture of 'low' and 'moderate' suitability for bats. As a precautionary approach the entire Site was classified as 'moderate' in defining the scope of the activity surveys. Based on this, one visit per month (May to October) was undertaken, with at least one survey comprising a dusk and following pre-dawn survey. 2016 activity surveys relate to land north of Vicarage Road and activity surveys undertaken in 2017 were on land south of Vicarage Road.
- 4.6.28 The surveys were led by licenced bat ecologist Chris Hodsman BSc MSc MCIEEM and supported by:
- vi. Emily McVean BSc ACIEEM;
  - vii. Carl Bailey BSc MCIWEM; and
  - viii. James Fraser BSc.
- 4.6.29 The objectives of these surveys were to establish the species of bat present, assess the levels of bat activity, how and when they use the Site and assess the Site in the context of adjacent habitats.
- 4.6.30 Transect routes incorporated all areas of the Site including all habitats likely to be used by foraging and commuting bats including woodland, hedgerows, scattered trees, grassland, arable crops, ponds, canals and ditches. The locations of transects are shown on Figure 10.1.616. Activity surveys in 2016 were undertaken over several consecutive nights to provide adequate coverage due to the size of the Site and diversity of habitats present. The 2017 activity surveys comprised one transect and as such was undertaken on a single night, monthly. Table 4.28 below details the dates and times at which activity surveys were undertaken and associated conditions.

**Table 4.28: Manual Bat Activity Survey Details**

Month	Transect Number	Date Undertaken	Dusk/ Dawn Times	Survey Time(s)	Weather
May	1	17/05/2016	21:02	21:07 – 23:42	12°C; 100% cloud cover; light breeze; no precipitation
	2	17/05/2016	21:02	21:05 – 23:30	12°C; 100% cloud cover; light breeze; no precipitation
	3	16/05/2016	21:02	21:02 – 23:44	10°C; 33% cloud cover; calm; no precipitation
	4	16/05/2016	21:02	21:02 – 23:20	10°C; 33% cloud cover; light breeze; no precipitation
	5	18/05/2016	21:05	21:12 – 23:30	10°C; <10% cloud cover; light breeze; no precipitation
	6	03/05/2017	20:38	20:40-23:26	10°C; 100% cloud cover; moderate breeze; no precipitation
June	1	20/06/2016	21:36	21:40 – 00:25	15°C; 30% - 100% cloud cover; light breeze; no precipitation
	2	20/06/2016	21:36	21:40 – 00:31	15°C; 30% - 100% cloud cover; calm; no precipitation
	3	21/06/2016	21:36	21:36 – 00:22	15°C; 60% cloud cover; calm; no precipitation
	4	20/06/2016	21:36	21:40 – 11:50	15°C; 30% - 100% cloud cover; calm; no precipitation
	5	21/06/2016	21:36	21:36 – 00:22	15°C; 60% cloud cover; calm; no precipitation
	6	21/06/2017	21:36	21:36-23:53	26°C; 30% cloud cover; calm; no precipitation
July	1	18/07/2016	21:21	21:21 – 23:55	18-21°C; No cloud cover; calm; no precipitation
	2	18/07/2016	21:21	21:21 – 00:12	20°C; No cloud cover; calm; no precipitation
	3	19/07/2016	21:20	21:20 – 23:53	26°C; 30 – 50% cloud cover; calm; no precipitation
	4	18/07/2016	21:21	21:22 – 00:12	20°C; No cloud cover; calm; no precipitation
	5	19/07/2016	21:20	21:20 – 23:30	24°C; 50% cloud cover; calm; no precipitation
	6	05/07/2017	21:33	21:33-23:51	20°C; 60% cloud cover; light-moderate breeze; no precipitation
	6	06/07/2017	04:53	02:53-05:00	16°C; 10% cloud cover; light breeze; no precipitation
August	1	10/08/2016	20:43	20:43 - 23:13	14°C; 100% cloud cover; light breeze; light precipitation (Occasional drizzle)
	2	10/08/2016	20:43	20:43 - 23:15	14°C; 100% cloud cover; light breeze; light precipitation (occasional drizzle)
	3	11/08/2016	20:41	20:41 – 23:18	16 - 18°C; 50/60% cloud cover; calm; no precipitation
	4	10/08/2016	20:43	21:10* - 23:21	14°C; 100% cloud cover; light breeze; light precipitation (occasional drizzle)
	5	11/08/2016	20:41	20:43 – 22:50	16°C; 60% cloud cover; calm; no precipitation



Month	Transect Number	Date Undertaken	Dusk/ Dawn Times	Survey Time(s)	Weather
	6	15/08/2017	20:35	20:35-23:00	17°C; 5% cloud cover; light breeze; no precipitation
September	1	05/09/2016	19:46	19:50 – 22:02	20°C; 10-30% cloud cover; calm; no precipitation
	2	05/09/2016	19:46	19:50 – 22:10	20°C; 30% cloud cover; calm; no precipitation
	3	06/06/2016	19:43	19:44 – 22:14	20°C; 40% cloud cover; light breeze; no precipitation
	4	05/09/2016	19:46	19:57 – 22:18	20°C; 30% cloud cover; light breeze; no precipitation
	5	06/06/2016	19:43	19:45 – 21:51	18-20°C; 40% cloud cover; light breeze; no precipitation
	6	13/09/2017	19:27	19:30-21:48	11°C; 40% cloud cover; light breeze; no precipitation
October	1	19/10/2016	18:03	18:00 – 20:06	13°C; 20% cloud cover; light breeze; no precipitation
	1	20/10/2016	07:42	05:35 – 07:32	8°C; 70% cloud cover; light breeze; no precipitation
	2	19/10/2016	18:03	18:00 – 20:06	11°C; 30% cloud cover; light breeze; no precipitation
	2	20/10/2016	07:42	05:38 – 07:42	8°C; 70% cloud cover; light breeze; no precipitation
	3	20/10/2016	18:01	18:01 - 20:10	12°C; 25% cloud cover; light breeze; no precipitation
	3	21/10/2016	07:46	05:38 – 07:30	4°C; 85% cloud cover; calm; no precipitation
	4	19/10/2016	18:03	18:04 – 20:12	12°C; 20% cloud cover; calm; no precipitation
	4	20/10/2016	07:42	05:42 – 07:46	8°C; 70% cloud cover; light breeze; no precipitation
	5	20/10/2016	18:01	17:56 – 20:03	12°C; 25% cloud cover; light breeze; no precipitation
	5	21/10/2016	07:46	05:36 – 07:37	5°C; 85% cloud cover; calm; no precipitation
	6	12/10/2017	18:21	18:21-20:35	13°C; 10% cloud cover; light breeze; no precipitation

\*Start delayed due to battery failure on detector

4.6.31 In 2016 two or three suitably qualified surveyors were present on-site for each survey, with each surveyor walking a separate transect route. In 2017 one transect was walked. Each transect had between 10 and 12 point counts spread across the route, these were consistent month to month and were selected to represent the different habitat types present. The surveyor stopped for three minutes at each point count and noted any bat activity recorded or observed. Dusk surveys commenced at sunset and concluded approximately two to three hours after. Dawn surveys commenced approximately two hours before sunrise and concluded at sunrise. Weather

conditions (temperature, precipitation and wind speed) were recorded on each survey. The surveyors made a note of bat activity, using both visual observation and bat detectors to identify foraging and/or commuting behaviour. Surveyors recorded the time and a description of any activity. Additionally, where bats could be seen, the patterns/directions of the bats' flight were also recorded. The equipment and analysis used was as specified in Paragraph 4.6.28.

- 4.6.32 Bat activity is inherently variable from night to night. Automated bat surveys over multiple consecutive nights were therefore undertaken in parallel to the manual bat activity surveys. One automatic bat detector (Wildlife Acoustics Song Meter SM 2 or SM 4 detector) was deployed on each transect for a minimum of five consecutive nights per month (May to October).. In 2016 a total of five automated bat detectors were left at the Site each month with a single detector being deployed each month in 2017 covering all habitats represented in the survey area which could be impacted by the proposed development. In habitats of 'moderate' suitability for bats the BCT Guidelines 2016 suggest that automated detectors should be deployed in two locations per transect. The deployment of one (not two) automated detectors per transect was considered a valid and robust approach when combined with the use of Advanced Licence Bat Survey Techniques (ALBSTs), namely bat trapping and radio tracking surveys, the methods for which are described in the sections below.
- 4.6.33 The deployment of the automatic detectors and weather details are presented in Table 4.29 below.

**Table 4.29: Weather Conditions During Automated Bat Surveys**

Month	Date	Weather*
	<b>2017</b>	
May	03/05/2017	9°C; wind speed 16.7 km/h; overcast
	04/05/2017	8°C; wind speed 13 km/h; mostly cloudy
	05/05/2017	8°C; wind speed 16.7 km/h; mostly cloudy
	06/05/2017	8°C; wind speed 9.3 km/h; overcast
	07/05/2017	9°C; wind speed 13 km/h; scattered clouds
	18/05/2017	10°C; wind speed 3.7 km/h; partly cloudy
	19/05/2017	9°C; wind speed 5.6 km/h; clear
	20/05/2017	9°C; wind speed 5.6 km/h; clear
	21/05/2017	10°C; wind speed 9.3 km/h; clear
	22/05/2017	14°C; wind speed 14.8 km/h; partly cloudy

Month	Date	Weather*
June	<b>2016</b>	
	15/06/2016	13°C; wind speed calm; clear
	16/06/2016	13°C; wind speed 9.3 km/h; rain
	17/06/2016	13°C; wind speed 20.4 km/h; clear
	18/06/2016	18°C; wind speed 16.7 km/h; overcast
	19/06/2016	16°C; wind speed 16.7 km/h; overcast
	20/06/2016	16°C; wind speed 7.4 km/h; mostly cloudy
	21/06/2016	15°C; wind speed 7.4 km/h; mostly cloudy
	22/06/2016	17°C; wind speed 5.6 km/h; overcast
	<b>2017</b>	
	21/06/2017	23°C; wind speed 5.6 km/h; clear
	22/06/2017	15°C; wind speed 5.6 km/h; partly cloudy
	23/06/2017	16°C; wind speed 11.1 km/h; overcast
	24/06/2017	15°C; wind speed 11.1 km/h; clear
	25/06/2017	15°C; wind speed 13 km/h; clear
July	<b>2016</b>	
	19/07/2016	24°C; wind speed 20.4 km/h; clear
	20/07/2016	19°C; wind speed 13.0 km/h; clear
	21/07/2016	17°C; wind speed 3.7 km/h; unknown
	22/07/2016	19°C; wind speed 9.3 km/h; clear
	23/07/2016	20°C; wind speed 13.0 km/h; partly cloudy
	<b>2017</b>	
	05/07/2017	18°C; wind speed 13 km/h; clear
	06/07/2017	21°C; wind speed 16.7 km/h; clear
	07/07/2017	18°C; wind speed 9.3 km/h; scattered clouds
	08/07/2017	19°C; wind speed 9.3 km/h; clear
	09/07/2017	19°C; wind speed 13.0 km/h; partly cloudy
	August	<b>2016</b>

Month	Date	Weather*	
	11/08/2016	17°C; wind speed 16.7 km/h; mostly cloudy	
	12/08/2016	17°C; wind speed 13.0 km/h; scattered clouds	
	13/08/2016	17°C; wind speed 13.0 km/h; overcast	
	14/08/2016	15°C; wind speed 5.6 km/h; clear	
	15/08/2016	15°C; wind speed 13.0 km/h; clear	
	16/08/2016	15°C; wind speed 9.3 km/h; clear	
	17/08/2016	18°C; wind speed 14.8 km/h; clear	
	18/08/2016	17°C; wind speed 16.7 km/h; scattered clouds	
	<b>2017</b>		
	16/08/2017	16°C; wind speed 18.5 km/h; overcast	
	17/08/2017	17°C; wind speed 16.7 km/h; scattered clouds	
	18/08/2017	11°C; wind speed 9.3 km/h; mostly cloudy	
	19/08/2017	14°C; wind speed 13.0 km/h; clear	
	20/08/2017	13°C; wind speed 13 km/h; partly cloudy	
	September	<b>2016</b>	
		06/09/2016	18°C; wind speed 7.4 km/h; mostly cloudy
		07/09/2016	17°C; wind speed 9.3 km/h; unknown
08/09/2016		15°C; wind speed 13.0 km/h; clear	
09/09/2016		17°C; wind speed 16.7 km/h; scattered clouds	
10/09/2016		12°C; wind speed 7.4 km/h; clear	
11/09/2016		11°C; wind speed 9.3 km/h; clear	
12/09/2016		16°C; wind speed 5.6 km/h; clear	
13/09/2016		18°C; wind speed 11.1 km/h; clear	
<b>2017</b>			
14/09/2017		10°C; wind speed 9.3 km/h; clear	
15/09/2017		10°C; wind speed 7.4 km/h; clear	
16/09/2017		8°C; wind speed 3.7 km/h; scattered clouds	
17/09/2017	11°C; wind speed 9.3 km/h; mostly cloudy		

Month	Date	Weather*
	18/09/2017	10°C; wind speed 1.9 km/h; clear
October	<b>2016</b>	
	19/10/2016	9°C; wind speed 13 km/h; clear
	20/10/2016	7°C; wind speed 13 km/h; clear
	21/10/2016	7°C; wind speed 7.4 km/h; clear
	22/10/2016	6°C; wind speed 5.6 km/h; clear
	23/10/2016	7°C; wind speed 9.3 km/h; clear
	<b>2017</b>	
	11/10/2017	12°C; wind speed 14.8 km/h; clear
	12/10/2017	11°C; wind speed 13 km/h; partly cloudy
	13/10/2017	17°C; wind speed 14.8 km/h; overcast
	14/10/2017	13°C; wind speed 14.8 km/h; clear
	15/10/2017	13°C; wind speed 9.3 km/h; mostly cloudy

\*Weather data taken at 11:50pm using historical data available at [www.wunderground.com](http://www.wunderground.com)

4.6.34 Recordings from the static detectors were analysed to gain further information on the species present and relative amount of activity through the night. Locations of the automated bat detector deployments are shown on Figure 10.1.617.

#### *Bat Survey – Advanced Licence Bat Survey Techniques*

4.6.35 In line with Chapter 9 of the BCT Guidelines 2016, Davidson-Watts Ecology Ltd were commissioned to undertake bat surveys of the Site and adjacent areas in 2016 and 2017 using advanced techniques to achieve the following objectives:

- Investigate the status of bats species at the Site with an emphasis on woodland habitat and tree lines during the breeding season (May – August 2016 & 2017);
- Radio-track key individuals using the Site, to locate breeding colonies of tree roosting bat species, including barbastelle, natterers' bat, noctule, Daubenton's bat, leisler's bat, alcathe bat, whiskered bat, and the brown long-eared bat, and where possible to determine broad activity patterns and use of the Site to complement the activity surveys described above; and
- Present a robust data set of the use of the Site and surrounding areas by tree roosting and other bat species to further establish an ecological

baseline, assist the assessment of potential impacts, and support the development of appropriate mitigation including appropriate roost protection measures, lighting design, detailed landscaping/planting inventories and habitat management.

- 4.6.36 Due to the difficult nature of locating bat roosts in trees and assessing the context of bat activity over large areas with bat detector/acoustic surveys, the primary approach to meeting the project aims was to trap free-flying bats and to radio-track individual bats to locate maternity and other roost types.
- 4.6.37 Four survey sessions of approximately one week each were undertaken, including one session in June 2016, one in June 2017, one session in August 2016 and one in August 2017. Each session began with the trapping of bats. Any radio-tagged bats were subsequently followed by radio-tracking for the remainder of the week to locate roost sites. Where access was possible, emergence counts were undertaken at identified roosts to determine the function of the roost and to provide an estimate of population sizes.
- 4.6.38 The following methods were undertaken in line with Chapter 9 (Advanced licensed bat survey methods) in the BCT Guidelines 2016.

#### Trapping Methods

- 4.6.39 All trapping and tracking were undertaken by licenced bat ecologists under project licences from Natural England, numbers: 2016-23560-SCI-SCI and 2017-28570-SCI-SCI.
- 4.6.40 Bats were caught using 6m or 18m mist nets and 4m<sup>2</sup> harp traps placed in Calf Heath Wood and other woodland locations on the Site (see Figures 10.1.624 to 10.1.626). Up to six acoustic lures (Sussex Autobats) were used to improve catch efficiency in woodland<sup>31</sup>. The lures emitted synthesised bat social calls. Lures were placed next to mist nets and harp traps and any bats captured were identified, sexed, aged and their breeding status determined.

#### Tracking Methods

- 4.6.41 Target bats were fitted with lightweight radio transmitter tags (Biotrack Ltd, Wareham, Dorset, United Kingdom) weighing less than 5% of the weight of the bat using Torbot skin bond adhesive. Tagging of female bats in advanced stages of pregnancy was avoided. Lactating bats were tagged if they met the target weight and were in good condition, although early lactating bats were not tagged for welfare reasons. Bats were processed quickly and released within 30 minutes of capture provided the glue attaching the transmitter had cured sufficiently. All tagged bats were fitted with 3.5 mm or 2.9 mm

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<sup>31</sup> Hill D A and Greenaway F G. (2005). Effectiveness of an acoustic lure for surveying bats in British woodlands. *Mammal Review*, 35, 116-122

aluminium rings (Porzana Ltd, Icklesham, East Sussex, United Kingdom) to allow identification of recaptured individuals and prevent repeated tracking of single animals (pseudoreplication of data and welfare reasons).

- 4.6.42 All tagged bats were tracked using Sika receivers (Biotrack Ltd., Wareham, United Kingdom) and a three-element Yagi antenna (Biotrack Ltd). Tagged bats were tracked predominantly during the day to find roost sites the day after initial capture, using a combination of the "homing-in" method<sup>32</sup> and triangulation method, either on foot or by vehicle. Radio-tracking fixes for each individual bat and associated roost were plotted in the field on digitised 1:25,000 scale Ordnance Survey maps in the MemoryMap mobile application. Aerial images in the Google Earth mobile application were used in the field as an additional visual guide when plotting fixes in MemoryMap.

### Roost Emergence

- 4.6.43 Where tagged bats were tracked to roost sites, subsequent roost exit counts were undertaken using infrared cameras (Canon XA25 or Canon XA10) with infrared illuminators to determine roost size and status (e.g. maternity roost). Roost attributes such as location, type of structure and other descriptors were recorded.

### Limitations

- 4.6.44 Limited access was made to the quarry area during the manual bat activity surveys due to open workings, standing water and uneven, unconsolidated ground. The survey incorporated the greatest level of coverage of the quarry as possible where safe access allowed. Two surveyors were deployed to this transect on each occasion as a precautionary health and safety measure.
- 4.6.45 Transect 3 in the manual bat activity surveys originally included a parcel of land associated with the Bericote development in the southwest of the Site off Vicarage Road at SJ 92074 08768. This land was removed from the redline boundary. This land was incorporated within Transect 3 between May and August 2016 but was excluded in September and October that year as works associated with the Bericote development had commenced.
- 4.6.46 No safe access was possible to the arable field in the north-western extent of Transect 2 in the September 2016 manual bat activity surveys. Farm machinery was in operation preventing safe passage across the field to complete the transect. Point Counts 2.04 and 2.05 on this transect were therefore not completed in September 2016.

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<sup>32</sup> White G C and Garrott R A. (1990). Analysis of wildlife radio-tracking data. Academic Press, San Diego, California

- 4.6.47 The May 2016 manual bat activity survey of Transect 4 was suspended for approximately 15 minutes (approximately 20 minutes into the survey) due to access issues. No further problems were encountered.
- 4.6.48 A security light and indoor lights were on during the dusk emergence survey on 4 August 2016 at Woodside Farmhouse. This made it difficult for the surveyor to confidently conclude if any bats emerged. This limitation was overcome with the scheduling of an additional dawn survey where no lights were on.
- 4.6.49 Surveys undertaken at Clovelly were partly constrained owing to large 20ft+ hedges/tree lines being present in close proximity to the property on two sides. This reduced visibility and made it difficult for surveyors to get a good vantage point.
- 4.6.50 The weather conditions on the third survey visit (dawn 14/09/2017) at Heath Farmhouse - main farmhouse were constrained by two rain showers. Results obtained on this date were not consistent with previous surveys. However, this is not considered to be a notable constraint to defining the roost status as roosting bats had already been confirmed on visits 1 and 2 with comparable results obtained over these two surveys. In addition, surveyors have observed bat activity at this building while surveying the adjacent Heath Farm Outbuilding (3 Visits) and sufficient data exists to classify the roost.
- 4.6.51 Weather conditions were appropriate on all trapping sessions except the last night of trapping in June and August both in 2016 and 2017. Both tracking sessions in June and August 2016 and 2017 were hampered on one night each by rain, however tracking continued throughout these nights as the bats remained active despite the conditions, albeit for more limited periods of time.
- 4.6.52 Radio transmitters can fail for a variety of reasons due to weather and damage from the bats. During the August surveys tags were also scratched off by one bat after a couple of days, limiting data. Where applicable, these events are recorded in the results.
- 4.6.53 Where reference is made to 'big bats' this could include noctule, leisler's bat or serotine. These bats have calls with low peak frequencies and typically, with distinctive rhythms. However, the call are variable and are very difficult (sometimes impossible) to distinguish from each other, particularly in woodland, when the peak frequency is raised and the distinctive rhythms tend to disappear.
- 4.6.54 Bats are mobile species and may use a variety of roosts, commuting routes and foraging areas during their yearly lifecycle, which is influenced by a range of factors such as breeding status, energetic requirements and the



availability of prey. These surveys are considered suitable for providing a sufficient sampling effort (without disturbing the population adversely) to obtain information to assist the location of roosts potentially affected by the proposed development proposals. The methods used are unable to provide a full account of all bat activity in the survey at all times and the sample size is too low to provide a sufficient baseline at other times of the year. The work is therefore confined to providing information for the summer season and for roosting behaviour only.

### Desk Study

- 4.6.55 SERC holds records of bats at three classification levels (family, genus and species) within 2 km of the Site.
- 4.6.56 SERC provided records of seven species of bat within 2 km of the Site namely common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle, brown long-eared bat, Daubenton's bat (*Myotis daubentonii*), noctule, Brandt's bat (*Myotis brandtii*) and whiskered bat (*Myotis mystacinus*). Whiskered bat have been recorded in the north-west of the Site. The other species have been recorded with 200 m of the Site boundary. Several further records were returned for genus *Myotis* where identification had not been made to species level. Likewise, records were received for pipistrelle genus but there was no identification to species level.
- 4.6.57 A search of statutory designated sites within 10 km of the Site was undertaken. Two designated sites reference the presence of bats though they are not the primary reason for their designation. These sites include Cannock Chase Site of Special Scientific Interest (SSSI) which references bats as animals of note (presence of five species) and Smestow Valley Local Nature Reserve (LNR) which states there have been records of Daubenton's bats using the reserve and the adjacent canal.

### Results

#### *Bat Survey – Preliminary Ecological Appraisal*

- 4.6.58 The PEA completed by Ramboll in 2016 (Reference UK15-22306\_PEA) identified the habitats within the Site as offering 'low' to 'moderate' suitability for foraging and commuting bats (in accordance with the BCT Guidelines 2016). This was determined due to the matrix of habitats present within the Site boundary comprising woodland, hedgerows, scattered trees, grassland, arable crops, ponds, canals and ditches.

#### *Bat Survey – Roost Assessment of Structures*

- 4.6.59 Fifteen buildings present on the Site have been identified as having potential to support roosting bats during the Roost Assessment of Structures Surveys.

A summary of the assessment of these buildings are provided in Table 4.30 below. Full details of the inspections are provided in Annexes 10.1.6 (A-O) as referenced in Table 4.30. Several buildings are pending inspection where they have been brought into the red line boundary. This table and the inspection survey information will be updated when further assessment has been undertaken.

**Table 4.30: Considerations for Assessing the Potential Suitability of the Site for Bats**

<b>Building</b>	<b>Potential for Support Roosting Bats</b>	<b>Inspection Survey Information</b>
Woodside Farmhouse	Moderate	Annex 10.1.6 A
Woodside Barn	High	Annex 10.1.6 B
Fir Tree Cottage	Moderate	Annex 10.1.6 C
Gailey Magazine	Moderate	Annex 10.1.6 D
The Barn (Gravelly Way)	Low	Annex 10.1.6 E
The Farmhouse (Gravelly Way)	Moderate	Annex 10.1.6 F
The Stables (Gravelly Way)	Low	Annex 10.1.6 G
Heath Farm – Main Farmhouse	High	Annex 10.1.6 H
Heath Farm – Converted Outbuilding	High	Annex 10.1.6 I
Clovelly	Moderate	Annex 10.1.6 J
Ash House	Moderate	Annex 10.1.6 K
Stoney Brook Annex	Moderate	Annex 10.1.6 L
Stoney Brook Cottage	Moderate	Annex 10.1.6 M
Croft House	Moderate	Annex 10.1.6 N
Mile End Cottage	Moderate	Annex 10.1.6 O

### *Bat Survey – Preliminary Ground Level Roost Assessment of Trees*

- 4.6.60 The ground level roost assessment of trees undertaken in February 2017 identified a number of mature trees on the Site as being suitable for roosting bats.

The records of the assessment of roosting potential of individual trees are provided in Annex 10.1.7. The suitability of each mature tree identified as being lost as a result of the Proposed Development for roosting bat is presented in Figure 10.1.627 (moderate and high value trees only).

- 4.6.61 Findings are cross referenced to the tree survey schedule (FPCR, 2016).

### *Bat Survey –Potential Roost Feature Inspection Surveys of Trees*

PRF Inspection Surveys Tree climbing surveys were undertaken over three days in August 2017. The survey resulted in several trees valuation being reclassified following the detailed off-ground inspection. These changes are summarised below in Table 4.31 and are detailed in Annex 10.1.7 and presented in Figure 10.1.627. One soprano pipistrelle roost was confirmed in T97-Oak via DNA testing of droppings. No bats were using the roost at the time of the survey.

**Table 4.31: Changes to Roost Potential Valuation Following Climbing**

<b>Tree Reference and Species</b>	<b>Valuation Prior to Climb</b>	<b>Valuation After Climb</b>
G48 Alder	Moderate	Negligible
T117 Oak	High	Moderate
T115 Oak	Moderate	Negligible
T301 Ash	High	Negligible
T159 Oak	High	Moderate
T153 Oak	Moderate	Negligible
T150 Ash	Moderate	Negligible
T182 Oak	High	Moderate
G15 Ash	Moderate	Low
W1 Oak	Moderate	Negligible
W1A Oak	Moderate	Low
T131 Oak	High	Moderate
G26 Oak	Moderate	Negligible
T20 Oak	High	Low
T25 Oak	Moderate	Negligible
T32 Oak	Moderate	Low
307 Oak	Moderate	Low
309 Silver Birch	High	Moderate
311 Oak	Moderate	Negligible
314 Oak	Moderate	Low
316 Oak	High	Moderate
317 Silver Birch	Moderate	Negligible

Tree Reference and Species	Valuation Prior to Climb	Valuation After Climb
319 Oak	Moderate	Low

4.6.62 In summary, following tree climbing 58 trees were classified to be of low suitability for roosting bats, 32 trees were classified as offering moderate suitability for roosting bats and 13 trees were classified as being of high suitability for roosting bats. The remaining trees offered negligible potential. Ten trees which were identified as offering potential for roosting bats were downgraded to negligible having been climbed and subject to close inspection.

*Bat Survey – Presence/Absence and Roost Characterisation*

4.6.63 Bat emergence and re-entry surveys were undertaken between May and September in 2016 and 2017. The results of these surveys are presented below in Table 4.32 to Table 4.46 (below) and on Figures 10.1.601 to 10.1.615.

**Table 4.32: Summary of Emergence and Re-entry Surveys at Woodside Farmhouse**

Date	Survey Type	Sunrise /Sunset	Survey Findings
26/05/2016	Dawn re-entry	05:00	<p>Survey start 03:08</p> <ul style="list-style-type: none"> <li>03:08 - two Myotis passes, bats seen flying up access way to Woodside Farmhouse in the direction of Calf Heath Wood from Vicarage Road</li> <li>03:39 - Myotis heard not seen. Likely Daubenton's based on call analysis</li> <li>03:42 - bat seen flying behind Woodside Farmhouse towards barn. Did not register on detector – possible brown long-eared</li> <li>03:45 - Common pipistrelle flying behind Woodside Farmhouse towards barn</li> <li>03:51 - Common pipistrelle heard not seen</li> <li>04:06 - Myotis heard not seen. Likely Daubenton's based on call analysis</li> </ul> <p>No bats were seen to re-enter the property</p> <p>Survey end: 05:15</p>
04/08/2016	Dusk emergence	20:55	<p>Survey start 20:40</p> <ul style="list-style-type: none"> <li>21:19 - suspected brown long-eared (seen not heard) flying south along farm track</li> <li>21:23 - Noctule heard not seen</li> <li>21:33 - Common pipistrelle heard not seen</li> <li>21:35 - Myotis heard not seen</li> </ul>

Date	Survey Type	Sunrise /Sunset	Survey Findings
			<ul style="list-style-type: none"> <li>• 21:36 to 21:45 - Common pipistrelle foraging around rear garden (two bats)</li> <li>• 21:48 - <i>Myotis</i> flying low over wall between farmhouse outbuilding and barn yard. <b>Possible emergence</b> – view hampered by lighting</li> <li>• 21:55 - Soprano pipistrelle, heard not seen</li> <li>• 21:56 to 22:23 - on/off foraging by common pipistrelle over barn and Farmhouse rear garden foraging around rear garden (one bat)</li> <li>• 22:09 - <i>Myotis</i> two passes, bat foraging along lane in from of Woodside Farmhouse</li> <li>• 22:23 - <i>Myotis</i> foraging/commuting up lane</li> <li>• 22:23 - Brown long-eared – not seen</li> <li>• 22:26 - Common pipistrelle heard not seen</li>   <li>• No bats were confirmed to emerge from the property</li> </ul> <p>Survey end: 23:00</p>
07/09/2016	Dawn re-entry	06:28	<p>Survey start 04:45</p> <ul style="list-style-type: none"> <li>• 04:53 - Common pipistrelle with social calls</li> <li>• 04:58 - <i>Myotis</i> heard not seen</li> <li>• 05:00 - 05:02 – <i>Myotis</i> heard not seen</li> <li>• 05:08 - Common pipistrelle heard not seen</li> <li>• 05:08 - <i>Myotis</i> heard not seen</li> <li>• 05:14 - faint not recorded – possible brown long-eared</li> <li>• 05:22 - <i>Myotis</i> heard not seen. Brief</li> <li>• 05:25 - Common pipistrelle with social calls</li> <li>• 05:28 - Soprano pipistrelle heard not seen</li> <li>• 05:38 - Common pipistrelle with social calls</li> <li>• 05:42 - 05:45 – Two noctules flying over and around Farmhouse and Courtyard</li> <li>• 05:55 - two common pipistrelles flying over main roof and around chimney with social calls</li> <li>• 06:09 - Noctule</li> <li>• 06:23 - Noctule</li>   <li>• No bats were seen to re-enter the property</li> </ul> <p>Survey End: 06:45</p>

**Table 4.33: Summary of Emergence and Re-entry Surveys at Woodside Barn**

Date	Survey Type	Sunrise /Sunset	Survey Findings
25/05/2016	Dawn re-entry	04:58	<p>Survey start: 03:00</p> <ul style="list-style-type: none"> <li>• 03:00 - Common pipistrelle heard not seen</li> <li>• 03:15 - Common pipistrelle flying between barn and outbuilding adjacent arable field</li> </ul>

Date	Survey Type	Sunrise /Sunset	Survey Findings
			<ul style="list-style-type: none"> <li>• 03:17 - Myotis circled over yard then over Farmhouse garden (away from barn)</li> <li>• 03:30 - Common pipistrelle heard not seen</li> <li>• 03:40 - Common pipistrelle heard not seen</li> <li>• 03:42 - Common pipistrelle heard not seen</li> <li>• 04:17 - Common pipistrelle flying along rear of barn then down access track towards Vicarage Road</li> <li>• 04:24 - Common pipistrelle seen to re-enter the barn through the 'portal' on the north elevation</li> <li>• 04:27 - Common pipistrelle seen to re-enter the barn through the 'portal' on the north elevation</li> </ul> <p>Survey end: 05:04</p>
03/08/2016	Dusk emergence	20:43	<p>Survey start: 20:23</p> <ul style="list-style-type: none"> <li>• 21:20 - probable <b>emergence</b> from portal over open barn to rear, no echolocation – Possible brown long-eared based on DNA dropping analysis.</li> <li>• 21:35 - <b>emergence</b> out of barn door, no echolocation. Possible brown long-eared based on DNA dropping analysis.</li> <li>• 21:37 - Common pipistrelle flying over barn roof towards Woodside Farmhouse</li> <li>• 21:38 - bat heard on detector but not recorded. Bat not seen</li> <li>• 21:40 - 21:50 – Common pipistrelle foraging over back garden of Woodside Farmhouse</li> <li>• 21:53 - Myotis heard not seen</li> <li>• 22:34 - Myotis heard not seen</li> <li>• 22:19 - Common pipistrelle foraging over yard to barn, three passes</li> <li>• 22:23 - Common pipistrelle heard not seen</li> <li>• 22:33 - Common pipistrelle heard not seen</li> <li>• 22:37 - 22:38 – Common pipistrelle heard not seen</li> </ul> <p>Survey end: 22:38</p>
06/09/2016	Dawn re-entry		<p>Survey start: 04:30</p> <ul style="list-style-type: none"> <li>• 04:32 and 04:35 - Common pipistrelle with social calls</li> <li>• 04:37 - Common pipistrelle flying around portal and barn doors, multiple passes – re-entry not confirmed</li> <li>• 04:42 - Noctule heard not seen</li> <li>• 04:44 - Noctule and common pipistrelle heard not seen</li> <li>• 04:48 - Common pipistrelle along rear of barn from the east</li> <li>• 04:49 - <i>Myotis</i> two passes</li> <li>• 04:55 - Common pipistrelle with social calls heard not seen</li> <li>• 05:07 - probable <b>re-entry</b> of <i>Myotis</i> (likely natterer's) through barn doors on north elevation</li> <li>• 05:07 and 05:09 – Soprano pipistrelle heard not seen</li> <li>• 05:18 - Soprano pipistrelle heard not seen</li> <li>• 05:26 - Noctule heard not seen</li> <li>• 05:34 - Soprano pipistrelle <b>re-entry</b> through barn doors</li> </ul>

Date	Survey Type	Sunrise /Sunset	Survey Findings
			<ul style="list-style-type: none"> <li>05:38/05:40 - two Common pipistrelle flying along back side of barn - likely past barn</li> <li>05:48 - 05:56 - Common pipistrelle foraging over garden</li> <li>05:56 - two noctules observed flying from field over barn at height curving back south towards Vicarage Road</li> <li>06:02 - Common pipistrelle heard not seen.</li> </ul> <p>Survey end: 06:45</p>

**Table 4.34: Summary of Emergence and Re-entry Surveys at Fir Tree Cottage**

Date	Survey Type	Sunrise /Sunset	Survey Findings
24/05/2016	Dusk emergence	21:00	<p>Survey start: 21:53</p> <ul style="list-style-type: none"> <li>21:54 - Common pipistrelle from east over garden towards house then north along A449</li> <li>21:58 - Common pipistrelle pass over road to north</li> <li>22:10 - Noctule heard not seen</li> <li>22:17 - Common pipistrelle heard not seen</li> <li>22:52 - Common pipistrelle heard not seen</li> </ul> <p>No bats were seen to emerge from the property</p> <p>Survey end: 22:59</p>
26/08/2016	Dawn re-entry	06:10	<p>Survey start: 04:20</p> <ul style="list-style-type: none"> <li>04:27 - Common pipistrelle over rear garden heading towards Station Drive</li> </ul> <p>No bats were seen to re-enter the property</p> <p>Survey end: 06:25</p>

**Table 4.35: Summary of Emergence and Re-entry Surveys at the Barn Gravelly Way**

Date	Survey Type	Sunrise /Sunset	Survey Findings
17/08/2016	Dusk emergence	20:29	<p>Survey start: 20:16</p> <ul style="list-style-type: none"> <li>20:46 - Noctule seen commuting over house/field from rear of premises</li> <li>20:50 - Noctule heard not seen multiple bats or passes</li> <li>21:00 - Soprano pipistrelle foraging around driveway</li> <li>21:22 - Common pipistrelle commuting from field over driveway and house</li> <li>21:33 - Noctule heard not seen</li> <li>21:37 - Common pipistrelle heard not seen</li> </ul>

Date	Survey Type	Sunrise /Sunset	Survey Findings
			<ul style="list-style-type: none"> <li>• 21:46 - Soprano pipistrelle heard not seen</li> <li>• 21:52 - Common pipistrelle heard not seen</li> <li>• 21:56 - Soprano pipistrelle heard not seen</li> <li>• 22:02 - Common pipistrelle heard not seen with social calls</li> </ul> <ul style="list-style-type: none"> <li>• No bats were seen to emerge from the property</li> </ul> <p>Survey end: 22:05</p>

**Table 4.36: Summary of Emergence and Re-entry Surveys at The Stables Gravelly Way**

Date	Survey Type	Sunrise /Sunset	Survey Findings
18/08/2016	Dusk emergence	20:25	<p>Survey start: 20:10</p> <ul style="list-style-type: none"> <li>• 20:55 - Noctule heard not seen</li> <li>• 21:05 - Noctule foraging over house and field</li> <li>• 21:06 - Soprano pipistrelle heard not seen</li> <li>• 21:10 - Common pipistrelle single quick pass</li> <li>• 21:15 - Soprano pipistrelle commuting from canal direction along the hedge to adjacent arable field</li> <li>• 21:20 - Noctule heard not seen</li> <li>• 21:40 - Common and soprano pipistrelle</li> <li>• 21:45 - Common pipistrelle heard not seen</li> <li>• 21:47 - Soprano pipistrelle heard not seen, one pass</li> <li>• 21:54 - Big bat seen – call with characteristics of Leisler’s bat</li> <li>• 21:57 - Common pipistrelle heard not seen</li> </ul> <ul style="list-style-type: none"> <li>• No bats were seen to re-enter the property</li> </ul> <p>Survey end: 22:00</p>

**Table 4.37: Summary of Emergence and Re-entry Surveys at The Farmhouse Gravelly Way**

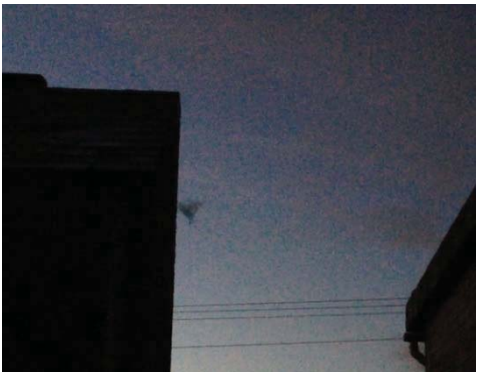
Date	Survey Type	Sunrise /Sunset	Survey Findings
25/05/2016	Dusk emergence	21:14	<p>Survey start: 21:00</p> <ul style="list-style-type: none"> <li>• 21:36 - Common pipistrelle flew from arable field across the driveway and over the barn</li> <li>• 21:50 - 21:55 - Common pipistrelle on/off activity foraging along canal and into courtyard/driveway area</li> <li>• 21:59 - Common pipistrelle heard not seen</li> <li>• 22:08 - heard not seen</li> </ul> <ul style="list-style-type: none"> <li>• No bats were seen to re-enter the property</li> </ul> <p>Survey end: 22:50</p>



Date	Survey Type	Sunrise /Sunset	Survey Findings
19/08/2016	Dawn re-entry	05:59	<p>Survey start: 04:24</p> <ul style="list-style-type: none"> <li>• 04:28 - Common pipistrelle one pass with social calls</li> <li>• 04:30 - Soprano pipistrelle, three passes over courtyard then back towards the canal between the barn and the farmhouse</li> <li>• 04:37 - Noctule heard not seen. Recorded only by surveyor in rear garden adjacent canal</li> <li>• 04:39 - brown long-eared heard not seen. Recorded only by surveyor in rear garden adjacent canal</li> <li>• 04:39 - 04:47 –Common pipistrelle foraging over courtyard/drive area – multiple passes</li> <li>• 04:50 - 05:10 – two common pipistrelles chasing each other over and around courtyard/driveway. Social calls recorded – multiple passes</li> <li>• 05:11 - 05:13 – Bat observed flying around chimney of farmhouse – no registration on detectors no re-entry noted</li> <li>• 05:15 - 05:36 – Common pipistrelles foraging / socialising over courtyard/driveway area – multiple passes.</li> <li>• 05:18 - Common pipistrelles seen investigating (but flying away from) ridge tile area of southwest elevation of the Farmhouse. No re-entry noted</li> <li>• 05:18 - <i>Myotis</i> heard not seen</li> <li>• 05:36 - light rain started</li> <li>• 05:46 - Common pipistrelle two passes; bat observed approaching and temporarily landing on the adjacent barn building (no PRFs in this location – no re-entry noted).</li> <li>• 05:54 - Common pipistrelle – foraging over courtyard area</li> <li>• 05:57 - Common pipistrelle observed landing on front of fascia board of the adjacent stable building (No PRFs in this location – no re-entry noted)</li> <li>• 06:00 - Common pipistrelle seen flying at and momentarily pausing on southern gable end of the barn three times. No PRFs noted in this location, considered investigating, no re-entry noted</li> <li>• 06:05 - one common pipistrelle noted approaching and clinging to the southern gable end of the stables building. No PRFs noted in this location, considered investigating, no re-entry noted</li> </ul> <p>• No bats were seen to re-enter the property</p> <p>Survey end: 06:15</p>

**Table 4.38: Summary of Emergence and Re-entry Surveys at Gailey Magazine**

Date	Survey Type	Sunrise /Sunset	Survey Findings
26/05/2016	Dusk emergence	21:16	<p>Survey start: 21:00</p> <ul style="list-style-type: none"> <li>• 21:38 - Soprano pipistrelle heard not seen</li> <li>• 21:38 - <b>probable emergence</b> of common pipistrelle from half pitched store building (most easterly adjacent arable field) from soffit</li> <li>• 21:39 - Common pipistrelle heard not seen</li> <li>• 21:45 - three noctule bats seen foraging over arable field at height</li> <li>• 21:47 - Common pipistrelle heard not seen</li> <li>• 21:54 - Soprano pipistrelle heard not seen</li> <li>• 21:56 - Common pipistrelle heard not seen</li> <li>• 22:08 - Common pipistrelle heard not seen</li> <li>• 22:09 to 22:23 - Several noctule passes, heard not seen</li> <li>• 22:11 - Common pipistrelle heard not seen</li> <li>• 22:15 - Common pipistrelle heard not seen</li> <li>• 22:22 - Common pipistrelle heard not seen</li> <li>• 22:24 - Noctule commuting from woodland, over arable field towards canal</li> <li>• 22:24 - Common pipistrelle heard not seen</li> <li>• 22:27 - Common pipistrelle from but likely over roof of dilapidated building in bund also foraging along hedgerow from direction of woodland towards canal</li> <li>• 22:32 - Common pipistrelle heard not seen</li> <li>• 22:34 - Common pipistrelle heard not seen</li> <li>• 22:44 - Common pipistrelle heard not seen</li> <li>• 22:49 - Common pipistrelle heard not seen</li> </ul> <p>Survey end: 23:00</p>
05/07/2016	Dawn re-entry	05:35	<p>Survey start: 03:38</p> <ul style="list-style-type: none"> <li>• 03:53 - Common pipistrelle foraging along hedge line adjacent linking canal and Calf Heath Wood.</li> <li>• 03:54 - Likely brown long-eared heard not seen</li> <li>• 03:55 - <i>Myotis</i> (likely Daubenton's) heard not seen</li> <li>• 03:55 and 03:58 – Soprano pipistrelle heard not seen</li> <li>• 03:56 - Common pipistrelle heard not seen</li> <li>• 04:04 and 04:06 - Soprano pipistrelle foraging along hedge line adjacent linking canal and Calf Heath Wood</li> <li>• 04:06 - Common pipistrelle heard not seen</li> <li>• 04:12 - Common pipistrelle heard not seen</li> <li>• 04:27 - <i>Myotis</i> foraging along hedge line adjacent linking canal and Calf Heath Wood</li> <li>• 04:31 - Soprano pipistrelle heard not seen – three passes</li> <li>• 04:33 - Common pipistrelle from direction of Calf Heath Wood over Gailey Magazine buildings and then bearing north</li> <li>• 04:38 - Soprano pipistrelle several approaches made prior to <b>re-entry</b> on west elevation behind fascia board</li> <li>• 04:40 - Common pipistrelle heard not seen</li> <li>• 04:44 and 04:47 - Common pipistrelle heard not seen</li> </ul>

Date	Survey Type	Sunrise /Sunset	Survey Findings
			<ul style="list-style-type: none"> <li>• 04:45 - Soprano pipistrelle <b>re-enter</b> building behind fascia/gap in tile on western elevation</li> <li>• 04:52 - Common pipistrelle heard not seen</li> <li>• 04:56 - 'Big bat' heard not seen</li> <li>• 05:01 - Soprano pipistrelle <b>re-entry</b> – clear daylight, confirmed access point as fascia/tile gap on corner of west elevation. Photograph (still from a video) below shows bat about to re-enter building</li> </ul>  <p>Survey end: 05:48</p>

**Table 4.39: Summary of Emergence and Re-entry Surveys at Heath Farm – Main Farmhouse**

Date	Survey Type	Sunrise /Sunset	Survey Findings
05/07/2017	Dawn re-entry	04:51	<p>Survey start: 03:00</p> <ul style="list-style-type: none"> <li>• 03:08 - Soprano pipistrelle heard not seen</li> <li>• 03:13 - Common pipistrelle heard not seen</li> <li>• 03:14 - Soprano pipistrelle heard not seen</li> <li>• 03:17 - Common and soprano pipistrelle heard not seen</li> <li>• 03:32 - Soprano pipistrelle foraging over the garden to the west of the property</li> <li>• 03:38 - Common pipistrelle – seen over Vicarage Road to frontage of property</li> <li>• 03:42 - Common pipistrelle foraging along hedgerow to Vicarage Road</li> <li>• 03:51 - Soprano pipistrelle commuting between farmhouse and outbuilding.</li> <li>• 03:52 - Noctule flying over fields on edge of quarry at height (north of Vicarage Road)</li> <li>• 03:55 - Soprano pipistrelle heard not seen</li> <li>• 03:57 - Brown long-eared (x3) seen circling around eastern end of farmhouse over area with hole in roof and eastern chimney. <b>Re-entry</b> likely.</li> <li>• 03:58 - Bat seen flying over east end of farmhouse – not recorded on detector, likely brown long-eared.</li> </ul>

Date	Survey Type	Sunrise /Sunset	Survey Findings
			<ul style="list-style-type: none"> <li>• 04:00 - Brown long-eared <b>re-entry</b> very likely – Access point likely in roof valley running north west to south east.</li> <li>• 04:40 - Noctule heard not seen</li> </ul>
25/07/2017	Dusk emergence	21:11	<p>Survey end: 05:07</p> <p>Survey start: 20:55</p> <ul style="list-style-type: none"> <li>• 21:46 - Noctule heard not seen</li> <li>• 21:50 - Noctule heard not seen</li> <li>• 21:52 - Soprano pipistrelle heard not seen</li> <li>• 21:53 - Common pipistrelle commuting appeared over ridge of eastern end of farmhouse</li> <li>• 21:57 - Noctule two passes heard not seen</li> <li>• 21:58 - Two bats not picked up on detector seen flying around / in large hole in roof and courtyard to eastern elevation</li> <li>• 21:59 - Brown long-eared probable <b>emergence</b> from roof valley over roof, courtyard then flew west – seen not heard</li> <li>• 21:59 - 22:02 - Common pipistrelle foraging over garden to the west and courtyard</li> <li>• 22:01 - Common pipistrelle commuting</li> <li>• 22:04 - Soprano pipistrelle heard not seen</li> <li>• 22:05 - Common pipistrelle flew over ridge beam on eastern end of farmhouse then west over courtyard</li> <li>• 22:08 - 2 common pipistrelle foraging over courtyard</li> <li>• 22:12 - Bat seen over hole in roof on eastern part of farmhouse from direction of roof valley – bat not heard, likely brown long-eared.</li> <li>• 22:12 - Soprano pipistrelle foraging in courtyard.</li> <li>• 22:15 - Common pipistrelle heard not seen</li> <li>• 22:18 - 22:20 Common pipistrelle heard not seen</li> <li>• 22:24 - Bat seen not heard</li> <li>• 22:24 - 22:31 Common pipistrelle heard not seen</li> <li>• 22:29 - 22:33 – Noctule heard not seen 2 passes</li> <li>• 22:35 - Common pipistrelle foraging over courtyard</li> <li>• 22:36 - 22:43 – Noctule foraging, 3 passes</li> <li>• 22:37 - Noctule and soprano pipistrelle heard not seen</li> <li>• 22:38 - Common pipistrelle heard not seen</li> <li>• 22:39 - 22:41 – Soprano pipistrelle heard not seen</li> <li>• 22:40 - Common pipistrelle heard not seen</li> <li>• 22:43 - 22:45 Common pipistrelle heard not seen 2 passes</li> <li>• 22:46 - 22:50 Common and soprano pipistrelle passes</li> <li>• 22:50 - Faint brown long-eared</li> </ul>
14/09/2017	Dawn re-entry	06:40	<p>Survey end: 22:45</p> <p>Survey start: 04:40</p> <ul style="list-style-type: none"> <li>• Moderate rain starting 04:45 - surveyors sought cover until 04:57.</li> <li>• Rain 05:07 - 05:10</li> <li>• Light rain from 05:35</li> </ul>

Date	Survey Type	Sunrise /Sunset	Survey Findings
			<ul style="list-style-type: none"> <li>No bats detected - constrained survey.</li> </ul> Survey end: 06:00

**Table 4.40: Summary of Emergence and Re-entry Surveys at Heath Farm – Converted Outbuilding**

Date	Survey Type	Sunrise /Sunset	Survey Findings
21/06/2017	Dusk emergence	21:36	Survey start: 21:17 <ul style="list-style-type: none"> <li>21:21 - Soprano pipistrelle heard not seen</li> <li>22:10 - Noctule heard not seen</li> <li>22:12 - Noctule commuting in south west direction high over courtyard</li> <li>22:24 - 22:34 - Soprano pipistrelle foraging over courtyard, 20+ passes. Arrived from west and left in easterly direction</li> <li>22:34 - Common pipistrelle foraging in courtyard 10+ passes</li> <li>22:34 - Bat – very quick and feint heard not seen</li> <li>22:36 - 22:37 Soprano pipistrelle heard not seen – 2 passes</li> <li>22:40 - Noctule heard not seen</li> <li>22:43 - 22:53 – Common pipistrelle foraging over courtyard</li> <li>22:49 - Noctule heard not seen</li> <li>22:57 - Common pipistrelle heard not seen</li> <li>22:58 - Soprano pipistrelle commuting</li> <li>23:03 - Soprano pipistrelle heard not seen</li> <li>23:05 - Soprano pipistrelle foraging</li> <li>23:06 - 22:13 – Common pipistrelle heard not seen</li> <li>23:10 - 23:16 - Common pipistrelle heard not seen</li> <li>23:15 - Noctule heard not seen</li> <li>23:23 - Myotis heard not seen</li> <li>23:29 - Soprano pipistrelle heard not seen</li> <li>23:33 - Common pipistrelle heard not seen</li> </ul> Survey end: 23:37
06/07/2017	Dawn re-entry	04:52	Survey start: 02:54 <ul style="list-style-type: none"> <li>02:55 - Common pipistrelle foraging over courtyard</li> <li>02:59 - 03:10 - Common and soprano pipistrelles foraging over courtyard (sustained)</li> <li>03:13 - 03:26 - Common and soprano pipistrelles foraging over courtyard (sustained)</li> <li>03:31 - Brown long-eared seen not heard commuting from direction of Heath Farm farmhouse.</li> <li>03:48 - Soprano pipistrelle, three passes came from direction of Heath Farm farmhouse.</li> <li>03:53 - Myotis commuting</li> <li>03:54 - Brown long-eared from road between Heath Farm farmhouse and outbuilding.</li> <li>03:55 - Myotis heard not seen.</li> </ul>

Date	Survey Type	Sunrise /Sunset	Survey Findings
			<ul style="list-style-type: none"> <li>• 04:03 - Brown long-eared swooping between Heath Farm farmhouse and outbuilding - seen not heard.</li> <li>• 04:15 - Common pipistrelle flying over and around roof – not re-seen.</li> </ul> <p>Survey end: 05:09</p>
24/07/2017	Dusk emergence	21:13	<p>Survey start: 20:55</p> <ul style="list-style-type: none"> <li>• 22:03 - Common pipistrelle heard not seen – 2 passes</li> <li>• 22:06 - Soprano pipistrelle commuting across courtyard between Heath Farm farmhouse and outbuilding (W – E).</li> <li>• 22:09 - Common pipistrelle heard not seen – 2 passes</li> <li>• 22:13 - Common pipistrelle heard not seen – foraging (feeding buzzes)</li> <li>• 22:17 - 22:26 Common pipistrelle from south heading east and foraging – Total 3* bats</li> <li>• 22:27 - Noctule heard not seen</li> <li>• 22:36 - Common pipistrelle foraging over courtyard</li> <li>• 22:37 - Brown long-eared heard not seen</li> <li>• 22:38 - Common pipistrelle heard not seen</li> <li>• 22:40 - Soprano pipistrelle heard not seen</li> </ul> <p>Survey end: 22:50</p>

**Table 4.41: Summary of Emergence and Re-entry Surveys at Clovelly**

Date	Survey Type	Sunrise /Sunset	Survey Findings
04/07/2017	Dusk emergence	21:34	<p>Survey start: 21:22</p> <ul style="list-style-type: none"> <li>• 22:06 - 22:14 - Soprano pipistrelle foraging over garden. Sustained activity</li> <li>• 22:11 - Common pipistrelle foraging over paddock behind house - 3 passes</li> <li>• 22:12 - Common pipistrelle foraging over north west corner of garden</li> <li>• 22:15 - 22:21 - Common pipistrelles *4 heard not seen (Other surveyor confirmed foraging over garden)</li> <li>• 22:28 - Soprano pipistrelle heard not seen</li> <li>• 22:29 - Soprano pipistrelle foraging over paddock behind house - &gt;10 passes</li> <li>• 22:30 - Soprano pipistrelle foraging over garden</li> <li>• 22:31 - Common pipistrelle – foraging over garden then foraging over paddock behind house</li> <li>• 22:33 - Common pipistrelle heard not seen</li> <li>• 22:36 - Common pipistrelle heard not seen</li> <li>• 22:43 - Common pipistrelle heard not seen</li> <li>• 22:48 - Myotis - two passes</li> <li>• 22:52 - Brown long-eared multiple passes gleaning from ash</li> </ul>

Date	Survey Type	Sunrise /Sunset	Survey Findings
			<p>tree at rear of property to the south west adjacent horse paddock</p> <ul style="list-style-type: none"> <li>• 22:53 - Noctule heard not seen</li> <li>• 22:55 - Soprano pipistrelle heard not seen</li> <li>• 22:57 &amp; 22:59 - Common pipistrelle heard not seen</li> <li>• 23:09 - Common and soprano pipistrelle foraging along rear of house</li> <li>• 23:21 - Common pipistrelle foraging over garden to A5 and paddock behind house</li> </ul> <p>Survey end: 23:25</p>
26/07/2017	Dawn re-entry	05:18	<p>Survey start: 03:15</p> <ul style="list-style-type: none"> <li>• 03:23 - Common pipistrelle heard not seen</li> <li>• 03:28 - Soprano pipistrelle foraging over paddock – several passes</li> <li>• 03:28 - 03:31 – Brown long-eared heard not seen</li> <li>• 03:40 - Brown long-eared – 3 passes, heard not seen</li> <li>• 03:43 - Soprano pipistrelle heard not seen</li> <li>• 03:48 - Common pipistrelle foraging</li> <li>• 04:10 - Bat seen not heard or recorded</li> <li>• 04:16 - Brown long-eared – two bats circled over house, seen not heard</li> <li>• 04:19 - 04:20 – single bat circled roof of house. Seen not heard</li> <li>• 04:20 - Common pipistrelle foraging along tree line at rear of house</li> <li>• 04:23 - Common pipistrelle foraging along tree line at rear of house then over house.</li> <li>• 04:27 - Bat flying low in rear corner of garden (south east). Seen not heard</li> <li>• 04:44 - Bat – seen not heard</li> </ul> <p>Survey end: 05:30</p>

**Table 4.42: Summary of Emergence and Re-entry Surveys at Ash House**

Date	Survey Type	Sunrise /Sunset	Survey Findings
20/06/2017	Dawn re-entry	04:44	<p>Survey start: 02:44</p> <ul style="list-style-type: none"> <li>• 02:55 - Common pipistrelle – heard not seen security light on</li> <li>• 02:57 - 03:12 - Common pipistrelle foraging, heard not seen</li> <li>• 03:06 - Soprano pipistrelle foraging, heard not seen</li> <li>• 03:07 - Common pipistrelle foraging, heard not seen</li> <li>• 03:12 - Common pipistrelle foraging, heard not seen</li> <li>• 03:18 - Common pipistrelle foraging, heard not seen</li> <li>• 03:23 - Soprano pipistrelle foraging, heard not seen</li> <li>• 03:23 - Brown long-eared, brief, heard not seen</li> </ul>

Date	Survey Type	Sunrise /Sunset	Survey Findings
			<ul style="list-style-type: none"> <li>• 03:28 - Noctule heard not seen</li> <li>• 03:29 - Common pipistrelle foraging, heard not seen</li> <li>• 03:36 - Common pipistrelle commuting flying over property</li> <li>• 03:33 - 03:35 - Common pipistrelle foraging, heard not seen</li> <li>• 03:36 - Noctule heard not seen</li> </ul> <p>Survey end: 05:00</p>
06/07/2017	Dusk emergence	21:33	<p>Survey start: 21:18</p> <ul style="list-style-type: none"> <li>• 21:58 - Noctule commuting high above garden</li> <li>• 22:03 - Noctule heard not seen</li> <li>• 22:20 - Common pipistrelle heard not seen</li> <li>• 22:26 - Common and soprano pipistrelle heard not seen</li> <li>• 22:27 - Noctule heard not seen</li> <li>• 22:29 - Common pipistrelle foraging, three passes</li> <li>• 22:32 - Brown long-eared heard not seen</li> <li>• 22:36 - Common and soprano pipistrelle heard not seen</li> <li>• 22:46 - Common pipistrelle heard not seen</li> <li>• 22:51 - Soprano pipistrelle heard not seen</li> <li>• 22:54 - Common and soprano pipistrelle heard not seen</li> <li>• 22:59 - Common pipistrelle foraging over garden then headed south</li> <li>• 23:00 - Soprano pipistrelle heard not seen, 2 passes</li> <li>• 23:06 - Common pipistrelle heard not seen</li> <li>• 23:08 - Common pipistrelle heard not seen</li> </ul> <p>Survey end: 23:10</p>

**Table 4.43: Summary of Emergence and Re-entry Surveys at Stoney Brook Annex**

Date	Survey Type	Sunrise /Sunset	Survey Findings
20/06/2017	Dusk emergence	21:36	<p>Survey start: 21:15</p> <ul style="list-style-type: none"> <li>• 22:09 - Common pipistrelle from west over garden then sharp turn north around rear of property</li> <li>• 22:19 - Noctule heard not seen</li> <li>• 22:29 - Common pipistrelle from north behind house then flew east over garden</li> <li>• 22:31 - Common pipistrelle heard not seen</li> <li>• 22:33 - Common pipistrelle heard not seen</li> <li>• 22:35 - Soprano pipistrelle from west over garden then sharp turn north around rear of property</li> <li>• 22:37 - Soprano pipistrelle heard not seen</li> <li>• 22:38 - Common pipistrelle heard not seen</li> <li>• 22:45 - Common pipistrelle heard not seen</li> </ul> <p>Survey end: 23:10</p>



Date	Survey Type	Sunrise /Sunset	Survey Findings
16/08/2017	Dawn re-entry	05:51	<p>Survey start: 04:15</p> <ul style="list-style-type: none"> <li>• 04:48 - Brown long-eared heard not seen</li> <li>• 04:52 - Common pipistrelle heard not seen</li> <li>• 04:54 - Common pipistrelle from west over garden then sharp turn north around rear of property</li> <li>• 05:07 - Soprano pipistrelle heard not seen</li> <li>• 05:20 - Soprano pipistrelle heard not seen</li> </ul> <p>Survey end: 06:06</p>

**Table 4.44: Summary of Emergence and Re-entry Surveys at Stoney Brook Cottage**

Date	Survey Type	Sunrise /Sunset	Survey Findings
21/06/2017	Dawn re-entry	04:44	<p>Survey start: 03:14</p> <ul style="list-style-type: none"> <li>• 03:29 - Common pipistrelle heard not seen</li> <li>• 03:33 - Common pipistrelle heard not seen</li> <li>• 03:35 - Common pipistrelle heard not seen</li> <li>• 04:23 - Noctule heard not seen</li> <li>• 04:24 - Noctule over field at height to north heading east then turning back south over horse paddocks to south</li> <li>• 04:26 - Noctule heard not seen</li> </ul> <p>Survey end: 05:00</p>
16/08/2017	Dusk emergence	20:35	<p>Survey start: 20:20</p> <ul style="list-style-type: none"> <li>• 20:43 - Noctule heard not seen</li> <li>• 21:02 - Common pipistrelle heard not seen</li> </ul> <p>Survey end: 22:05</p>

**Table 4.45: Summary of Emergence and Re-entry Surveys at Croft House**

Date	Survey Type	Sunrise /Sunset	Survey Findings
19/06/2017	Dusk emergence	21:36	<p>Survey start: 21:20</p> <ul style="list-style-type: none"> <li>• 22:17 - Common pipistrelle – flew over house roof from north to south</li> <li>• 22:30 - Noctule heard not seen</li> <li>• 22:52 - Soprano pipistrelle and common pipistrelle heard not seen</li> <li>• 22:58 - Noctule heard not seen</li> <li>• 22:59 - Common pipistrelle foraging along field/house boundary in the north towards yard past street lights</li> </ul>

Date	Survey Type	Sunrise /Sunset	Survey Findings
			<ul style="list-style-type: none"> <li>• 23:01 - Noctule heard not seen</li> <li>• 23:07 - Pipistrelle heard not seen</li> <li>• 23:22 - Common pipistrelle and soprano pipistrelle heard not seen, brief</li> <li>• 23:24 - Common pipistrelle heard not seen</li> <li>• 23:35 - Common pipistrelle foraging over rear garden</li> <li>• 23:32 - Common pipistrelle commuting, heard not seen, brief</li> </ul> <p>Survey end: 23:36</p>
25/07/2017	Dawn re-entry	05:14	<p>Survey start: 03:20</p> <ul style="list-style-type: none"> <li>• 03:48 - Noctule heard not seen, commuting</li> <li>• 03:51 - Common pipistrelle heard not seen</li> <li>• 04:15 - Common pipistrelle heard not seen</li> <li>• 04:17 - 04:19 – Bat, possible brown long-eared. Seen not heard circling over apex of roof</li> <li>• 04:20 - 2 bats seen chasing each other over the garden. Seen not heard</li> <li>• 04:23 - Soprano pipistrelle heard not seen</li> <li>• 04:32 - Common pipistrelle five passes circling outside rear of house then <b>re-entry</b> into hole between the tiles and the fascia/soffit box on south west corner</li> <li>• 04:43 - Common pipistrelle seen flying loops around roof and garden, no re-entry noted</li> </ul> <p>Survey end: 05:30</p>

**Table 4.46: Summary of Emergence and Re-entry Surveys at Mile End Cottage**

Date	Survey Type	Sunrise /Sunset	Survey Findings
22/06/2017	Dawn re-entry	04:44	<p>Survey start: 03:00</p> <ul style="list-style-type: none"> <li>• 03:05 - Common pipistrelle heard not seen</li> <li>• 03:15 - Common pipistrelle heard not seen, 2 passes</li> <li>• 03:31 - Common pipistrelle, 2 passes flying over garden heading south</li> <li>• 03:32 - Soprano pipistrelle heard not seen</li> <li>• 03:39 - Common pipistrelle heard not seen</li> <li>• 03:41 - Common pipistrelle foraging over Vicarage Road and garden</li> <li>• 03:44 - Common pipistrelle 4 loops over garden to west of property then <b>re-entry</b> behind tile hung westerly aspect (nearest Vicarage Road)</li> <li>• 03:56 - Common pipistrelle heard not seen</li> <li>• 04:05 - Common pipistrelle heard not seen</li> </ul> <p>Survey end: 05:01</p>

Date	Survey Type	Sunrise /Sunset	Survey Findings
26/07/2017	Dusk emergence	21:12	Survey start: 20:55  <ul style="list-style-type: none"> <li>• 21:35 - Common pipistrelle <b>emerged</b> from tile hung aspect on western elevation (northern end) turned quickly east and flew along Vicarage Road</li> <li>• 21:41 - Common pipistrelle emerged from tile hung aspect on western elevation (southern end) bat flew north crossing Vicarage Road narrowly avoiding impact with lorry</li> <li>• 21:45 - Noctule observed flying at height over field to the north</li> <li>• 22:18 - Common pipistrelle commuting from north to south</li> <li>• 22:19 - Soprano pipistrelle heard not seen</li> <li>• 22:20 - Common pipistrelle heard not seen</li> <li>• 22:27 - Soprano pipistrelle heard not seen</li> <li>• 22:38 - Common pipistrelle heard not seen</li> </ul> Survey end: 22:45

*Bat Survey – Bat Activity Surveys*

4.6.64 A summary of results of the manual and automated bat activity surveys are presented below by month. The text below should be read in conjunction with Figures 10.1.616 and 10.1.628 to 10.1.633 and 10.1.617 and 10.1.618 to 10.1.623.

May

2016

4.6.65 A moderate level of bat activity was recorded during this survey, with six species of bat recorded; common pipistrelle, soprano pipistrelle, noctule, serotine, brown long-eared and Myotis (likely to be Daubenton's). Refer to Figure 10.1.628 for a plan showing the bat activity at the Site during the survey.

4.6.66 The surveys were undertaken by two surveyors (Chris Hodsmen and Emily McVean) over three days. Transects 3 and 4 were undertaken on 16 May 2016. The first bat, a soprano pipistrelle, was recorded at 21.23, 21 minutes after sunset. This bat was seen commuting through a woodland wayleave in Calf Heath Wood on Transect 3. Further bats identified foraging or commuting in Calf Heath Wood included one further soprano pipistrelle pass, four records of common pipistrelle and a single serotine pass. The woodland edge of Calf Heath Wood was used for foraging by a similar assemblage of bat species as recorded within the canopy with high levels of activity along

the southern edge. This activity extended along the woodland block of Calf Heath Wood associated with the adjacent Bericote development.

- 4.6.67 The highest level of bat activity recorded was along the canal in the northwest of Transect 3 with commuting and foraging common pipistrelle and *Myotis* (Considered likely Daubenton's based on habitat, behaviour and call parameters).
- 4.6.68 Lower levels of activity were recorded on Transect 4 with four species of bat recorded but in low numbers; common pipistrelle (five registrations), soprano pipistrelle (one registration), noctule (one registration) and brown long-eared (one registration).
- 4.6.69 Surveys of Transects 1 and 2 were undertaken on 17 May 2016. Three species of bat were recorded on Transect 1; common pipistrelle, soprano pipistrelle and noctule. Common pipistrelle was the most frequently observed foraging or commuting along tree/hedge lines associated with field boundaries. Three species of bat were recorded on Transect 2; common pipistrelle, soprano pipistrelle and *Myotis* (Likely Daubenton's). The first bat recorded on Transects 1 and 2 was at 21:17, a common pipistrelle 15 minutes after sunset. This was in the southwest of the Site adjacent the railway line. Levels of bat activity across Transect 2 (away from the canal) were generally quite low with two registrations of soprano pipistrelle and four registrations of common pipistrelle. There were, however, high levels of activity observed along the canal with significant foraging and commuting by *Myotis* (Daubenton's) and common pipistrelle observed.
- 4.6.70 The survey of Transect 5 was undertaken on 18/05/2016. The first bat, a noctule was observed adjacent to Vicarage Road at 21:39, 34 minutes after sunset. Five species of bat were observed / recorded including common and soprano pipistrelle, noctule, *Myotis* and a likely brown long-eared. The majority of pipistrelle activity occurred along the woodland edge (southeast of Calf Heath Wood) and the established tree / hedge line which runs southwest to northeast connecting the woodland to Calf Heath Reservoir. A bat was seen along this hedge / tree line but not recorded on the detectors; this was recorded as a likely brown long-eared. A single *Myotis* was recorded over standing water associated with quarrying activities to the northeast of Calf Heath Wood. With the exception of the noctule observed early in the survey, no bat activity was observed along Vicarage Road.
- 4.6.71 The most frequently recorded bat was the common pipistrelle.

## 2017

- 4.6.72 A moderate level of bat activity was recorded during the survey of Transect 6, with four species of bat recorded; common pipistrelle, soprano pipistrelle,

noctule and *Myotis*. Refer to Figure 10.1.628 for a plan showing the bat activity at the Site during the survey.

- 4.6.73 The surveys were undertaken by two surveyors (Chris Hodsmen and James Fraser) on 03/05/2017. The first bat, a soprano pipistrelle was observed foraging on the leeward side of a tree/hedge line running northwest to southeast in the east of the site parallel with Stable Lane at 20:57, 19 minutes after sunset. Pipistrelle species were most frequently observed foraging or commuting along tree/hedge lines associated with field boundaries. This was most notable in the east of the Site adjacent a woodland block and tree line off Woodlands Lane and Stable Lane and the hedgerow running north west to south east between Vicarage Road and Straight Mile (This includes Point Count 6.07). Noctule were observed foraging over improved grassland at the east of this transect, near Point Count 6.02. Two *Myotis* were recorded (heard not seen) along the woodland adjacent the canal in the south which runs broadly west to east.
- 4.6.74 Bat activity away from the locations described above was limited to single passes by pipistrelle species which were recorded in low numbers. The most frequently recorded bats were common and soprano pipistrelle.
- 4.6.75 Table 4.46 below provides a summary of data obtained by static monitoring by transect in May to provide additional context to the manual bat activity surveys undertaken. A total of 10,012 common pipistrelle passes, 1,149 soprano pipistrelle passes, 2 nathusius pipistrelle passes, 297 *Myotis* passes, 90 noctule passes, 12 big bat passes and 41 brown long-eared passes were recorded in May across the six transects. The locations where the static detectors were deployed and levels of associated activity are shown in Figure 10.1.618.

**Table 4.47: May Automated (Static) Detector Results**

Transect	Date	Species	Number of Passes
1	18/05/2017	Common pipistrelle	12
	19/05/2017	-	-
	20/05/2017	Common pipistrelle	1
	21/05/2017	Common pipistrelle	15
		<i>Myotis</i>	2
	22/05/2017	-	-
2	18/05/2017	Common pipistrelle	44
		Soprano pipistrelle	7
	19/05/2017	Common pipistrelle	38

Transect	Date	Species	Number of Passes	
		Soprano pipistrelle	2	
		Common pipistrelle	39	
	20/05/2017	Soprano pipistrelle	4	
		Common pipistrelle	36	
	21/05/2017	Soprano pipistrelle	15	
		Common pipistrelle	35	
	22/05/2017	Soprano pipistrelle	20	
		Common pipistrelle	4	
	3	18/05/2017	Common pipistrelle	4
			Soprano pipistrelle	2
Noctule			2	
19/05/2017		Common pipistrelle	1	
		Noctule	5	
20/05/2017		Common pipistrelle	1	
		Soprano pipistrelle	3	
		Noctule	1	
21/05/2017		Common pipistrelle	6	
		Soprano pipistrelle	22	
		<i>Myotis</i>	2	
		Noctule	2	
22/05/2017		Common pipistrelle	2	
		Soprano pipistrelle	42	
		<i>Myotis</i>	4	
		Noctule	3	
4	18/05/2017	Common pipistrelle	509	
		Soprano pipistrelle	45	
		Nathusius pipistrelle	1	
		<i>Myotis</i>	26	
		Noctule	5	

Transect	Date	Species	Number of Passes
	19/05/2017	Brown long-eared	3
		Common pipistrelle	884
		Soprano pipistrelle	17
		<i>Myotis</i>	26
		Noctule	4
		Brown long-eared	3
		20/05/2017	Common pipistrelle
	Soprano pipistrelle		231
	<i>Myotis</i>		47
	Noctule		3
	Brown long-eared		4
	21/05/2017	Common pipistrelle	1226
		Soprano pipistrelle	67
		<i>Myotis</i>	27
		Noctule	1
		Brown long-eared	2
	22/05/2017	Common pipistrelle	101
		Soprano pipistrelle	4
		<i>Myotis</i>	7
		Noctule	1
		Big bat	5
Brown long-eared		1	
5	18/05/2017	Common pipistrelle	509
		Soprano pipistrelle	45
		Nathusius pipistrelle	1
		<i>Myotis</i>	26
		Noctule	5
		Brown long-eared	3

Transect	Date	Species	Number of Passes
6	19/05/2017	Common pipistrelle	884
		Soprano pipistrelle	17
		<i>Myotis</i>	26
		Noctule	4
		Brown long-eared	3
	20/05/2017	Common pipistrelle	1105
		Soprano pipistrelle	231
		<i>Myotis</i>	47
		Noctule	3
		Brown long-eared	4
	21/05/2017	Common pipistrelle	1226
		Soprano pipistrelle	67
		<i>Myotis</i>	27
		Noctule	1
		Brown long-eared	2
	22/05/2017	Common pipistrelle	734
		Soprano pipistrelle	18
		<i>Myotis</i>	21
		Noctule	2
		Big bat	5
		Brown long-eared	12
03/05/2017	Common pipistrelle	154	
	Soprano pipistrelle	38	
	<i>Myotis</i>	1	
	Noctule	7	
	04/05/2017	Common pipistrelle	10
		Soprano pipistrelle	32
		<i>Myotis</i>	1



Transect	Date	Species	Number of Passes
	05/05/2017	Common pipistrelle	37
		Soprano pipistrelle	20
		Noctule	7
	06/05/2017	Common pipistrelle	704
		Soprano pipistrelle	59
		<i>Myotis</i>	20
		Noctule	3
	07/05/2017	Common pipistrelle	586
		<i>Myotis</i>	4
		Noctule	13
		Big bat	2
		Brown long-eared	1

June

2016

4.6.76 A low to moderate level of bat activity was recorded during this survey, with four species of bat recorded in the manual bat activity surveys; common pipistrelle, soprano pipistrelle, noctule and *Myotis*. Refer to Figure 10.1.629 for a plan showing the bat activity at the Site during the survey. The automated (static) surveys also identified brown long-eared as present in low numbers.

4.6.77 The surveys were undertaken by three surveyors (Chris Hodsman, Emily McVean and Carl Bailey) over two days. Transects 1, 2 and 4 were undertaken on 20 June 2016. The first bat, a common pipistrelle, was recorded at 21.58, 22 minutes after sunset. This bat was seen foraging under the tree canopy overhanging the canal on Transect 2. The level of activity observed along the canal was much reduced than that observed in May. The surveyor was present earlier in the evening than in May having reversed the transect route. A greater level of activity was observed away from the canal with common and soprano pipistrelles being observed or recorded along internal field boundaries north and south of Croft Lane. A limited amount of common pipistrelle activity was noted in the northwest of the Site along the A449 Stafford Road and the rear of the police station off the A5 as shown in Figure 10.1.629. These areas are subject to moderate / high levels of light spill from the police station, road lighting and the Gailey

Highways Depot. Several registrations for foraging and/or commuting common and soprano pipistrelle were recorded on the northern margin of Calf Heath Wood and the hedgerow/ditch which connects the woodland to the canal (adjacent Gailey Magazine).

- 4.6.78 The highest level of bat activity recorded was by common pipistrelle foraging/commuting along the field boundaries in the southern part of Transect 1 (south of Gravelly Way). Two registrations for soprano pipistrelle were also obtained in this location adjacent the railway.
- 4.6.79 Surveys of Transects 3 and 5 were undertaken on 21 June 2016. Four species of bat were recorded; common pipistrelle, soprano pipistrelle, noctule and *Myotis*. The first bat recorded on 21 June 2016 (Transects 3 and 5) was recorded at 21:51, a common pipistrelle approximately 15 minutes after sunset. This was recorded along the hedgerow to the south of Gailey Magazine between Calf Heath Wood and the canal. Gailey Magazine was later confirmed as a pipistrelle roost, the bat recorded is likely to have emerged from this building. Common pipistrelle were recorded commuting and foraging along the canal, woodland edge/wayleaves in Calf Heath Wood and along hedgerows running from the Bericote development site towards the convergence of Vicarage Road and Mile End Road. A noctule and soprano pipistrelle were also recorded in this location. The majority of bat activity observed on Transect 5 was on the southern edge of Calf Heath Wood and the wayleave which runs southwest to northeast within the wood with common and soprano pipistrelle, a noctule and a *Myotis* bat being recorded. Four further registrations of common pipistrelle and a single soprano pipistrelle registration were noted proximal to Woodside Farm. No bats were recorded in the east of the Site along the hedgerow linking Calf Heath Wood and Reservoir as was observed in May.
- 4.6.80 The most frequently recorded bat was the common pipistrelle.

## 2017

- 4.6.81 A moderate level of bat activity was recorded during the survey of Transect 6, with five species of bat recorded; common pipistrelle, soprano pipistrelle, noctule, brown long-eared and *Myotis*. Refer to Figure 10.1.629 for a plan showing the bat activity at the Site during the survey.
- 4.6.82 The surveys were undertaken by one surveyor (Chris Hodsmen) on 21/06/2017. The first bats, three soprano pipistrelles were observed foraging (sustained) within wet woodland in the south of the Site adjacent to Straight Mile at Point Count 6.03 at 21:53, 17 minutes after sunset. Pipistrelle species were most frequently observed foraging or commuting along tree/hedge lines or within woodland most notably at Point Count 6.03 and on the western margin of the Site north of Point Count 6.05. Noctule were observed foraging

over horse paddocks south of Straight Mile and over arable field just south of Vicarage Road. A brown long-eared was recorded in the same location. Two *Myotis* were recorded (heard not seen) adjacent the canal at Point Count 6.05 and at Point Count 6.10 near Heath Farm on an oak lined track.

- 4.6.83 The most frequently recorded bats were common and soprano pipistrelle. Noctule activity was sustained over the horse paddocks south of Vicarage Road.
- 4.6.84 Table 4.48 below provides a summary of data obtained by static monitoring by transect in June to provide additional context to the manual bat activity surveys undertaken. A total of 2793 common pipistrelle passes, 636 soprano pipistrelle passes, 123 *Myotis* passes, 92 noctule passes and 36 brown long-eared passes were recorded in June across the six transects. The locations where the static detectors were deployed and levels of associated activity are shown in Figure 10.1.619.

**Table 4.48: June Automated (Static) Detector Results**

Transect	Date	Species	Number of Passes
1	17/06/2016	Common pipistrelle	106
		Soprano pipistrelle	6
	18/06/2016	Common pipistrelle	682
		Soprano pipistrelle	50
		Brown long-eared	1
		<i>Myotis</i>	20
		Noctule	1
	19/06/2016	Common pipistrelle	119
		Soprano pipistrelle	11
		Brown long-eared	1
		<i>Myotis</i>	3
	20/06/2016	Common pipistrelle	30
		Soprano pipistrelle	4
		<i>Myotis</i>	3
	21/06/2016	Common pipistrelle	36
Soprano pipistrelle		4	
<i>Myotis</i>		8	

Transect	Date	Species	Number of Passes
		Noctule	1
2	17/06/2016	Common pipistrelle	97
		<i>Myotis</i>	2
	18/06/2016	Common pipistrelle	334
		Soprano pipistrelle	43
		<i>Myotis</i>	4
	19/06/2016	Common pipistrelle	113
		Soprano pipistrelle	1
		<i>Myotis</i>	2
	20/06/2016	Common pipistrelle	81
		Soprano pipistrelle	1
		<i>Myotis</i>	1
	21/06/2016	Common pipistrelle	128
<i>Myotis</i>		5	
3	17/06/2016	Common pipistrelle	2
		<i>Myotis</i>	2
		Noctule	2
	18/06/2016	Common pipistrelle	4
		Soprano pipistrelle	1
		Noctule	1
	19/06/2016	Common pipistrelle	13
		Soprano pipistrelle	2
		Noctule	11
	20/06/2016	Common pipistrelle	10
		Soprano pipistrelle	1
		<i>Myotis</i>	10
Noctule		1	
21/06/2016	Common pipistrelle	30	

Transect	Date	Species	Number of Passes
		Soprano pipistrelle	12
		<i>Myotis</i>	3
		Noctule	4
		Brown long-eared	2
4	17/06/2016	Common pipistrelle	147
		Soprano pipistrelle	11
		<i>Myotis</i>	1
	18/06/2016	Common pipistrelle	234
		Soprano pipistrelle	61
		<i>Myotis</i>	3
		Brown long-eared	2
	19/06/2016	Common pipistrelle	121
		Soprano pipistrelle	33
		<i>Myotis</i>	1
		Noctule	3
		Brown long-eared	5
	20/06/2016	Common pipistrelle	43
		Soprano pipistrelle	9
		<i>Myotis</i>	4
		Brown long-eared	1
21/06/2016	Common pipistrelle	7	
	Soprano pipistrelle	1	
	Noctule	2	
	Brown long-eared	1	
5	17/06/2016	Common pipistrelle	8
		Soprano pipistrelle	7
		<i>Myotis</i>	3
		Noctule	11

Transect	Date	Species	Number of Passes
6	18/06/2016	Brown long-eared	3
		Common pipistrelle	42
		Soprano pipistrelle	30
		<i>Myotis</i>	8
		Noctule	10
		Brown long-eared	4
	19/06/2016	Common pipistrelle	142
		Soprano pipistrelle	25
		<i>Myotis</i>	32
		Brown long-eared	2
	20/06/2016	Common pipistrelle	211
		Soprano pipistrelle	301
		Noctule	32
		Brown long-eared	9
	21/06/2016	Common pipistrelle	46
		Soprano pipistrelle	16
<i>Myotis</i>		2	
Brown long-eared		3	
21/06/2017	21/06/2017	Soprano pipistrelle	1
		<i>Myotis</i>	1
		Noctule	6
	22/06/2017	Common pipistrelle	2
		<i>Myotis</i>	2
		Noctule	1
	23/06/2017	Common pipistrelle	1
		Soprano pipistrelle	1
		Noctule	3
24/06/2017	Common pipistrelle	2	

Transect	Date	Species	Number of Passes
		Soprano pipistrelle	3
		<i>Myotis</i>	1
		Noctule	1
	25/06/2017	Common pipistrelle	2
		Soprano pipistrelle	1
		<i>Myotis</i>	2
		Noctule	2
		Brown long-eared	2

## July

### 2016

4.6.85 A moderate level of bat activity was recorded during this survey, with four species of bat recorded; common pipistrelle, soprano pipistrelle, noctule and brown long-eared. Refer to Figure 10.1.630 for a plan showing the bat activity at the Site during the survey. The automated (static) surveys also identified *Myotis* as present.

4.6.86 The surveys were undertaken by three surveyors (Chris Hodsman, Emily McVean and Carl Bailey) over two days. Transects 1, 2 and 4 were undertaken on 18 July 2016. The first bat, a noctule, was recorded at 21.34, 13 minutes after sunset. This bat was observed commuting at height from the direction of the railway over arable fields and over Gravelly Way Farmhouse towards the canal. Three species of bat; common pipistrelle, soprano pipistrelle and noctule were observed on Transects 1, 2 and 4. The most frequently recorded species were noctule and common pipistrelle. Significant noctule activity was observed over arable fields in the north of the Site (north of Gravelly Way and Calf Heath Wood). A single noctule pass was observed in the south of the Site in fields adjacent the existing industrial estate. Common pipistrelle activity was encountered across all three transects but was concentrated along the canal. Five observations of soprano pipistrelle were recorded on 18 July 2016, two on Transects 1 and 4 and one on Transect 2.

4.6.87 Surveys of Transects 3 and 5 were undertaken on 19 July 2016. Four species of bat were recorded on Transect 3; common pipistrelle, soprano pipistrelle, noctule and brown long-eared. The first bat recorded on 19 July 2016 (Transects 3 and 5) was recorded at 21:22, a noctule approximately 1

minute after sunset. This bat was heard and not seen while surveyors were walking down the access road to Woodside Farmhouse (Off Vicarage Road). As on the preceding evenings surveys, significant noctule activity was observed, particularly over arable fields south of Calf Heath Wood where a maximum of 4 noctule bats were observed at the same time seemingly socialising. Common pipistrelles were recorded commuting and foraging along the canal, in wayleaves/along paths in Calf Heath Wood and along hedgerows (and over standing water in the quarry) between the woodland and Calf Heath Reservoir. Soprano pipistrelle were recorded twice in Calf Heath Wood along the main wayleave/access track, once commuting from the wood towards the canal and a single pass adjacent Vicarage Road in the southwest. Two registrations or observations of brown long-eared bats were made along the main access track and northern wayleave through Calf Heath Wood on Transect 3.

- 4.6.88 Noctule and common pipistrelle were the most frequently recorded or observed bats.

2017

- 4.6.89 A moderate level of bat activity was recorded during the survey of Transect 6, with five species of bat recorded; common pipistrelle, soprano pipistrelle, noctule, brown long-eared and *Myotis*. Refer to Figure 10.1.630 for a plan showing the bat activity at the Site during the survey.
- 4.6.90 Surveys were undertaken at dusk and pre-dawn. The surveys were undertaken by two surveyors (Chris Hodsman and James Fraser) on the dusk of 05/07/2017 and the dawn of 06/07/2017. The first bats, a soprano pipistrelle, a common pipistrelle and a noctule were observed foraging (sustained) along a tree line and over the arable field (noctule) at Point Count 6.08 at 22:06, 33 minutes after sunset. Pipistrelle species were most frequently observed foraging or commuting along tree/hedge lines most notably at Point Count 6.07 near a pond and along the woodland edge adjacent the canal. Noctules were observed foraging over horse paddocks and arable fields across the Site. Four brown long-eared bats were recorded. Two were in the east of the Site in a woodland block off Woodlands Lane (Point Count 6.02) and the wet woodland in the south of the Site adjacent Staright Mile (Point Count 6.03). Two further registrations were recorded on Deepmore Lane and in the sheep grazed field near Point Count 6.06. Two *Myotis* were recorded (heard not seen).
- 4.6.91 The most frequently recorded bats during the dusk survey were common pipistrelle, soprano pipistrelle and noctules.
- 4.6.92 The pre-dawn survey recorded common pipistrelle, soprano pipistrelle (Most frequently recorded), noctule and a *Myotis*. Activity was reduced relative to



the dusk survey. Greater activity was recorded in the east of the Transect notably at Point Counts 6.02 and 6.03.

4.6.93 Table 4.49 below provides a summary of data obtained by static monitoring by transect in July to provide additional context to the manual bat activity surveys undertaken. A total of 1508 common pipistrelle passes, 853 soprano pipistrelle passes, 2 pip social calls, 95 *Myotis* passes, 931 noctule passes, 43 'big bat' passes, 48 brown long-eared passes were recorded in July across the six transects. The locations where the static detectors were deployed and levels of associated activity are shown in Figure 10.1.620.

**Table 4.49: July Automated (Static) Detector Results**

Transect	Date	Species	Number of Passes
1	19/07/2016	Common pipistrelle	33
		Soprano pipistrelle	4
		<i>Myotis</i>	3
		Noctule	8
	20/07/2016	Common pipistrelle	34
		Soprano pipistrelle	10
		Brown long-eared	2
		<i>Myotis</i>	1
		Noctule	5
	21/07/2016	Common pipistrelle	58
		Soprano pipistrelle	7
		Brown long-eared	2
		<i>Myotis</i>	1
		Noctule	2
	22/07/2016	Common pipistrelle	48
		Soprano pipistrelle	11
		<i>Myotis</i>	3
		Brown long-eared	4
		Noctule	2
	23/07/2016	Common pipistrelle	3
Soprano pipistrelle		3	
<i>Myotis</i>		3	
2	19/07/2016	Common pipistrelle	2

Transect	Date	Species	Number of Passes	
	20/07/2016	Noctule	7	
		Common pipistrelle	3	
		Noctule	1	
		<i>Myotis</i>	1	
	21/07/2016	Common pipistrelle	22	
		Soprano pipistrelle	4	
		Noctule	1	
	22/07/2016	Common pipistrelle	34	
		Soprano pipistrelle	9	
		Noctule	1	
	23/07/2016	Common pipistrelle	13	
		Soprano pipistrelle	11	
		<i>Myotis</i>	1	
		Noctule	4	
	3	19/07/2016	Common pipistrelle	62
			Soprano pipistrelle	10
<i>Myotis</i>			4	
Big bat			3	
Noctule			41	
20/07/2016		Common pipistrelle	68	
		Soprano pipistrelle	25	
		Brown long-eared	2	
		<i>Myotis</i>	10	
		Noctule	28	
21/07/2016		Common pipistrelle	110	
		Soprano pipistrelle	42	
		Pipistrelle social	1	
		Brown long-eared	4	
		<i>Myotis</i>	19	
		Noctule	32	
	Common pipistrelle	127		
	Soprano pipistrelle	56		

Transect	Date	Species	Number of Passes
	22/07/2016	Pipistrelle social	1
		Brown long-eared	5
		<i>Myotis</i>	13
		Big bat	2
		Noctule	23
	23/07/2016	Common pipistrelle	113
		Soprano pipistrelle	49
		Brown long-eared	4
		<i>Myotis</i>	8
		Big bat	25
		Noctule	56
4	19/07/2016	Common pipistrelle	28
		Soprano pipistrelle	8
		Brown long-eared	1
		Big bat	2
		Noctule	437
	20/07/2016	Common pipistrelle	60
		Soprano pipistrelle	27
		Noctule	26
		Brown long-eared	5
	21/07/2016	Common pipistrelle	52
		Soprano pipistrelle	21
		<i>Myotis</i>	2
		Noctule	14
		Brown long-eared	4
	22/07/2016	Common pipistrelle	66
		Soprano pipistrelle	36
		<i>Myotis</i>	1
		Noctule	1
		Brown long-eared	4
	23/07/2016	Common pipistrelle	5
Soprano pipistrelle		5	

Transect	Date	Species	Number of Passes
5	19/07/2016	Brown long-eared	1
		Common pipistrelle	10
		Soprano pipistrelle	1
		<i>Myotis</i>	1
		Big bat	3
	Noctule	96	
	20/07/2016	Common pipistrelle	13
		Soprano pipistrelle	2
		Big bat	4
		Noctule	17
		Brown long-eared	2
	21/07/2016	Common pipistrelle	12
		Soprano pipistrelle	1
		Noctule	54
	22/07/2016	Common pipistrelle	12
		Soprano pipistrelle	4
		Noctule	21
		<i>Myotis</i>	1
		Brown long-eared	2
	23/07/2016	Common pipistrelle	6
<i>Myotis</i>		2	
Noctule		6	
6	05/07/2017	Common pipistrelle	448
		Soprano pipistrelle	447
		Noctule	8
		<i>Myotis</i>	7
		Brown long-eared	1
	06/07/2017	Common pipistrelle	19
		Soprano pipistrelle	16
		Noctule	26
		Big bat	2
		<i>Myotis</i>	3

Transect	Date	Species	Number of Passes
	07/07/2017	Common pipistrelle	12
		Soprano pipistrelle	6
		Noctule	6
		Big bat	1
		<i>Myotis</i>	4
		Brown long-eared	1
	08/07/2017	Common pipistrelle	30
		Soprano pipistrelle	24
		Noctule	3
		Big bat	1
		<i>Myotis</i>	6
		Brown long-eared	3
	09/07/2017	Common pipistrelle	5
		Soprano pipistrelle	14
		Noctule	5
<i>Myotis</i>		1	
Brown long-eared		1	

## August

### 2016

- 4.6.94 A low to moderate level of bat activity was recorded during this survey, with five species of bat recorded; common pipistrelle, soprano pipistrelle, brown long-eared, noctule and *Myotis*. Refer to Figure 10.1.631 for a plan showing the bat activity at the Site during the survey.
- 4.6.95 The surveys were undertaken by three surveyors (Chris Hodsman, Emily McVean and Carl Bailey) over two days. Transects 1, 2 and 4 were undertaken on 10 August 2016. The first bat, a noctule, was recorded at 21.11, 17 minutes after sunset. This bat was heard not seen while the surveyor was walking along the canal on Transect 2. A moderate level of activity was observed along the canal with common pipistrelle being the most frequently recorded, with a single registration of *Myotis* (likely Daubenton's over water) and soprano pipistrelle also being recorded. Common pipistrelle were also recorded foraging under street lights on Croft Lane, in the northwest of the Site along the A449 Stafford Road and the rear of the police

station off the A5 and along field boundaries adjacent to the A449 in the south of the Site. Several registrations for soprano pipistrelle were recorded on Transects 1 (south of Gravelly Way) and 4 along field boundaries. Two registrations for brown long-eared bats were recorded on Transect 4, one near Calf Heath Reservoir and one along an arable field boundary running east to west in the centre of the transect plot. A further observation of brown long-eared bat was made on Transect 1 adjacent the railway line (where it is closest to the canal).

- 4.6.96 The highest level of bat activity recorded was by common pipistrelle foraging/commuting along the canal (Transects 2 and 3).
- 4.6.97 Surveys of Transects 3 and 5 were undertaken on 11 August 2016. Four species of bat were recorded on Transects 3 and 5; common pipistrelle, soprano pipistrelle, noctule and brown long-eared. The first bats recorded on 11 August 2016 were common and soprano pipistrelle recorded at 21:13. These were recorded emerging from Gailey Magazine on Transect 3 approximately 32 minutes after sunset. A total of five pipistrelles were seen to emerge from behind the deteriorated soffit board on the western elevation. Two noctule bats were observed foraging over the field between Calf Heath Wood and the canal on Transect 3 and a further registration (heard not seen) at an arable field margin on Transect 5 south of Calf Heath Wood. Common and soprano pipistrelle were recorded commuting and foraging along the canal, the woodland edge and in wayleaves in Calf Heath Wood and along hedgerows running from the Bericote development site/ Calf Heath Wood towards Vicarage Road. A single brown long-eared bat was recorded in the south of the Site on the Site perimeter of the Bericote development. A single soprano pipistrelle was recorded in the east of the Site along the hedgerow linking Calf Heath Wood and Reservoir.
- 4.6.98 The most frequently recorded bat was common pipistrelle.

## 2017

- 4.6.99 A moderate level of bat activity was recorded during the survey of Transect 6, with four species of bat recorded; common pipistrelle, soprano pipistrelle, noctule and brown long-eared. Refer to Figure 10.1.631 for a plan showing the bat activity at the Site during the survey.
- 4.6.100 The surveys were undertaken by two surveyors (Chris Hodsman and James Fraser) on 15/08/2017. The first bats, two soprano pipistrelles and two common pipistrelles were observed foraging (sustained) within woodland in the east of the Site adjacent Woodlands Lane at Point Count 6.02 at 20:50, 15 minutes after sunset. Pipistrelle species were most frequently observed foraging or commuting along tree/hedge lines or within woodland most notably at Point Count 6.02, on the western margin of the Site north of Point Count 6.05 and on the woodland edge adjacent the canal between Point

Counts 6.04 and 6.05. Noctule bats were observed foraging over semi-improved grassland and arable fields between Straight Mile and Vicarage Road. Three brown long-eared bats were recorded, two in the east along the access track to Heath Farm and one near Point Count 6.08.

4.6.101 The most frequently recorded bats were common and soprano pipistrelle.

4.6.102 Table 4.50 below provides a summary of data obtained by static monitoring by transect in August to provide additional context to the manual bat activity surveys undertaken. A total of 2697 common pipistrelle passes, 532 soprano pipistrelle passes, 289 pipistrelle social calls (individual and component), 166 *Myotis* passes, 128 noctule passes, 22 'Big bat' passes and 208 brown long-eared passes were recorded in August across the six transects. The locations where the static detectors were deployed and levels of associated activity are shown in Figure 10.1.621.

**Table 4.50: August Automated (Static) Detector Results**

Transect	Date	Species	Number of Passes
1	11/08/2016	Common pipistrelle	4
		Soprano pipistrelle	15
		Noctule	1
	12/08/2016	Common pipistrelle	36
		Soprano pipistrelle	2
	13/08/2016	Common pipistrelle	64
		<i>Myotis</i>	2
		Noctule	2
	14/08/2016	Common pipistrelle	107
		Soprano pipistrelle	3
		<i>Myotis</i>	3
	15/08/2016	Common pipistrelle	17
Soprano pipistrelle		3	
<i>Myotis</i>		2	
2	11/08/2016	Common pipistrelle	10
		Noctule	2
	12/08/2016	Common pipistrelle	230
		Noctule	4
		<i>Myotis</i>	2

Transect	Date	Species	Number of Passes	
	13/08/2016	Common pipistrelle	42	
		Soprano pipistrelle	1	
		<i>Myotis</i>	2	
	14/08/2016	Common pipistrelle	18	
		Soprano pipistrelle	2	
		<i>Myotis</i>	2	
	15/08/2016	Common pipistrelle	9	
		Soprano pipistrelle	6	
		<i>Myotis</i>	10	
		Noctule	2	
	3	11/08/2016	Common pipistrelle	26
			Soprano pipistrelle	19
Pipistrelle social			22	
Brown long-eared			3	
12/08/2016		Common pipistrelle	89	
		Soprano pipistrelle	59	
		Pipistrelle social	82	
		<i>Myotis</i>	1	
13/08/2016		Common pipistrelle	30	
		Soprano pipistrelle	80	
		Pipistrelle social	92	
		<i>Myotis</i>	1	
		Noctule	1	
		Brown long-eared	3	
14/08/2016		Common pipistrelle	2	
		Soprano pipistrelle	88	
		<i>Myotis</i>	3	
		Noctule	2	
15/08/2016		Common pipistrelle	12	
		Soprano pipistrelle	89	



Transect	Date	Species	Number of Passes
		Pipistrelle social	93
		<i>Myotis</i>	7
4	11/08/2016	Common pipistrelle	178
		Soprano pipistrelle	8
		Noctule	2
	12/08/2016	Common pipistrelle	637
		Soprano pipistrelle	9
		<i>Myotis</i>	1
		Brown long-eared	1
	13/08/2016	Common pipistrelle	959
		Soprano pipistrelle	24
		<i>Myotis</i>	3
		Noctule	2
	14/08/2016	Common pipistrelle	120
		Soprano pipistrelle	5
		Noctule	4
	15/08/2016	Common pipistrelle	1
	5	11/08/2016	Common pipistrelle
Soprano pipistrelle			13
<i>Myotis</i>			2
12/08/2016		Soprano pipistrelle	15
		Noctule	1
13/08/2016		Common pipistrelle	18
		Soprano pipistrelle	17
		<i>Myotis</i>	7
		Noctule	43
14/08/2016		Common pipistrelle	7
		Soprano pipistrelle	22
		Brown long-eared	1
	<i>Myotis</i>	4	

Transect	Date	Species	Number of Passes
6	15/08/2016	Noctule	31
		Soprano pipistrelle	1
		<i>Myotis</i>	2
	16/08/2017	Common pipistrelle	6
		Soprano pipistrelle	6
		<i>Myotis</i>	5
		Noctule	4
		Big bat	3
		Brown long-eared	53
	17/08/2017	Common pipistrelle	18
		Soprano pipistrelle	9
		<i>Myotis</i>	34
		Noctule	6
		Big bat	2
		Brown long-eared	64
	18/08/2017	Common pipistrelle	5
		Soprano pipistrelle	3
		<i>Myotis</i>	6
		Noctule	4
		Big bat	2
Brown long-eared		10	
19/08/2017	Common pipistrelle	9	
	Soprano pipistrelle	9	
	<i>Myotis</i>	6	
	Big bat	6	
	Brown long-eared	25	
20/08/2017	Common pipistrelle	36	
	Soprano pipistrelle	24	
	<i>Myotis</i>	61	

Transect	Date	Species	Number of Passes
		Noctule	17
		Big bat	9
		Brown long-eared	48

September

2016

- 4.6.103 A moderate level of bat activity was recorded during this survey, with six species of bat recorded; common pipistrelle, soprano pipistrelle, brown long-eared, noctule, serotine and *Myotis*. Refer to Figure 10.1.632 for a plan showing the bat activity at the Site during the survey.
- 4.6.104 The surveys were undertaken by three surveyors (Chris Hodsman, Emily McVean and James Fraser) over two days. Surveys of Transects 1, 2 and 4 were undertaken on 05/09/2016. The first bats, common and soprano pipistrelle were recorded at 20.19, 33 minutes after sunset on Transect 1 at Point Count 1.02. The most frequently recorded bat on Transect 1 was common pipistrelle with approximately 15 registrations, all were along field boundaries. There were 4 registrations of soprano pipistrelle and two registrations of *Myotis* species. These were equally distributed in the north and south of the transect i.e. either side of Gravelly Way. A moderate level of activity was observed along the canal in Transect 2, this was considered to be three bats foraging and included; two common pipistrelles and a single *Myotis* (likely Daubenton's over water). Common pipistrelle bats were again recorded foraging under street lights on Croft Lane and two noctule bats were observed foraging over the street lights in this location. Two noctule bats were recorded on Transect 4, one near Calf Heath Reservoir and one along an arable field boundary running east to west in the centre of the Transect plot. Four species of bat were recorded along the hedge/tree line between Croft Lane and a woodland block to the south which abuts the canal. Species recorded included; common and soprano pipistrelle, brown long-eared (seen not heard foraging in the tree canopy) and a single registration for a 'big bat', likely a Serotine. Common pipistrelles were the most commonly recorded bat on Transect 4. Where observed these bats were noted to be foraging along the tree and hedge lines.
- 4.6.105 The highest level of bat activity recorded was by a range of species foraging/commuting along the hedge and tree line linking Croft Lane and crossing the canal towards Calf Heath Wood (past Gailey Magazine).

4.6.106 Surveys of Transects 3 and 5 were undertaken on 6 September 2016. Five species of bat were recorded on Transect 3 and 5; common pipistrelle, soprano pipistrelle, noctule, *Myotis* and brown long-eared. The first bat recorded on 6 September 2016 was a noctule recorded at 19:46 approximately two minutes after sunset. This was recorded flying high over a quarried field east of Transect 3 and over towards Calf Heath Wood. A further noctule was recorded flying over arable fields in close proximity to Gailey Magazine where appreciable common and soprano pipistrelle foraging and commuting activity was once more observed. A single pass from a *Myotis* species was also recorded in this location, this bat was heard not seen. Five further *Myotis* species bats were recorded commuting along the field boundary south of the canal (near Gravelly Way Bridge) towards Calf Heath Wood (two registrations) and to the east of Calf Heath Wood over standing water associated with quarrying activities (the latter considered likely to be Daubenton's – three registrations). Three noctule bats were observed at height over the arable field immediately to the east of Woodside Farm. A hobby was noted interacting with these bats (hunting them). A further noctule was noted foraging over the quarry south of Calf Heath Wood. Two registrations (heard not seen) of noctule were also recorded on the southern margin of Calf Heath Wood. Common and soprano pipistrelle were recorded along the boundary line of the Bericote development, the southern woodland edge of Calf Heath Wood and the tree/hedge line which joins the wood to Calf Heath Reservoir. Two brown long-eared bats were recorded/observed, one on Transect 5 adjacent the woodland next to Calf Heath Reservoir and one on Transect 3 within the wayleave adjacent the main access track running northwest to southeast in Calf Heath Wood.

4.6.107 The most frequently recorded bat was common pipistrelle.

2017

- 4.6.108 A low level of bat activity was recorded during the survey of Transect 6, with four species of bat recorded; common pipistrelle, soprano pipistrelle, noctule and brown long-eared. Refer to Figure 10.1.632 for a plan showing the bat activity at the Site during the survey.
- 4.6.109 The surveys were undertaken by two surveyors (Emily McVean and James Fraser) on 13/09/2017. The first bat, a noctule was heard and not seen over improved grassland south of Point Count 6.08 at 20:04, 27 minutes after sunset. Soprano pipistrelle and noctule were most frequently recorded species with most activity recorded in the south east of the Site in/near the wet woodland at Point Count 6.03 and centrally near a pond at Point Count 6.08. Two common pipistrelles were recorded, one foraging along Vicarage Road and one foraging along Straight Mile. Two brown long-eared bats were recorded, one in the east adjacent woodland off Woodlands Lane (Point Count 6.02) and one at the wet woodland adjacent Straight Mile at Point Count 6.03.
- 4.6.110 The most frequently recorded bats were soprano pipistrelle and noctule.
- 4.6.111 Table 4.51 below provides a summary of data obtained by static monitoring by transect in September to provide additional context to the manual bat activity surveys undertaken. A total of 258 common pipistrelle passes, 165 soprano pipistrelle passes, 20 pipistrelle social calls, 22 *Myotis* passes, 152 noctule passes, 18 'big bats' and 44 brown long-eared passes were recorded in September across the six transects. A nathusius pipistrelle was also detected on the 12th September 2016. The locations where the static detectors were deployed and levels of associated activity are shown in Figure 10.1.622.

**Table 4.51: September Automated (Static) Detector Results**

Transect	Date	Species	Number of Passes
1	06/09/2016	Common pipistrelle	8
		Soprano pipistrelle	2
		<i>Myotis</i>	1
		Noctule	1
	07/09/2016	Common pipistrelle	3
		Soprano pipistrelle	4
	08/09/2016	Common pipistrelle	12
	09/09/2016	Common pipistrelle	31

Transect	Date	Species	Number of Passes
	10/09/2016	Soprano pipistrelle	15
		Common pipistrelle	10
		Soprano pipistrelle	2
		Brown long-eared	2
		<i>Myotis</i>	1
2	06/09/2016	Common pipistrelle	6
		Soprano pipistrelle	2
		Brown long-eared	4
		<i>Myotis</i>	1
		Noctule	17
	07/09/2016	Common pipistrelle	6
		Soprano pipistrelle	6
		Brown long-eared	2
		Noctule	11
	08/09/2016	Common pipistrelle	2
		Soprano pipistrelle	2
		<i>Myotis</i>	1
	09/09/2016	-	-
	10/09/2016	-	-
	3	06/09/2016	Common pipistrelle
Soprano pipistrelle			5
Brown long-eared			5
<i>Myotis</i>			2
Noctule			10
07/09/2016		Common pipistrelle	2
		Soprano pipistrelle	4
		Brown long-eared	2
		Big bat	2

Transect	Date	Species	Number of Passes
4	08/09/2016	Noctule	2
		Common pipistrelle	17
		Soprano pipistrelle	10
		Brown long-eared	4
		<i>Myotis</i>	1
		Big bat	1
		Noctule	12
	09/09/2016	Soprano pipistrelle	7
		Brown long-eared	1
		<i>Myotis</i>	4
		Noctule	4
	10/09/2016	Brown long-eared	1
		Noctule	2
	4	06/09/2016	Common pipistrelle
Soprano pipistrelle			2
Noctule			4
07/09/2016		Common pipistrelle	7
		Soprano pipistrelle	9
		Pipistrelle social	2
		Noctule	13
08/09/2016		Common pipistrelle	2
		Soprano pipistrelle	9
		Pipistrelle social	9
		<i>Myotis</i>	2
09/09/2016		Common pipistrelle	1
		Soprano pipistrelle	2
	Noctule	1	
10/09/2016	Common pipistrelle	3	

Transect	Date	Species	Number of Passes
5		Soprano pipistrelle	9
		Pipistrelle social	9
	06/09/2016	Common pipistrelle	4
		Soprano pipistrelle	8
		Noctule	4
	07/09/2016	Common pipistrelle	18
		Soprano pipistrelle	8
		Brown long-eared	4
		<i>Myotis</i>	2
		Noctule	14
	08/09/2016	Common pipistrelle	10
		Soprano pipistrelle	8
		Brown long-eared	1
		Big bat	1
		Noctule	3
	09/09/2016	Soprano pipistrelle	11
		Brown long-eared	2
		Big bat	4
		<i>Myotis</i>	1
		Noctule	2
10/09/2016	Common pipistrelle	10	
	Soprano pipistrelle	5	
	<i>Myotis</i>	2	
	Noctule	11	
6	14/09/2017	Common pipistrelle	15
		Soprano pipistrelle	8
		<i>Myotis</i>	1
		Noctule	2



Transect	Date	Species	Number of Passes
		Big bat	2
		Brown long-eared	11
	15/09/2017	Common pipistrelle	22
		Soprano pipistrelle	11
		<i>Myotis</i>	1
		Noctule	6
		Big bat	4
		Brown long-eared	3
		16/09/2017	Common pipistrelle
	Soprano pipistrelle		11
	<i>Myotis</i>		3
	Noctule		23
	Big bat		1
	Brown long-eared		1
	17/09/2017	Common pipistrelle	6
		Soprano pipistrelle	4
		Noctule	4
	18/09/2017	Common pipistrelle	6
		Soprano pipistrelle	1
		<i>Myotis</i>	1
		Noctule	6
		Big bat	2
		Brown long-eared	1

October

2016

4.6.112 A low to moderate level of bat activity was recorded during this survey, with five species of bat recorded; common pipistrelle, soprano pipistrelle, brown

long-eared, a 'big bat' and *Myotis*. Refer to Figure 10.1.633 for a plan showing the bat activity at the Site during the survey.

- 4.6.113 The surveys were undertaken by three surveyors (Chris Hodsmen, Emily McVean and James Fraser) over two days. Surveys were undertaken at dusk and pre-dawn. Transects 1, 2 and 4 were undertaken on 19 October 2016 into 20/10/2016. The first bat, a common pipistrelle, was recorded at 18.25, 23 minutes after sunset. This bat was heard not seen at Point Count 2.03 on Transect 2. A low to moderate level of activity was observed along the canal with common pipistrelle being the most frequently recorded, with a single registration of *Myotis* (likely Daubenton's over water). Common pipistrelle were also recorded foraging under street lights on Croft Lane, along field boundaries on Transect 1 and 4 and along the woodland edge (Calf Heath Wood) on Transect 4. Soprano pipistrelle were recorded foraging along field boundaries on Transect 1 (south of Gravelly Way) and on Transect 4 around Gailey Magazine and field boundaries proximal to Point Count 4.05 and at Point Count 4.06. A 'big bat' was recorded in the approximate location of Point Count 4.05 on Transect 4. Brown long-eared registrations were recorded in two locations along field boundaries on Transect 4 to the north of Calf Heath Wood on the dusk survey and a further brown long-eared observed foraging in the tree canopy on Transect 2 proximal to Point Count 2.10 during the pre-dawn survey.
- 4.6.114 The highest level of bat activity recorded was by common and soprano pipistrelle foraging/commuting along the canal and along field boundaries on Transects 1 and 4.
- 4.6.115 Surveys of Transects 3 and 5 were undertaken on 20 October 2016 into 21 October 2016. A reduced level of activity was observed relative to the previous evening. Four species of bat were recorded on Transect 3 and 5; common pipistrelle, soprano pipistrelle, *Myotis* and a 'big bat'. The first bat recorded on 20/10/2016 was a common pipistrelle recorded at 19:06. This was recorded at Point Count 5.07 commuting along the eastern woodland edge of Calf Heath Wood. Common and soprano pipistrelles were noted commuting and foraging along the tree line between Calf Heath Wood and the canal at Gravelly Way. A *Myotis* bat, likely a natterer's was recorded on the northern woodland edge of Calf Heath Wood proximal to Point Count 3.01. A single registration of a 'big bat' was recorded within Calf Heath Wood on the main access track from Woodside Farm to the northwest.
- 4.6.116 The most frequently recorded bat was common pipistrelle.

## 2017

- 4.6.117 A low level of bat activity was recorded during the survey of Transect 6, with three species of bat recorded; common pipistrelle, soprano pipistrelle and

noctule. Refer to Figure 10.1.633 for a plan showing the bat activity at the Site during the survey.

- 4.6.118 The surveys were undertaken by two surveyors (James Fraser and Carl Bailey) on 12/10/2017. The first bat, a noctule was seen not heard flying high from south to north along a hedgeline from the wet woodland at Point Count 6.03. This bat was recorded at 18:35, 14 minutes after sunset. A further noctule was recorded but not seen in the paddocks south of Straight Mile proximal to Point Count 6.04 at 18:57. A common pipistrelle was recorded at Point Count 6.09, this bat was heard not seen. The final bat recorded was a soprano pipistrelle along the tree/hedgeline running along Stable Lane south of Point Count 6.11.
- 4.6.119 The most frequently recorded bat was noctule but bat activity was very low.
- 4.6.120 Table 4.52 below provides a summary of data obtained by static monitoring by transect in October to provide additional context to the manual bat activity surveys undertaken. A total of 125 common pipistrelle passes, 640 soprano pipistrelle passes, 371 pipistrelle social calls, 965 *Myotis* passes, 10 noctule passes, 1 'big bat' and 9 brown long-eared passes were recorded in October across the transects. The locations where the static detectors were deployed are shown in Figure 10.1.623.

**Table 4.52: October Automated (Static) Detector Results**

Transect	Date	Species	Number of Passes
1	19/10/2016	Common pipistrelle	6
		Soprano pipistrelle	8
	20/10/2016	Common pipistrelle	10
		Soprano pipistrelle	6
		<i>Myotis</i>	1
	21/10/2016	-	-
	22/10/2016	-	-
23/10/2016	-	-	
2	19/10/2016	Common pipistrelle	8
		<i>Myotis</i>	1
	20/10/2016	<i>Myotis</i>	1
	21/10/2016	Common pipistrelle	1
	22/10/2016	-	-
23/10/2016	-	-	
3	19/10/2016	Common pipistrelle	3

Transect	Date	Species	Number of Passes
		Soprano pipistrelle	9
		Pipistrelle Social	7
		Brown long-eared	1
		<i>Myotis</i>	1
		Noctule	1
	20/10/2016	Soprano pipistrelle	5
		<i>Myotis</i>	1
		Noctule	3
	21/10/2016	Soprano pipistrelle	249
		Pipistrelle Social	190
		Brown long-eared	1
		<i>Myotis</i>	1
		Noctule	1
	22/10/2016	Soprano pipistrelle	1
		<i>Myotis</i>	2
	23/10/2016	Soprano pipistrelle	2
		Brown long-eared (social)	2
Big bat		1	
4	19/10/2016	Common pipistrelle	33
		Soprano pipistrelle	120
		Pipistrelle Social	84
		<i>Myotis</i>	56
	20/10/2016	Common pipistrelle	4
		Soprano pipistrelle	48
		Pipistrelle Social	2
		<i>Myotis</i>	243
	21/10/2016	Soprano pipistrelle	10
		<i>Myotis</i>	62
		Noctule	2
	22/10/2016	Common pipistrelle	4
		Soprano pipistrelle	3
		Pipistrelle Social	1

Transect	Date	Species	Number of Passes
	23/10/2016	<i>Myotis</i>	80
		Soprano pipistrelle	1
		<i>Myotis</i>	50
5	19/10/2016	Common pipistrelle	33
		Soprano pipistrelle	113
		Pipistrelle Social	82
		<i>Myotis</i>	62
	20/10/2016	Common pipistrelle	5
		Soprano pipistrelle	47
		Pipistrelle Social	3
		<i>Myotis</i>	242
	21/10/2016	Soprano pipistrelle	6
		<i>Myotis</i>	49
		Noctule	2
	22/10/2016	Common pipistrelle	4
		Soprano pipistrelle	3
		Pipistrelle Social	2
		<i>Myotis</i>	67
	23/10/2016	Soprano pipistrelle	1
<i>Myotis</i>		43	
6	11/10/2017	Soprano pipistrelle	2
	12/10/2017	<i>Myotis</i>	1
		Brown long-eared	2
	13/10/2017	Common pipistrelle	2
		Soprano pipistrelle	4
		Noctule	1
	14/10/2017	Common pipistrelle	5
		Brown long-eared	3
	15/10/2017	Common pipistrelle	7
		Soprano pipistrelle	2
		<i>Myotis</i>	2

### *Summary of Bat Activity*

- 4.6.121 Levels of bat activity (from the static detectors) were greatest in May. Levels of activity were relatively consistent between June and August. Reduced levels of activity were recorded in September and October. Common pipistrelles were the most frequently encountered species and accounted for approximately 67% of the registered passes on the static automated detectors. Soprano pipistrelle were the second most frequently recorded species accounting for approximately 15% of the registered passes on the static detectors. A further 2% of calls were pipistrelle social calls. Myotis and noctule were also frequently encountered. These species made up approximately 6.5% and 5.5% of the total registered passes on the static detectors respectively. Ninety-six bat passes were classified a 'Big bat', this equates to approximately 0.4% of total registrations on the static detectors. Common and soprano pipistrelle, Myotis species, brown long-eared and noctule bats were recorded on every transect (1-6). Brown long-eared bats accounted for approximately 3% of the total registered passes on the static detectors. Two nathusius pipistrelle bats were recorded in May. Summaries of bat activity (from static detectors) and composition are provided in Figures 10.1.618 to 10.1.623.
- 4.6.122 Significant noctule activity was recorded on both the manual and static automated bat activity surveys in July 2016. Approximately 66% of all noctule calls recorded on the static detectors were obtained in this month. The apparent interseasonal difference in activity may be caused by the weather and the species biology, juvenile noctule bats were captured during trapping in August. Their presence would increase the number of recorded individuals. The temperature during the July bat activity surveys was also the highest of any month (between 21°C and 26°C) which may have positively influenced the food supply targeted by this species such as moths, beetles (mainly chafer and dung beetles) and winged ants which are most plentiful in July<sup>33</sup>.
- 4.6.123 Soprano pipistrelle numbers recorded during the automated activity surveys were highest in the northeast of the Site and were the only bat captured around Calf Heath Reservoir indicating that the riparian and woodland habitats provide foraging resources for these species.
- 4.6.124 Bat activity was recorded across the Site; however, the following key commuting and foraging areas were noted and as shown on Figure 10.1.634. These have been revised since the draft Environmental Statement was issued where areas of greatest activity were presented by transect. Some of these areas whilst having the most commuting or foraging activity on a given transect are not considered to be key areas for bats given levels of activity were still generally limited when considering with the baseline established

<sup>33</sup> Bat Conservation Trust (BCT) Noctule Bat. Available at: [http://www.bats.org.uk/publications\\_download.php/217/noctule.pdf](http://www.bats.org.uk/publications_download.php/217/noctule.pdf)

across the Site and not just on a given transect. This is particularly true of Transect 1 in the west of the Site:

- i. Staffordshire and Worcestershire Canal;
- ii. Calf Heath Wood (Interior and woodland edge);
- iii. Ditch / hedgerow past Gailey Magazine linking the Staffordshire and Worcestershire Canal and Calf Heath Wood;
- iv. Access track past Woodside Farm leading into the wayleave/track running north west – south east in Calf Heath Wood;
- v. Hedgerow running east to west in centre of Transect 4 including Point Count 4.11;
- vi. Hedge / tree line running southwest to northeast between Calf Heath Woodland and Reservoir;
- vii. Hedgerow running north-west to south-east between Vicarage Road and Straight Mile;
- viii. Hedgerow / bund running north to south in the far south west of the Site between the canal and Straight Mile;
- ix. Hedge / treeline in location of Pond 24;
- x. Wet woodland in south of the Site adjacent Straight Mile and the tree line extending north from this to the wooded copse off Woodlands Lane; and
- xi. The canal and woodland habitats in the south of the Site have been shown to support foraging, commuting and roost sites for a range of species.

### *Bat Survey – Advanced Licence Bat Survey Techniques*

#### Bat Trapping

- 4.6.125 Four bat trapping survey sessions were undertaken; two each during mid-summer and late summer of 2016 and 2017. The primary aim of trapping was to capture tree roosting and/or breeding bats for radio tracking, therefore once sufficient bats had been captured, trapping ceased. All trapping data is contained in Annex 10.1.8.
- 4.6.126 A total of 19 bats of seven species were captured during 26 June to 1 July 2016 survey session. The majority of bats were captured in Calf Heath Wood, with checks of breeding status (pregnant or lactating) identifying common pipistrelle, soprano pipistrelle and brown long-eared confirmed as breeding in the locality (No maternity roosts identified on-site). Non breeding female natterer's bat, whiskered, Brandt's and Daubenton's male bats were also present.
- 4.6.127 A total of 22 bats were captured during 22 August to 26 August 2016 survey session. In addition to the species captured in June 2016, male adult serotine, male adult noctule and juvenile female noctule bats were also

confirmed at Calf Heath Wood. The surveys also confirmed that breeding whiskered bats were using Calf Heath Wood (no maternity roost identified on-site).

- 4.6.128 A total of 41 bats were captured over four nights of trapping in 2016 with nine species confirmed. Soprano pipistrelle were the most frequently captured species in 2016, with Brown long-eared being the second most frequently captured species.
- 4.6.129 A total of 22 bats of six species of bats were captured during the 25th -26th June 2017 trapping session. Species were common pipistrelle (males only), soprano pipistrelle (breeding females), brown long-eared (breeding females), Natterer's bat (breeding females), whiskered bat (breeding females), and Daubenton's (male bats).
- 4.6.130 A total of 37 bats were captured during the 27th – 28th August 2017 trapping survey session. A similar range of species were captured during this survey session as June 2017 with the addition of noctule bat (which included a female juvenile and two male bats). No whiskered bats were captured during the August 2017 survey session. A number of female Daubenton's bats were also captured (two adults and three juveniles).
- 4.6.131 A total of 59 bats were captured over four nights of trapping in 2017 with nine species confirmed. Brown long-eared were the most frequently captured species in 2017, with Daubenton's bat being the second most frequently captured species.

## Radio Tracking and Roosting Patterns

### *26 June to 1 July 2016*

- 4.6.132 Trapping data in Annex 10.1.8 show that during the June 2016 survey session, three bats were marked with radio transmitters to assist in locating their roosting sites. This included a male Daubenton's bat (Bat1), female non-breeding brown long-eared bat (Bat2) and female non-breeding natterer's bat (Bat3). Figures 10.1.635 and 10.1.636 show the location of the roosts with images of the roosts, and a summary of the bats' movements is provided below.

### Bat1 – Male Daubenton's bat

- 4.6.133 Bat1 was tagged on 27 June 2016 in Calf Heath Wood (trap 5, Figure 10.1.624). On 28 June Bat1 was found roosting in a hollow birch tree in the western part of Calf Heath Wood (outside the Site) at OSGrid SJ 91928 09442 (Roost 1, Figure 10.1.635). The entrance to the roost was approximately 4.5 m high and south facing.



- 4.6.134 Prior to the evening emergence survey, social calling from the tree hole indicated multiple bats were present. Weather conditions for the survey were light drizzle with 100% cloud cover. The temperature was 13°C and sunset was at 21:36. A Canon XA25 IR camera was used to observe emergence. The first Daubenton's bat emerged at 22:06, with a total of 15 bats emerging until 22:40. Bat1 emerged at 22:38 in moderate rain and flew east towards Calf Heath Reservoir.
- 4.6.135 On 29 June 2016, Bat1 returned to Roost 1. The second emergence survey of Roost 1 commenced prior to sunset (21:36). Weather conditions for the survey were dry with a light breeze and 50% cloud cover. The temperature was 14°C. The bats occupying the roost made a number of social calls prior to emergence and the first bat emerged at 22:21. To confirm the status of the roost, a hand net on a 5 m pole was used to capture a sample of bats (approximately one bat captured in every three bats that emerged). Twenty-four bats emerged with the last emergence at 23:40. A total of six bats were captured during the emergence, and all bats were confirmed as adult male Daubenton's bats.
- 4.6.136 On 30 June 2016 Bat1 returned Roost 1. No emergence survey was undertaken on 30 June as resources were utilised for other tagged bats. However, Bat1 moved to another roost in Calf Heath Wood on 1 July 2016 located in a large split in another birch tree at OS Grid SJ 92161 09295 (Figure 10.1.635, Roost 2, again outside the Site). The roost was on its western side approximately 3.5 m in height. The emergence survey was undertaken in poor weather conditions 11°C, light to moderate rain, light wind, with some strong gusts during showers, cloud 100%. The first bat emerged at 22:34, with Bat1 emerging at 22:41. A total of 16 bats emerged with the last bat emerging at 22:59.

#### Bat 2- Female brown long-eared bat (non-breeding)

- 4.6.137 Bat2 was captured on 27 June 2016 in Calf Heath Wood (trap6) and marked with a radio transmitter. On 28 June 2016 Bat2 was located in a brick outbuilding of Woodview cottage located at OS Grid SJ 92260 08727 (Roost 3, Figure 10.1.636). This roost which is outside the site was used by Bat2 for the entire survey period.
- 4.6.138 An emergence survey of Woodview on 28 June 2016 was unable (due to access limitations) to determine the exit point of the roost. However, through radio tracking, it was possible to confirm that Bat2 emerged at 22:11. Bat2 flew to the south over the nearby canal and returned to the roost at 22:40.
- 4.6.139 Bat2 emerged from Woodview at 21:25 on 30 June (sunset was 21:20). It flew to the woodlands to the south by the canal and then returned to Woodview after around 30 minutes. Bat2 appeared to be moving around

various buildings within the roosting complex (Woodview) for the next two hours. No further evening survey of Bat2 was undertaken during the survey session; however Bat2 was found roosting in the same roost location on 1 July 2016 as she had done since capture.

#### Bat3 – Female natterer's bat (non-breeding)

- 4.6.140 Bat3 was caught in trap5 on 27 June 2016 and found day roosting in a large barn at Somerford Grange Farm located at OS Grid SJ 89990 08706 (Roost 4, Figure 10.1.636). Bat3 roosted at this site (outside the site) all week and made regular foraging bouts to Calf Heath Wood until the end of the survey session on 1 July 2016.
- 4.6.141 Access to the barn was restricted due to it being located on private property. One emergence survey was done from a public road on 29 June 2016, where Bat3 was recorded flying within the barn (moving around) from 22:25, and then emerged from the barn at 22:31, and flew in a direct line to Calf Heath Wood.

#### *22 to 26 August 2016*

- 4.6.142 Trapping data in Annex 10.1.8 show that during the August 2016 survey session, three bats were marked with radio transmitters to assist in locating their roosting sites. This included a female post lactating whiskered/Brandt's (Bat4), female post lactating brown long-eared bat (Bat5) and an adult male brown long-eared bat (Bat6). Figures 10.1.625 shows the August trapping locations and 10.1.637 show the location of the roosts with images of the roosts, and a summary of their movements is provided below.

#### Bat4 – Female post-lactating (breeding) whiskered/Brandt's

- 4.6.143 Captured on the evening of 22 August 2016 in trap1, Bat4 was tagged and found roosting in a house located at SJ9187206400 (Roost 5, Figure 10.1.637) on 23 August. Due to private property outside the site, the roost position was not recorded, however the roof area of the building was suitable to support this species and a strong signal was recorded on the western side of the roof area. Bat4 emerged at 21:05 on 23 August and flew south.
- 4.6.144 On 24 August 2016, Bat4 was found roosting in a downy birch tree located in a small woodland adjacent to a canal SJ9223707166 outside the site (Roost 6, Figure 10.1.637). The woodland is situated immediately north of Laches Wood Outdoor Education Centre. The bat did not emerge (bad weather may have been responsible due to rain), and on 25 August the tagged was located at the base of the tree, indicating the tag had been scratched off.

#### Bat5 – Female post lactating brown long-eared bat

- 4.6.145 Captured at trap2 and marked with a radio transmitter on 22 August 2016, Bat5 was found roosting in the same building outside the site at Woodview as Bat2 had been in June 2016 (Roost 3, Figures 10.1.636 and 10.1.637), and is likely part of the same population. Bat5 used this roosting site throughout the entire survey period and was recorded occasionally in Calf Heath Wood.

#### Bat6 – Male adult brown long-eared bat

- 4.6.146 Bat6 was captured in Calf Heath Wood in trap6. On 24, 25 and 26 August 2016 Bat6 was found to be roosting in a small bungalow outside the site (Roost 7, Figure 10.1.637) at OS Grid SJ93510 09137. Bat6 emerged at 21:20 on 24 August and flew to the north.

#### *25 June to 26 June 2017*

- 4.6.147 Trapping data in Annex 10.1.8 show that during the June 2017 survey session, four bats were marked with radio transmitters to assist in locating their roosting sites. This included a lactating female natterer's (Bat106), a male Daubenton's bat (Bat206), a female lactating whiskered/brandt's bat (Bat306) and a male brown long-eared bat (Bat406). Figures 10.1.626 shows the June 2017 trapping locations and 10.1.638 show the location of the roosts with images of the roosts, and a summary of their movements is provided below.

#### Bat106 – Female lactating (breeding) natterer's bat

- 4.6.148 Bat106 was caught in the woodland strip on the north bank of the Staffordshire and Worcestershire Canal on 25 June 2017 and found day roosting in a barn conversion at Standeford approximately located at OS Grid SJ 9133107653 (Roost 8, Figure 10.1.638). Bat106 roosted in the roof of this building and the core foraging area for this bat was along the canal beyond the south of the Site and over/in adjacent woodland.
- 4.6.149 One emergence survey was done from a public road. Bat106 was recorded emerging; a total of 31 bats emerged from the gable end. The access point was shown to be a hole around a steel roof joist on the north east elevation. This has been classified as a maternity roost.

#### Bat206 – Male Daubenton's bat

- 4.6.150 Bat206 was caught in the woodland strip on the north bank of the Staffordshire and Worcestershire Canal on 25 June 2017 and found day roosting in a tree within woodland next to the canal approximately 90m south of the Site at OS Grid SJ 9329508723 (Roost 9, Figure 10.1.638). Bat206 roosted in a hole in this tree and the core foraging area for this bat

was along the canal beyond the south of the Site and over/in adjacent woodland.

- 4.6.151 An emergence survey was undertaken and Bat206 was recorded emerging, a total of 22 bats emerged from the hole in the tree.

Bat 306 – Female lactating (breeding) Whiskered/Brandt's

- 4.6.152 Bat306 was caught in the woodland strip on the north bank of the Staffordshire and Worcestershire Canal on 26 June 2017 and found night roosting in a tree within woodland south of the canal approximately 45m south of the Site at OS Grid SJ 9254308614 (Roost 10, Figure 10.1.638). Bat306 also used two houses as day roosts. The first, is located on Stable Lane, approximately 200m east from the Site at OS Grid SJ 9357208985 (Roost 11, Figure 10.1.638). The second is located in a house in Slade Heath, approximately 2.1km south west of the Site at OS Grid SJ 9185806549 (Roost 12, Figure 10.1.638). This is considered likely to be a maternity roost.
- 4.6.153 The core foraging area for this bat was over Woodlands Lane and Stable Lane and over the south east of the Site in what is proposed to be Calf Heath Community Park. The second core foraging area for this bat was to the north of Vicarage Road in woodland to the east between Vicarage Road and Calf Heath Reservoir where the access track for the reservoir is located.

Bat 406 – Male Brown Long-eared

- 4.6.154 Bat406 was caught in the wooded copse off Woodlands Lane on 26 June 2017 and found day roosting in a house on Stable Lane approximately 25m east of the Site at OS Grid SJ 9349909098 (Roost 13, Figure 10.1.638). The core foraging area for Bat406 was very localised to the roost location over Woodlands Lane and Stable Lane.

*27 August to 28 August 2017*

- 4.6.155 Trapping data in Annex 10.1.8 show that during the August 2017 survey session, four bats were marked with radio transmitters to assist in locating their roosting sites. This included a juvenile female brown long-eared (Bat108), juvenile female noctule bat (Bat208), a male juvenile natterer's bat (Bat308) and a non-reproductive adult female Daubenton's bat (Bat408). Figure 10.1.639 show the location of the roosts with images of the roosts, and a summary of their movements is provided below.

Bat 108 - Juvenile Female Brown Long-eared

- 4.6.156 Bat108 was caught in woodland on the south bank of the Staffordshire and Worcestershire Canal on 27 August 2017 and was found day roosting in a

house on Vicarage Road approximately 20m south of the Site at OS Grid SJ 9227408734 (Roost 3, Figure 10.1.639). This property is Woodview Cottage which was identified as being a maternity or satellite roost in 2016. The core foraging area for Bat108 was very localised to the roost location and a field to the south of the property.

#### Bat 208 - Juvenile Female Noctule

- 4.6.157 Bat208 was caught in the woodland strip on the north bank of the Staffordshire and Worcestershire Canal on 27 August 2017 and was found roosting in two trees. The first is located near Somerford approximately 1400m west of the Site at OS Grid SJ 8987508667 (Roost 14, Figure 10.1.639). The second is located in woodland approximately 40m south of the Site adjacent the Staffordshire and Worcestershire Canal at OS Grid SJ 9330008773 (Roost 15, Figure 10.1.639).
- 4.6.158 Emergence surveys were undertaken at both roosts. Roost 14 (In Somerford) had 16 bats emerge and Roost 15 south of the Site had 13 bats emerge. Both Roosts 14 and 15 have been classified as noctule maternity roosts.
- 4.6.159 The four core foraging area for Bat208 were over arable fields and plantation woodland next to the River Penk near the Roost 14, over woodland and arable fields over Saredon Brook to the immediate south of Four Ashes Industrial Estate, over the canal and woodland south of the Site in close proximity to Roost 15 and in the west of Calf Heath Wood mostly over the retained Bericote woodland.

#### Bat 308 - Juvenile Male Natterer's

- 4.6.160 Bat308 was caught in the woodland in the south of the Site adjacent Straight Mile on 28 August 2017 and was found day roosting in the same barn conversion at Standeford as Bat106 located at OS Grid SJ 9133107653 (Roost 8, Figure 10.1.638). Bat308 roosted in the roof of this building and the core foraging area for this bat was over woodland and arable fields over Saredon Brook to the immediate south of Four Ashes Industrial Estate, over the canal and fields between the energy from waste plant off Enterprise Drive and Deepmore Lane and within the north of Calf Heath Wood. Roost 8 has been classified as a maternity roost.

#### Bat 408 – Non-reproductive Female Daubenton's

- 4.6.161 Bat408 was caught in the broadly triangular wooded copse off Woodlands Lane in the east of the Site on 28 August 2017 and was found roosting in a tree adjacent quarry workings located approximately 1300m to the south east of the Site at OS Grid SJ 9442208061 (Roost 16, Figure 10.1.639). The core foraging area for this bat was near to the roost location over arable

fields between the Staffordshire and Worcestershire Canal and Latherford Lane.

- 4.6.162 An emergence survey was undertaken and Bat408 was recorded emerging, a total of 9 bats emerged from the hole in the tree. This has been classified as a maternity roost.

#### *Trapping and Radio Tracking Summary*

- 4.6.163 Fourteen bats of five species were tagged, from which sixteen separate roost sites/structures were located. Eight roosts were located in trees, with four of these supporting Daubenton's bats. Two Daubenton's day roosts were located in the western side of Calf Heath Wood (off-site), one day roost in woodland adjacent to the canal located 90m south of the Site and the fourth, a maternity roost adjacent quarry workings approximately 1300m to the south east of the Site. Two noctule maternity roosts were found in trees, one near Somerford approximately 1400m west of the Site and the second 40m south of the Site adjacent the Staffordshire and Worcestershire Canal. Two whiskered/brandt's roosts were identified, one day roost at woodland north of Laches Wood Outdoor Education Centre and a night roost located within woodland south of the canal approximately 45m south of the Site. No tree roosts were established within the Site boundary via radio-tracking.
- 4.6.164 Eight building roosts were identified including two maternity roosts (for natterer's and brown long-eared) all located within approximately 2 km from the Site.
- 4.6.165 Species specific accounts are provided below; no roosts were found within the Site as a result of trapping and radio-tracking, however, two building roosts and five tree roosts including two breeding populations are located within 20-100m from the boundary of the Site.
- 4.6.166 The majority of bats were trapped in Calf Heath Wood and in woodland adjacent the canal in the south of the Site, and the number of bats captured and the range of species does suggest a locally important role of the habitat in this woodland for the species present, including foraging, roosting and potentially other social related behaviour including mating.

#### *Roosting Summary*

- 4.6.167 A total of twenty-two roosts were identified. Nine bat roosts were identified in 2016 and 13 bat roosts were identified in 2017 via a combination of survey methods. Six of these were on-site and sixteen were off-site. Of the sixteen off-site roosts, seven were identified within 100m of the Site boundary. Nine tree roosts and thirteen building roosts were identified. The

roosts identified are summarised below in Table 4.53 and presented in Figures 10.1.635 to 10.1.641.

**Table 4.53: Confirmed Bat Roosts**

Roost Name	Distance and Orientation from Site	Species	Roost Classification
Gailey Magazine	On-site	Common pipistrelle Soprano pipistrelle	Day roost
Woodside Barn	On-site	Natterer's Common pipistrelle Soprano pipistrelle Brown long-eared	Day roost Night roost Probable feeding perch
Mile End Cottage	On-site	Common pipistrelle	Day roost
Croft House	On-site	Common pipistrelle	Day roost
Heath Farm – Main Farmhouse	On-site	Brown long-eared	Day roost
T97 –Oak	On-site	Soprano pipistrelle	Day roost
Calf Heath Wood Birch 2 Roost 2	Approximately 20 m west	Daubenton's	Day roost
Woodview Cottage Roost 3	20 m south	Brown long-eared	Maternity roost or satellite roost
Stable Lane Building Roost 13	25 m east	Brown long-eared	Day roost
Tree Roost 15	40 m south	Noctule	Maternity roost
Tree Roost 10	45 m south	Whiskered/brandt's	Night roost
Calf Heath Wood Birch 1 Roost 1	Approximately 80 m west	Daubenton's	Day roost
Tree Roost 9	90 m south	Daubenton's	Day roost
Bungalow – Stable Lane Roost 7	120 m east	Brown long-eared	Day roost
Stable Lane Building Roost 11	200 m east	Whiskered/brandt's	Day roost
Standeford Barn Conversion Roost 8	1000 m south	Natterer's	Maternity roost
Somerford Grange Farm Roost 4	1250 m west	Natterer's	Day roost
Quarry Tree Roost 16	1300 m south east	Daubenton's	Maternity roost
Somerford Tree Roost 14	1400 m west	Noctule	Maternity roost
Woodland north of Laches Wood Outdoor Education Centre – Birch. Roost 6	1500 m south west	Whiskered/brandt's	Day roost
Slade Heath Building Roost 12	2100 m south west	Whiskered/brandt's	Day roost / Possible maternity roost
House – Old Stafford Road Roost 5	2350 m south west	Whiskered/brandt's	Day roost

### ***Bat Species Evaluation***

4.6.168 Ten species of bat were confirmed to be present in the survey area and individual bat species are evaluated below.

#### Daubenton's bat

- 4.6.169 This species was captured in June 2016 in Calf Heath Wood and in June and August 2017 in woodland off Woodland Lane and on the canal towpath. The tracking of a tagged male in 2016 led to the location of two birch tree roosts within the western part of Calf Heath Wood. Unusually the male appears to have roosted with 20+ other males, which is not a widely reported phenomena with male bats generally, and if bats were not captured and checked during the emergence survey, the number of bats present would normally be assumed as a maternity roost.
- 4.6.170 The tracking of a male in June 2017 located a further tree roost supporting 20+ individuals 90m south of the Site adjacent the canal. The tracking of a non-reproductive female in August 2017 located a further roost (a maternity roost) in a tree adjacent quarry workings located approximately 1300m to the south east of the Site.
- 4.6.171 Daubenton's were the most frequently encountered Myotis species on emergence and re-entry surveys and the manual bat activity surveys with numbers being greatest along the canal and over open water associated with quarrying activities. While Myotis species recorded elsewhere away from water have not been defined to species level, investigation of the call parameters suggest that the majority of calls are indeed attributable to Daubenton's. Myotis species were recorded across the Site with highest numbers being noted on Transect 5 and 4 (largely attributable to significant activity in October 2016 where detectors were left near areas of standing water associated with quarrying activity). Transects 3 and 6 had broadly equivalent levels of Myotis activity both comprising woodland proximal to standing water. Limited Myotis activity was recorded on Transect 1. The lowest level of Myotis activity was recorded on Transect 2 though this would not likely be the case if a static detector was placed along the canal (Not deployed in this location due to security concerns). Significant Daubenton's activity was noted here on manual activity surveys.
- 4.6.172 Daubenton's bats are considered relatively common and widespread across the UK, with increasing populations. In Staffordshire records of this species are numerous and are therefore considered widespread and locally abundant. These species are generally associated with water and riparian habitats and roost in woodlands and buildings.



- 4.6.173 The results of the surveys suggest that Calf Heath Wood is likely to provide an important roosting resource for this species, especially given the proximity to the potential foraging habitats associated with the canal and reservoir locally. Due to the mobility of tree roosting bat species, it is likely that further tree roosts will be used within the Calf Heath Wood area than currently known, and it should be assumed that trees within the Site and especially Calf Heath Wood, with suitable roosting cavities are likely to form part of this roosting resource. Significant use of the canal habitats and woodland adjacent the canal was noted by this species.
- 4.6.174 Daubenton's bats are a relatively common species, however notwithstanding the slightly lower conservation status usually associated with male bats, the Daubenton's bat population roosting in Calf Heath Wood and foraging in the standing water and canal habitats on the Site is considered to be of District importance. Whilst 2017 surveys identified breeding populations of this species they are located more than 1km from the Site and as such, valuation at District importance is considered to remain valid.

#### Whiskered/Brandt's bat

- 4.6.175 Small *Myotis* species, which include Brandt's, whiskered and alcahooe (*Myotis alcahooe*) bats are often grouped together due the difficulty of identifying these species from morphological features. It is confirmed that both Brandt's and whiskered bats were captured at Calf Heath Wood, as males of both species with clear identification features were examined (identified through the differences in male sexual organs). However as alcahooe bat has not been recorded in Staffordshire, and many previous records of whiskered and Brandt's bat are likely to be unreliable, these species are evaluated together because roosting behaviour and habitat use of these species have not been reliably established.

- 4.6.176 The trapping data shows that whiskered/brandt's bats were a frequently captured species and consistently captured during all surveys with the exception of August 2017. Data from August 2016 shows that a higher number of breeding whiskered/brandt's bats were captured, indicating the presence of a nearby breeding roost. These species regularly use tree roosts and could be roosting in trees bordering or within the Site. The tagging of the single post lactating female on site in August 2016 (breeding), confirmed the use of both a building and a tree roost approximately 1.5 km south of the Site when the bat's activity was tracked. Trapping and tracking data from 2017 of a single lactating female identified three further roosts; a night roost in a tree 45m south of the Site and two building roosts, one on Stable Lane, approximately 200m east from the Site and one in Slade Heath, approximately 2.1km south west of the Site which is a likely maternity roost.
- 4.6.177 *Myotis* species were recorded across the Site with highest numbers being noted on Transect 5 and 4 (largely attributable to significant activity in October 2016 where detectors were left near areas of standing water associated with quarrying activity). Transects 3 and 6 had broadly equivalent levels of *Myotis* activity both comprising woodland proximal to standing water. Limited *Myotis* activity was recorded Transect 1. The lowest level of *Myotis* activity was recorded on Transect 2 though this would not likely be the case if a static detector was placed along the canal.
- 4.6.178 Whiskered/Brandt's bats have a wide distribution across the UK with a stable population<sup>34</sup>, whiskered/Brandt's bat is considered one of the 'rarer' bats<sup>35</sup>. Brandt's bat is thought to be slightly less common and widespread than the whiskered bat<sup>36</sup>.
- 4.6.179 The likely presence of a nearby breeding population however is significant and as this species was captured during all bar one trapping surveys, it is likely that the Site has a role in supporting foraging and commuting, and possibly roosting bats from this breeding population. Therefore, the local whiskered population is considered to be of District value.

### Natterer's bat

- 4.6.180 Natterer's bats were captured in Calf Heath Wood in 2016 and in woodland adjacent the canal and in woodland off Woodlands Lane in 2017. The 2017 surveys confirmed breeding bats and a maternity roost was identified in a barn conversion in Standeford 1km to the south of the Site (Bat106 and

<sup>34</sup> Bat Conservation Trust (2016). National Bat Monitoring Programme Report. London

<sup>35</sup> Wray S, Wells D and Mitchell-Jones A M. (2010). Valuing Bats in Ecological Impact Assessment. In: In Practice, 70. Institute of Ecology and Environmental Management. Winchester

<sup>36</sup> Bat Conservation Trust (BCT) Whiskered bat. Species Info Sheet. Available online at: [http://www.bats.org.uk/data/files/Species\\_Info\\_sheets/whiskered\\_bat.pdf](http://www.bats.org.uk/data/files/Species_Info_sheets/whiskered_bat.pdf)

Bat308). In 2016 anon-breeding female tagged in June (Bat3), roosted in a large barn in Somerford approximately 1.2km west of the Site.

- 4.6.181 A *Myotis* species was noted occupying Woodside Barn (Hung on wall high up in the gable end) when an inspection was made after the October manual bat activity survey of Transect 3. Due to the height at which the bat was located it was not possible to accurately identify the bat but based on observations made it was considered likely to be a natterer's bat. DNA testing of droppings underneath this area confirmed the identification (See Annex 10.1.9). The presence of this bat and feeding remains suggest that Woodside Barn is a night roost for natterers. A *Myotis* bat with call parameters in line with a natterer's was recorded re-entering (probable) Woodside Barn in September suggesting a summer day roost as being present.
- 4.6.182 As detailed above, *Myotis* species were recorded across the Site with highest numbers being noted on Transect 5 and 4. Transects 3 and 6 had broadly equivalent levels of *Myotis* activity and limited *Myotis* activity was recorded Transect 1. The lowest level of *Myotis* activity was recorded on Transect 2.
- 4.6.183 This *Myotis* species has a wide distribution across Staffordshire<sup>37</sup> and the UK with an increasing population<sup>38</sup>. This species is known to roost in trees and buildings, especially outbuildings and barns.
- 4.6.184 The confirmed presence of a nearby breeding population (two bats trapped from same population) and likely presence of a day and night roost within Woodside Barn is of note and as this species was captured during all trapping surveys, it is likely that the Site has a role in supporting foraging and commuting, and possibly roosting bats of this species. Therefore, the natterer's bat population is considered to be of District value.

#### Brown long-eared bat

- 4.6.185 Brown long-eared bats were captured on every trapping survey and included a mix of adult male, female, breeding and juvenile bats. In 2016 two female bats, including a post lactating female, were tagged and both used a building roost just beyond the southern boundary of the Site in June and August (Roost 3 – Woodview Cottage). A juvenile female was tagged in 2017 and used the same roost. This indicates that this roost is either a satellite or full maternity roost for this species. In addition, two male adults were also tagged (one in 2016 and one in 2017) and were found to be roosting in two properties on Stable Lane approximately 25m (Roost 13) and 130m (Roost 7) to the east of the Site. DNA tests of droppings in Woodside barn confirmed this species as present and roosting in this building on site. DNA tests of

<sup>37</sup> Staffordshire Ecological Record (2016). Staffordshire Mammal Atlas. Retrieved from <http://www.staffs-ecology.org.uk/atlas/atlas.php?atlasid=M&page=m-intro&menu=M>

<sup>38</sup> Bat Conservation Trust (2016). National Bat Monitoring Programme Report. London

droppings sampled at Clovelly were also confirmed as being from brown long-eared, however, these were few and degraded and no active roost was confirmed in surveys undertaken at this building on site in 2017 (See Annex 10.1.9).

- 4.6.186 Brown long-eared bats were recorded across the Site and in greatest number on Transect 6. The majority of records for this species were from the static detector deployed within the wet woodland in the south of the site adjacent Straight Mile in August 2017. Very limited brown long-eared activity was recorded on Transect 1 and 2. Levels of activity were broadly similar across the remaining transects.
- 4.6.187 Brown long-eared bats are a relatively common species with stable populations, and widespread over the UK and in Staffordshire<sup>3940</sup>. They are generally considered a woodland bat, using trees and a wide variety of building types for roosting.
- 4.6.188 The presence of an adjacent breeding population is important, and as this species was captured during all trapping surveys, it is likely that the Site, especially woodland, has a role in supporting foraging and commuting, and possibly roosting bats of this species. Therefore, the local brown long-eared bat population is considered to be of Local value.

#### Common, soprano and nathusius pipistrelle bats

- 4.6.189 Common and soprano pipistrelle bats were regularly captured throughout the trapping surveys in 2016 and 2017. Soprano pipistrelles were the only bat captured around Calf Heath Reservoir. Both male bats and breeding females were captured indicating that the riparian and woodland habitats provide foraging resources for these species.
- 4.6.190 Davidson-Watts et al (2006) found that the common pipistrelle is a generalist forager using a wider variety of mainly woodland habitats for foraging, whereas soprano pipistrelle bats prefer riparian habitats.
- 4.6.191 The regular and high levels of captures including breeding bats of these species on the Site during the surveys, indicates that common and soprano pipistrelle bats forage and commute regularly across the site, and it is likely the Site supports animals from a nearby breeding population. Five pipistrelle (Common and soprano) summer day roosts were confirmed on-site at; Woodside Barn, Gailey Magazine, Mile End Cottage, Croft House and T97-Oak. Common pipistrelle populations are considered to be increasing and soprano pipistrelle bats are considered stable nationally. DNA tests of droppings in Woodside barn confirmed this species as present (See Annex

<sup>39</sup> Staffordshire Ecological Record (2016). Staffordshire Mammal Atlas. Retrieved from <http://www.staffs-ecology.org.uk/atlas/atlas.php?atlasid=M&page=m-intro&menu=M>

<sup>40</sup> Bat Conservation Trust (2016). National Bat Monitoring Programme Report. London

10.1.9). Both species are locally common and widespread in Staffordshire. Three nathusius pipistrelle passes were recorded during the static automated activity surveys, two in May 2017 and one in September 2016. Nathusius' pipistrelle are rare in Staffordshire (SER, 2016) and rare but widespread in the British Isles. Nathusius pipistrelle has not been recorded roosting on-site. The pipistrelle species populations recorded are of Local value.

#### Serotine bat

- 4.6.192 Two male serotine bats were captured in Calf Heath Wood during the August 2016 surveys. Both were captured on woodland rides and may have been captured whilst foraging. This species generally roosts in buildings, however woodland edge habitat is known to be a foraging habitat.
- 4.6.193 Serotine bats were infrequently encountered during manual and static bat activity surveys.
- 4.6.194 Serotines are rare in Staffordshire (SER, 2016) and uncommon throughout their range, which is known to be southern England and parts of the Midlands region. Serotine bats are considered stable in population<sup>41</sup>, but Staffordshire is likely to be near their northern extent, so their presence is significant. Although no breeding populations were confirmed, given their general rarity in the County, the population of serotine bats at the Site (assumed roosting elsewhere) is considered of District value.

#### Noctule bat

- 4.6.195 A male adult and two female juvenile noctule bats were captured in Calf Heath Wood, during the August 2016 surveys. All were captured on woodland rides and may have been captured whilst foraging. In 2017 surveys a juvenile female (Bat208) and adult male were trapped in the linear woodland north of the canal (in the south of the Site) and a juvenile female and adult male were trapped within woodland copses in the east of the Site south of Vicarage Road. Tracking data from Bat208 identified two maternity roosts for this species in trees, one (Tree Roost 15) located 40m south of the Site within woodland adjacent the canal and a second (Somersford Tree Roost 14) located approximately 1400m to the west.
- 4.6.196 This species generally roosts in trees and open space, riparian and woodland habitats are known to be foraging habitat for noctule bats.
- 4.6.197 Noctule bats were recorded and observed across the Site, often with several bats being seen at the same time. Manual and static activity surveys in July demonstrated significant noctule activity.

<sup>41</sup> Bat Conservation Trust (2016). National Bat Monitoring Programme Report. London

4.6.198 Noctule bats are widespread in Staffordshire (SER, 2016), and although they are found throughout the UK, they are likely to be relatively scarce due to the large home ranges they occupy. Noctule bats are considered stable in population<sup>42</sup>. A breeding population was confirmed with the nearest maternity roost being located 40m south of the Site within woodland adjacent the canal. Given the presence of a breeding population near the Site, the population of noctule bats at the Site is considered of District value.

### Valuation Summary

4.6.199 As an assemblage of bats the species presence described above is considered significant as there are 12 species recorded in Staffordshire<sup>43</sup> (SER, 2016) and the Site appears to support to a greater or lesser extent the majority of these species. Only lesser horseshoe (*Rhinolophus hipposideros*) and Leisler's bat which have been recorded in Staffordshire, were not recorded/confirmed on the Site.

4.6.200 It is clear from fieldwork carried out (particularly radio-tracking) that the bats recorded on the Site form part of populations using habitats at the landscape scale. Surveys have demonstrated that bats roosting off site are commuting to and using habitats within the Site to forage. Similarly, bats recorded roosting on-site have been recorded commuting off-site and foraging in habitats in the local landscape. The habitats on the site are not unique in the context of the surrounding areas. Other areas in the locality include habitats associated with quarrying activity, canals, farmland, woodland and buildings. It has not been possible in the fieldwork carried out to determine the relative importance of habitat on the site for bats to that in the surrounding areas but it is unlikely that it is any more important than any other areas, given the similarities in habitats present.

4.6.201 The bat assemblage present on-site is considered to be of value at the District scale and is to be considered as an 'Important Ecological Feature' within the EIA.

## 4.7 Badger

4.7.1 Full details of badger surveys and results are provided in Confidential Technical Appendix 10.2 to the ES.

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<sup>42</sup> Bat Conservation Trust (2016). National Bat Monitoring Programme Report. London.

<sup>43</sup> Staffordshire Ecological Record (2016). Staffordshire Mammal Atlas. Retrieved from <http://www.staffs-ecology.org.uk/atlas/atlas.php?atlasid=M&page=m-intro&menu=M>

## 4.8 Water Vole

### Legislation

- 4.8.1 Water voles (*Arvicola amphibius*) are protected under Section 9 of the WCA 1981. Legal protection makes it an offence to:
- i. Intentionally kill, injure or take (capture) a water vole;
  - ii. Possess or control a live or dead water vole, or any part of a water vole;
  - iii. Intentionally or recklessly damage, destroy or obstruct access to any structure or place which water voles use for shelter or protection or disturb water voles while they are using such a place; and
  - iv. Sell, offer for sale or advertise for live or dead water voles.

### Methodology

- 4.8.2 Water vole surveys were carried out in four ditches on the Site (as shown by TN 6, TN 7, TN 8 and TN 12 on Figure 10.1.002) and the Staffordshire and Worcestershire Canal. Water vole field signs were searched for at ponds on-site but these were considered largely unsuitable for this species. The surveys were undertaken in line with methods set out in the Water Vole Conservation Handbook<sup>44</sup> and Water Vole Mitigation Handbook<sup>45</sup> (Strachan et al, 2011). Each ditch was surveyed twice; once in late May and once in October 2016. The canal was surveyed in May 2017 and July 2017 and the survey was extended to the canal banks 200 m beyond the Site boundaries. Both banks of the ditches and canal were surveyed for signs of water vole such as latrines, feeding stations/lawns, droppings, burrows and prints and in accordance with best practice guidance. In addition, observations in relation to habitat suitability, value and likely sources of disturbance were recorded.

### Limitations

- 4.8.3 Although October is generally considered to be outside the optimal survey season (except in southeast England), the October 2016 survey was considered to be valid due to the preceding good, stable and mild weather experienced in the survey area. It was noted that surface water levels throughout the Site varied considerably based on rainfall during mid-summer, therefore field signs from early in the breeding season may have been washed away throughout the summer following heavy rainfall and not been evident during the October 2016 survey.

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<sup>44</sup> Strachan R, Moorhouse T, Gelling M. 2011. Water Vole Conservation Handbook. 3rd edition. Wildlife Conservation Research Unit: Oxford

<sup>45</sup> Dean M, Strachan R, Gow D, Andrews R. 2016. The Water Vole Mitigation Handbook (Mammal Society Mitigation Guidance Series). Eds. Fiona Mathews and Paul Chanin. The Mammal Society, London

## Desk Study

- 4.8.4 SERC provided a record of water vole (*Arvicola terrestris*) on the Site's northern boundary from 1998. This record was accurate to a 100m grid square (i.e. a six figure OS grid reference was provided), and was noted as located in Gailey Wharf, which is at the intersection of the Staffordshire and Worcestershire Canal and the A5 main road. SERC hold an additional four records within 2 km of the Site. These date from 1997 to 2002 with location details given as Coven, Staffordshire and Worcestershire Canal and River Penk – all locations apart from Coven are approximately 500 m to 2 km north of the site.
- 4.8.5 Coven is approximately 2.5 km south of the site and close to the Staffordshire and Worcestershire Canal. The Coven general area is also identified as water vole alert area (an area of water vole presence/potential dispersal identified as part the National Water Vole Database and Mapping project)<sup>46</sup> and local key area (area for which the alert area is more than 6km<sup>2</sup>).
- 4.8.6 The American mink (*Neovison vison*) is a non-native predator of water vole. Between 1989 and 1998, following the spread of American mink, the population of water vole fell by almost 90%<sup>47</sup>. American mink has been recorded as present within the region of the Site (within 10km grid square) in the last 10 years<sup>48</sup>.

## Results

- 4.8.7 The findings of the water vole surveys on ditches are presented in Table 4.54 below. No evidence of water vole presence was observed within any of the ditches surveyed. Feeding stations from a vole species were found on three of the four ditches (TN6, TN7 and TN8). No conclusive field signs for water vole such as water vole burrows, droppings/latrines, prints and/or lawns were identified. Small burrows (approximately 2 cm diameter: too small for water vole), small droppings and short lengths (relative to those typically encountered for water vole) of chewed vegetation forming the feeding stations were recorded. These feeding signs were considered to be attributed to field vole (*Microtus agrestis*).
- 4.8.8 Two of the ditches showed signs of existing human influence (other than management): the TN7 ditch is adjacent to the A5 layby, this was well-used

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<sup>46</sup> McGuire, C, Whitfield D, Perkins H and Owen C. (2014) National Water Vole Database and Mapping Project. Guide to the Use of Project Outputs to End of 2012

<sup>47</sup> People's Trust for Endangered Species (PTES) Water Vole [online] Available at: <https://ptes.org/get-informed/facts-figures/water-vole/> [Accessed 04/11/16]





<sup>48</sup> McGuire C, Whitfield D, Perkins H and Owen C. (2014) National Water Vole Database and Mapping Project. Guide to the Use of Project Outputs to End of 2012



by lorry drivers and had evidence of eutrophication and large numbers of bottles/cans in the water and on the banksides. The TN12 ditch runs between the A449 and the Four Ashes Industrial Estate, this ditch held approximately 5 cm of water had an oily film on the surface of the water and a smell of petrochemicals. Rats (likely brown rat (*Rattus norvegicus*)) and voles (likely field voles) were directly observed in this ditch.

- 4.8.9 The remaining two ditches were found to be partly or wholly dry later in the season after holding small amounts on water in May (the TN6 and TN8 ditches). The TN6 ditch runs south from the A5 on the northern boundary of the Site and is bounded by arable fields with significant scrub and vegetation grown on the ditch. It was found to have vole feeding signs (not considered to be water vole). TN8 runs east from the railway along arable field boundaries. The ditch comprised grasses, ruderal vegetation, scrub and trees. Small mammal feeding signs were found but were considered to be attributed to bank vole (*Myodes glareolus*).

**Table 4.54: Water Vole Survey Findings for Ditches**

Ditch	TN6	TN7	TN8	TN12
<b>Survey dates</b>	20/05/2016 and 20/10/2016	26/05/2016 and 20/10/2016	20/05/2016 and 20/10/2016	26/05/2016 and 20/10/2016
<b>Description</b>	<ul style="list-style-type: none"> <li>• Ditch with earth banks</li> <li>• Bare earth, bankside trees and short grass present. Tall ruderal vegetation and scrub growth in ditch by October</li> <li>• No aquatic vegetation</li> <li>• Adjacent land use of arable crop</li> <li>• Banks sides steep</li> <li>• Water static.</li> <li>• Level of disturbance low to medium</li> <li>• Water depth 3 cm</li> <li>• DRY DURING OCTOBER SURVEY</li> </ul>	<ul style="list-style-type: none"> <li>• Ditch with earth banks</li> <li>• Herbs and tall grass present</li> <li>• Aquatic marginal present</li> <li>• Adjacent land use of arable crop and trunk road (including lorry layby)</li> <li>• Banks sides steep</li> <li>• Water static</li> <li>• Level of disturbance high, significant litter in ditch</li> <li>• Water depth 1 m</li> </ul>	<ul style="list-style-type: none"> <li>• Ditch with earth banks</li> <li>• Herbs, bankside trees, shrubs, short and tall grass present</li> <li>• No aquatic vegetation</li> <li>• Adjacent land use of arable crop</li> <li>• Banks sides steep in places (mostly shallow banks)</li> <li>• Water static</li> <li>• Level of disturbance low to medium</li> <li>• Water depth 1 cm to 3 cm</li> <li>• DRY DURING OCTOBER SURVEY</li> </ul>	<ul style="list-style-type: none"> <li>• Ditch with earth banks</li> <li>• Bare earth, herbs, bankside trees and shrubs present.</li> <li>• No aquatic vegetation</li> <li>• Adjacent land use of arable crop, gardens and grassland</li> <li>• Banks sides steep to vertical</li> <li>• Water flow slow</li> <li>• Level of disturbance low to medium</li> <li>• Water depth 5 cm</li> </ul>
<b>Image</b>				
<b>Observations</b>	Evidence of vole species feeding stations – small cut lengths not consistent with water vole. Small burrows and bolt-holes (approximately 2 cm diameter). No latrines, lawns.	100% duckweed cover (likely Lemna sp.), also litter from layby. Smell of urine. Culverted under access tracks. Typha sp and reeds to the western end. Small vole holes and grass grazing- cut at 90°. Small feeding stations. No latrines.	Water approximately 1 cm to 3 cm deep. Some parts completely dry. Small mammal feeding signs, not characteristic of water vole. No latrines.	Poor water quality (oily film, smell of petrochemicals), approximately 5 cm depth. Burrows of rat, rabbit and bank vole present. Rat and bank vole sightings.
<b>Presence / likely absence</b>	Likely absence of water vole	Likely absence of water vole	Likely absence of water vole	Likely absence of water vole

- 4.8.10 Three of the four ditches were found to hold shallow depths of water (<5 cm) at the time of survey. This has implications for water vole's predator avoidance but does not preclude water vole presence. Only the ditch adjacent to the A5 road (at TN7) was found to have water depths of more than 5 cm throughout both survey visits. This ditch is largely within an area of high disturbance with strong human influence.
- 4.8.11 The ponds on-site were considered sub-optimal for water vole, no field signs were identified during any surveys (for instance the amphibian surveys) and this species is considered absent from ponds present on-site.
- 4.8.12 Of the 3.5 km of canal surveyed, approximately 85-90% comprised intact engineered banks with steep, sheet-piled sides (occasional degraded parts of the bank were present and were inspected for water vole field signs). The remaining 10-15% had at least one bank that had 'soft edges'. The most naturalised part of the canal corridor surveyed was off-site (200 m stretch north of the A5). A 400 m stretch of the canal is adjacent to the Bericote land and the chemical works. The western bank which included the canal tow path comprised amenity grassland. Small areas of 'soft bank' were identified however these areas were mainly due to erosion behind (and degradation of) the sheet piles, which allowed water ingress and access to soil substrate being retained. This was largely evident south of the bridge for Vicarage Road.
- 4.8.13 Large rodent droppings were observed adjacent to the chemical works on both surveys in 2017, however, these were not present as a typical latrine, were large and not consistent with water vole droppings. The presence of a dead brown rat nearby and the size and form of the droppings indicated that droppings were likely to be attributed to the rat population. No water vole latrines, lawns or other feeding signs were evident during the survey of the canal
- 4.8.14 Water Voles are considered to be likely absent from the Site. Despite the current human influences on the ditches and the seasonal drying of parts of these, the potential for the ditches to support water vole persists due to the suitable feeding resource. However, many of the ditches have shallow water (<5 cm depths) during the summer and therefore provide limited defence from predators for water voles. Additionally, the presence of water vole in the wider landscape, and therefore potential connectivity to a current population, is undetermined. The potential connectivity to water vole populations outside the Site is also limited due to the presence of culverts under roads (i.e. the M6, the A5 and the A449) which present a partial or complete barrier to movement to ditches offsite. The most recent record in the study area was in 2002 and the key predator, American mink, has been present in the region (10 km grid square) since this time.

## Valuation Summary

- 4.8.15 Water vole are considered absent from the Site based on 2016 and 2017 survey findings and therefore are not a receptor considered in the impact assessment.

## 4.9 European Otter

### Legislation

- 4.9.1 The primary legislative mechanism for the protection of otters (*Lutra lutra*) is its designation as a European Protected Species (EPS). All EPS are protected under the WCA 1981 and the Habitat Regulations. Under this legislation it is illegal to:

- Intentionally or deliberately capture, kill or injure EPS;
- Intentionally, deliberately or recklessly damage, destroy or obstruct access to any place used for shelter or protection including resting and breeding places, whether occupied or not; and
- Deliberately, intentionally or recklessly disturb listed species when in a place of shelter (and elsewhere for European protected species).

- 4.9.2 The European otter is a near threatened priority species, included within the following designations:

- Bern Convention, Appendix 2;
- EC Cites, Annex A;
- Habitats Directive, Annex 2 and Annex 4;
- Biodiversity Lists - England NERC s41;
- The Conservation of Habitats and Species Regulations 2017, Schedule 2;
- Global Red list status - Near Threatened<sup>49</sup>;
- Biodiversity Action Plan UK list of priority species;
- Wildlife and Countryside Act 1981, Schedule 5 Sections 9.4b, c and 9.5a; and
- Staffordshire Biodiversity Action Plan.

## Methodology

- 4.9.3 Otter surveys were carried out in four ditches on the Site and on the Staffordshire and Worcestershire Canal at the same time as water vole surveys (see section water vole section 4.8) the location of the ditches is shown by TN 6, TN 7, TN 8 and TN 12 on Figure 10.1.002), and otter field signs were searched for at ponds on-site. Each ditch was surveyed twice; once in late May and once in October 2016. The canal was surveyed in May

<sup>49</sup> Roos A, Loy A, de Silva P, Hajkova P & Zemanová B. (2015) *Lutra lutra*. The IUCN Red List of Threatened Species 2015: e.T12419A21935287. <http://dx.doi.org/10.2305/IUCN.UK.2015-2.RLTS.T12419A21935287.en>. Downloaded on 13 December 2016

2017 and July 2017 and the survey was extended to the canal banks 200 m beyond the site boundaries. Both banks of the canal and ditches were surveyed for signs of otter such as holts, spraints, feeding remains and prints and in accordance with best practice guidance. In addition, observations in relation to habitat suitability, value and likely sources of disturbance were recorded. Infra-red camera traps were deployed, monthly on-site from July to September 2017. The locations of the cameras were primarily focused on suitable polecat habitat (see section 4.10) but the footage was analysed for records of otter also – the deployment locations are shown in Figure 10.1.901.

### Limitations

No limitations to survey are noted.

### Desk Study

- 4.9.4 SERC provided ten records of otter on the Staffordshire and Worcestershire Canal, six of which may be considered within or directly adjacent to the Site. These records were from between 2004 and 2014. A further 20 records of otter presence were within 2 km of the Site, the records were made from 1996 to 2013 and comprise field signs, road fatalities or unspecified observations (i.e. no direct, live sightings). The records indicate that otters are present in the Staffordshire and Worcestershire Canal, the River Penk, and Saredon Brook (at Standeford and Deepmore Farm, 500 m to 600 m south of the Site). The road fatalities occurred on the A449, approximately 850 m north of the Site, and on Four Ashes Road (Brewood), approximately 1.9 km west of the Site, near the River Penk. These were recorded in September 2013 and October 2005 respectively. Staffordshire Wildlife Trust provided records of otter field signs from a survey of Wryley-Saredon Brook undertaken on 22 May 2017. These included nine otter spraints (1 fesh, 2 recent and 6 old). These were recorded at SJ 91763 07827 located approximately 750m to the south of the Site at its closest point.
- 4.9.5 Five national Otter surveys of England have been conducted by the Environment Agency since 1977. The most recent of these covered the period 2009-10<sup>50</sup>. The survey found that of all the 3,327 sites surveyed across England, 1,874 showed signs of otter presence (i.e. 56%). A 50 km grid square covering the Site was surveyed (OS grid square 'SJ s/e'), this area included 148 survey sites, of which 93 (62.8%) had positive signs of otter presence. The long term observations indicate that the region's otter population is increasing and expanding its range, as 0% of sites surveyed had otter presence in 1977 to 1979 and 47.9% of the sites had otter presence in 2000 to 2002.

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<sup>50</sup> Andrew Crawford (Environment Agency) (2010) Fifth otter survey of England 2009 – 2010. Technical report, October 2010

- 4.9.6 Harris et al (1995)<sup>51</sup> estimated the density of otters in England as one adult per 27 linear km of river, which would allow for a single otter to affect the district-wide distribution if it experienced a change in its home range.

## Results

- 4.9.7 The broad-leaved woodland habitat on-site that adjoin the canal are suitable for otter resting up, although the hard engineered sides that have been constructed throughout most of the canal potentially reduce the amount of access for otters into the adjacent areas.
- 4.9.8 No otter holts were identified during Phase 1 Habitat Survey of the Site. Inspections of the Gravelly Way road bridge and the Gravelly Way footbridge were undertaken monthly from May to October 2016 (following bat activity transects) and identified staining possibly caused by spraint in May (no other indicators such as smell or prey remnants were present due to the apparent age and weathering of the field sign), with no fresh signs for the following months. An otter footprint was observed in the very north of the Site during the badger survey; it was by the ditch south of the A5, approximately 100 m east of the Staffordshire and Worcestershire canal in March 2017. The canal was subjected to full survey in 2017 and no tracks, slides, feeding remains or spraint were observed. The Canal and River Trust confirmed that the Staffordshire and Worcestershire Canal provides important habitat for otter, therefore they are assumed to be present. It is considered canal forms part of an otter territory, and otters are likely to use the stretch of canal that passes through the Site, using the terrestrial parts of the Site on occasion.

## Valuation Summary

- 4.9.9 Otters are a near threatened priority species but with an increasing population. The habitats that support the species at the Site are common and widespread. The animals within the Site are well within their known range and have good connectivity to offsite areas of similar habitat, but due to the relatively low density of otters in English watercourses, any otter(s) that may be present within the Site has potential to influence distribution at a District scale.
- 4.9.10 Otters are considered to be of value at the District scale and are to be considered as an 'Important Ecological Feature' within the EIA.

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<sup>51</sup> Harris S, Morris P, Wray S and Yalden D. 1995. A review of British mammals: population estimates and conservation status of British mammals other than cetaceans. Joint Nature Conservation Committee, Peterborough, UK

## 4.10 Other Notable Mammals

### Legislation

4.10.1 This section addresses other mammal species that are of note due to their protection under legislative or policy drivers. The legislation and policy relevant to each species is listed below.

4.10.2 Brown hare (*Lepus europaeus*): is a Priority species included within the following designations and lists:

- Biodiversity Lists - England NERC s41;
- Biodiversity Action Plan UK list of priority species; and
- Staffordshire Biodiversity Action Plan.

4.10.3 Polecat (*Mustela putorius*): is Priority species included within the following designations and lists:

- Bern Convention, Appendix 3;
- Habitats Directive, Annex 5;
- The Conservation of Habitats and Species Regulations 2017, Schedule 4 (animals that must not be captured or killed in certain ways);
- Wildlife and Countryside Act 1981 (as amended) – Schedule 6;
- Global Red list status – Least concern; Biodiversity Lists - England NERC s41; and
- Biodiversity Action Plan UK list of priority species.

4.10.4 West European hedgehog (*Erinaceus europaeus*): is a Priority species included within the following designations and lists:

- Bern Convention, Appendix 3;
- Global Red list status – Least concern; Biodiversity Lists - England NERC s41; and
- Biodiversity Action Plan UK list of priority species.

4.10.5 Harvest mouse (*Micromys minutus*): is a Priority species included within the following designations and lists:

- Biodiversity Lists - England NERC s41; and
- Biodiversity Action Plan UK list of priority species.

### Methodology

4.10.6 Surveys for mammal species comprised the deployment of three infra-red camera traps across the site, primarily focussing on areas of habitat suitable for polecat. These were deployed in the late summer period, when the young

polecat would have dispersed and the number of active individuals is at its peak. The three cameras were therefore deployed monthly from July to September 2017. The monthly locations of the cameras are shown on Figure 10.1.901.

- 4.10.7 Direct observation or field sign surveys for the mammals mentioned in Paragraphs 4.10.1 to 4.10.5 were not undertaken. Any observations of the mammals were noted by ecologists during the regular ecological monitoring surveys that have been undertaken on the Site in 2016 and 2017. These included nocturnal surveys that may reasonably be expected to record hedgehog and hare if present in surveyed areas, e.g. around the monitored ponds and throughout approximately 30 km of the Site walked for bat transect surveys that have been undertaken monthly from May to October in 2016 and 2017. Any notable mammals were also recorded during daytime surveys such as the reptile surveys, badger survey and bird surveys. These surveys were not reasonably expected to encounter harvest mice or polecat due to the small, unobtrusive size and the low density within their range respectively.

### Limitations

- 4.10.8 Specific surveys for brown hare, hedgehog and harvest mouse were not undertaken; however, over 300 hours of field observations were documented. Therefore, the likelihood of encounter of species such as brown hare and hedgehog were considered to be high. The surveys were not considered suitable for encountering harvest mice.

### Desk Study

- 4.10.9 Brown hare: brown hares are widespread in the lowlands of England, Wales and Scotland<sup>52</sup>. SERC provided 12 records of hare within 2km of the Site ranging from 2001 to 2010. Many of the records are accurate to 10km grid squares only, but locational information indicates that no records have been made within the Site; the closest record is 1km north of the Site boundary. Despite cereal crops forming part of brown hares' diet (along with other tender grass shoots), modern farming is known to cause threats to brown hares, as arable crops provide little or no food in late summer/autumn and modern machinery and pesticides may kill hares. The status of brown hares in Staffordshire has been classed as 'very common'<sup>53</sup>.
- 4.10.10 Polecat: SERC provided nine records of polecat within the study area, dating from 2001 to 2012. All records relate to animals dead on a road. Five of the records relate to the A449 and three relate to the A5 (the remaining record is missing accurate location data). One record from 2007 is for the A5 on the

<sup>52</sup> The Mammal Society (2016) Brown Hare – *Lepus europaeus*. [online Available at: <http://www.mammal.org.uk/species-hub/full-species-hub/full-species-hub-list/species-brown-hare/>] [Accessed 12/12/2015].

<sup>53</sup> Staffordshire Ecological Record (2014) The Mammals of Staffordshire by Staffordshire Mammal Group. Data last updated: March 2014



northern boundary of the Site – two additional records from 2001 and 2009 have potential to overlap the southwest of the Site (but the exact location is uncertain due to generalised coordinate data). A national polecat survey was undertaken in 2014 to 2015<sup>54</sup>. A total of 1,761 records of polecats and polecat-ferrets were collected from mainland Britain in two years. The study confirmed that polecats are maintaining their historical stronghold (including the West Midlands) and have increased their range substantially in the southeast of Britain: polecats are now more widespread in Britain than at any time in the last 100 years. The status of polecat in Staffordshire has been classed as 'frequent'<sup>55</sup>.

- 4.10.11 Polecat territories vary in size depending on the habitat and food availability. Male territories vary from 16 ha to 500 ha and females vary from 25 ha to 375 ha<sup>56</sup>. Due to presence of the preferred habitats (farmlands, hedgerows and small woods) and the abundance of preferred prey species (rabbits and rats) throughout the Site and the adjacent areas, the landscape is considered to have a higher carrying capacity. The local polecat population is therefore considered to be resilient and have more dense territories throughout the Site and wider landscape.
- 4.10.1 Hedgehog: SERC provided 31 records of European hedgehog within a 2 km radius of the Site, ranging from 1999 to 2015. The closest record being 10 m to the north of the assessment area along the A5 road corridor. Rural populations of hedgehogs halved between 2000 and 2015<sup>57</sup>. The relative hedgehog abundance in the West Midlands is estimated to be approximately 0.6 when compared to the mean abundances across England (where 0 is lowest mean abundance in England and 1 is the highest mean relative abundance for England). The highest mean relative abundances of hedgehog are generally in the East of England, with those in the region of the Site being mid-to-low relative to the nation. The status of hedgehogs in Staffordshire has been classed as 'common but declining'<sup>55</sup>; such is the case for many areas across the country.
- 4.10.2 Harvest mouse: SERC provided seven records of harvest mouse within a 2 km radius of the Site, ranging from 2004 to 2010. All records are from 1 km to the north of the Site. The British distribution of harvest mouse is generally south of a line between the Bristol Channel to the Humber, with an extension northwards to Yorkshire. The density of harvest mice in cereal fields is typically 0.05-0.4 individuals per ha<sup>58</sup>. Harvest mice have been recorded throughout Staffordshire, but no records have been made within

<sup>54</sup> Croose E. (2016) The Distribution and Status of the Polecat (*Mustela putorius*) in Britain 2014-2015. 7 April 2016.

<sup>55</sup> Staffordshire Ecological Record (2014) The Mammals of Staffordshire by Staffordshire Mammal Group. Data last updated: March 2014

<sup>56</sup> The Mammal Society (2016) Species Factsheet: Polecat (*Mustela putorius*). [online] Available at: <[http://www.mammal.org.uk/sites/default/files/factsheets/polecat\\_complete.pdf](http://www.mammal.org.uk/sites/default/files/factsheets/polecat_complete.pdf)> [Accessed 19/12/2016]

<sup>57</sup> Wembridge D and Langston S (2015) The State of Britain's Hedgehogs 2015. People's Trust for Endangered Species/British Hedgehog Preservation Society, London

<sup>58</sup> Macdonald D W & Tattersall F. (2001) Britain's Mammals: The Challenge for Conservation. People's Trust for Endangered Species, London

the 2 km grid squares covering the Site, or the adjacent 2km grid squares, in the last sixyears<sup>55</sup>.

## Results

- 4.10.3 The results from analysis of camera trap footage are displayed in Table 4.55. Only results for notable mammals are presented. The results for specific species are presented in the paragraphs below. The camera that was deployed near the canal in the south of the Site in July recorded images of an unidentifiable nocturnal mammal moving within the undergrowth. This mammal was observed via reflection from its eyes, but the full outline of its form was not fully discernible. The mammal was considered larger than a brown rat (also caught on this camera trap) but is inconclusive.

**Table 4.55: Infra-red Camera Trap Notable Mammal Observations**

Trap	July	August	September
1	<b>Calf Heath Wood Southern Wayleave</b> None	<b>Woodland - Calf Heath Reservoir</b> None	<b>Field boundary northeast of Gailey Magazine</b> None
2	<b>North Calf Heath Wood</b> None	<b>Woodland Straight Mile</b> Two records of hedgehogs – separate evenings	<b>Woodland off of A449</b> None
3	<b>Woodland by Canal, South</b> Unidentified nocturnal mammal – obscured by vegetation	<b>Croft Lane Pond 5/6</b> None	<b>Woodland off of Woodlands Lane</b> None

- 4.10.4 **Brown Hare:** No brown hares were observed on site during the course of the regular ecological monitoring surveys that have been undertaken in 2016 and 2017. The farmland and pasture present within the Site are considered suitable habitat for brown hare and if a resident population of brown hare was present, it would be expected that this species would have been recorded by the ecological surveyors during the 2016 and 2017 monitoring. The linear features that surround and intercept the site (i.e. main roads, railway, canal) present partial boundaries to land mammals, which may hinder movement of any resident population in the wider landscape (no

brown hares have been recorded within 2km) or across the entire site. It is concluded likely that brown hares are absent from the Site.

- 4.10.5 Polecat: a single polecat or ferret-polecat sighting was made outside the Site while ecologists were returning from great crested newt torch surveys at approximately 01:00 on 07 June 2016. The sighting was approximately 200m northeast of the Site, at the A5-M6 junction roundabout, and confirmed that polecat readily cross the A5, as the animal was seen to be running north across the road A5 west of the M6 junction roundabout. For the purpose of this baseline report and the subsequent EIA the sighting is assumed to be a polecat rather than a ferret-polecat as a precautionary measure. Polecat is a priority species but with an increasing population and an expanding range. The habitats that support these species at the Site (farmland and woodland) are common and widespread. It is likely that at least one polecat's territory overlaps with the Site, specifically the northeast section. The animal(s) within the Site are well within their known range have good connectivity to offsite areas of similar habitat.
- 4.10.6 Hedgehog: four hedgehog sightings were made across the site in total. Two of the hedgehog sightings were made within the Site during the night-time ecological surveys on the 16<sup>th</sup> May 2016 and 17<sup>th</sup> May 2016. The sightings were within 300m of each other on arable field boundaries between Croft Lane and the A5, in the central-northern section of the Site. The two remaining hedgehog sightings were made via the infra-red camera deployed in the Woodland by Straight Mile in August 2017 (Camera 2 August on Figure 10.1.901). This area is separated from the other sighting locations by the canal and roads. The mosaic of scrubby hedgerows, broadleaf woodland, field margins and grassland throughout the site are considered suitable foraging and hibernation habitat for hedgehogs. However, the arable farmland is less suitable and the movement from the area in which the hedgehog(s) were observed to the rest of the site is limited due to the canal to the east and south, and the railway to the west, as well as the A5 main road to the north. The population of hedgehogs on site is considered to be small, and within the species' core range.
- 4.10.7 Harvest Mouse: no harvest mouse field signs were observed during the course of the regular ecological monitoring surveys that have been undertaken. The regular ecological monitoring was not considered appropriate to determine likely absence of harvest mouse. The field margins, hedgerows and dry ditches, and cereal crops are considered suitable habitat for harvest mouse, though limited to narrow linear strips. Similar quality habitats are prevalent throughout the region, although those on Site are bounded by linear features such as roads, the railway and the canal which present significant boundaries to harvest mice and fragment the habitats on Site, lessening their value. Since the likely absence of harvest mice on Site cannot be ruled out, the species is assumed to be present. Due to the habitats on Site presenting similar or lesser value to those throughout the

region, it is considered that no significant concentrations of harvest mouse are likely to occur within the Site compared to the wider region and national range.

### Valuation Summary

- 4.10.8 Brown hare are considered absent and are therefore not considered as a receptor in the EIA.
- 4.10.9 Polecat(s) are considered to be of value at the Local scale and are to be considered as an 'Important Ecological Feature' within the EIA.
- 4.10.10 Hedgehog(s) are considered to be of value at the Local scale and are to be considered as an 'Important Ecological Feature' within the EIA.
- 4.10.11 Harvest mice are considered to be of value at the Local scale and are to be considered as an 'Important Ecological Feature' within the EIA.

## 4.11 Summary of Species Valuation

- 4.11.1 The table below (Table 4.56) summarises the ecological value of the species receptors and notes whether they are important or other ecological features. Impacts on important ecological features are assessed in the EIA Ecology and Nature Conservation chapter.

**Table 4.56: Summary of Species Valuations**

Species	Geographic Value	'Important' or 'Other' Ecological Feature
Amphibians - GCN	Local	Important Ecological Feature
Amphibians – Common toad	Local	Important Ecological Feature
Amphibians – Smooth newt	Site	Other Ecological Feature
Amphibians – Common frog	Site	Other Ecological Feature
Reptiles	Absent	Not a Receptor
Other aquatic species – white clawed crayfish	County	Other Ecological Feature (Outside of zone of influence)
Other aquatic species – fish	Negligible	Other Ecological Feature
Birds	County	Important Ecological Feature
Invertebrates	Local	Important Ecological Feature
Bats	District	Important Ecological Feature
Badger	Local	Important Ecological Feature
Water Vole	Absent	Not a Receptor

Species	Geographic Value	'Important' or 'Other' Ecological Feature
Otter	District	Important Ecological Feature
Other mammals – Brown hare	Absent	Not a Receptor
Other mammals –Polecat	Local	Important Ecological Feature
Other mammals – Hedgehog	Local	Important Ecological Feature
Other mammals – Harvest mice	Local	Important Ecological Feature

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## FIGURES

### Appendix 10.1 Figures

**Series 000: Location, Vegetation and Habitats**

**Series 100: Amphibians**

**Series 200: Reptiles**

**Series 300: Not used**

**Series 400: Birds**

**Series 500: Not used**

**Series 600: Bats**

**Series 700: Not used**

**Series 800: Not used**

**Series 900: Terrestrial Mammals (excluding badger)**

**FIGURE SERIES 000: LOCATION, VEGETATION AND HABITATS**

**10.1.001 Site Location**

**10.1.002 Phase 1 Habitat Map**

**10.1.003 Invasive Plant Species**

**10.1.004 Pond Map**

**10.1.005 Veteran Trees and Important Hedrows Figure from Tree and Hedgerow Survey Reports**

Legend  
Site



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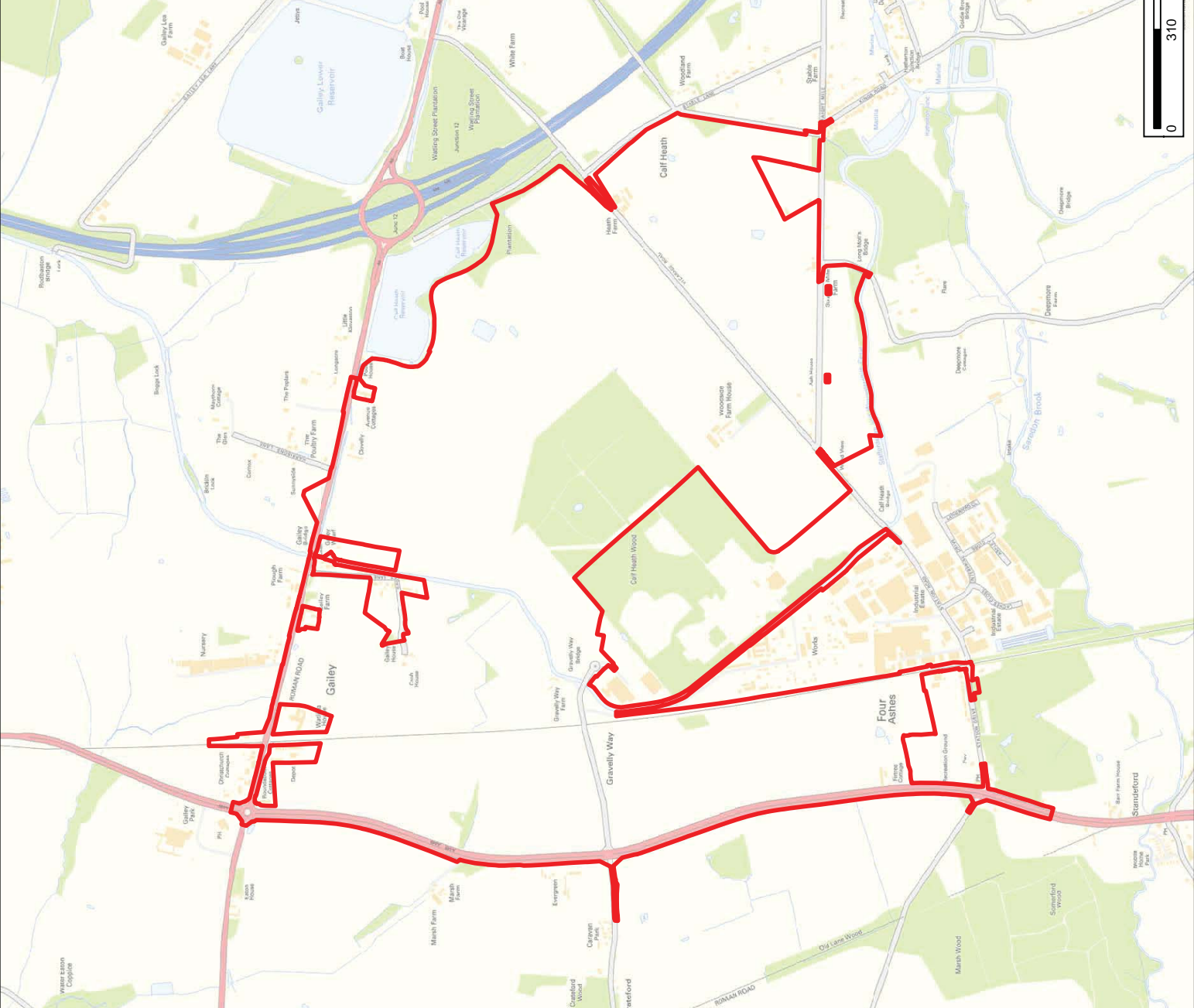
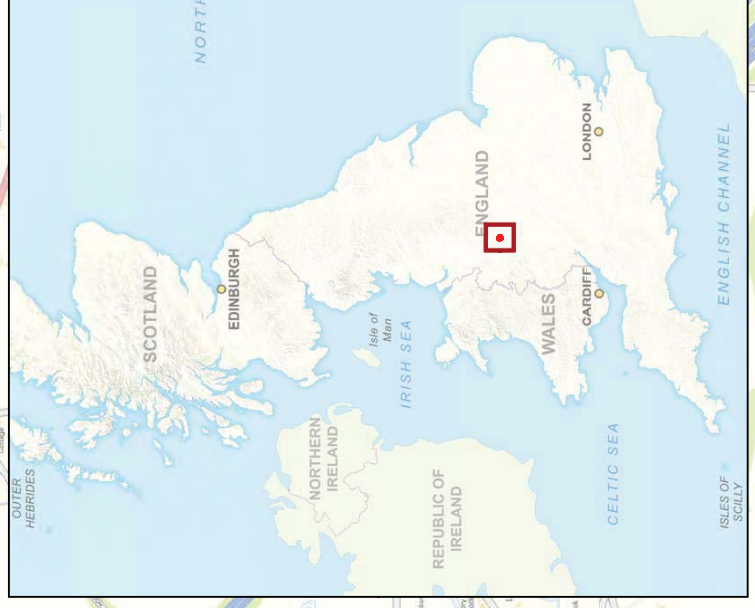
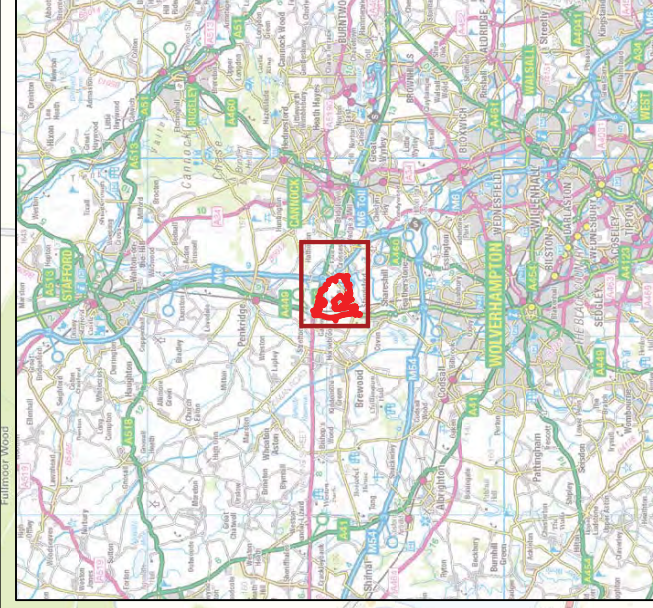
Project Number  
**1620002055**

Figure Title  
**Figure 10.1.001 Site Location**



Date **06/03/2018**

Scale **1:13,000 @A3**



**Legend**

- Site boundary
- Target Note
- Coniferous tree
- Broadleaf tree
- Standing water
- Running water
- ||||| Intact species-rich hedge
- - - Intact species-poor hedge
- - - Detruct species-poor hedge
- ||||| Hedge with trees (species-poor)
- Fence
- Dry ditch
- Mixed woodland plantation
- Broadleaved woodland plantation
- Semi-improved grassland
- Scattered scrub
- Quarry
- Broadleaved woodland
- Dense scrub
- Improved grassland
- Poor semi-improved grassland
- Tall ruderal
- Standing water
- Spoil
- Refuse tip
- Arable
- Amenity grassland
- Building
- Hardstanding

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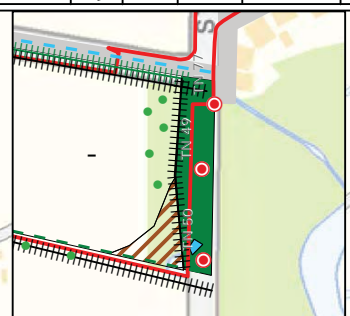
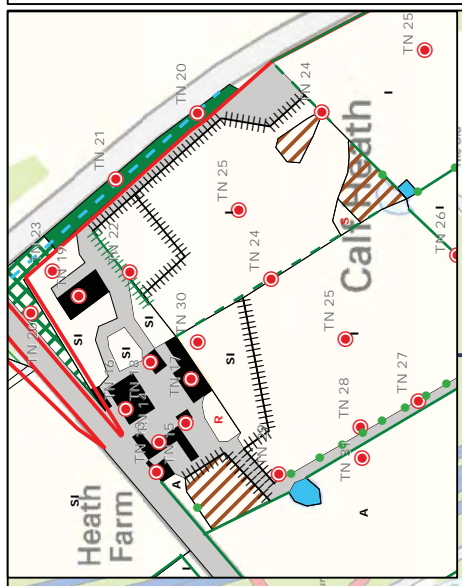
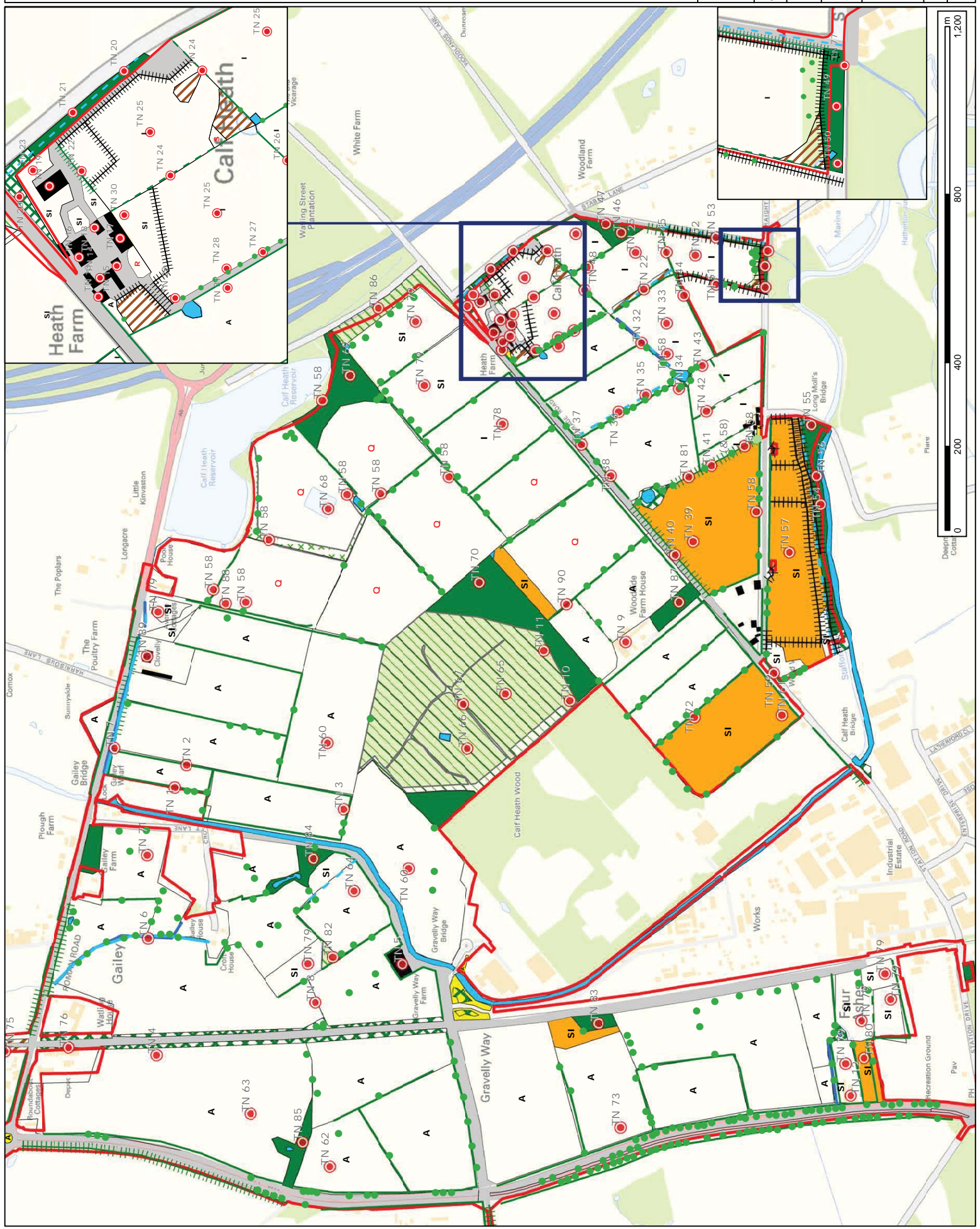
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**1620002055**

Figure Title  
**Figure 10.1.002 Phase 1 Habitat Map**





Date 06/03/2018

Scale 1:8,000 @A4



**Legend**

-  Site boundary
-  Invasive non-native weed location

Japanese knotweed

Japanese knotweed

Rhodedendron throughout woodland

Himalayan balsam

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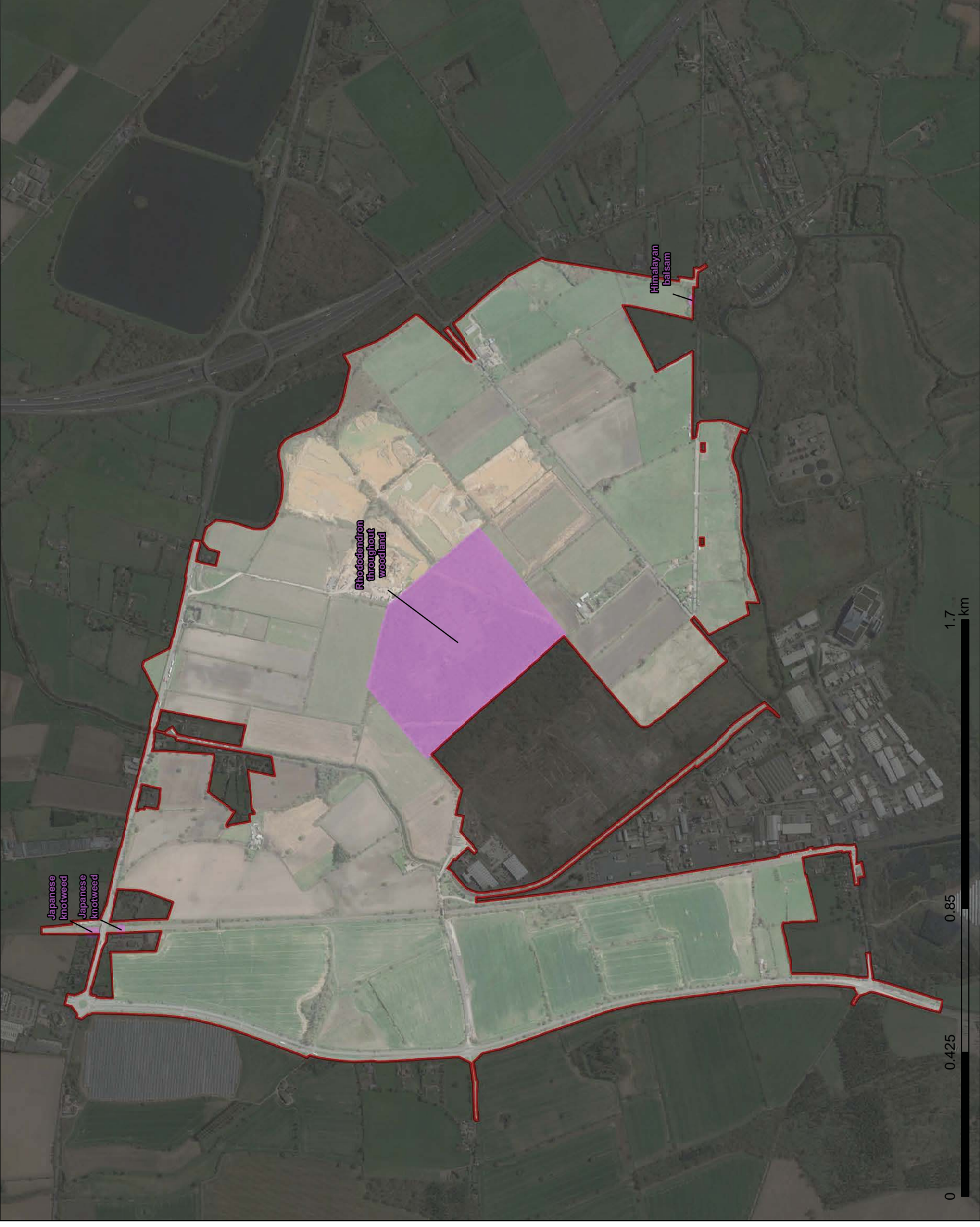
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**West Midlands Interchange (WMI)**  
Project Number  
**1620002055**

Figure Title  
**Figure 10.1.003 Invasive  
Non-native Weed Locations**



Date **06/03/2018**  
Scale **1:10,000 @A3**



- Legend**
- ▭ Site boundary
  - ▭ 500m buffer to Site boundary
  - ▭ On-site ponds 500m buffer
  - ▭ Off-site ponds 500m buffer

- Pond**
- EDNA positive and GCN confirmed via traditional methods
  - Far side of barrier to movement
  - ▲ EDNA negative
  - Pond dry
  - ▲ EDNA positive - no GCN found via traditional methods
  - ▲ EDNA positive
  - ◆ GCN likely absent via traditional methods
  - No access / not suitable

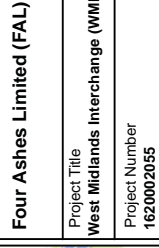
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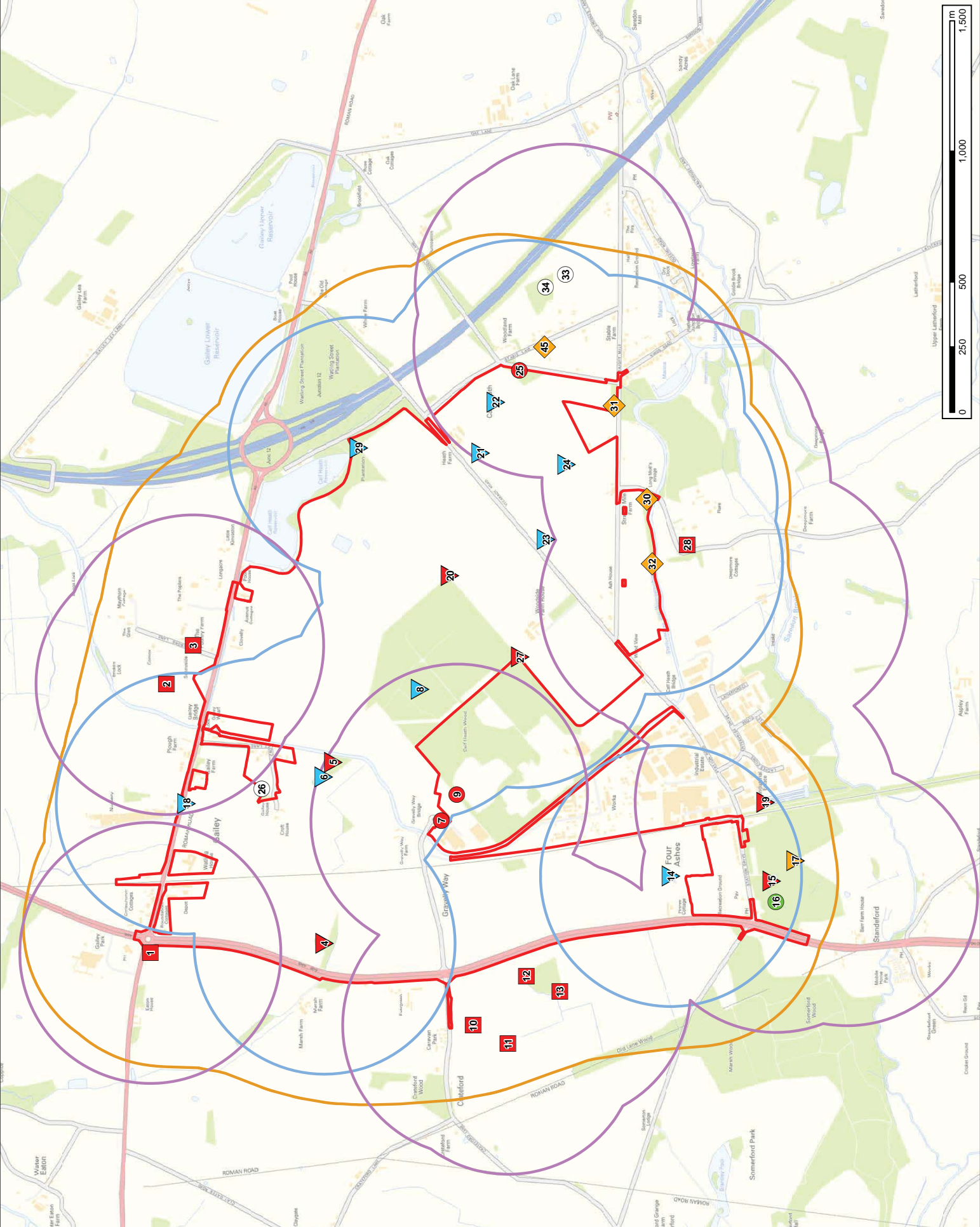
Project Number  
**1620002055**

Figure Title  
**Figure 10.1.004 Pond Map**



Date **06/03/2018**

Scale **1:13,000 @A3**



**Legend**

- Veteran trees

**Hedgerow Regulations Assessment**

- 'Important' hedgerow
- Borderline 'Important'

**HEGS Hedgerow Evaluation**

**Class**

- Moderately high / High value

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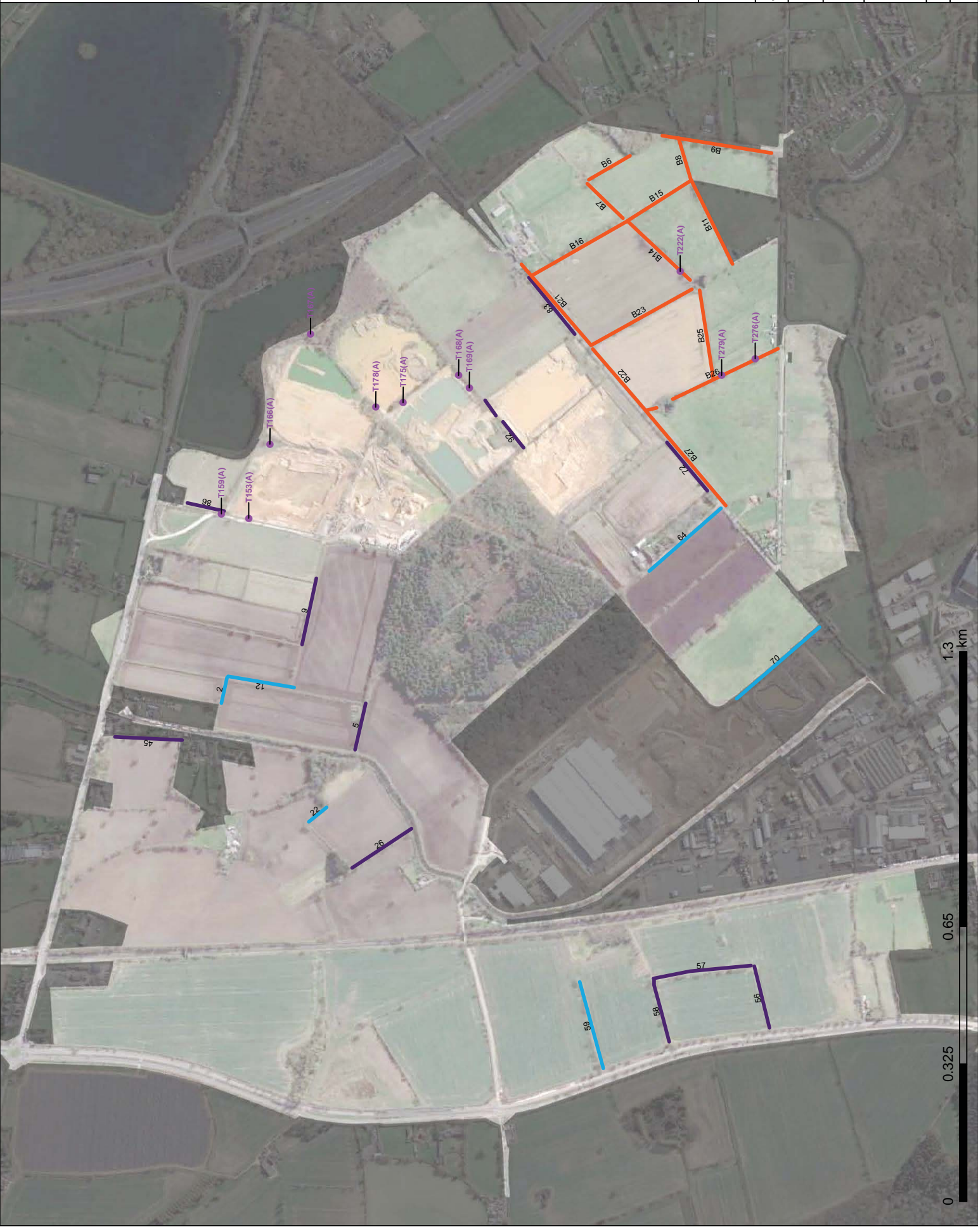
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Figure Title  
**Figure 10.1.005 Veteran Trees and Important Hedgerows**

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**FIGURE SERIES 100: AMPHIBIANS**

**10.1.101 Amphibian Species in Ponds**

- Legend**
- Site boundary
  - Pond surveyed (traditional methods)
- Species present**
- Common frog
  - ▲ Great crested newt
  - Smooth newt
  - Common toad

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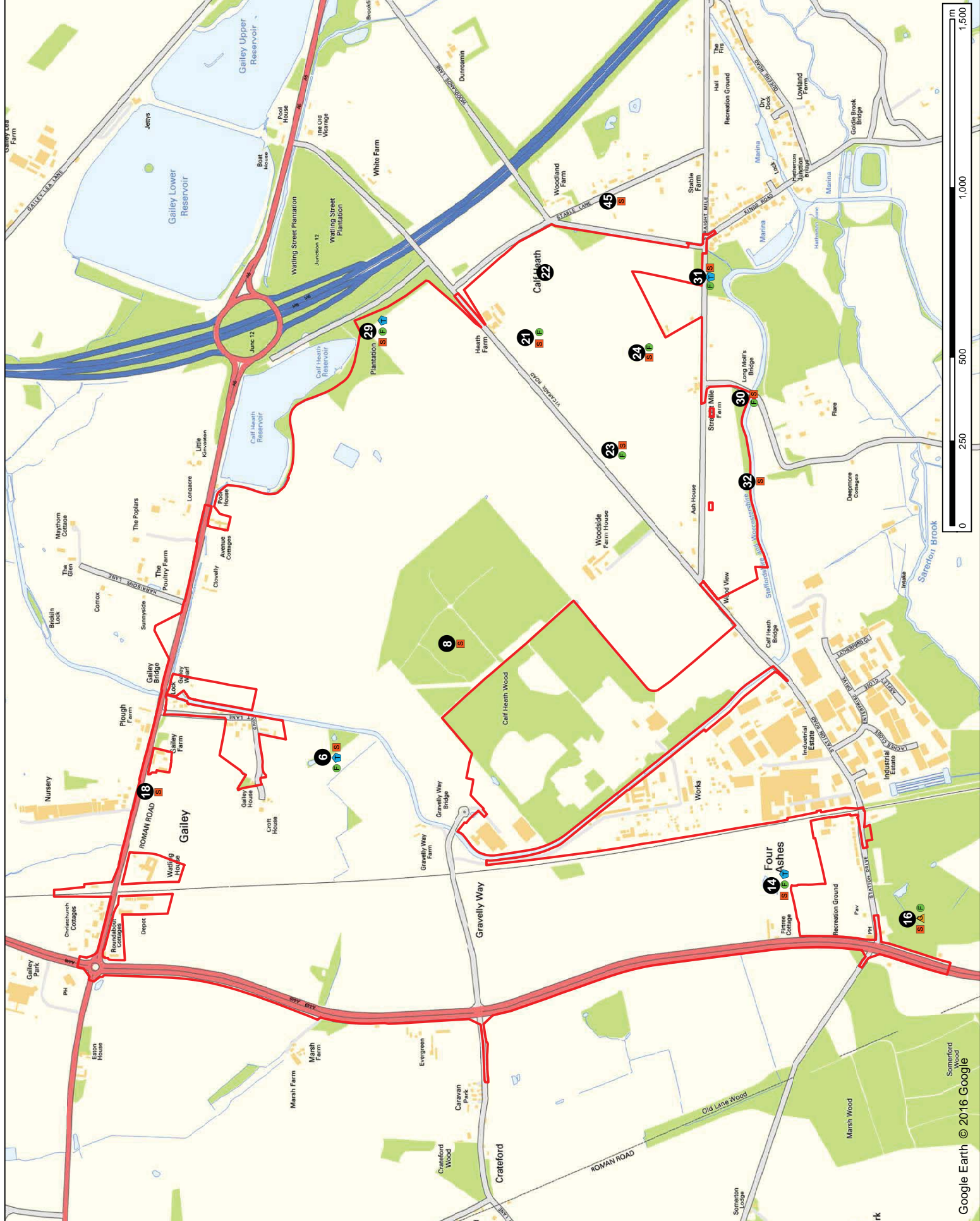
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Project Number  
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Figure Title  
**Figure 10.1.101 Amphibian species in ponds**

Date **06/03/2018**

Scale **1:10,000 @A3**



**FIGURE SERIES 200: REPTILES**

**10.1.201 Reptile Refugia**

**Legend**

- Site boundary
- Reptile refugia
- Reptile refugia continuation



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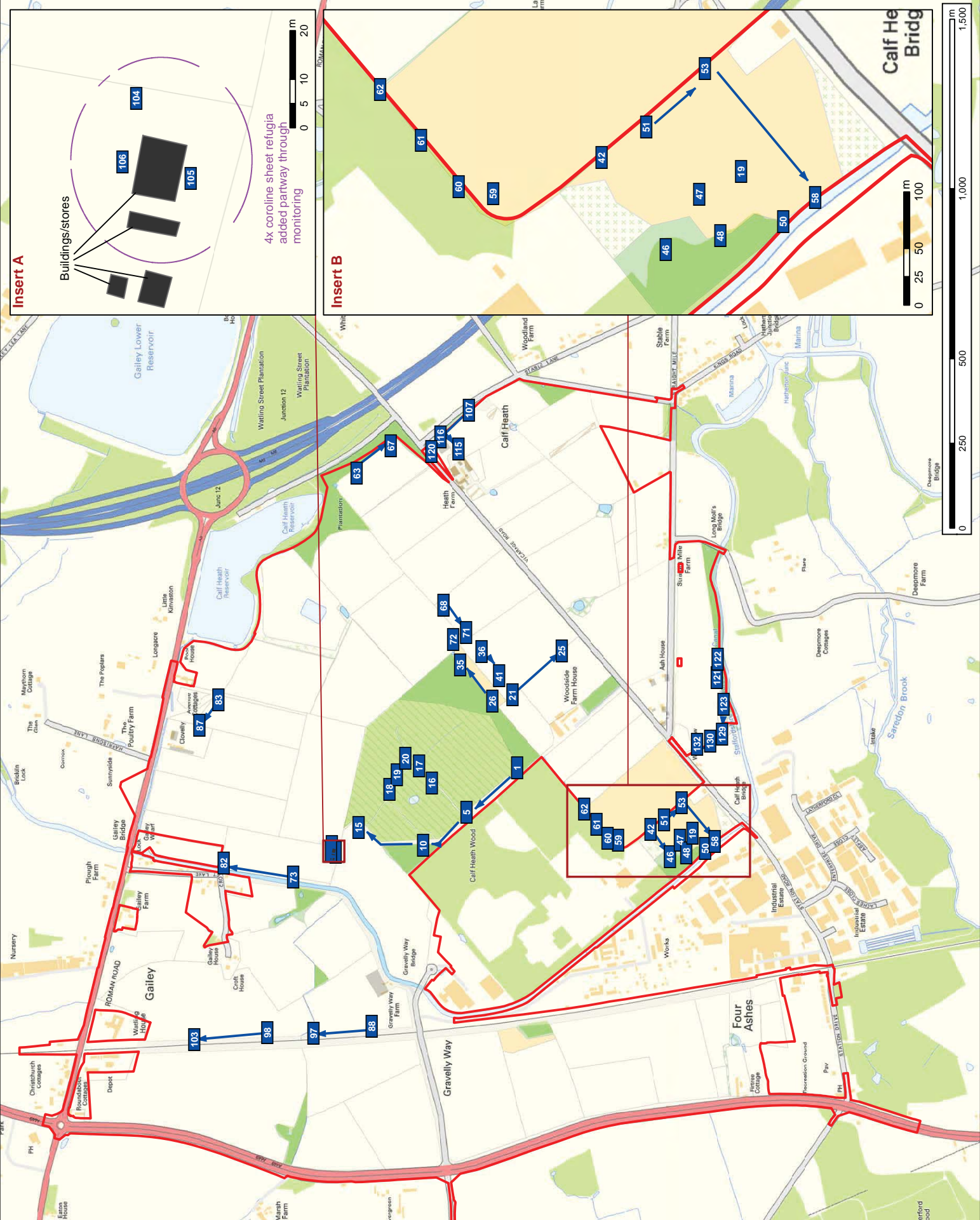
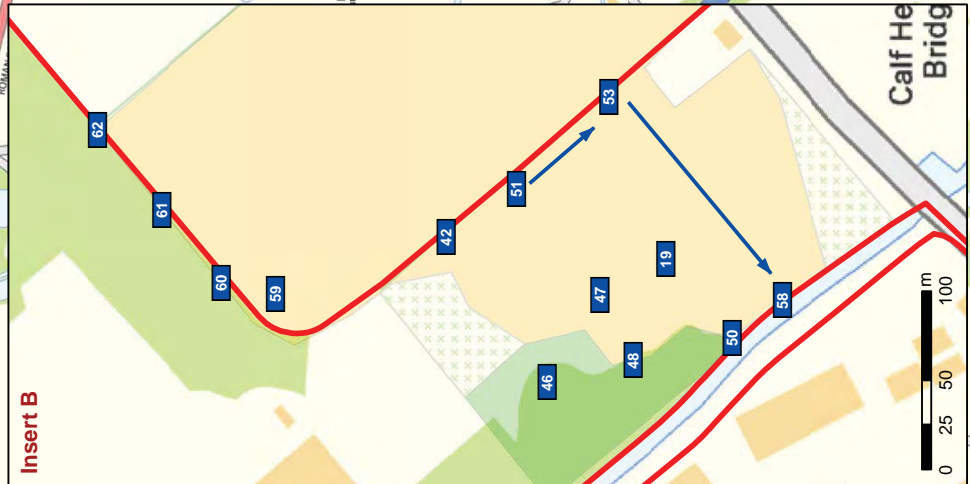
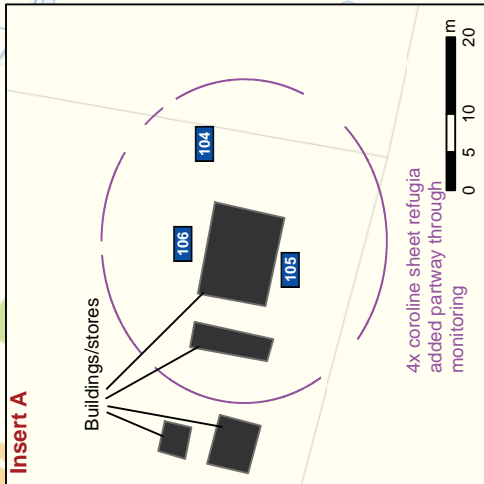
Project Number  
**1620002055**

Figure Title  
**Figure 10.1.201  
Reptile Refugia**



Date **06/03/2018**

Scale **1:10,000 @A3**



**FIGURE SERIES 400: BIRDS**

- 10.1.401 Breeding Birds: Swallow
- 10.1.402 Breeding Birds: Mallard
- 10.1.403 Breeding Birds: Lesser Black-Backed Gull
- 10.1.404 Breeding Birds: Stock Dove
- 10.1.405 Breeding Birds: Cuckoo, Tawny Owl, Little Owl and Barn Owl
- 10.1.406 Breeding Birds: Waterbirds
- 10.1.407 Breeding Birds: Skylark
- 10.1.408 Breeding Birds: Song Thrush and Mistle Thrush
- 10.1.409 Breeding Birds: House Sparrow
- 10.1.410 Breeding Birds: Yellow Wagtail
- 10.1.411 Breeding Birds: Lapwing
- 10.1.412 Breeding Birds: Yellowhammer
- 10.1.413 Breeding Birds: Starling
- 10.1.414 Breeding Birds: Bullfinch & Reed Bunting Various
- 10.1.415 Breeding Birds: Dunnock
- 10.1.416 Breeding Birds: Willow Warbler
- 10.1.417 Breeding Birds: Linnet
- 10.1.418 Breeding Birds: Calf Heath Reservoir - Kingfisher, Oystercatcher and Hobby
- 10.1.419 Breeding Birds: Calf Heath Reservoir - Mallard
- 10.1.420 Breeding Birds: Calf Heath Reservoir – Gulls and Terns
- 10.1.421 Breeding Birds: Calf Heath Reservoir – Other Waterbirds – Evidence of Nesting Birds in Suitable Habitat
- 10.1.422 Wintering Bird Distribution - Blackheaded gull
- 10.1.423 Wintering Bird Distribution - Bullfinch
- 10.1.424 Wintering Bird Distribution - Common gull
- 10.1.425 Wintering Bird Distribution - Dunnock
- 10.1.426 Wintering Bird Distribution - Fieldfare
- 10.1.427 Wintering Bird Distribution - Greylag
- 10.1.428 Wintering Bird Distribution - House sparrow
- 10.1.429 Wintering Bird Distribution - Lapwing
- 10.1.430 Wintering Bird Distribution - Lesser black-backed gull
- 10.1.431 Wintering Bird Distribution - Linnet
- 10.1.432 Wintering Bird Distribution - Mallard
- 10.1.433 Wintering Bird Distribution - Mistle thrush
- 10.1.434 Wintering Bird Distribution - Oystercatcher
- 10.1.435 Wintering Bird Distribution - Redwing
- 10.1.436 Wintering Bird Distribution - Reed bunting
- 10.1.437 Wintering Bird Distribution - Skylark
- 10.1.438 Wintering Bird Distribution - Song thrush
- 10.1.439 Wintering Bird Distribution - Starling
- 10.1.440 Wintering Bird Distribution: Calf Heath Reservoir - Blackheaded gull
- 10.1.441 Wintering Bird Distribution: Calf Heath Reservoir - Common gull
- 10.1.442 Wintering Bird Distribution: Calf Heath Reservoir - Fieldfare
- 10.1.443 Wintering Bird Distribution: Calf Heath Reservoir - Greylag
- 10.1.444 Wintering Bird Distribution: Calf Heath Reservoir - House sparrow
- 10.1.445 Wintering Bird Distribution: Calf Heath Reservoir - Kingfisher
- 10.1.446 Wintering Bird Distribution: Calf Heath Reservoir - Lesser black-backed gull
- 10.1.447 Wintering Bird Distribution: Calf Heath Reservoir - Linnet
- 10.1.448 Wintering Bird Distribution: Calf Heath Reservoir - Mallard
- 10.1.449 Wintering Bird Distribution: Calf Heath Reservoir - Mistle thrush
- 10.1.450 Wintering Bird Distribution: Calf Heath Reservoir - Oystercatcher

- 10.1.451 Wintering Bird Distribution: Calf Heath Reservoir - Song thrush
- 10.1.452 Wintering Bird Distribution: Calf Heath Reservoir - Starling
- 10.1.453 Wintering Bird Distribution: Gailey Reservoir - Black-headed gull
- 10.1.454 Wintering Bird Distribution: Gailey Reservoir - Common gull
- 10.1.455 Wintering Bird Distribution: Gailey Reservoir - Fieldfare
- 10.1.456 Wintering Bird Distribution: Gailey Reservoir - Greylag
- 10.1.457 Wintering Bird Distribution: Gailey Reservoir - Kestrel
- 10.1.458 Wintering Bird Distribution: Gailey Reservoir - Lapwing
- 10.1.459 Wintering Bird Distribution: Gailey Reservoir - Lesser black-backed gull
- 10.1.460 Wintering Bird Distribution: Gailey Reservoir - Linnet
- 10.1.461 Wintering Bird Distribution: Gailey Reservoir - Mallard
- 10.1.462 Wintering Bird Distribution: Gailey Reservoir - Mediterranean gull
- 10.1.463 Wintering Bird Distribution: Gailey Reservoir - Mistle thrush
- 10.1.464 Wintering Bird Distribution: Gailey Reservoir - Mute swan
- 10.1.465 Wintering Bird Distribution: Gailey Reservoir - Oystercatcher
- 10.1.466 Wintering Bird Distribution: Gailey Reservoir - Pink-footed goose
- 10.1.467 Wintering Bird Distribution: Gailey Reservoir - Reed bunting
- 10.1.468 Wintering Bird Distribution: Gailey Reservoir - Skylark
- 10.1.469 Wintering Bird Distribution: Gailey Reservoir - Starling
- 10.1.470 Wintering Bird Distribution: Gailey Reservoir - Whooper swan

**Legend**

- Site boundary
- Bird registrations**
- SL Visit 1
- SL Visit 2
- SL Visit 3
- SL Visit 4
- SL Visit 5
- SL Visit 6
- SL Calling
- SL Singing
- ♂ Male
- ♀ Female
- ♂♀ Pair
- Same bird
- - - Concurrent registration
- SL Flying
- SL Taking off and flying
- SL Flying in

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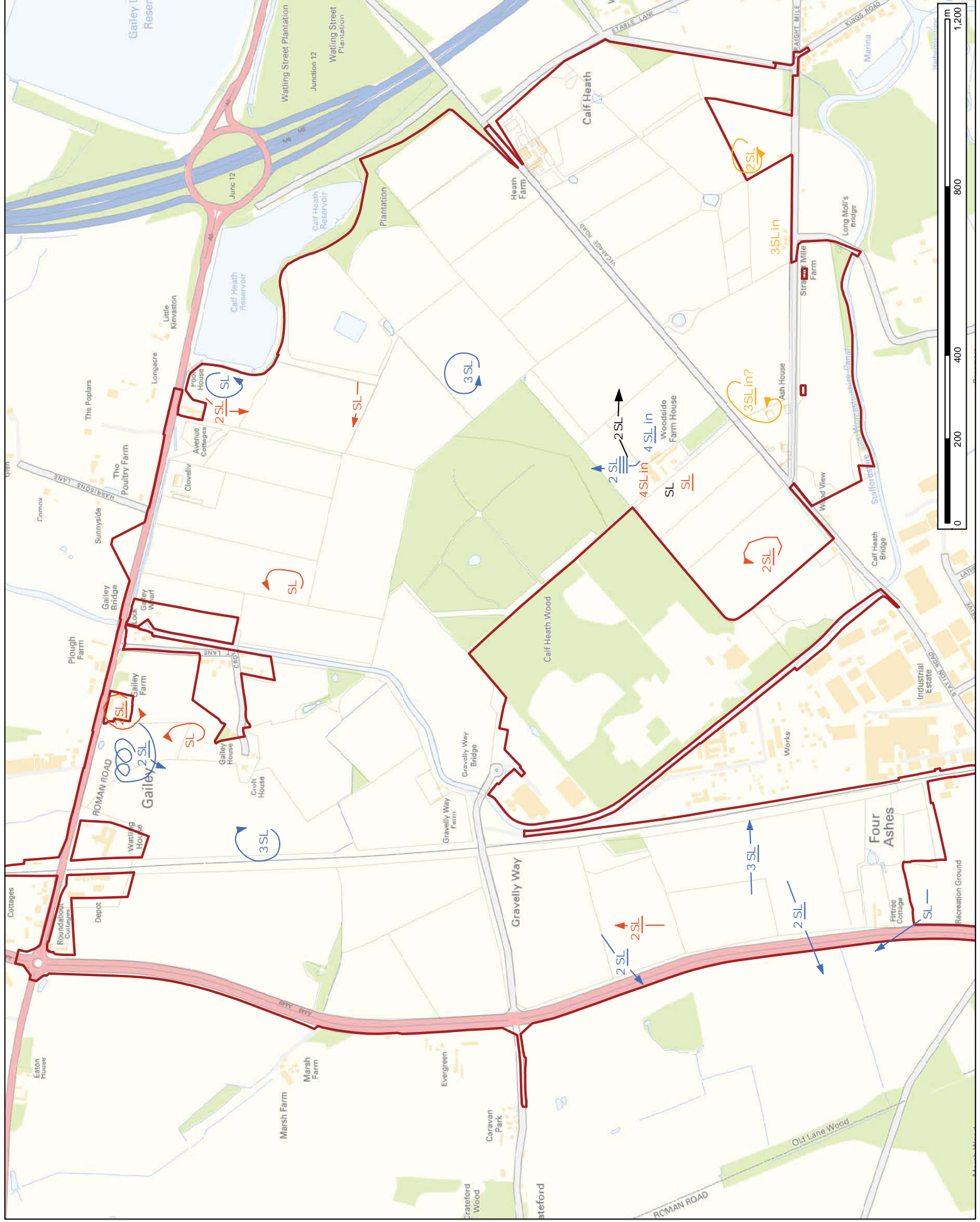
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Project Title  
**West Midlands Interchange (WMI)**  
 Project Number  
**1620002055**

Figure Title  
**Figure 10.1.401 Breeding birds: Swallow**



Date 06/03/2018  
 Scale 1:8,000 @A4



# Legend

Site boundary

## Bird registrations

MA Visit 1

MA Visit 2

MA Visit 3

MA Visit 4

MA Visit 5

MA Visit 6

MA Calling

MA Singing

MA ♂ Male

MA ♀ Female

MA ♀♀ Pair

MA — Same bird

MA - - - Concurrent registration

MA → Flying

MA → Taking off and flying

MA → MA Flying in

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Figure Title  
**Figure 10.1.402 Breeding Birds:**

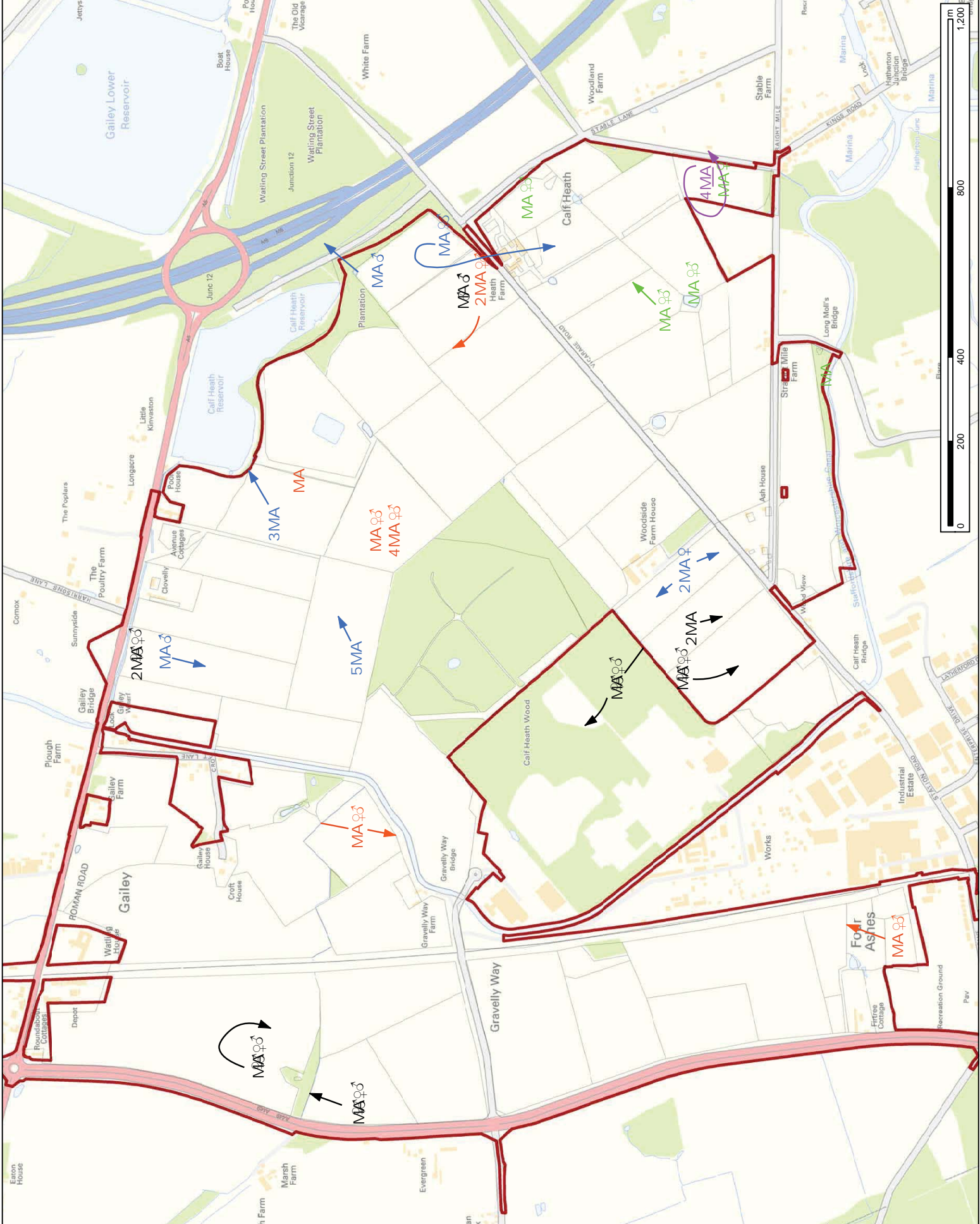
**Mallard**



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Date 06/03/2018

Scale 1:8,000 @A3





# Legend

-  Site boundary
- Bird registrations**
- LB Visit 1
- LB Visit 2
- LB Visit 3
- LB Visit 4
- LB Visit 5
- LB Visit 6
- LB Calling
- LB Singing
- LB ♂ Male
- LB ♀ Female
- LB ♂♀ Pair
- Same bird
- - - Concurrent registration
- L → Flying
- L → Taking off and flying
- L Flying in

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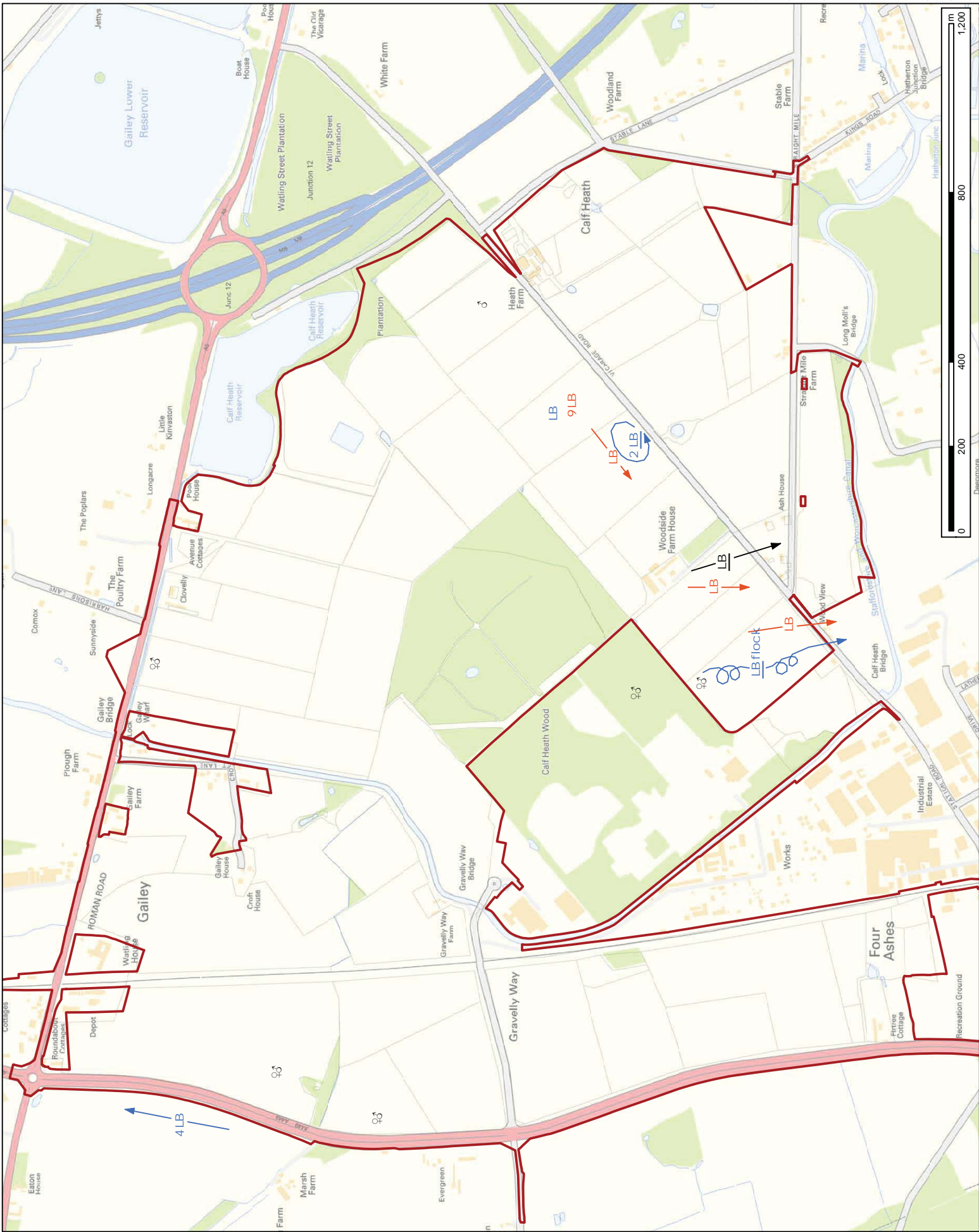
Project Title  
**West Midlands Interchange (WMI)**

Project Number  
**1620002055**

Figure Title  
**Figure 10.1.403 Breeding Birds: Lesser Black-Backed Gull**



Date 06/03/2018  
 Scale 1:8,000 @A4



**Legend**

- Site boundary
- Bird registrations**
- SD Visit 1
- SD Visit 2
- SD Visit 3
- SD Visit 5
- SD Visit 6
- SD Visit 4
- SD Calling
- SD Singing
- ♂ Male
- ♀ Female
- ♂♀ Pair
- Same bird
- Concurrent registration
- SD Flying
- SD Taking off and flying
- SD Flying in

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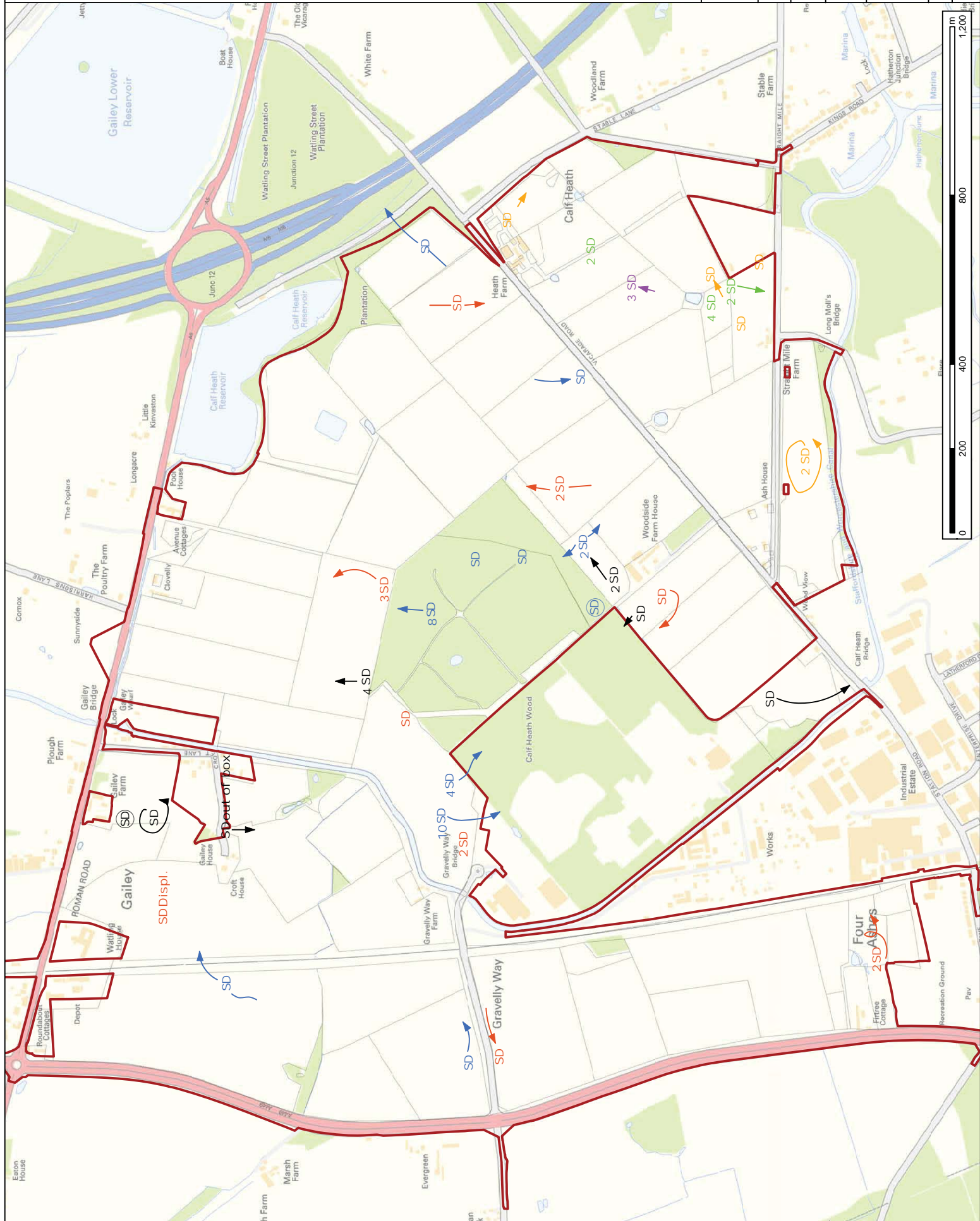
Project Title  
**West Midlands Interchange (WMI)**

Project Number  
**1620002055**

Figure Title  
**Figure 10.1.404 Breeding birds:  
 Stock Dove**



Date 06/03/2018  
 Scale 1:8,000 @A3



**Legend**

- Site boundary
- Bird registrations**
- CK Visit 1
- CK Visit 2
- CK Visit 3
- BO 05/07/2017 Dawn
- BO 06/07/2017 Dusk
- LO 24/07/2017 Dusk
- CK Calling
- CK Singing
- CK Cuckoo
- TO Tawny owl
- BO Barn Owl
- LO Little Owl
- ♂ Male
- ♀ Female
- ♂♀ Pair
- Same bird
- - - Concurrent registration
- TO→ Flying
- TO→ Taking off and flying
- TO Flying in

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Project Title  
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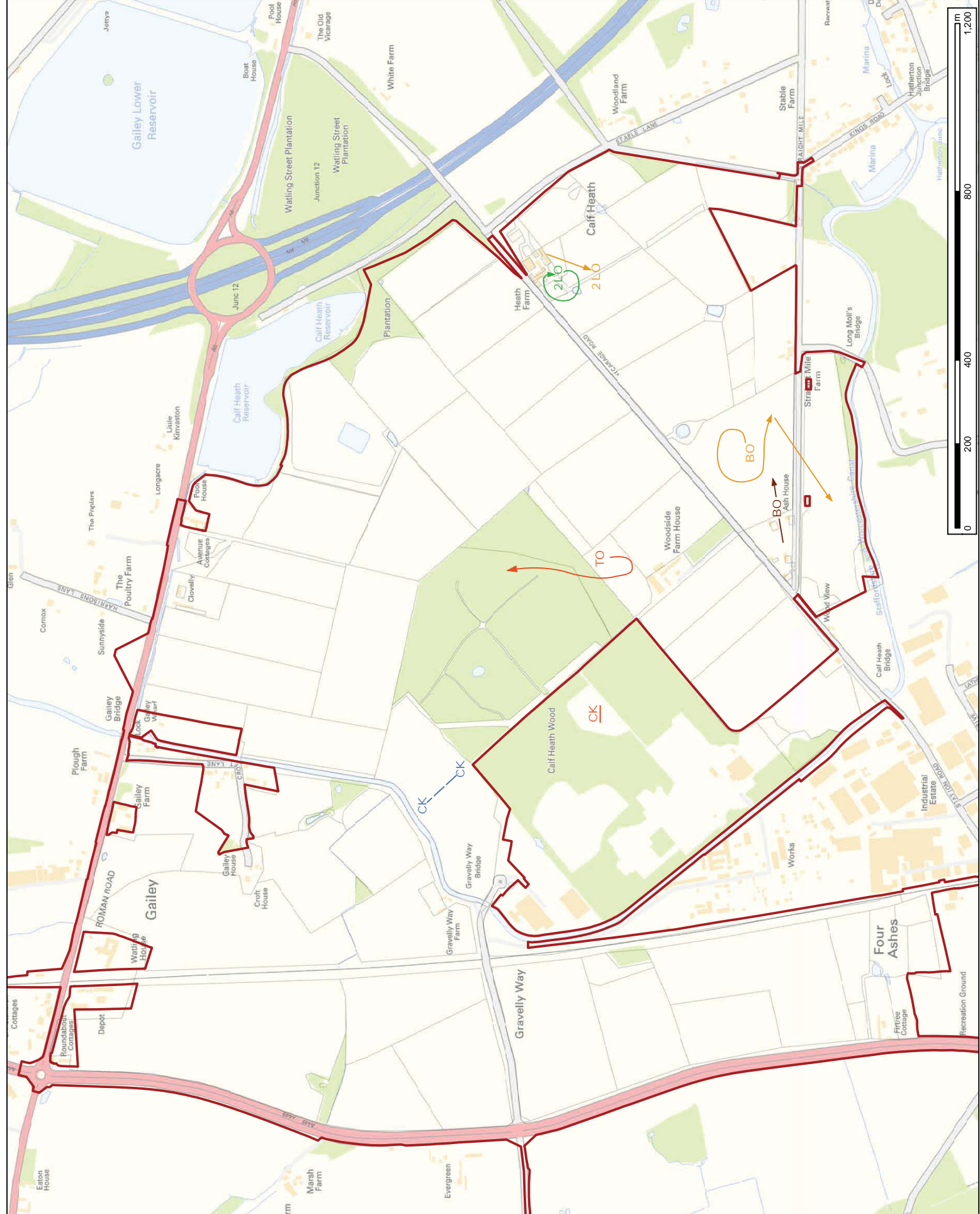
Figure Title  
**Figure 10.1.405 Breeding birds:  
 Curlew and Tawny Owls**



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Date 06/03/2018

Scale 1:8,000 @A3



**Legend**

Site boundary

**Bird registrations**

- CA Visit 1
- CA Visit 2
- CA Visit 3
- CA Visit 4
- CA Visit 5
- CA Visit 6
- CA Calling
- CA Singing
- CA Cormorant
- CG Canada goose
- OC Coot
- H Heron
- MH Moorhen
- CO Oystercatcher
- ♂ Male
- ♀ Female
- ♂♀ Pair
- Same bird
- - - Concurrent registration
- CA→ Flying
- CA→ Taking off and flying
- CA Flying in

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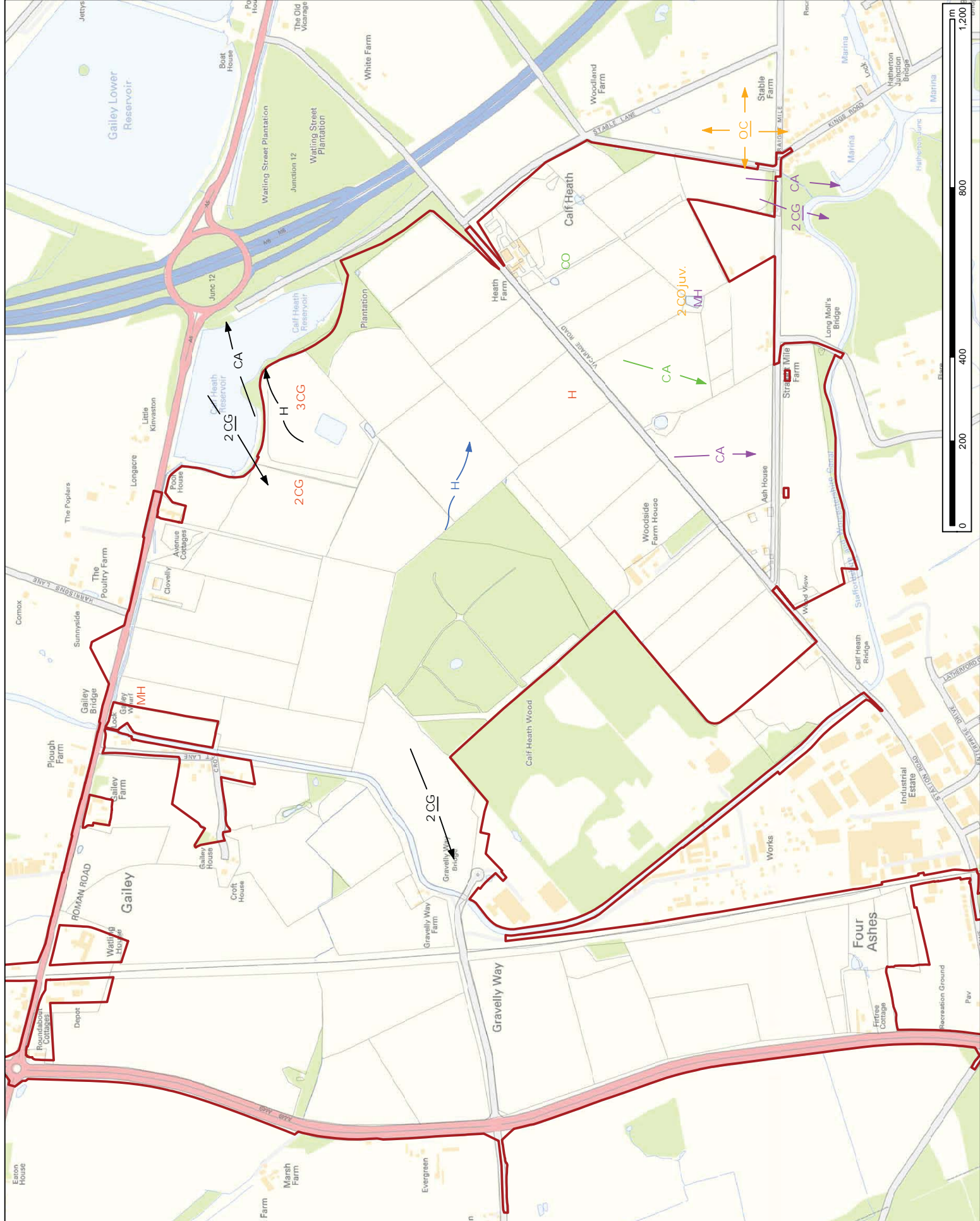
Project Title  
**West Midlands Interchange (WMI)**  
 Project Number  
**1620002055**

Figure Title  
**Figure 10.1.406 Breeding birds:  
 Waterbirds (excl. mallard)**



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Date 06/03/2018  
 Scale 1:8,000 @A3



**Legend**

Site boundary

**Bird registrations**

- S Visit 1
- S Visit 2
- S Visit 3
- S Visit 4
- S Visit 5
- S Visit 6
- Calling
- Singing
- ♂ Male
- ♀ Female
- ♂♀ Pair
- Same bird
- Concurrent registration
- S→ Flying
- S→ Taking off and flying
- S Flying in

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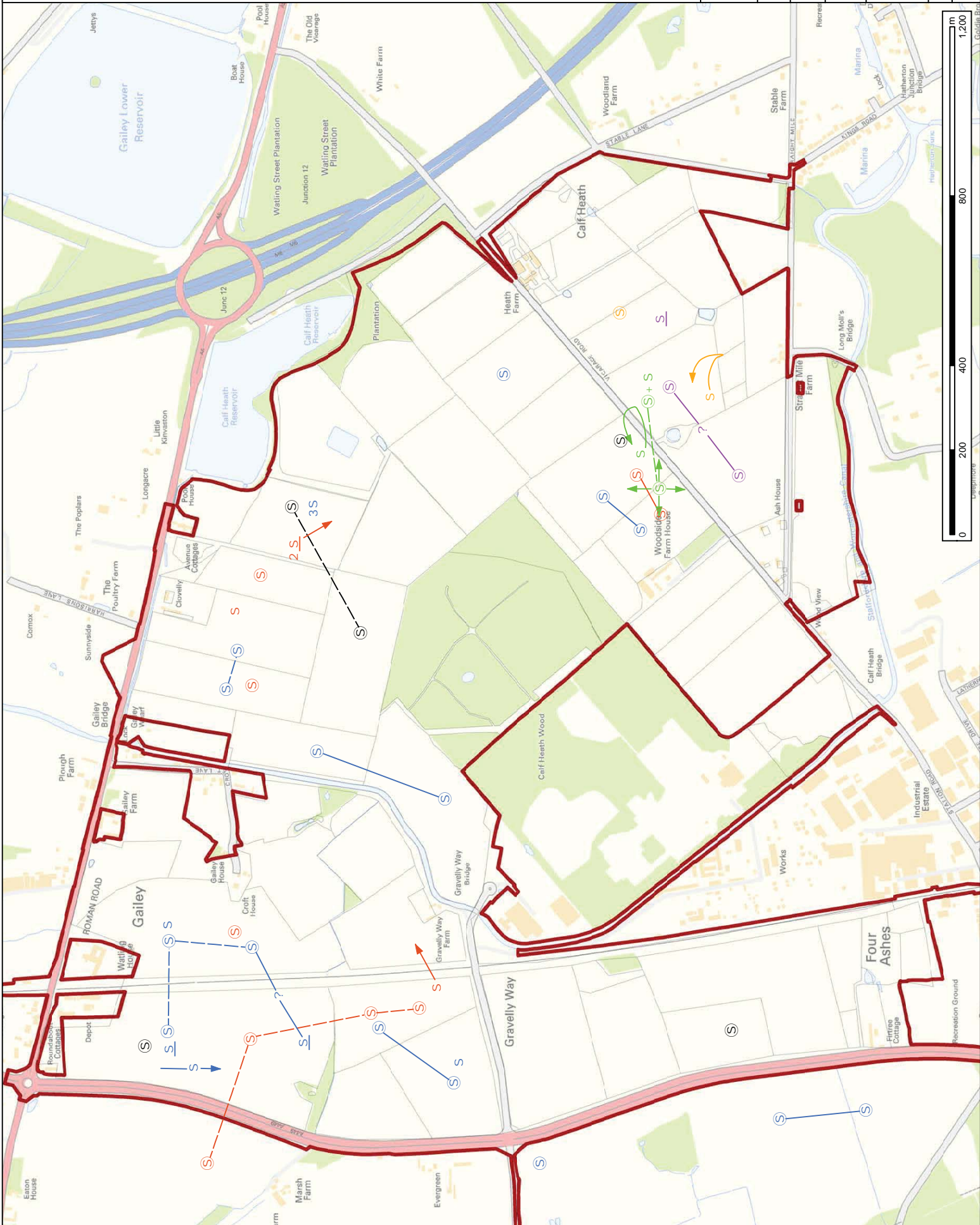
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Project Title  
**West Midlands Interchange (WMI)**  
 Project Number  
**1620002055**

Figure Title  
**Figure 10.1.407 Breeding Birds:  
 Skylark**



Date 06/03/2018  
 Scale 1:8,000 @A3



**Legend**

- Site boundary
- Bird registrations**
- ST Visit 1
- ST Visit 2
- ST Visit 3
- ST Visit 4
- ST Visit 5
- ST Visit 6
- M Mistle thrush
- ST Song thrush
- SI Calling
- (ST) Singing
- ♂ Male
- ♀ Female
- ♂♀ Pair

- Same bird
- - - Concurrent registration
- ST→ Flying
- ST→ Taking off and flying
- ST Flying in

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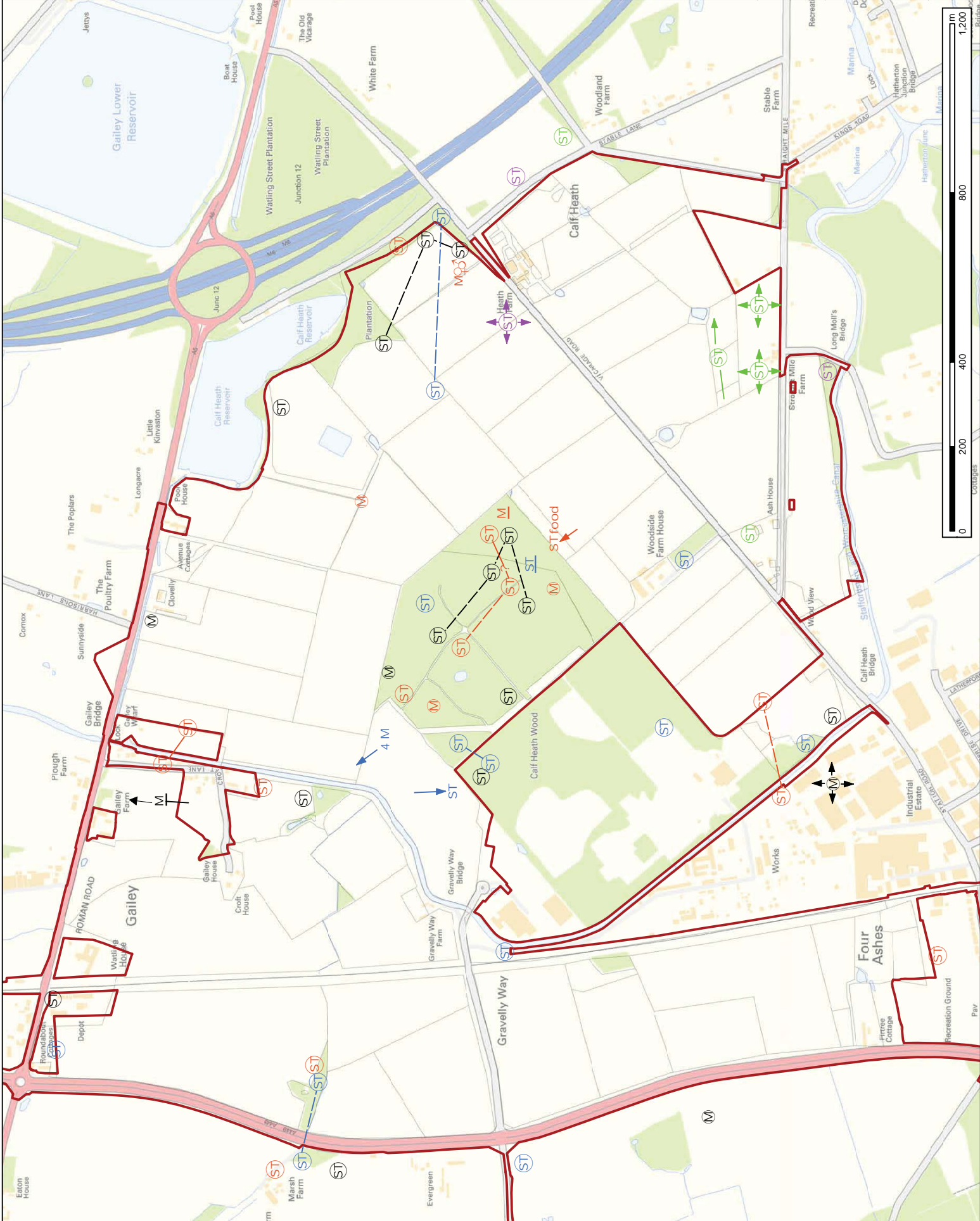
Client  
**Four Ashes Limited (FAL)**

Project Title  
**West Midlands Interchange (WMI)**  
 Project Number  
**1620002055**

Figure Title  
**Figure 10.1.408 Breeding birds:  
 Song and Mistle Thrush**



Date 06/03/2018  
 Scale 1:8,000 @A3



**Legend**

Site boundary

**Bird registrations**

- HS Visit 1
- HS Visit 2
- HS Visit 3
- HS Visit 4
- HS Visit 5
- HS Visit 6
- HS Calling
- HS Singing
- ♂ Male
- ♀ Female
- ♂♀ Pair

Same bird

Concurrent registration

HS Flying

HS Taking off and flying

HS Flying in

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Figure Title

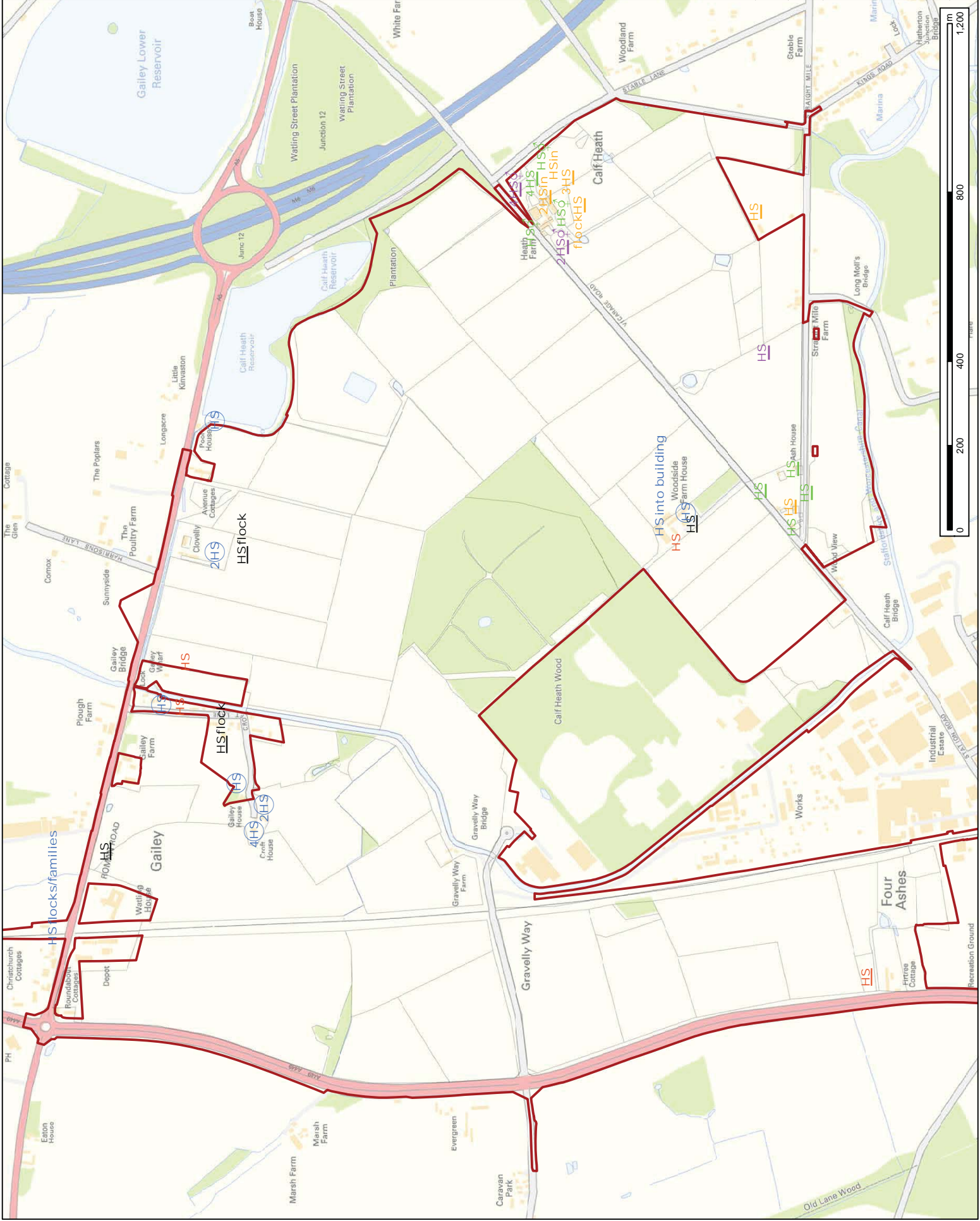
**Figure 10.1.409 Breeding birds:**

**House sparrow**



Date 06/03/2018

Scale 1:8,000 @A3



**Legend**

- Site boundary
- Bird registrations**
- YW Visit 1
- YW Visit 2
- YW Visit 3
- YW Visit 4
- YW Visit 5
- YW Visit 6
- YW Calling
- ♂ Male
- ♀ Female
- ♂♀ Pair
- Same bird
- Concurrent registration
- YW Flying
- YW Taking off and flying
- YW Flying in

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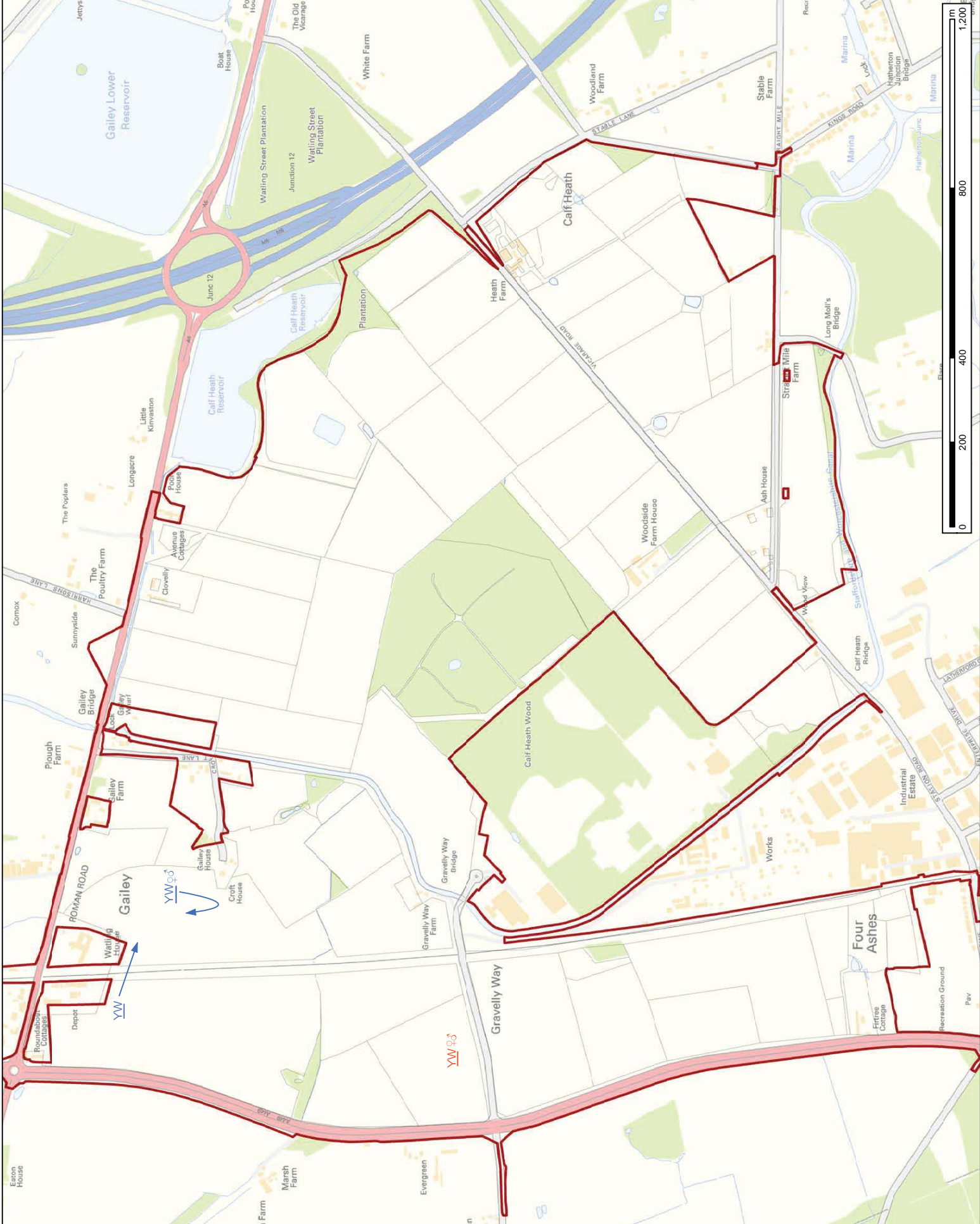
Client  
**Four Ashes Limited (FAL)**

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**West Midlands Interchange (WMI)**  
 Project Number  
**1620002055**

Figure Title  
**Figure 10.1.410 Breeding Birds:  
 Yellow wagtail**



Date 06/03/2018  
 Scale 1:8,000 @A3





**Legend**

- Site boundary
- Bird registrations**
- L Visit 1
- L Visit 2
- L Visit 3
- L Visit 4
- L Visit 5
- L Visit 6
- ⊥ Calling
- ⊔ Singing
- ♂ Male
- ♀ Female
- ♂♀ Pair
- Same bird
- - - Concurrent registration
- ⊔ Flying
- ⊔ Taking off and flying
- ⊔ Flying in

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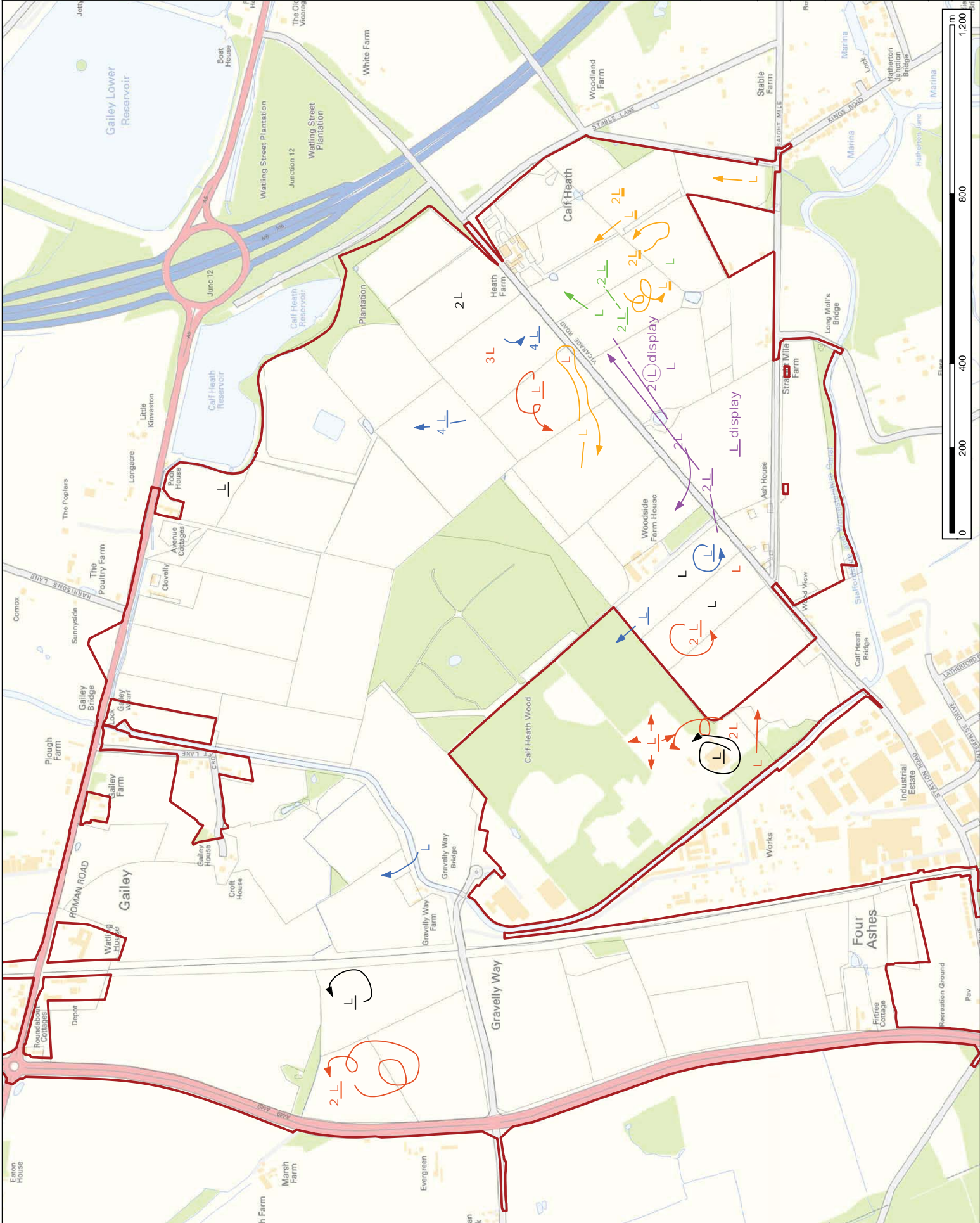
Figure Title  
**Figure 10.1.411 Breeding birds:  
 Lapwing**



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Scale 1:8,000 @A3



**Legend**

**Bird registrations**

- Y Visit 1
- Y Visit 2
- Y Visit 3
- Y Visit 4
- Y Visit 5
- Y Visit 6
- Y Calling
- Y Singing
- ♂ Male
- ♀ Female
- ♂♀ Pair
- Red outline Site boundary
- Same bird
- - - Concurrent registration
- Y → Flying
- Y → Taking off and flying
- Y Flying in

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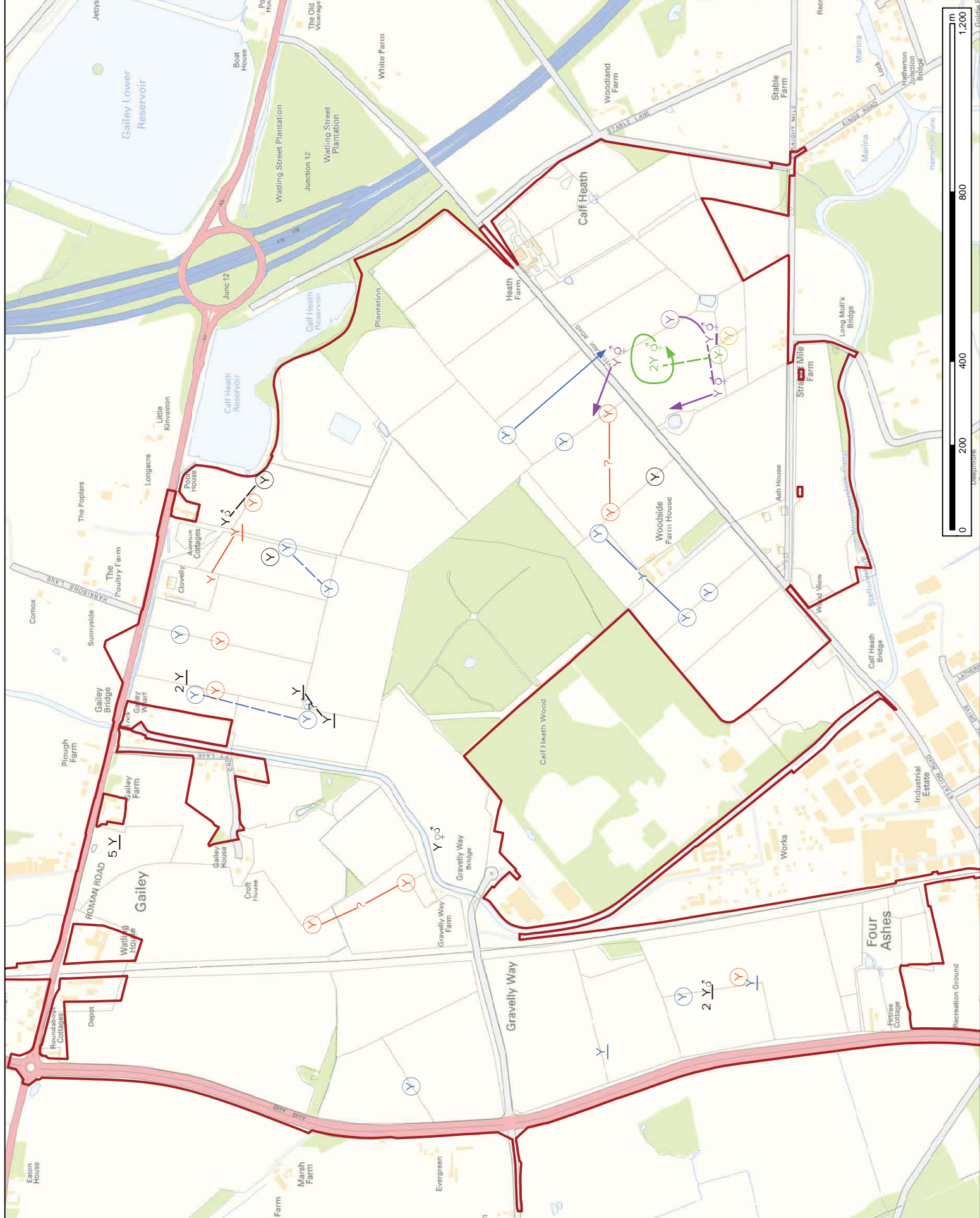
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 Project Number  
**1620002055**

Figure Title  
**Figure 10.1.412 Breeding birds:  
 Yellowhammer**



Date 06/03/2018  
 Scale 1:8,000 @A3



**Legend**

Site boundary

**Bird registrations**

- SG Visit 1
- SG Visit 2
- SG Visit 3
- SG Visit 4
- SG Visit 5
- SG Visit 6
- SG Calling
- SG Singing
- ♂ Male
- ♀ Female
- ♂♀ Pair
- Same bird
- - - Concurrent registration
- SG→ Flying
- SG→ Taking off and flying
- SG Flying in

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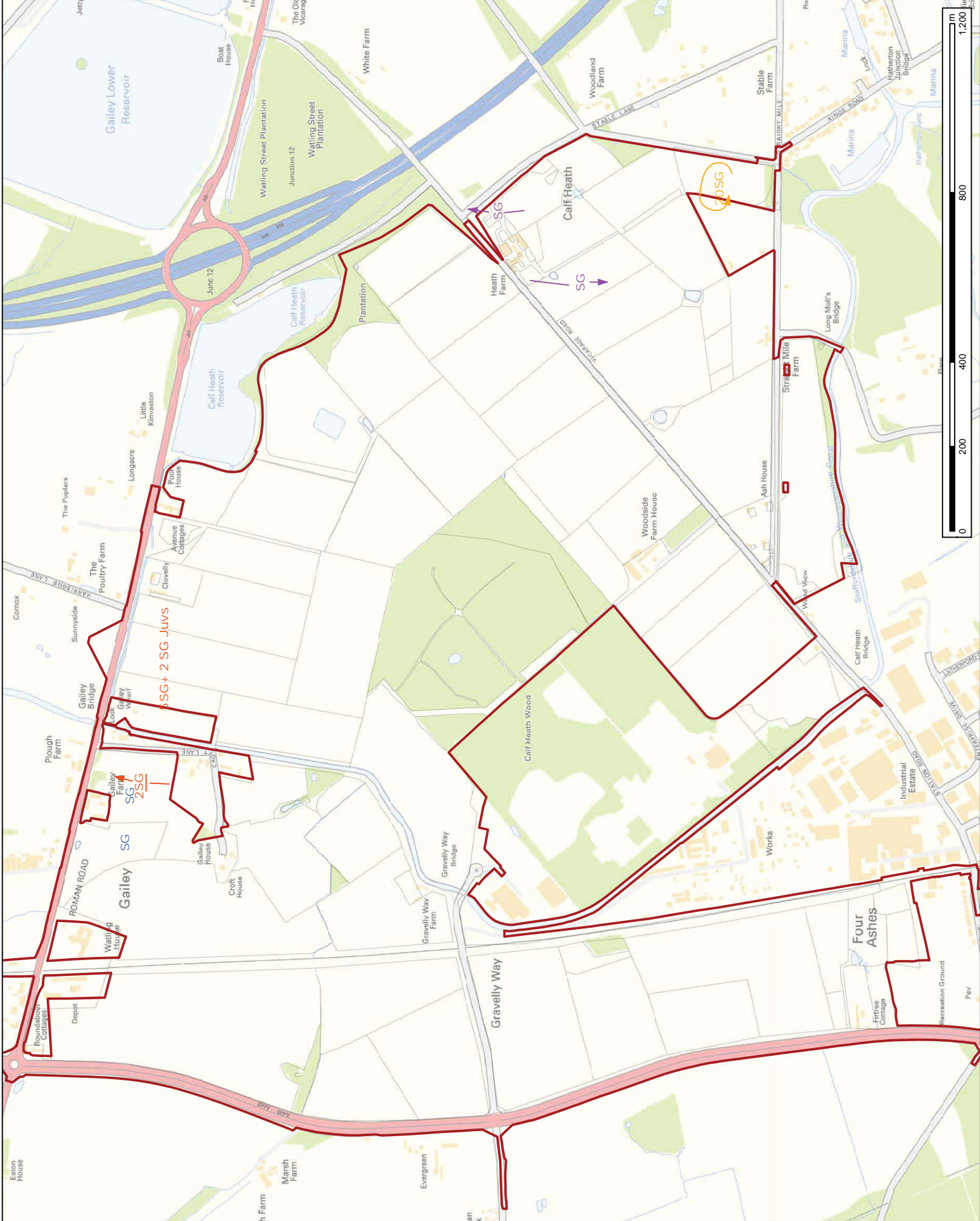
Figure Title  
**Figure 10.1.413 Breeding birds:  
 Starling**



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Scale **1:8,000 @A3**



**Legend**

- Site boundary
- Bird registrations**
- RB Visit 1
- RB Visit 2
- RB Visit 3
- RB Visit 4
- RB Visit 5
- RB Visit 6
- RB Calling
- RB Singing
- ♂ Male
- ♀ Female
- ♂♀ Pair
- BF Bullfinch
- K Kestrel
- RB Reed bunting
- SI Swift
- SN Snipe
- Same bird
- Concurrent registration
- RB→ Flying
- RB→ Taking off and flying
- RB Flying in
- ↔ Estimated location

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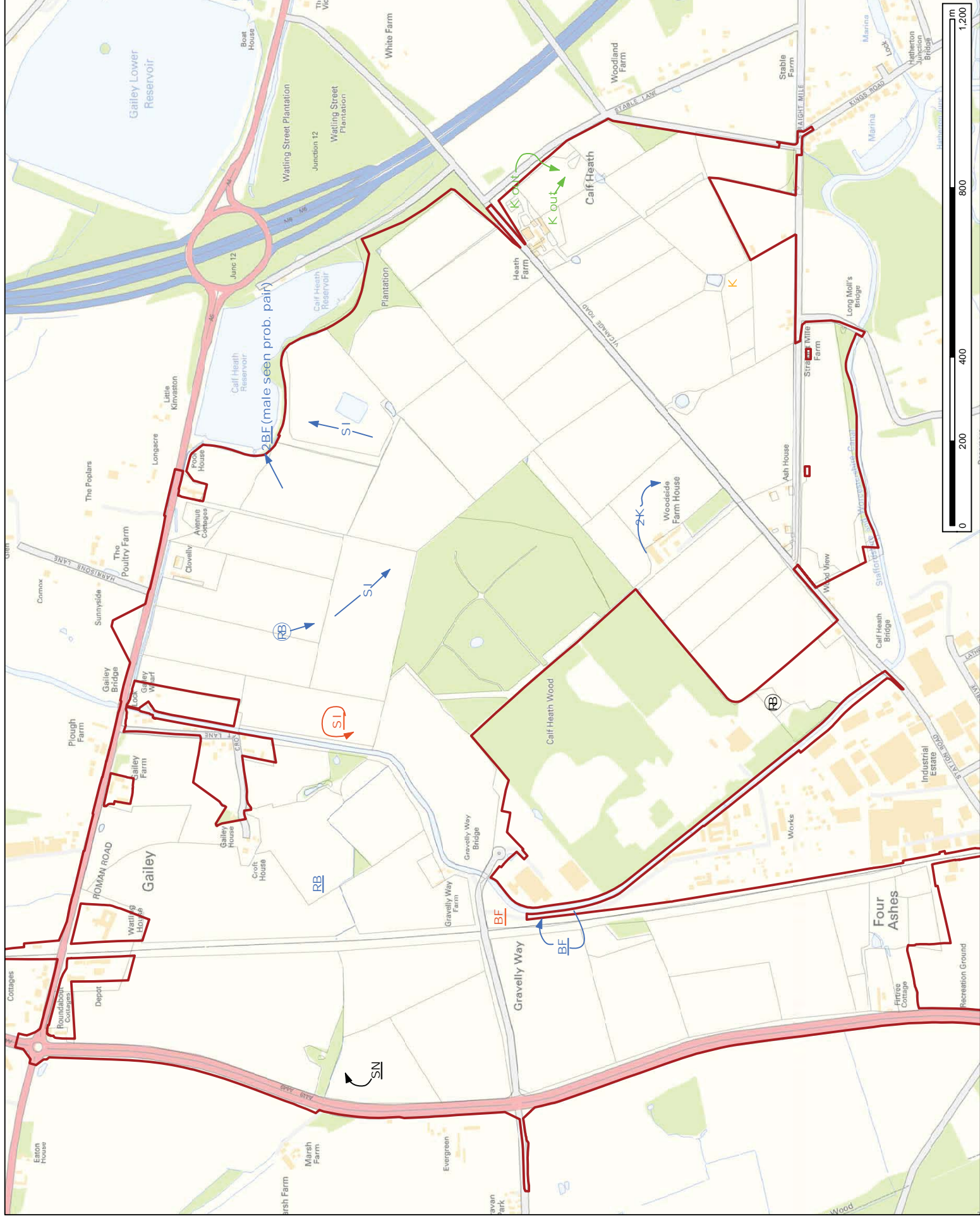
Project Number  
**1620002055**

Figure Title  
**Figure 10.1414 Breeding birds: Birds of Conservation Conservation Concern - Various**



Date **06/03/2018**

Scale **1:8,000 @A3**



**Legend**

- Site boundary
- Bird registrations**
- D Visit 1
- D Visit 2
- D Visit 3
- D Visit 4
- D Visit 5
- D Visit6
- Calling
- Singing
- ♂ Male
- ♀ Female
- ♂♀ Pair
- Same bird
- Concurrent registration
- D Flying
- D Taking off and flying
- D Flying in

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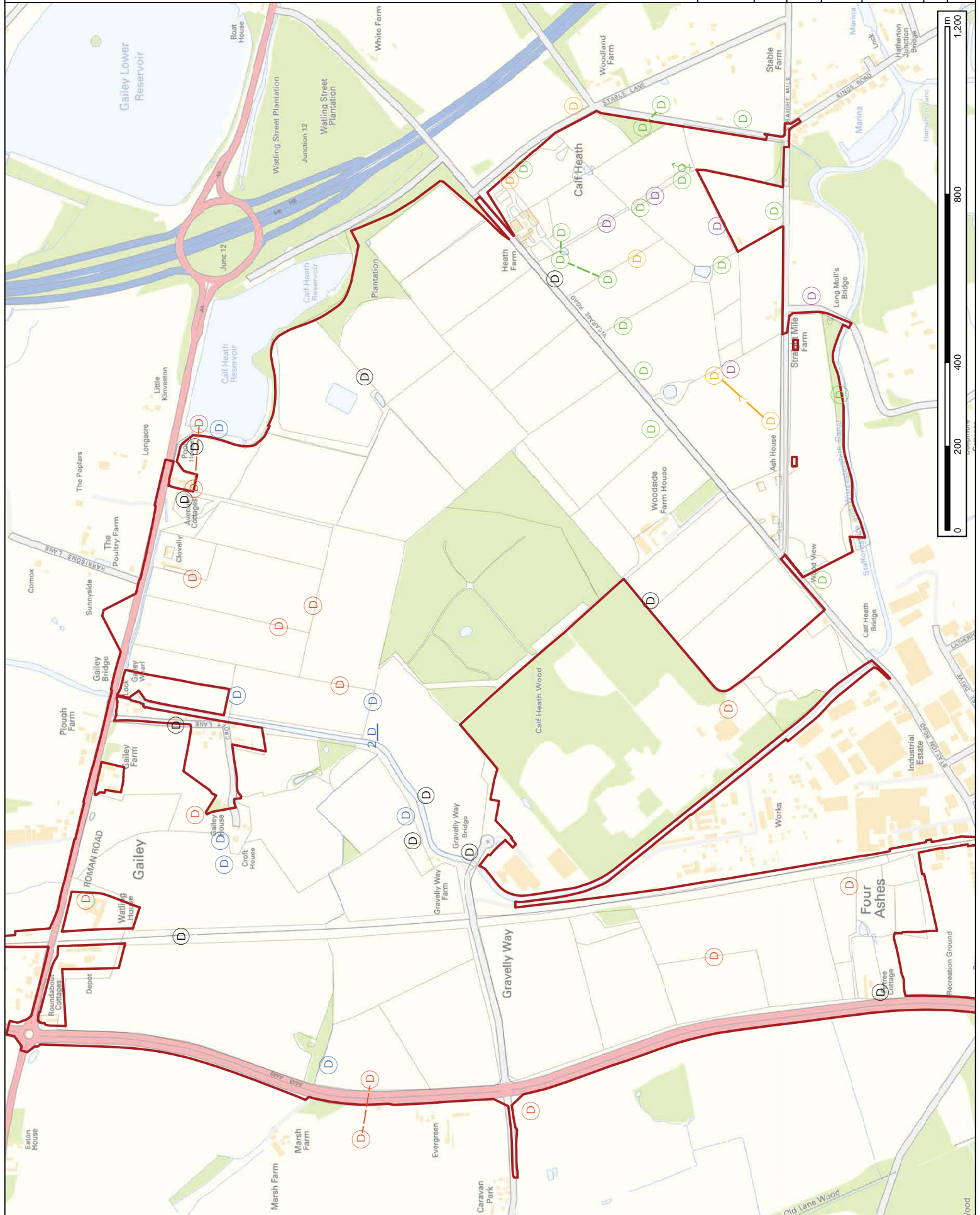
Figure Title  
**Figure 10.1.415 Breeding birds:  
 Dunnock**



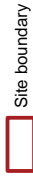
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Date 06/03/2018

Scale 1:8,000 @A3



**Legend**



**Bird registrations**

- WWV Visit 1
- WWV Visit 2
- WWV Visit 3
- WWV Visit 4
- WWV Visit 5
- WWV Visit 6
- WWV Calling
- WWV Signing
- ♂ Male
- ♀ Female
- ♂♀ Pair
- Same bird
- Concurrent registration
- WWV Flying
- WWV Taking off and flying
- WWV Flying in

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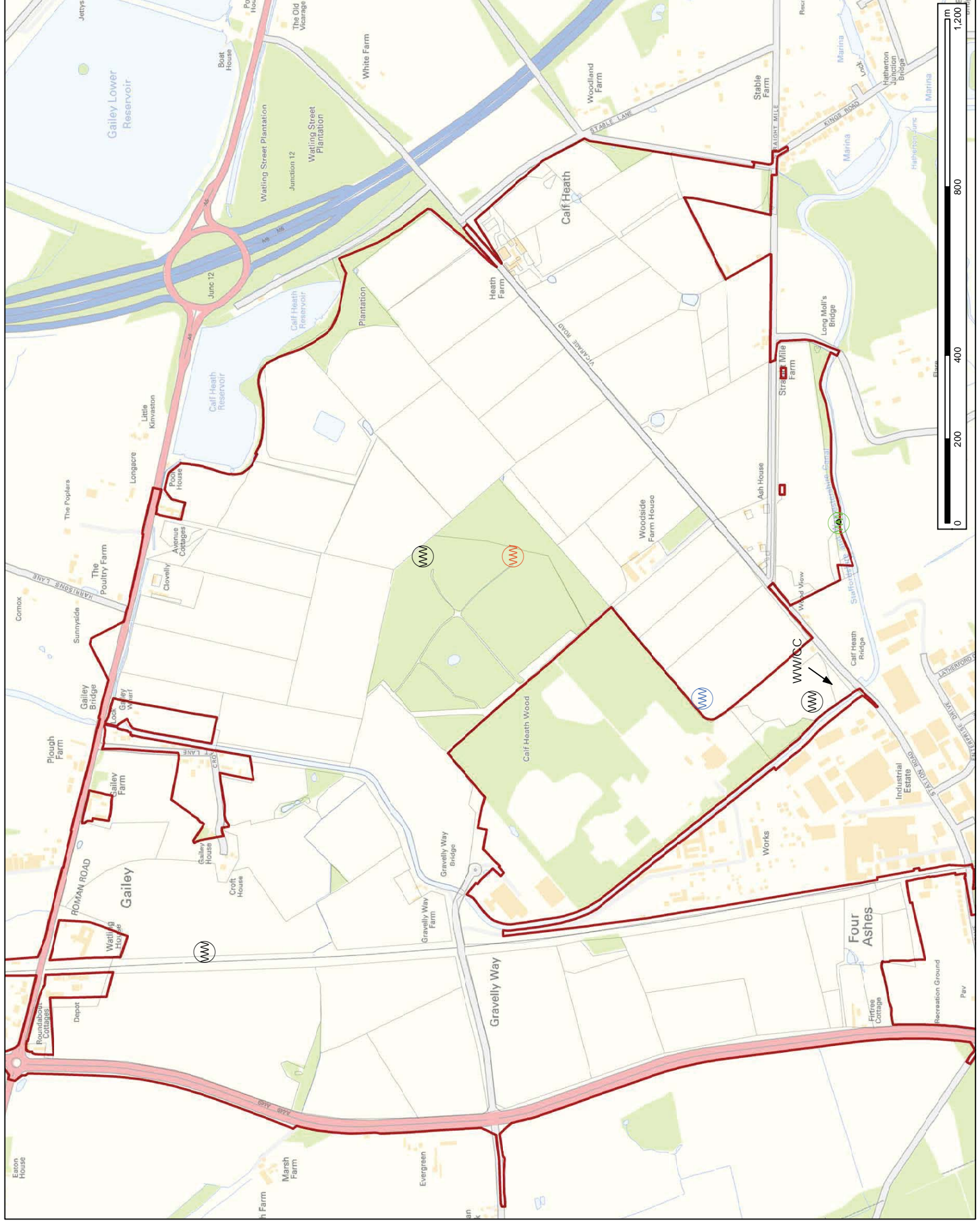
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Figure Title  
**Figure 10.1.416 Breeding Birds:  
 Willow Warbler**



Date 06/03/2018  
 Scale 1:8,000 @A3



**Legend**

- Site boundary
- Bird registrations**
- LI Visit 1
- LI Visit 2
- LI Visit 3
- LI Visit 4
- LI Visit 5
- LI Visit 6
- LI Calling
- LI Singing
- ♂ Male
- ♀ Female
- ♂♀ Pair
- Concurrent registration
- Same bird
- L Flying
- LI → Taking off and flying
- LI Flying in

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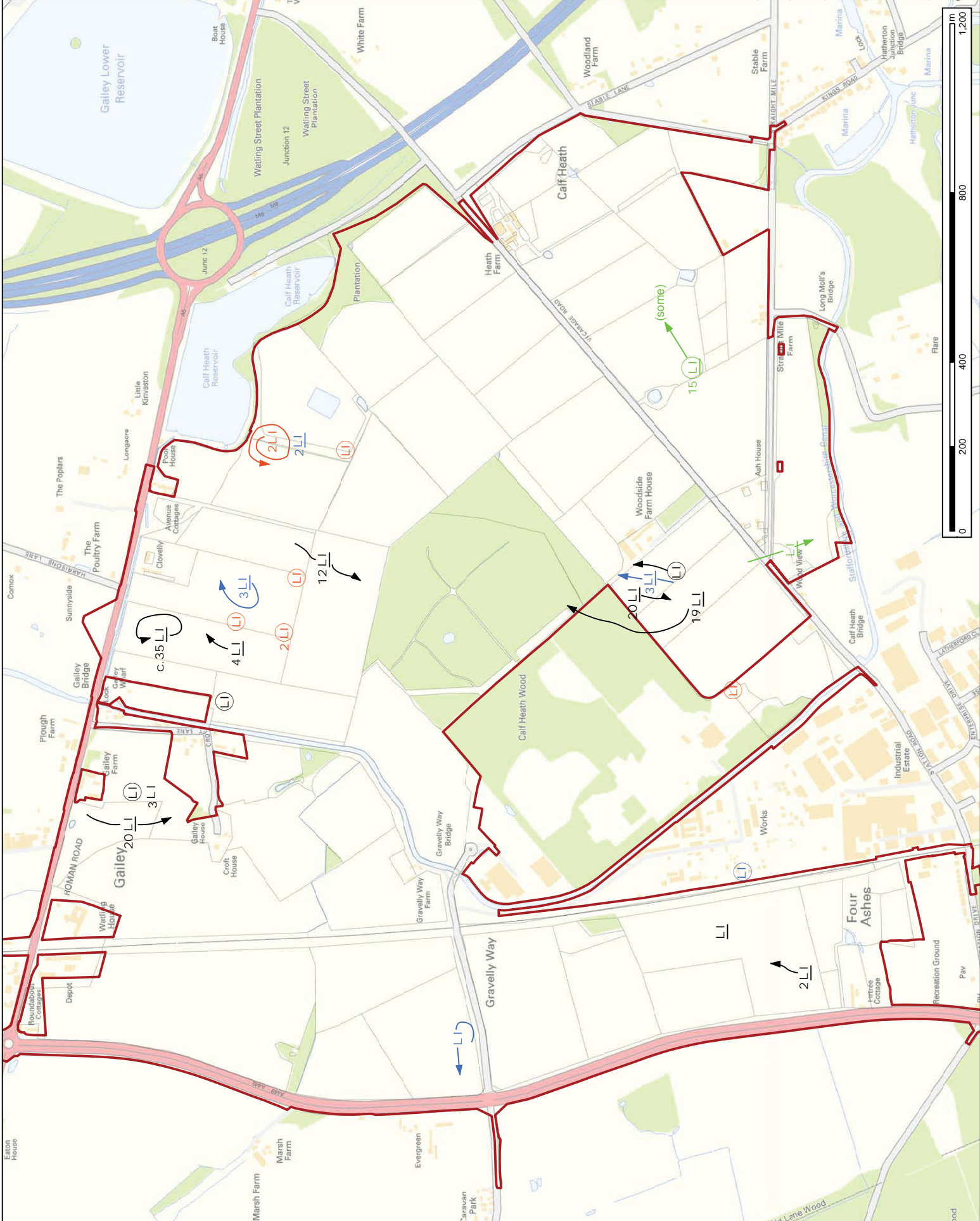
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**1620002055**

Figure Title  
**Figure 10.1.417 Breeding birds:  
 Linnet**



Date 06/03/2018  
 Scale 1:8,000 @A3



**Legend**

Site boundary

**Bird registrations**

- OC Visit 1
- OC Visit 2
- OC Visit 3
- OC Visit 4
- OC Visit 5
- OC Visit 6

- KF Kingfisher
- OC Oystercatcher
- HY Hobby
- OC Calling
- OC Singing

- ♂ Male
- ♀ Female
- ♂♀ Pair

— Same bird

- - - Concurrent registration

OC Flying

OC Taking off and flying

OC Flying in

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Figure Title

**0118 Breeding birds survey:**

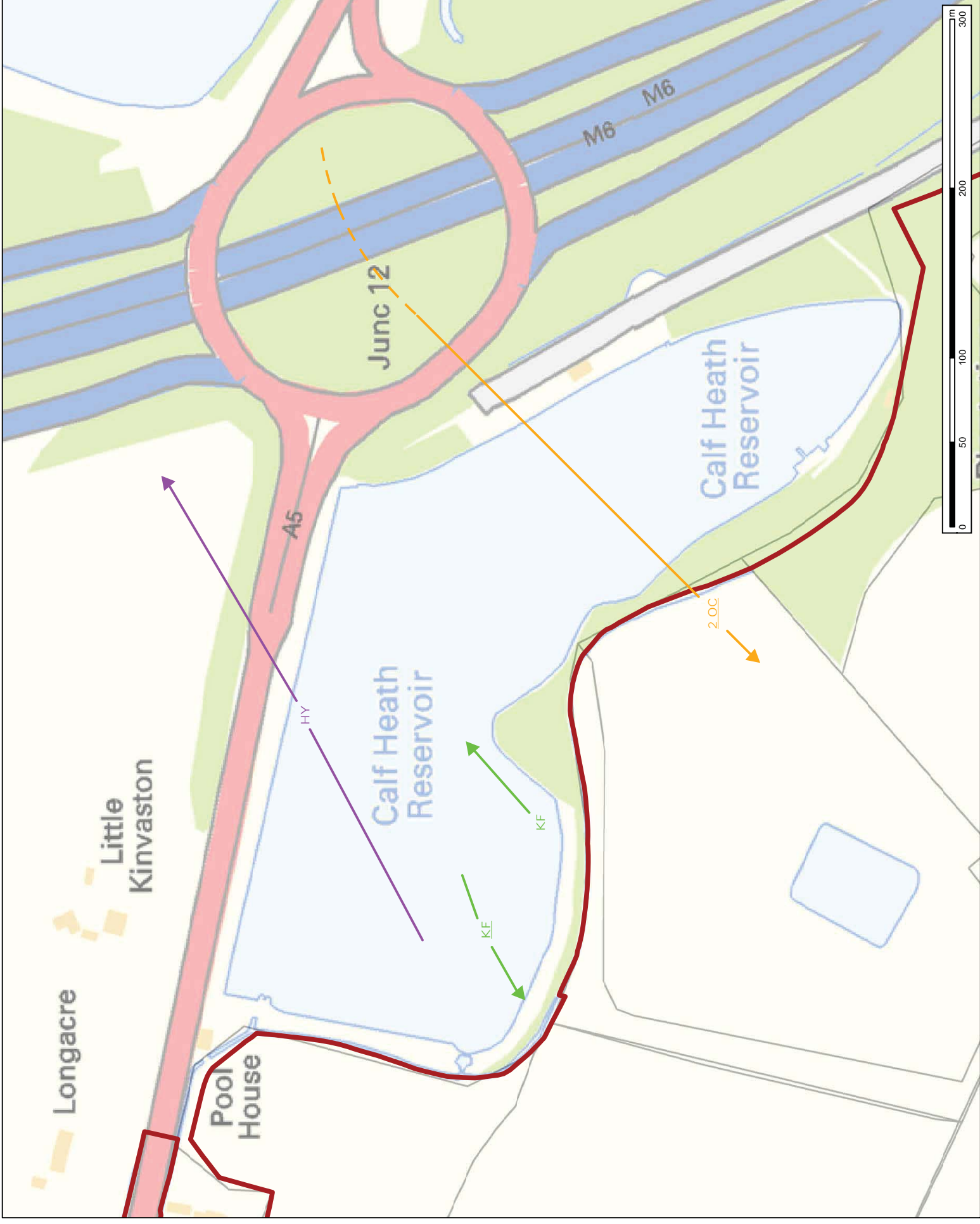
**Calf Heath Reservoir -**

**Kingfisher, Oystercatcher & Hobby**



Date 06/03/2018

Scale 1:2,000 @A3







**Legend**

- Site boundary

**Bird registrations**

- LB Visit 1
- LB Visit 2
- LB Visit 3
- LB Visit 4
- LB Visit 5
- LB Visit 6
- BH Black-headed gull
- CN Common tern
- LB Lesser black-backed gull
- LB Calling
- LB Singing
- ♂ Male
- ♀ Female
- ♀ Pair
- Same bird
- - - Concurrent registration
- LB Flying
- LB Taking off and flying
- LB Flying in

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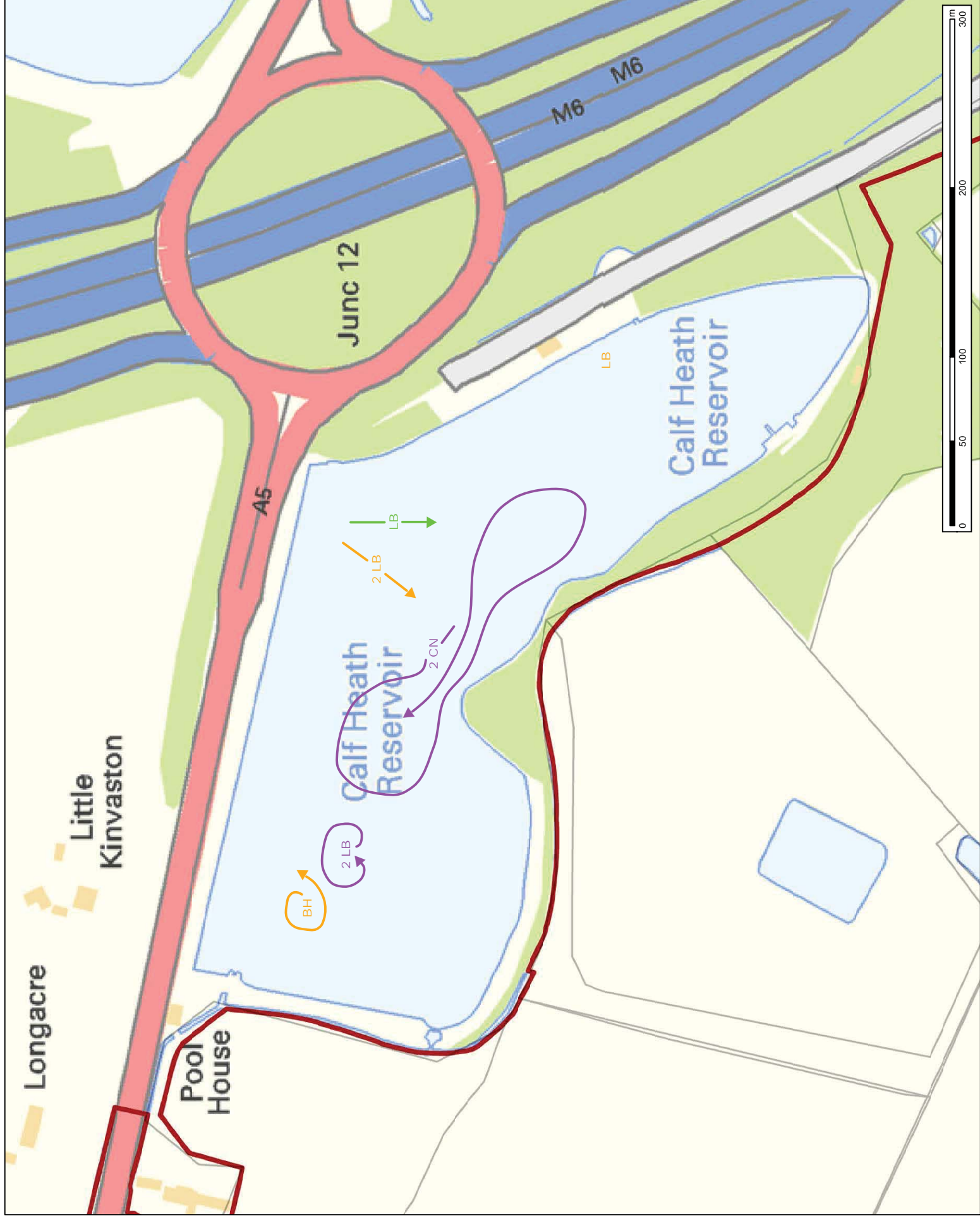
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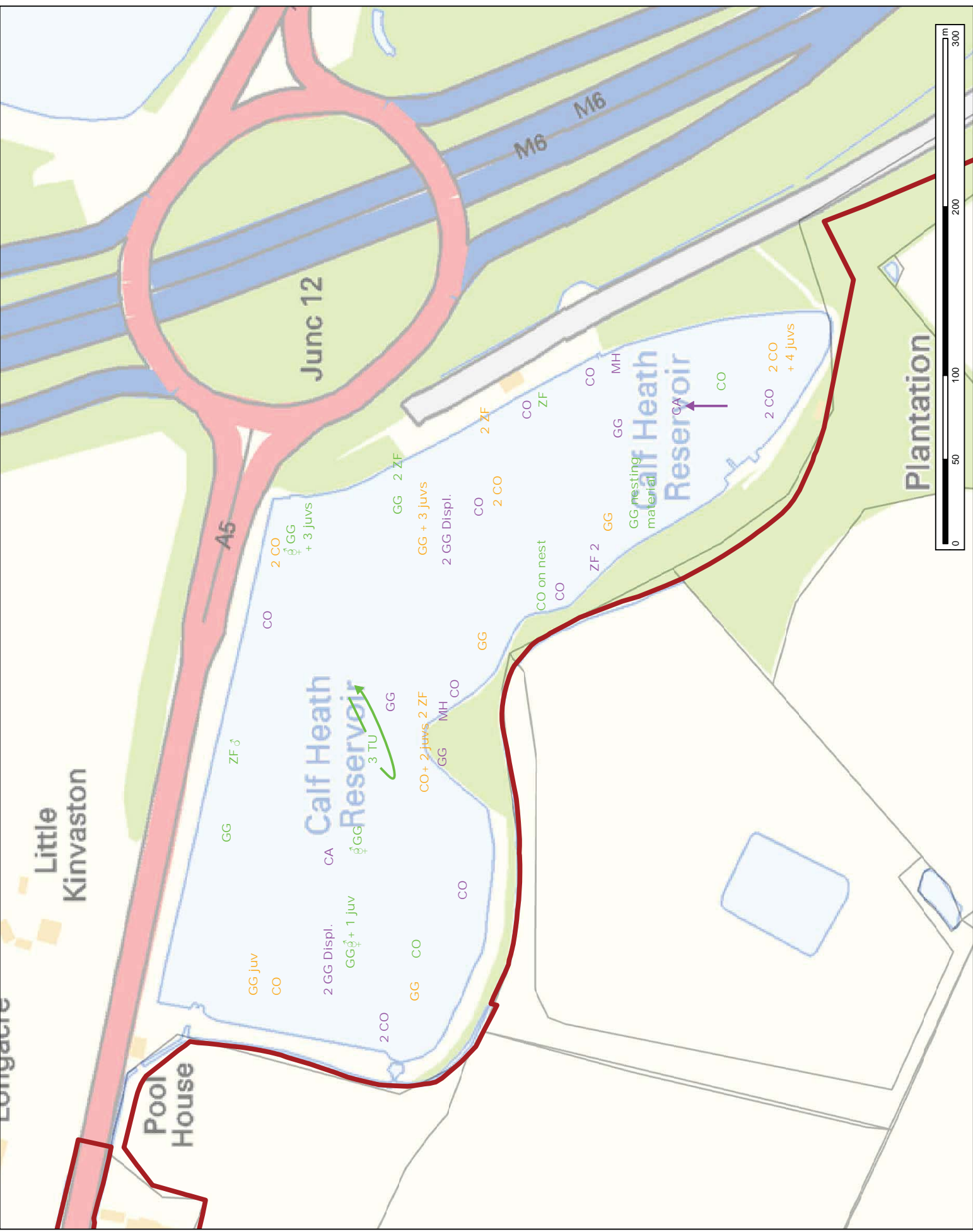
Project Number: **1620002055**

Figure Title: **Figure 10.1.420 Breeding birds survey: Calf Heath Reservoir - Gulls and Terns**

Date: 06/03/2018

Scale: 1:2,000 @A3





**Legend**

**Bird registrations**

- MH Visit 1
- MH Visit 2
- MH Visit 3
- MH Visit 4
- MH Visit 5
- MH Visit 6
- CO Coot
- ZF Feral/hybrid mallard
- GG Great crested grebe
- MH Moorhen
- MH Calling
- MH Singing
- ♂ Male
- ♀ Female
- ♂♀ Pair
- Site boundary
- Same bird
- Concurrent registration
- ← Flying
- ← Taking off and flying
- ← Flying in

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Figure Title  
**Figure 10: 27 Breeding birds Survey  
 Other Waterbirds - Evidence of  
 Nesting/Birds in Suitable Habitat**



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**Legend**

- Site boundary
- Bird Registration
- Flights

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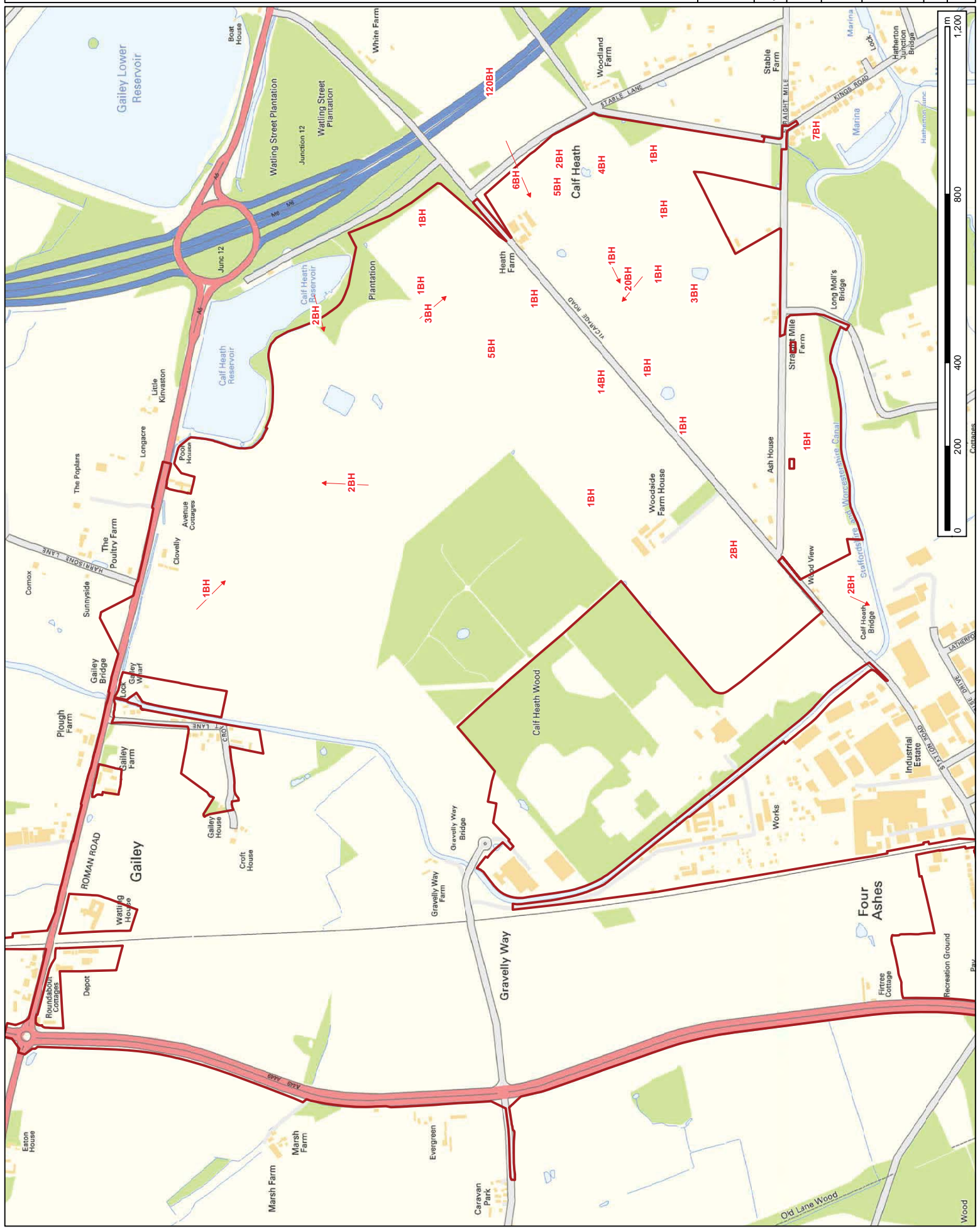
Project Number  
**1620002055**

Figure Title  
**Figure 10.1.42: Bird Distribution - Blackheaded gull**



Date **06/03/2018**

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Legend

- Site boundary
- Bird Registration
- Flights



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Figure Title

Figure 10.1.423  
Map of Bird Distribution  
Bullfinch



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Legend

- Site boundary
- Bird Registration
- Flights



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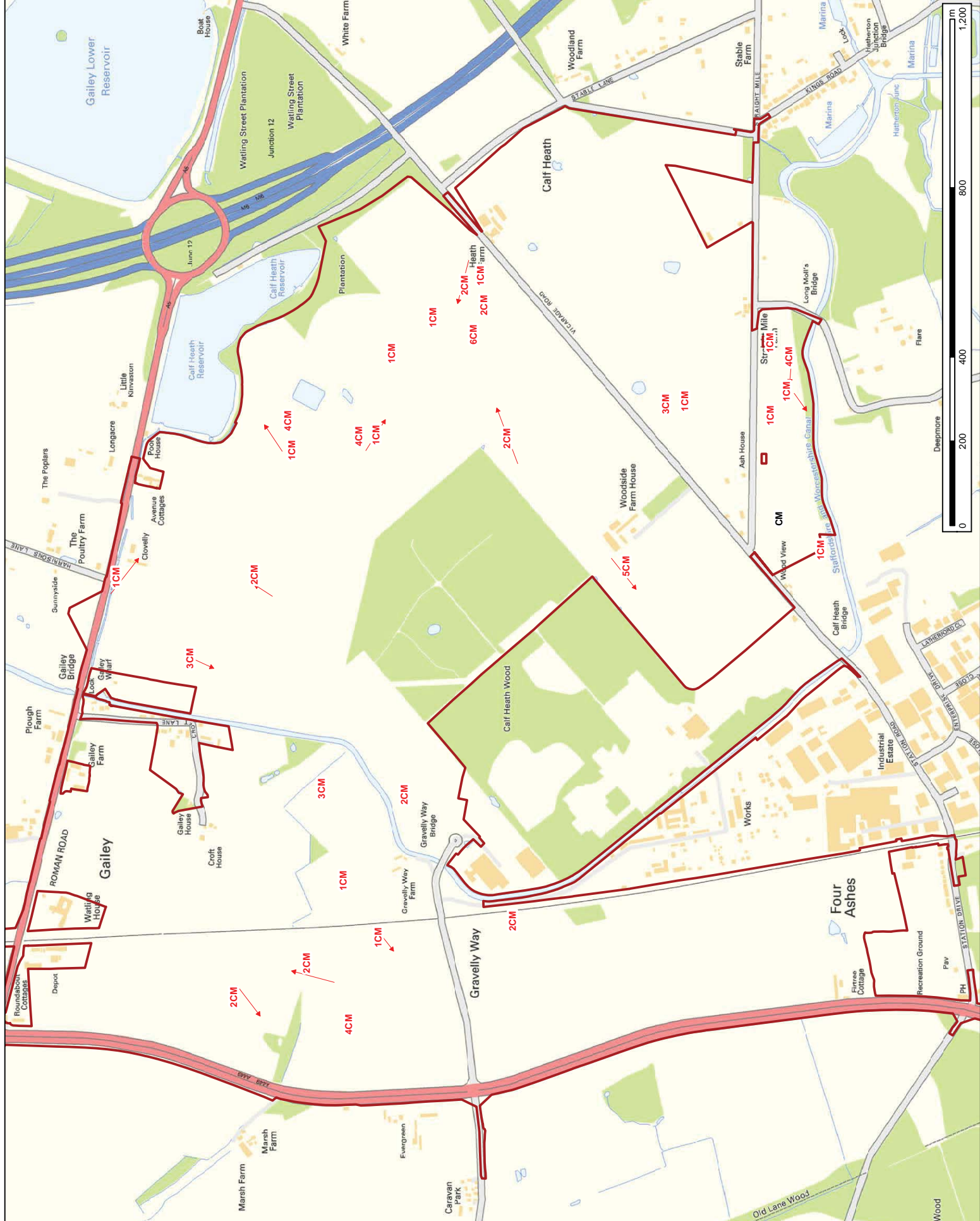
Figure Title

Figure 10.1.424  
Watering and Distribution -  
Cambs&Gill



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Legend

- Site boundary
- Bird Registration
- Flights



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Figure Title

**Figure 10.1.25**

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Legend

Bird Registration

Flights

Site boundary



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Figure Title

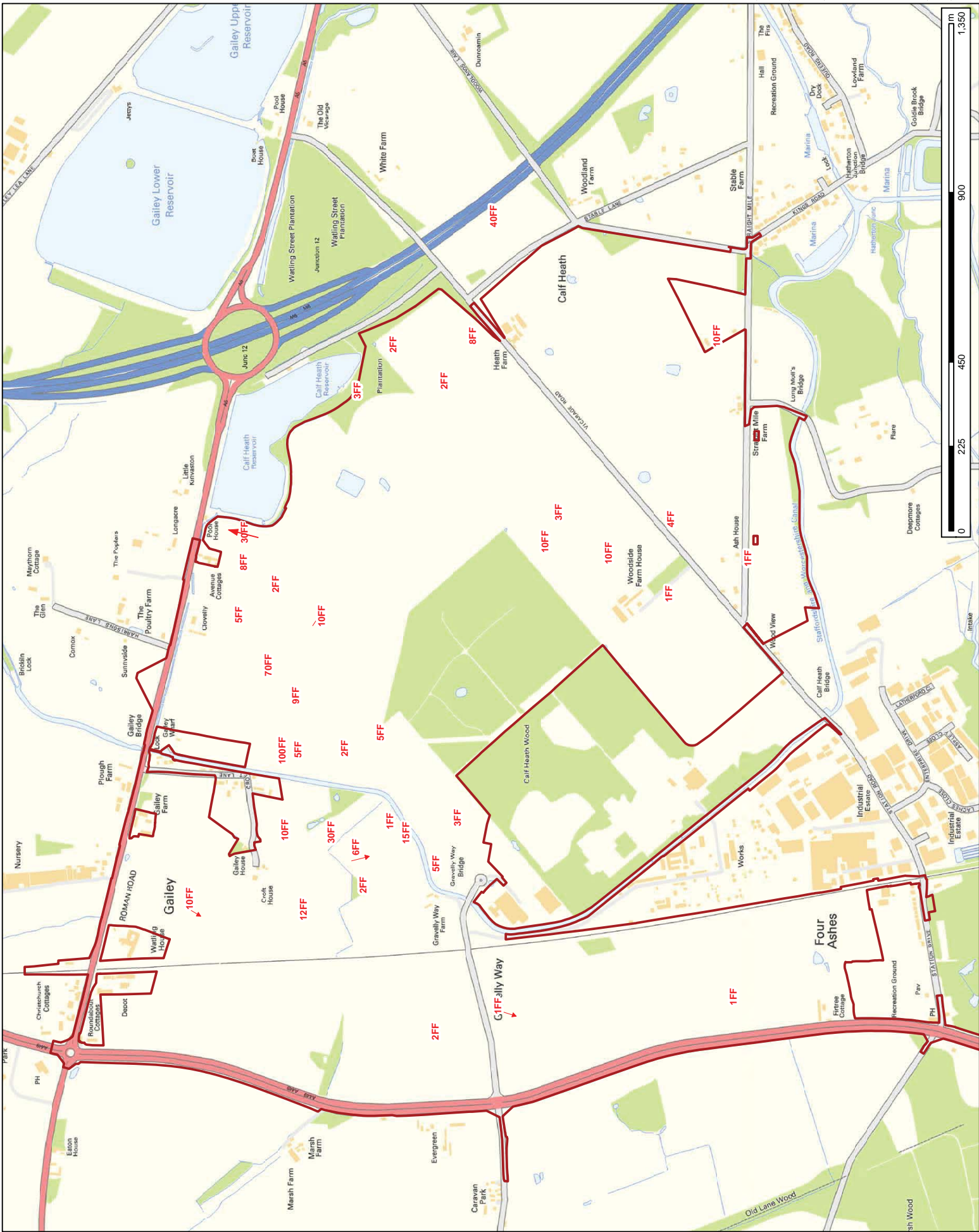
Figure 1: Flight paths for Whitering Bird Distribution - Fieldfare



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Legend

- Site boundary
- Bird Registration
- Flights



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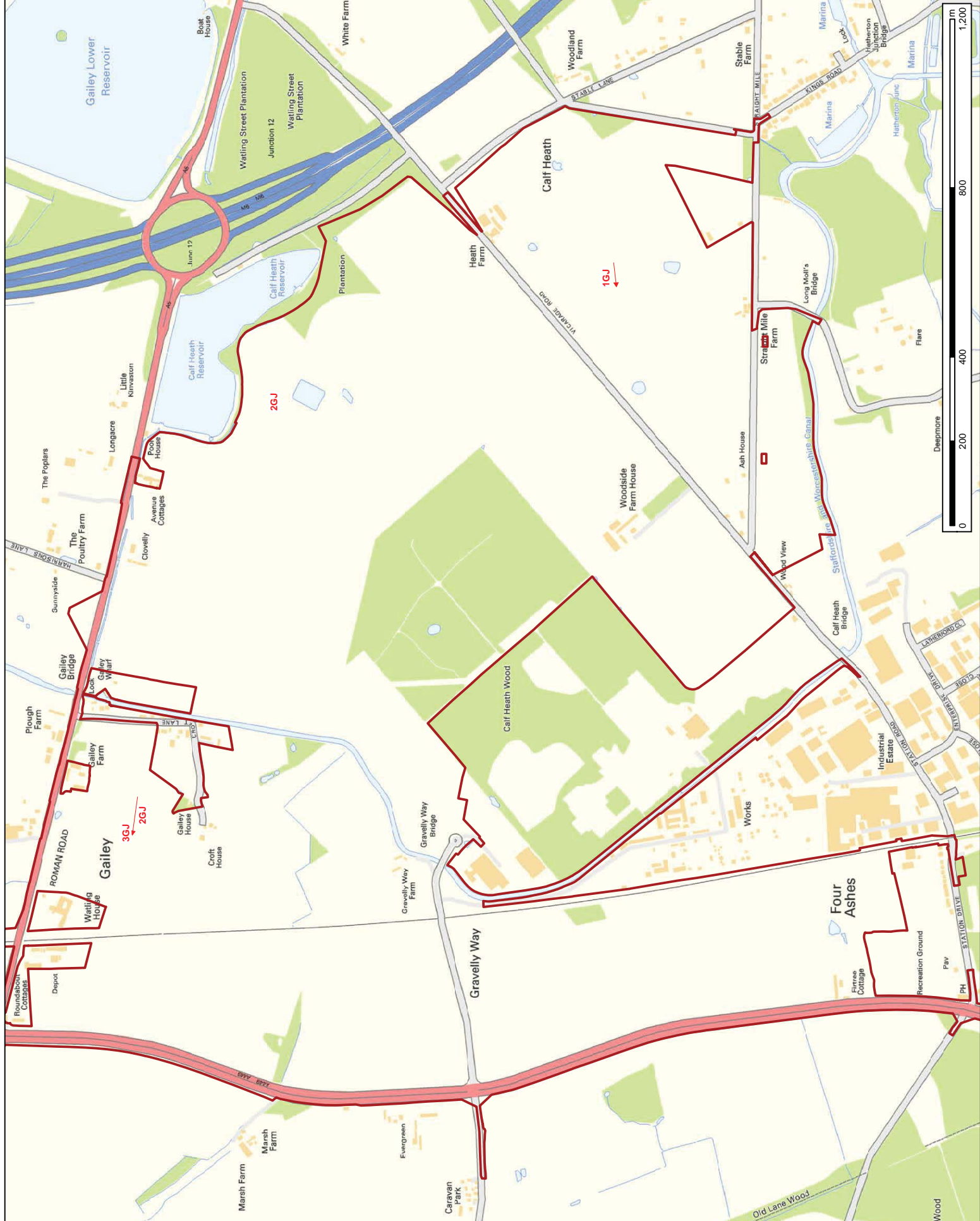
Project Number  
**1620002055**

Figure Title  
**Figure 10.1.427  
Minimising Bird Distribution  
Greylag**



Date **06/03/2018**

Scale **1:8,000 @A3**



Legend

- Site boundary
- Bird Registration
- Flights



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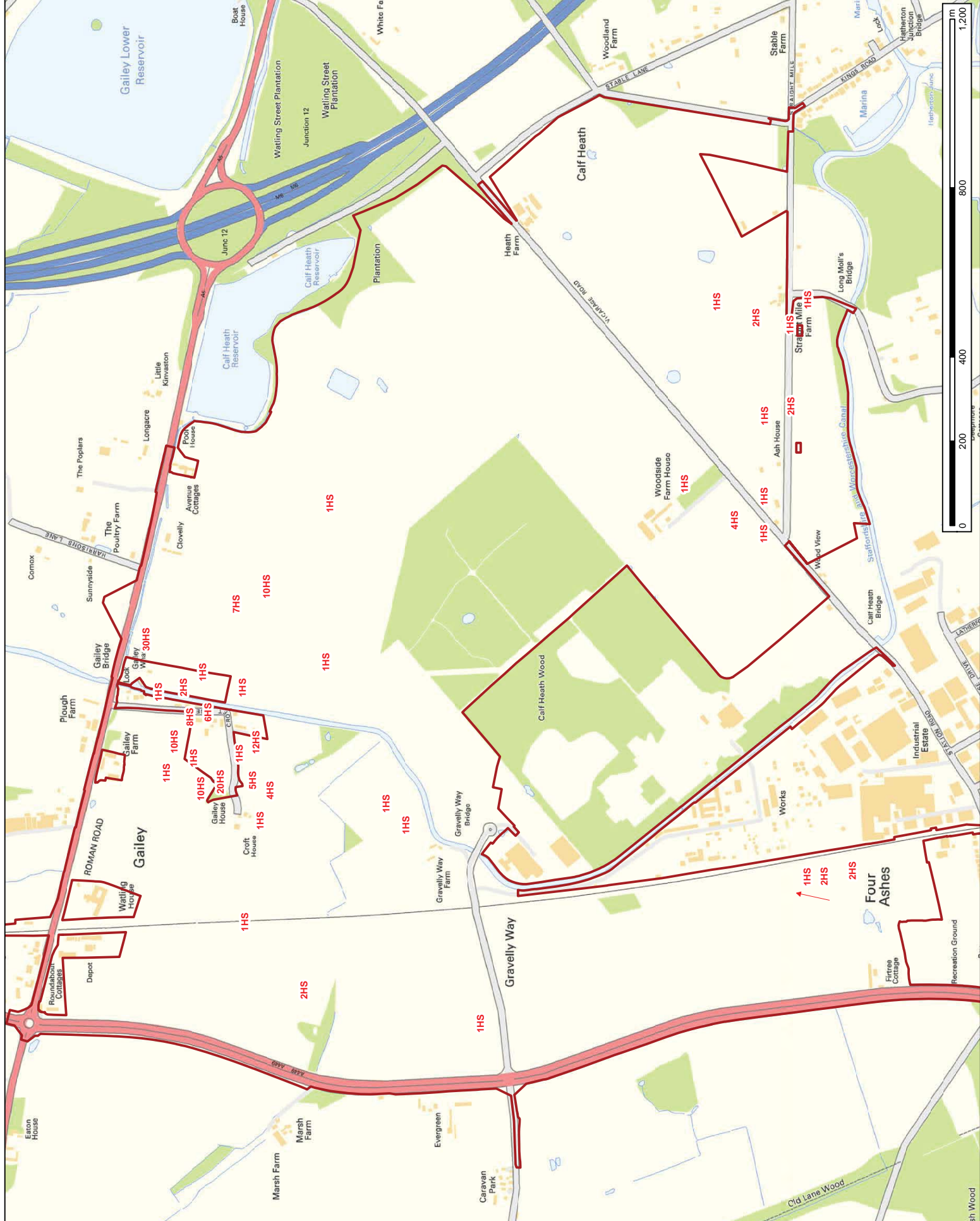
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**West Midlands Interchange (WMI)**

Project Number  
**1620002055**

Figure Title  
**Figure 10.1.28 Distribution House Sparrow**



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**Legend**

- Site boundary
- Bird Registration
- Flights



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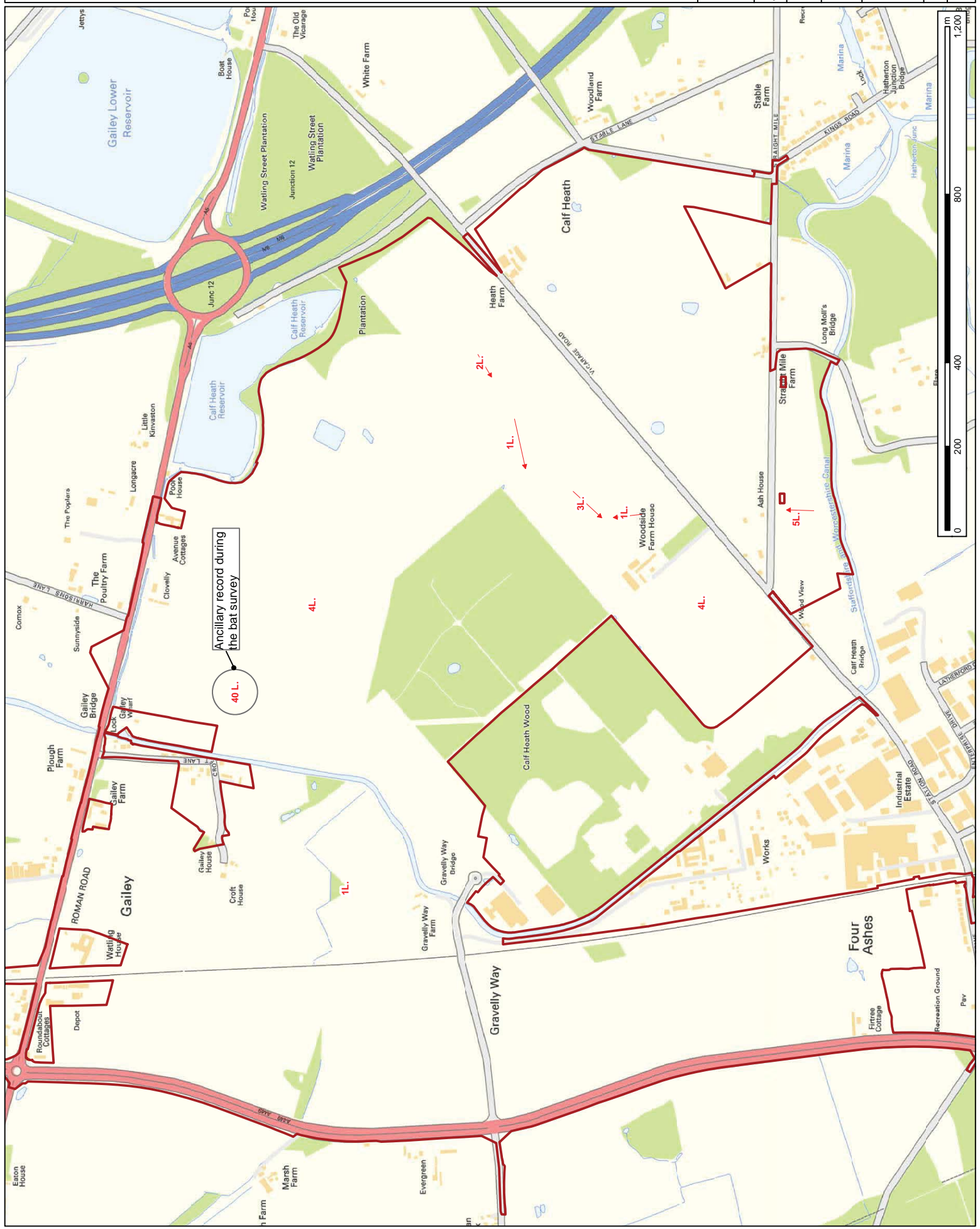
Project Number  
**1620002055**

Figure Title  
**Figure 10.1.4.29  
Flighting Bird Distribution  
Lapwing**



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Scale **1:8,000 @A3**



Legend

- Site boundary
- Bird Registration
- Flights



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Figure Title Figure 10.1.4.08

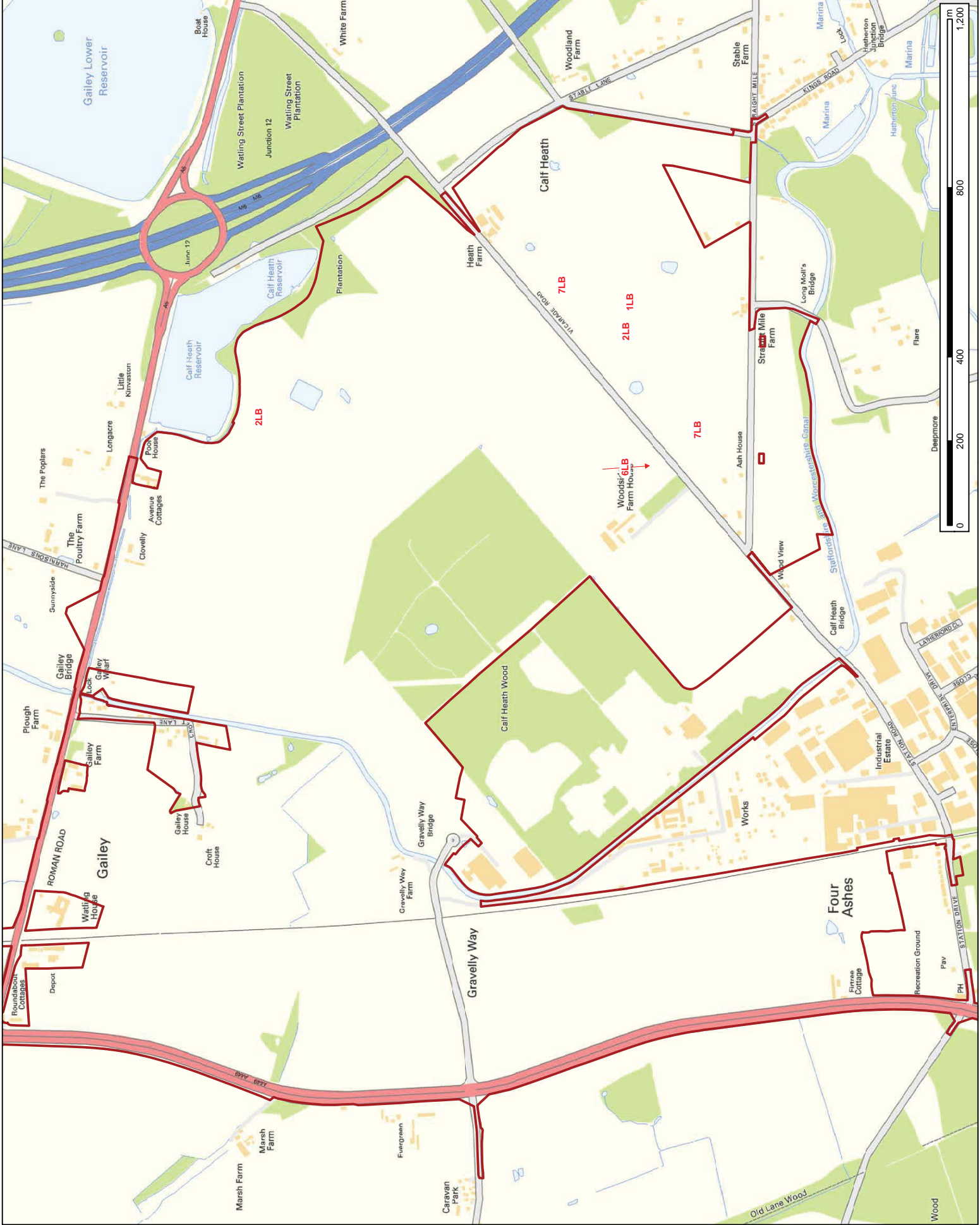
Woodside Farm Black Distribution

Lesser black-backed gull

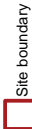


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Legend



Bird



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Figure Title

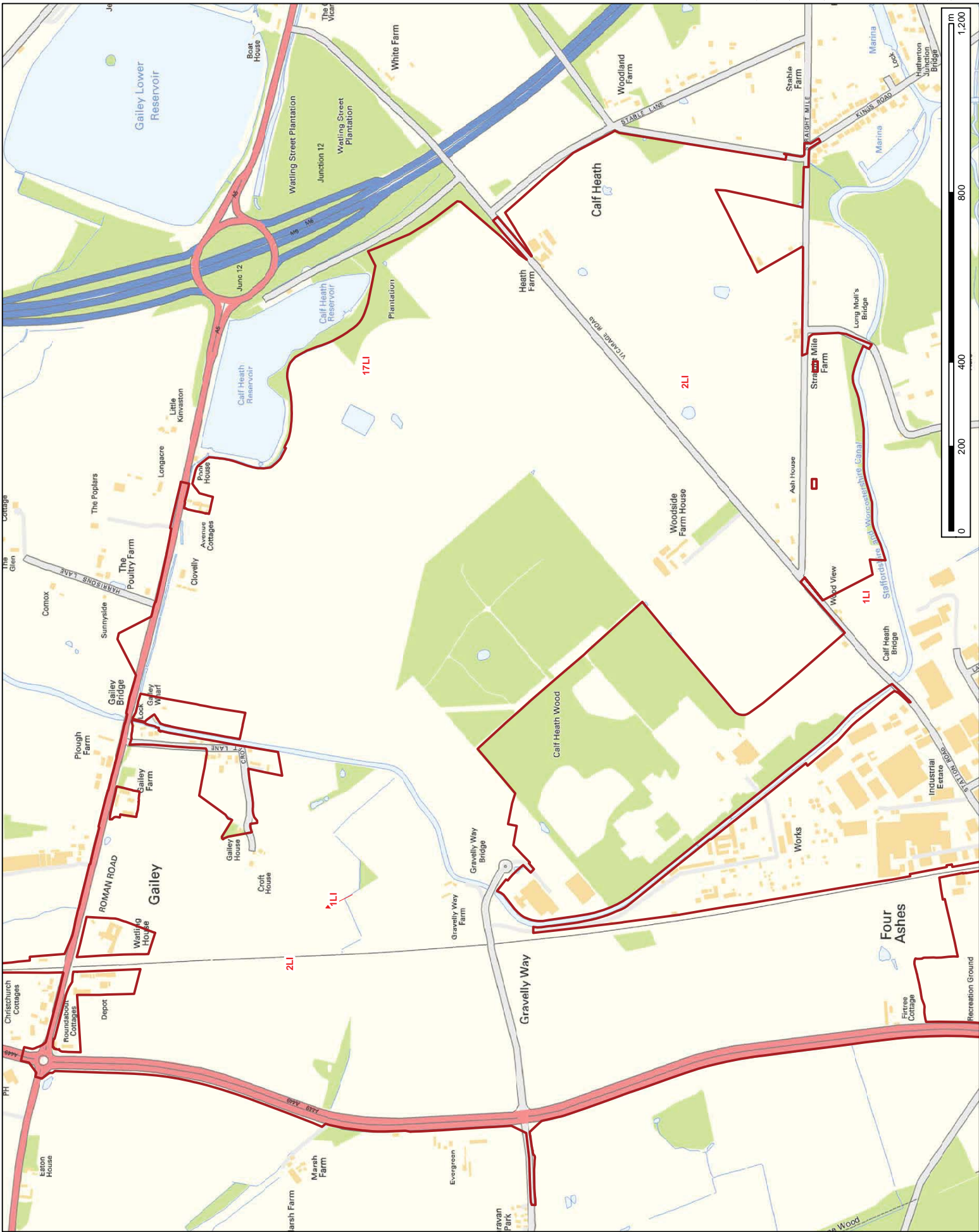
Figure 10.1.431  
Wintering Bird Distribution  
Linet



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Legend

- Site boundary
- Bird Registration
- Flights



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Figure Title Figure 10.1.432

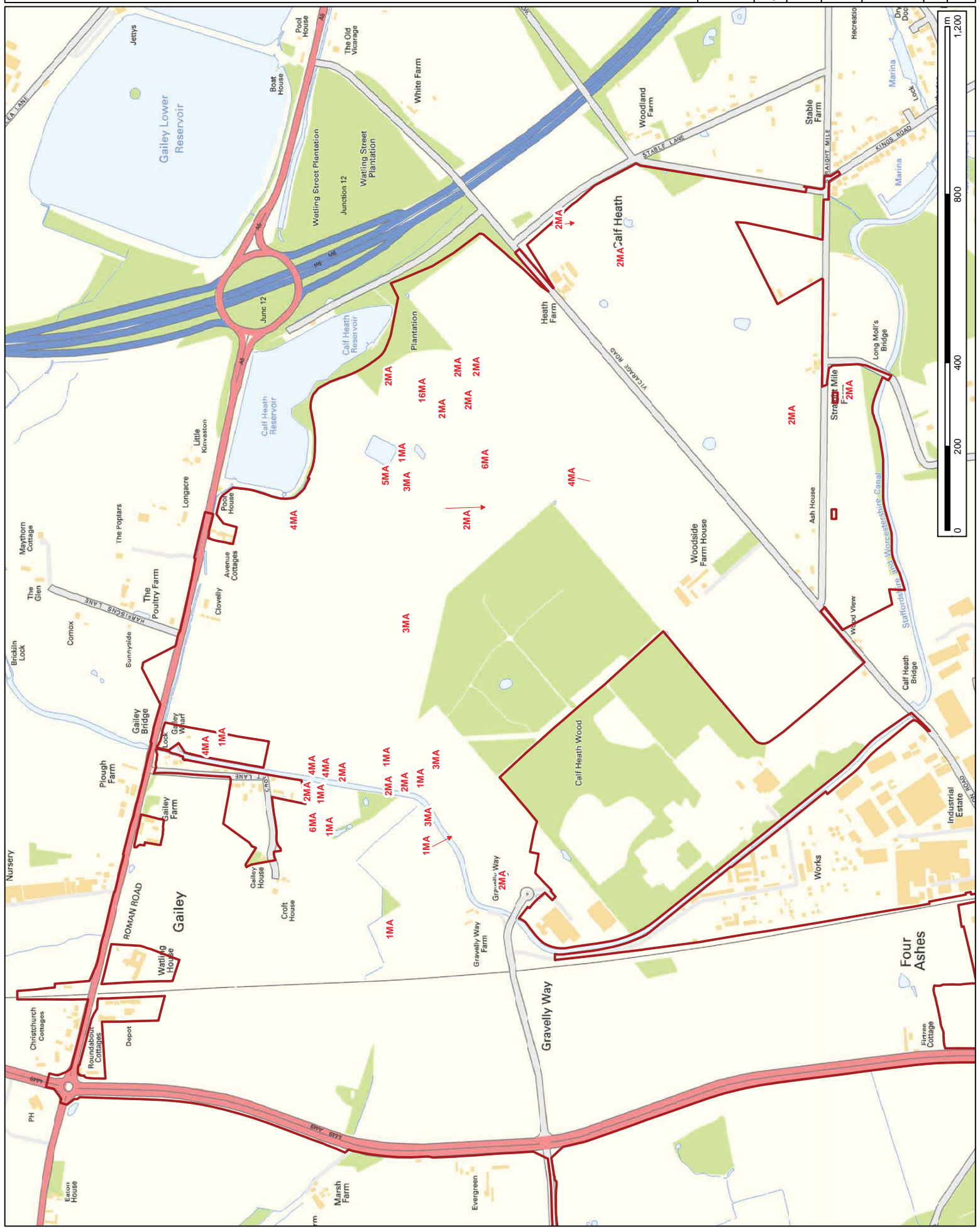
Wintering Bird Distribution

Malvern



Date 06/03/2018

Scale 1:8,000 @A3



**Legend**

- Site boundary
- Bird Registration
- Flights

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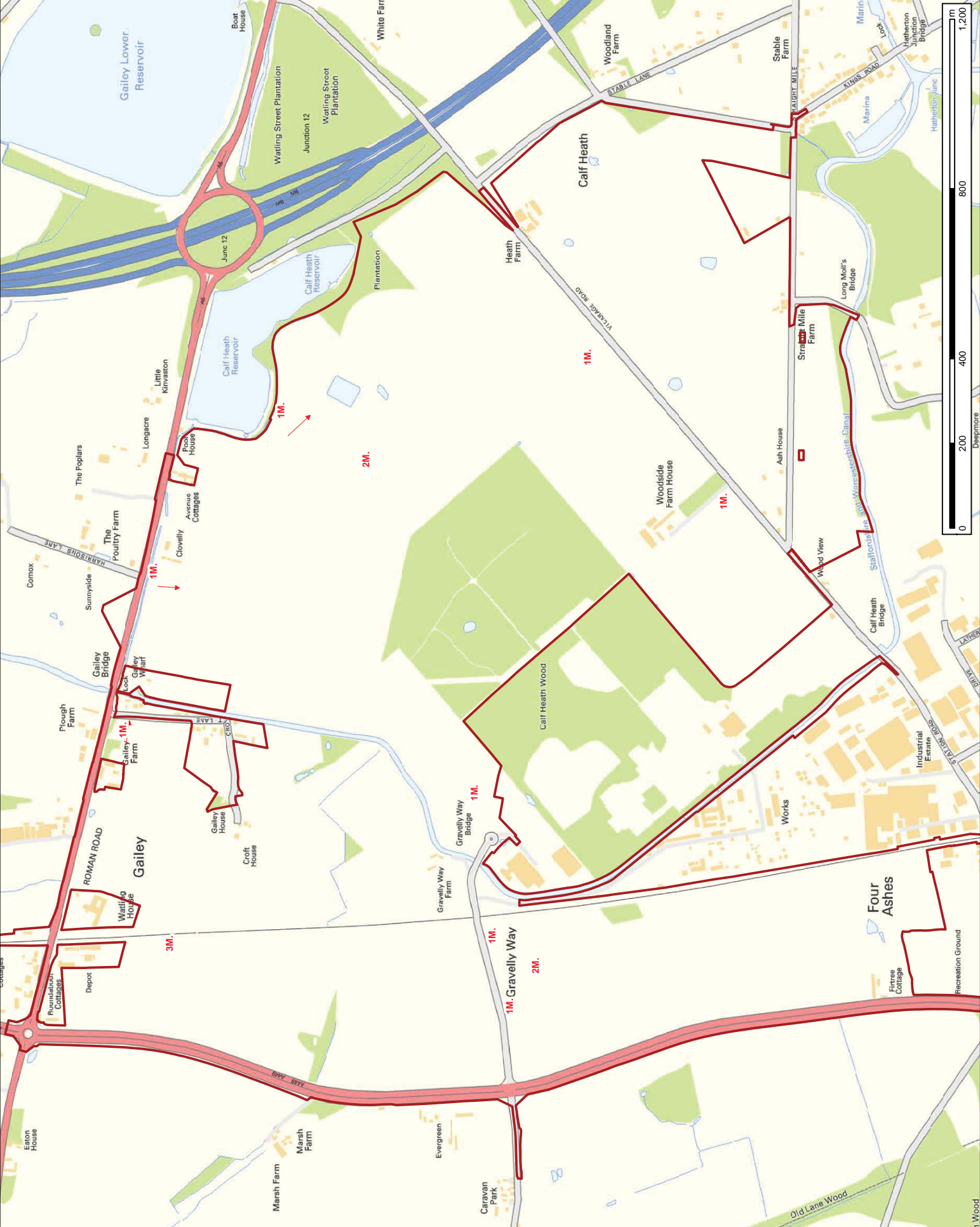
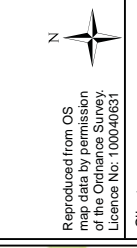
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Project Number  
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Figure Title Figure 10.1.433  
**Filtering Bird Distribution - Mistle Thrush**

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**Legend**

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- Flights

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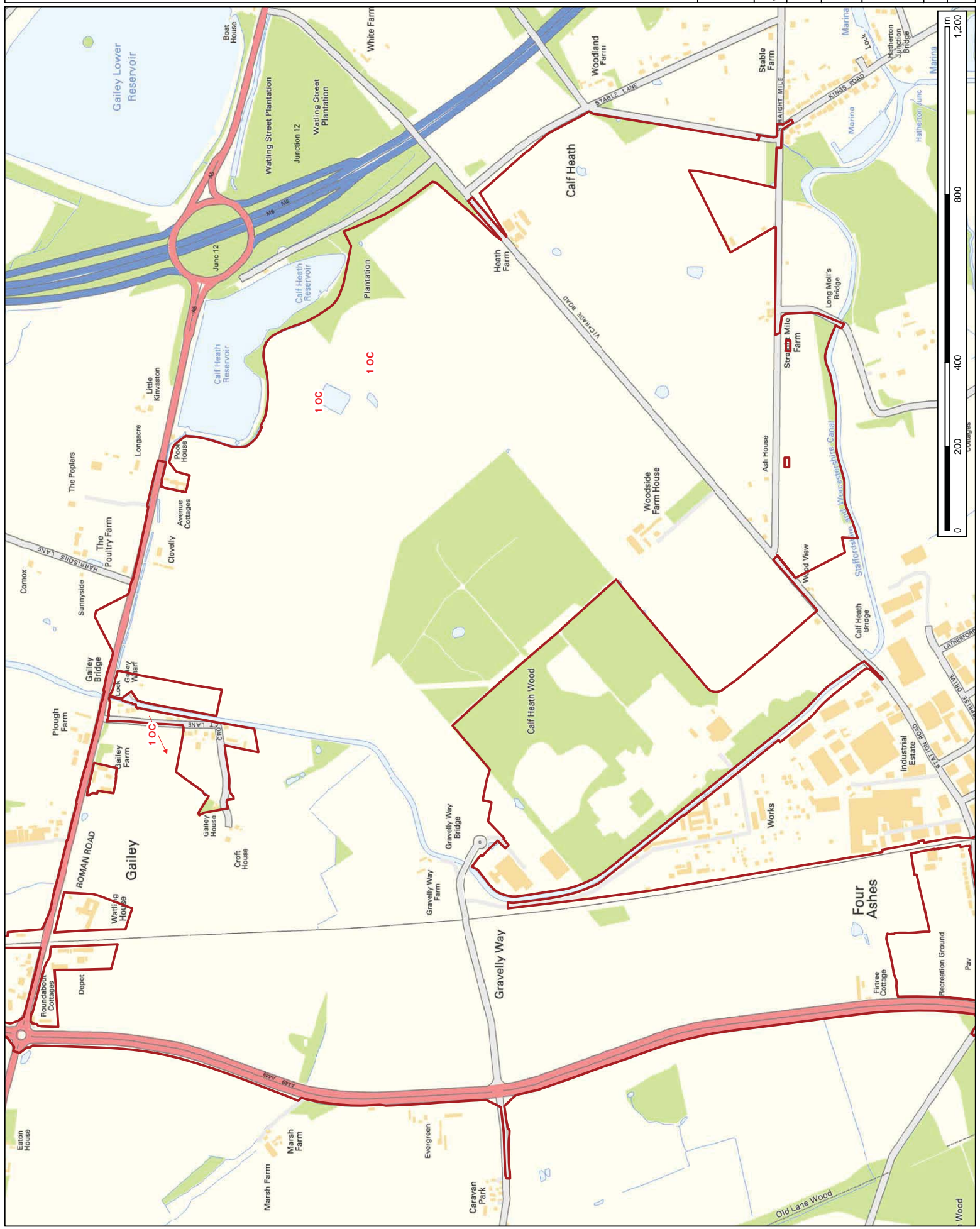
Project Title  
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Project Number  
**1620002055**

Figure Title Figure 10.1.434  
**Wintering Bird Distribution - Oystercatcher**

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Legend

- Site boundary
- Bird Registration
- Flights



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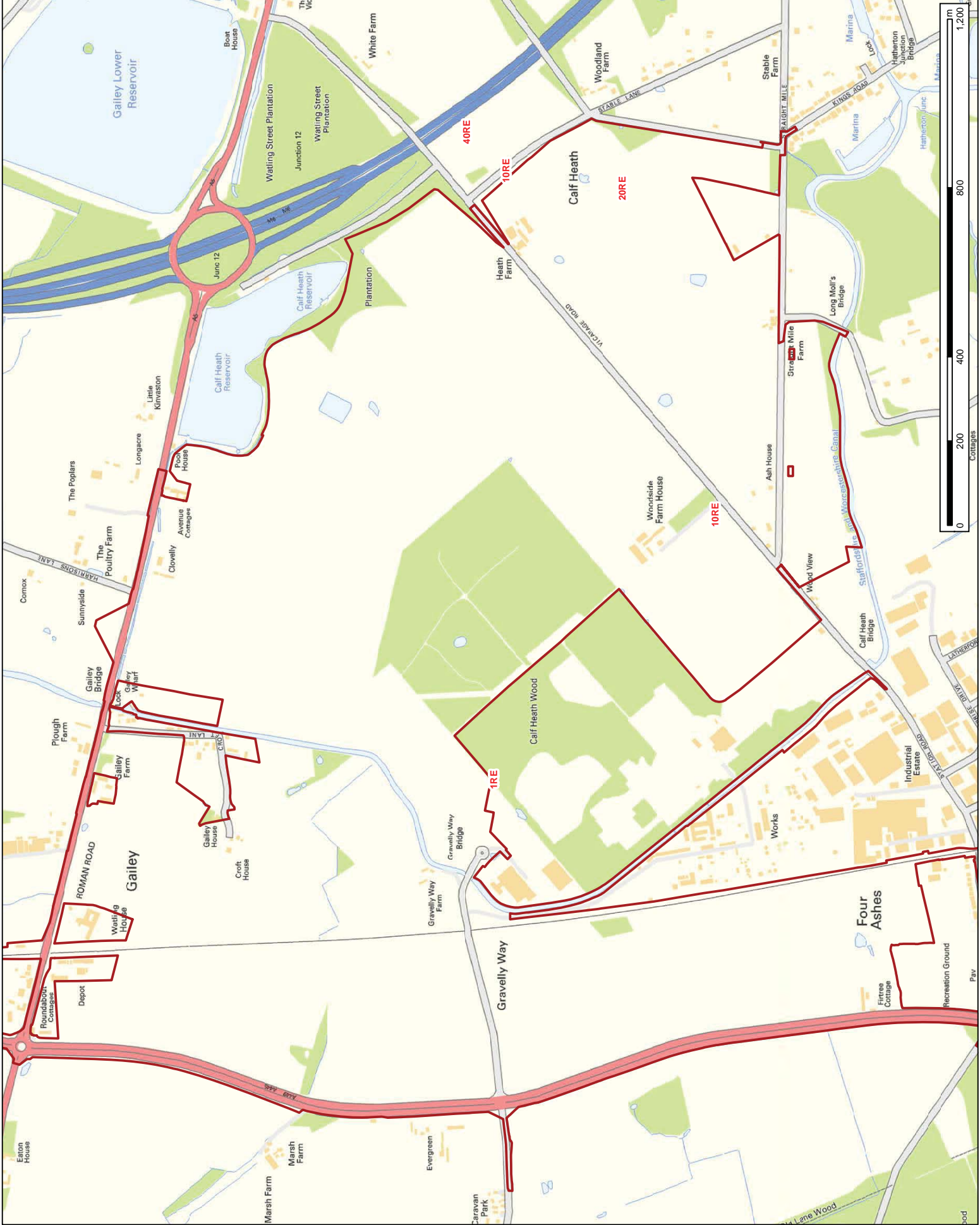
Figure Title  
**Figure 10.1.05  
Wintering Bird Distribution  
Redwings**






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-  Bird Registration
-  Flights

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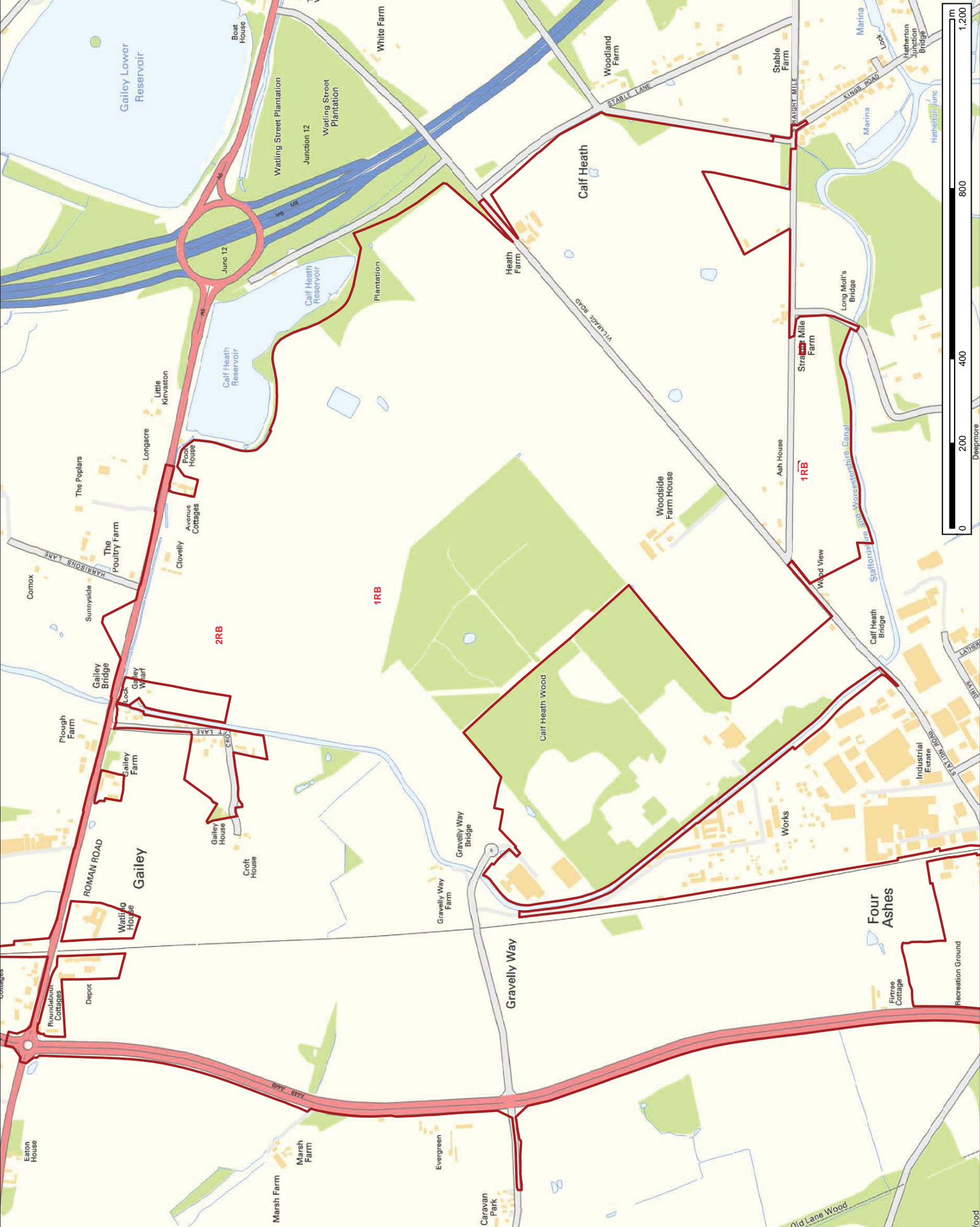
Figure Title  
**Figure 10.1.4.36  
Feasibility Bird Distribution  
Reed thinning**



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**Legend**

- Site boundary
- Bird Registration
- Flights

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**Four Ashes Limited (FAL)**

Project Title  
**West Midlands Interchange (WMI)**

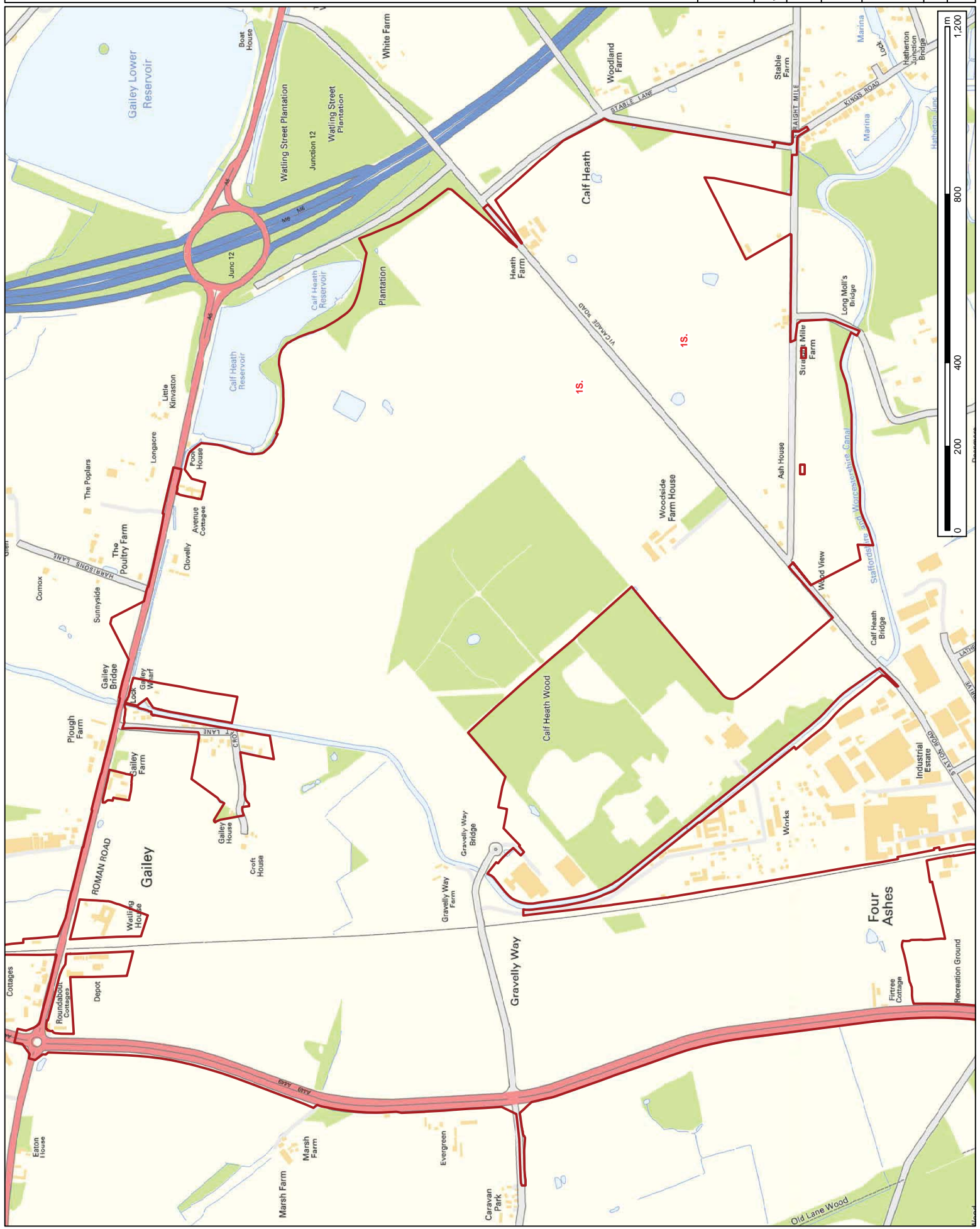
Project Number  
**1620002055**

Figure Title  
**Figure 10.1.437 Planning Bird Distribution Skyline**

Date **06/03/2018**

Scale **1:8,000 @A3**

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Legend

- Site boundary
- Bird Registration



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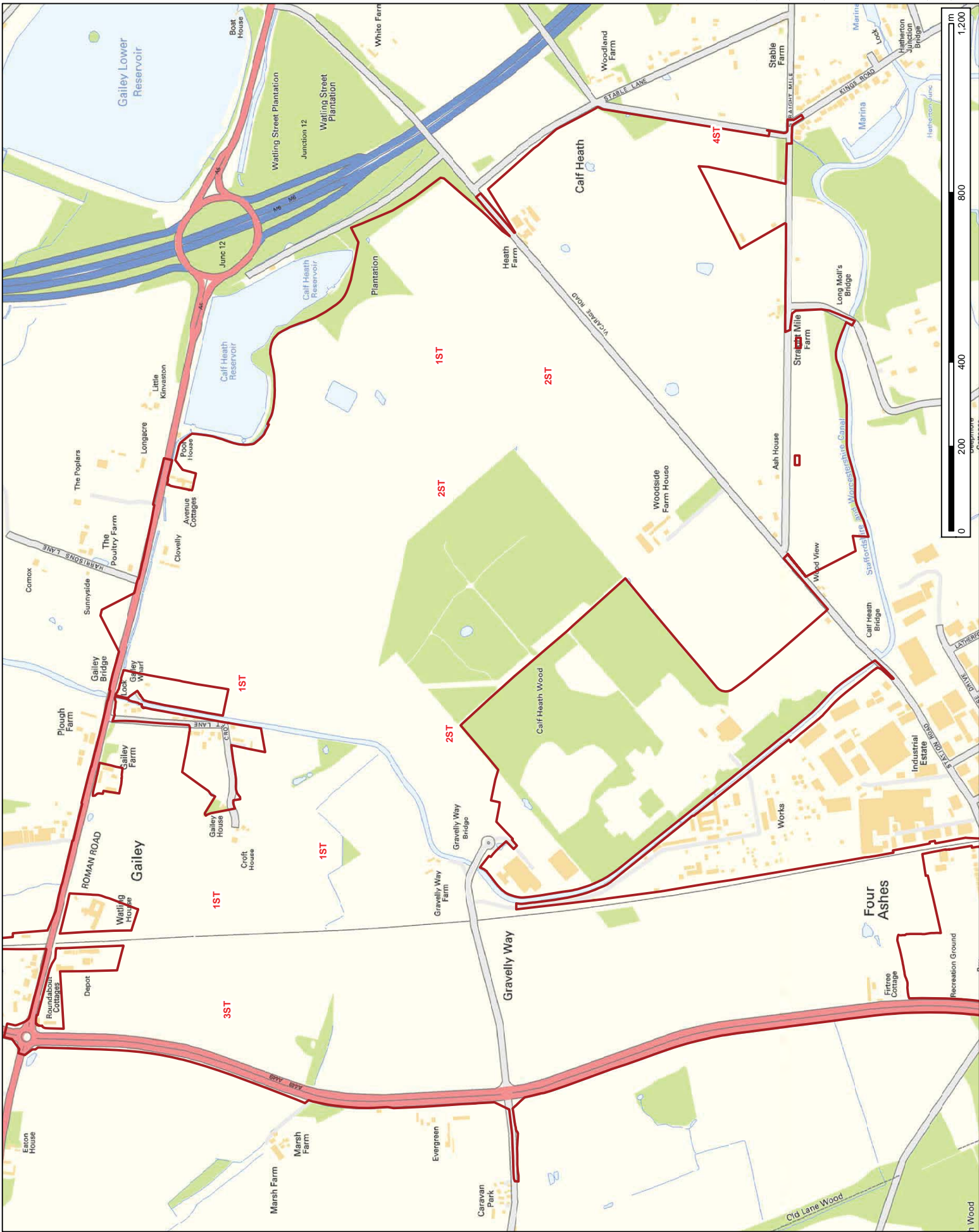
**1620002055**

Figure Title Figure 10.1.438  
Winning Bird Distribution  
Song Thrush



Date 06/03/2018

Scale 1:8,000 @A3



Legend

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- Bird Registration
- Flights



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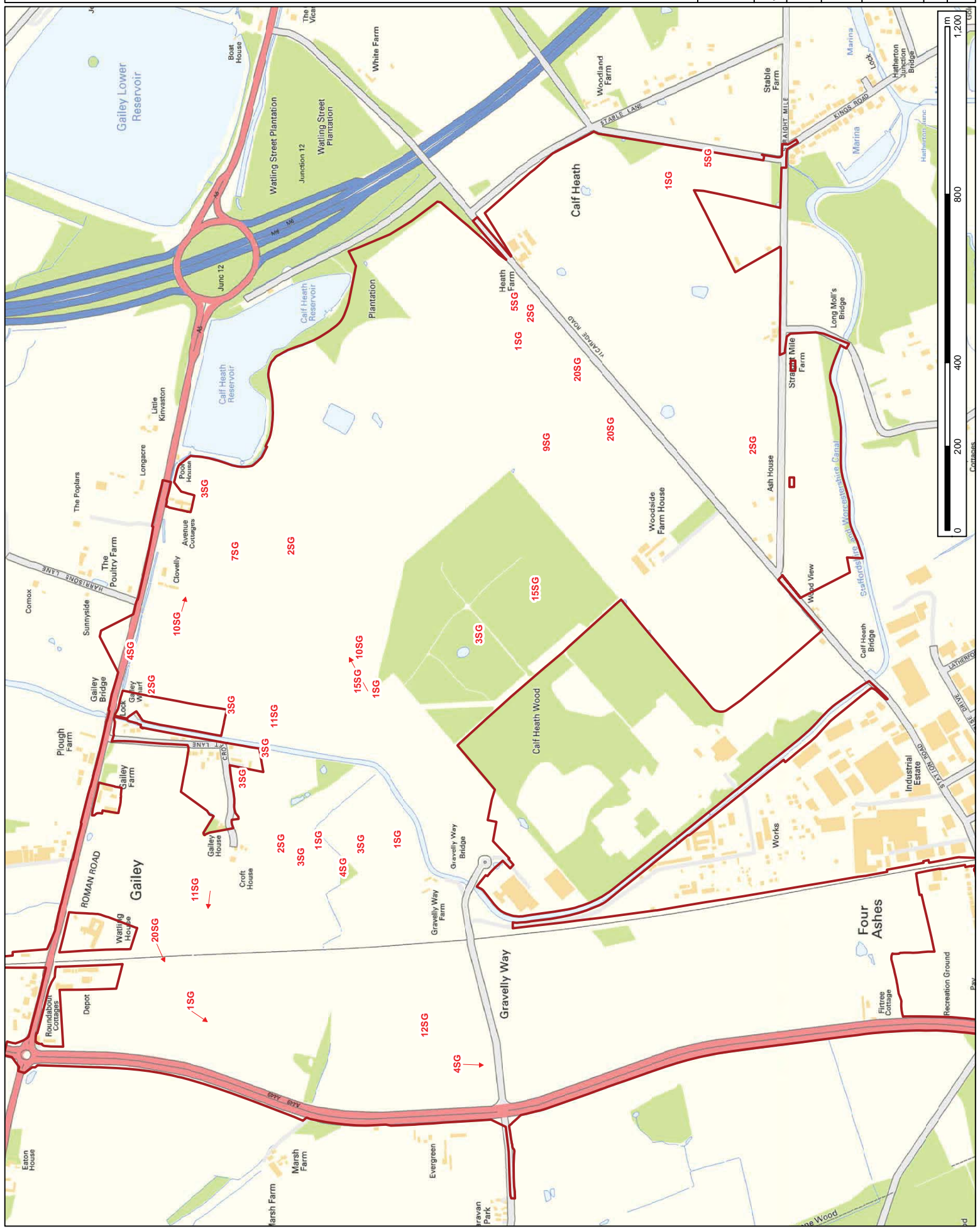
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1620002055

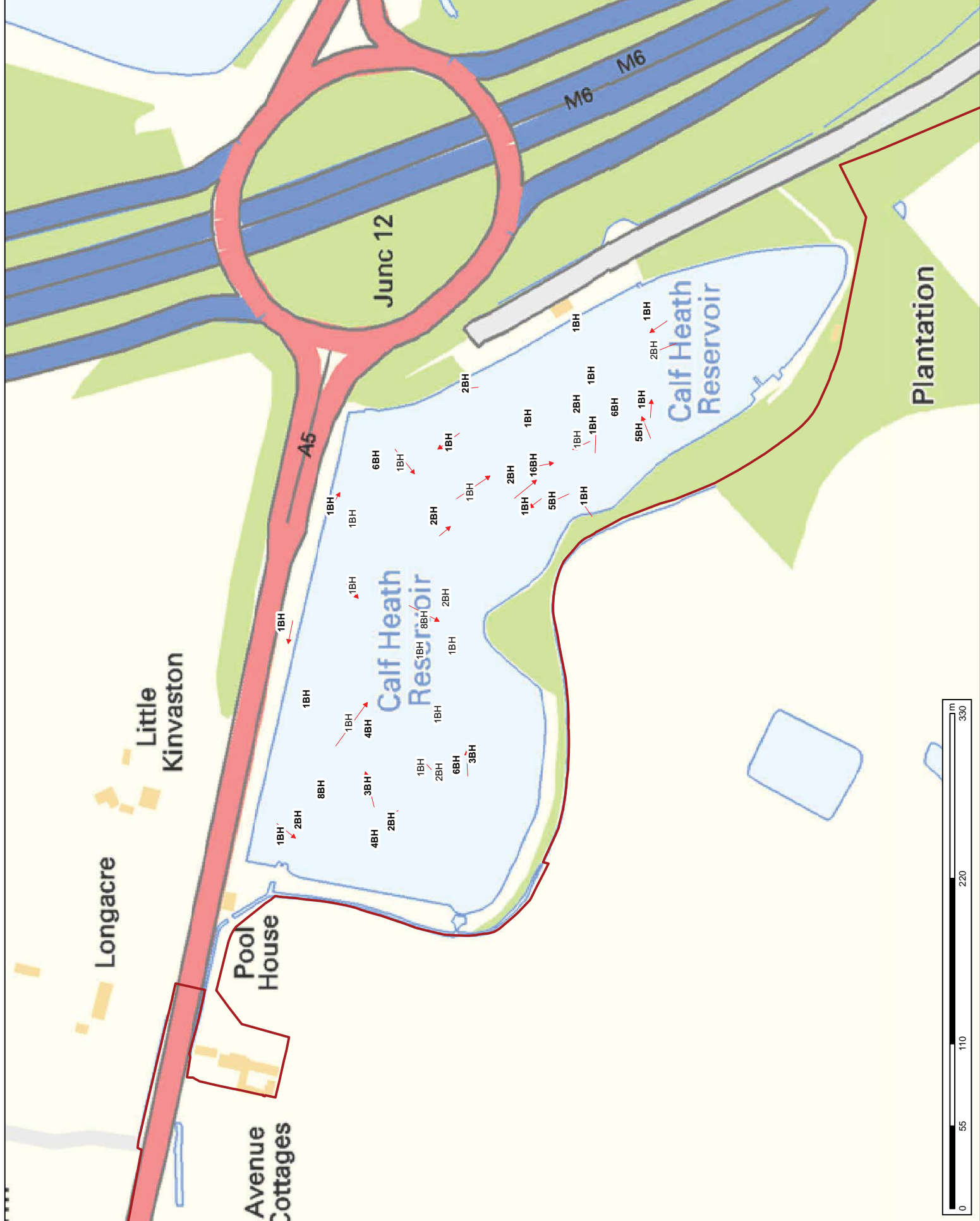
Figure Title Figure 10.1.439  
Wintering Bird Distribution -  
Staring



Date 06/03/2018

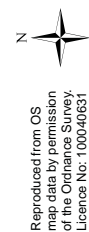
Scale 1:8,000 @A3





**Legend**

- Site boundary
- Bird Registration
- Flights



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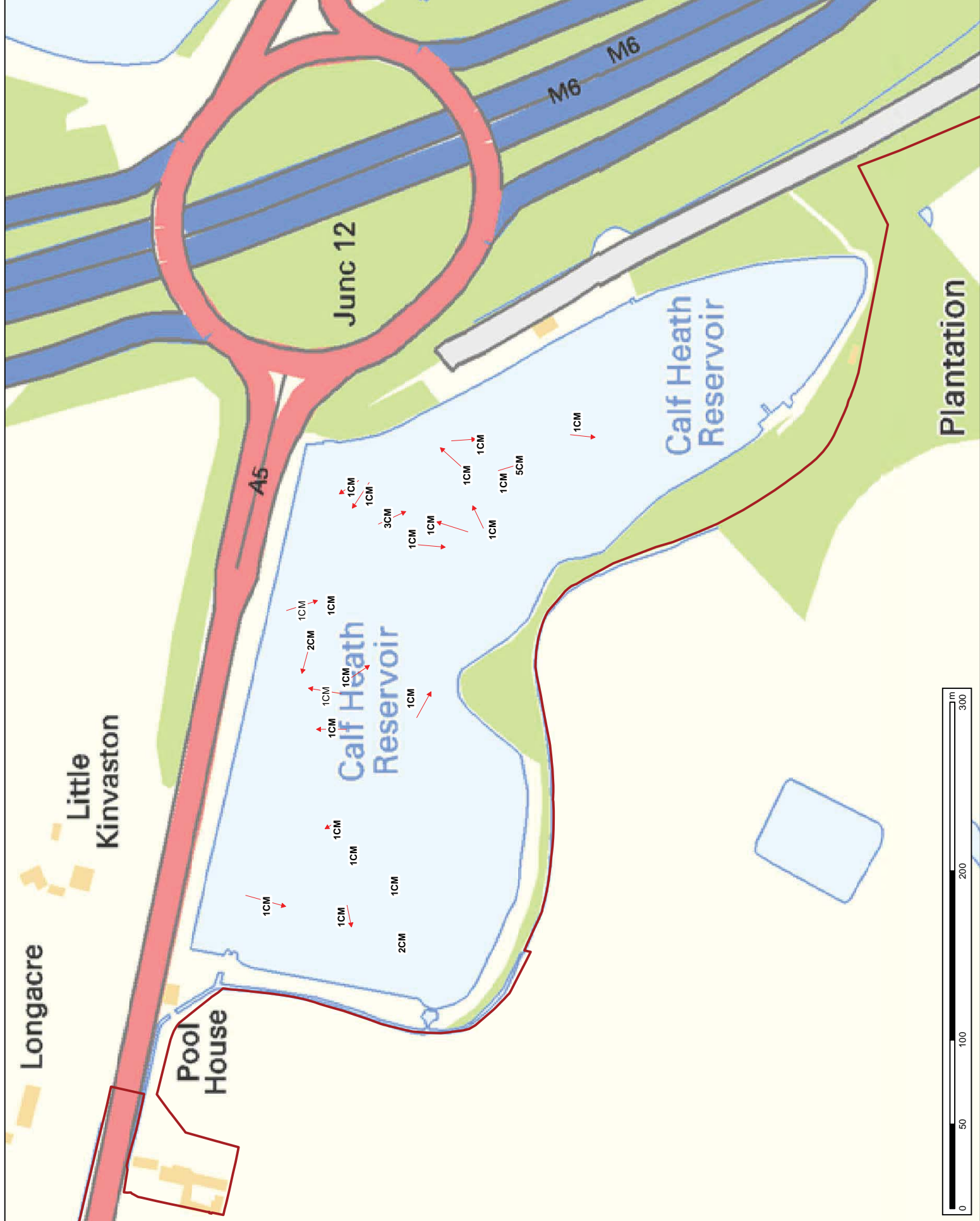
**Four Ashes Limited (FAL)**

Project Title  
**West Midlands Interchange (WMI)**  
 Project Number  
**1620002055**

Figure Title Figure 10.1.44b  
 Distribution of  
 Calf Heath Reservoir  
 Blackheaded gull



Date 06/03/2018  
 Scale 1:2,250 @A3



Legend  
 Site boundary  
 Bird Registration  
 Flights

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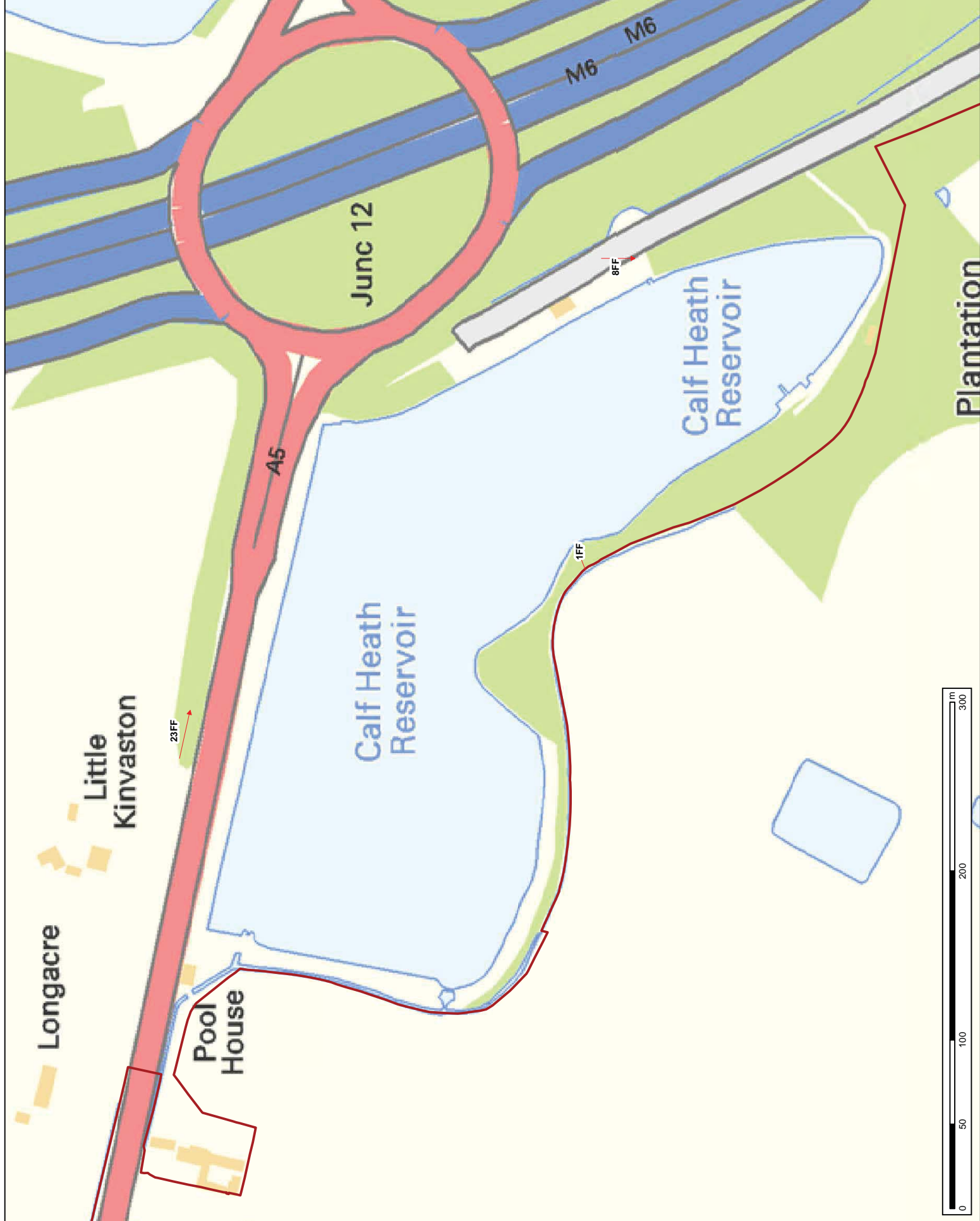
Project Title  
**West Midlands Interchange (WMI)**  
 Project Number  
**1620002055**

Figure Title  
**Figure 10.1.443  
 Distribution of  
 Calf Heath Reservoir  
 Common gull**

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Date **06/03/2018**  
 Scale **1:2,000 @A3**





Legend



Site boundary

Bird Registration



Flights



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Project Title

**West Midlands Interchange (WMI)**

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Figure Title Figure 10.1.442  
 Wintering Bird Distribution  
 Calf Heath Reservoir  
 Fieldfare



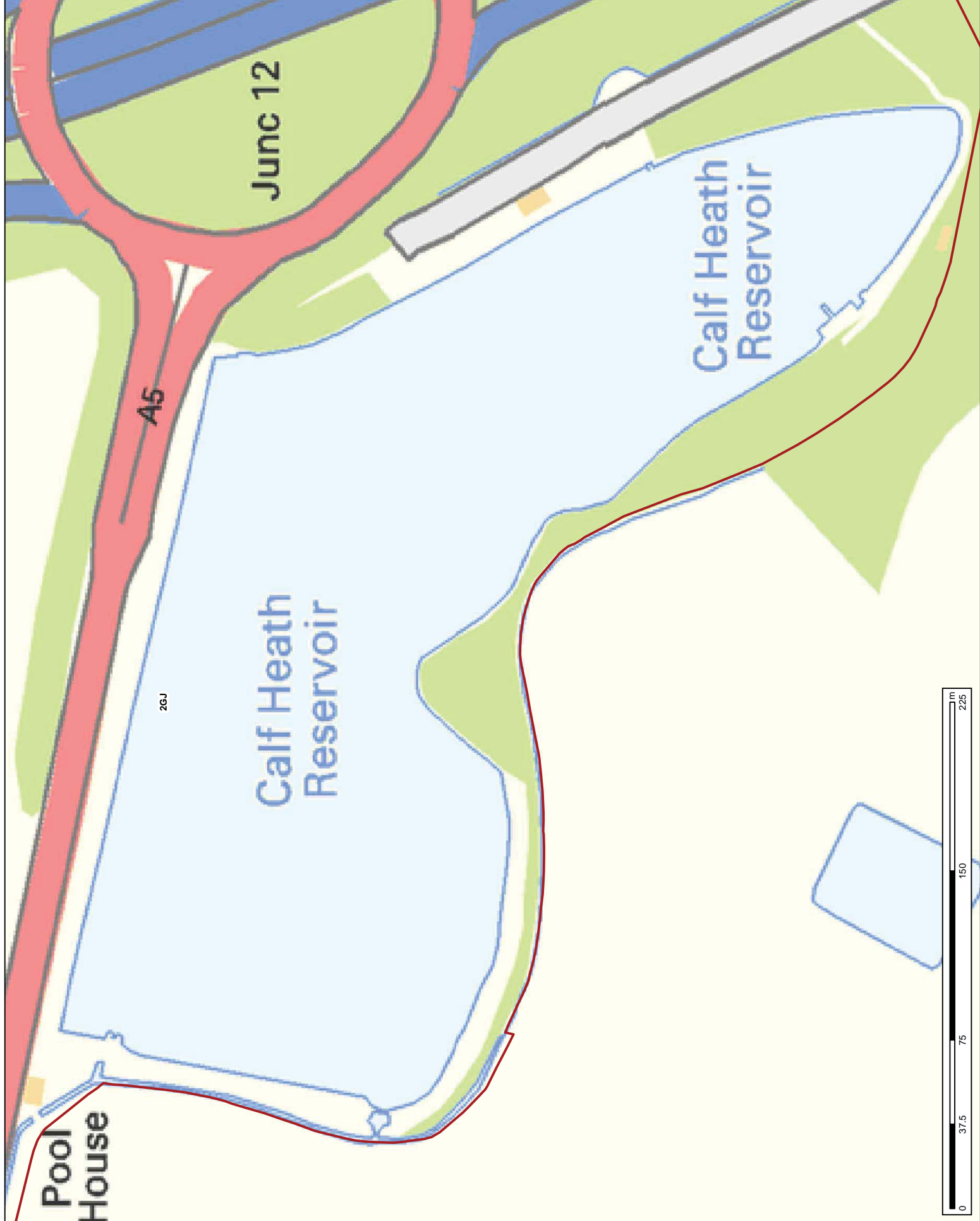
Tel: 023 8081 7500 southampton@ramboll.co.uk  
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Date 06/03/2018

Scale 1:2,000 @A3







- Legend**
- Site boundary
  - Bird Registration
  - Flights

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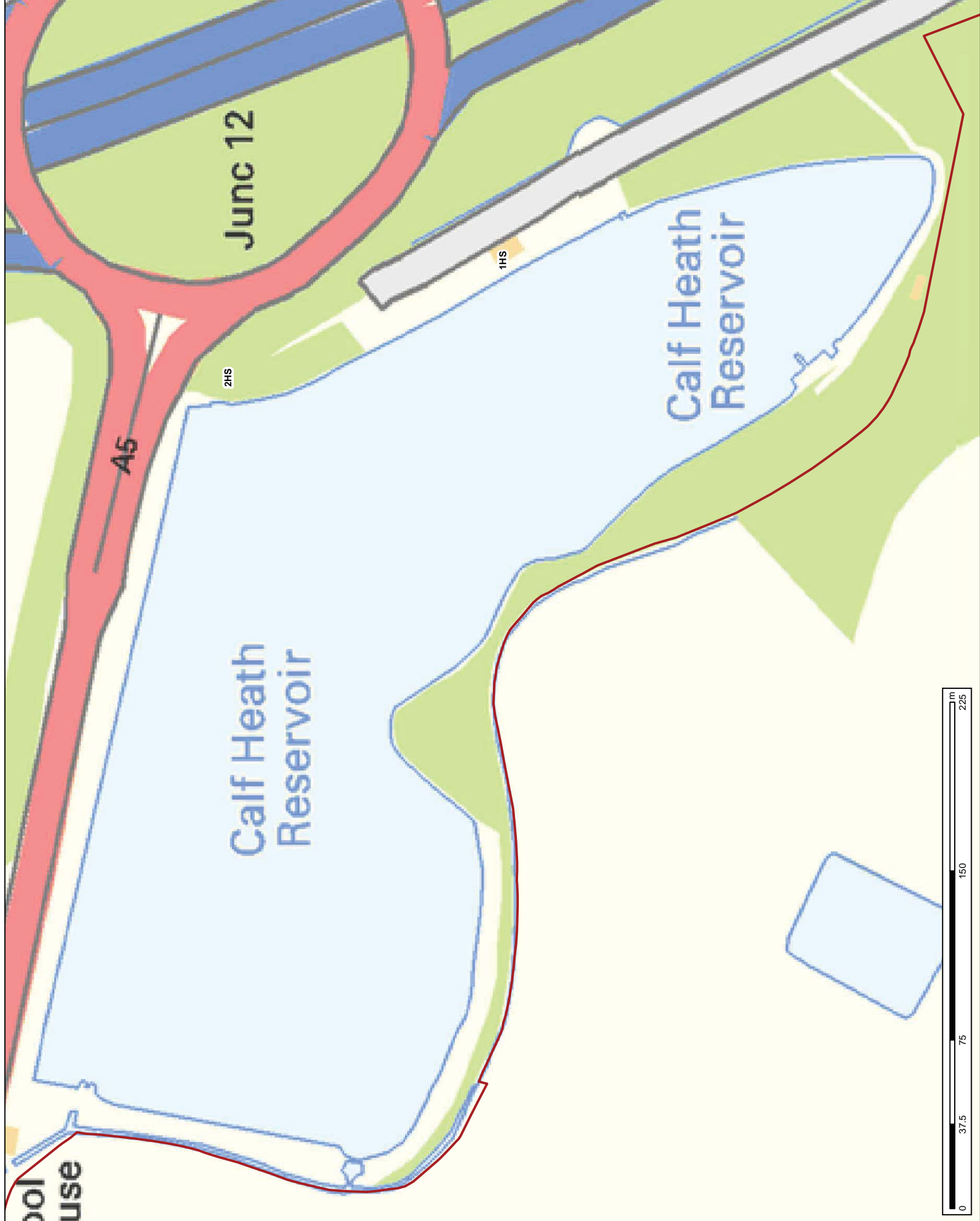
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**Four Ashes Limited (FAL)**

Project Title  
**West Midlands Interchange (WMI)**  
Project Number  
**1620002055**

Figure Title **Figure 10.1.4.8**  
**Wildlife Bird Distributions**  
**Calf Heath Reservoir**  
Greylag



Date **06/03/2018**  
Scale **1:1,500 @A3**



Legend



Site boundary

Bird Registration



Flights



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Project Number

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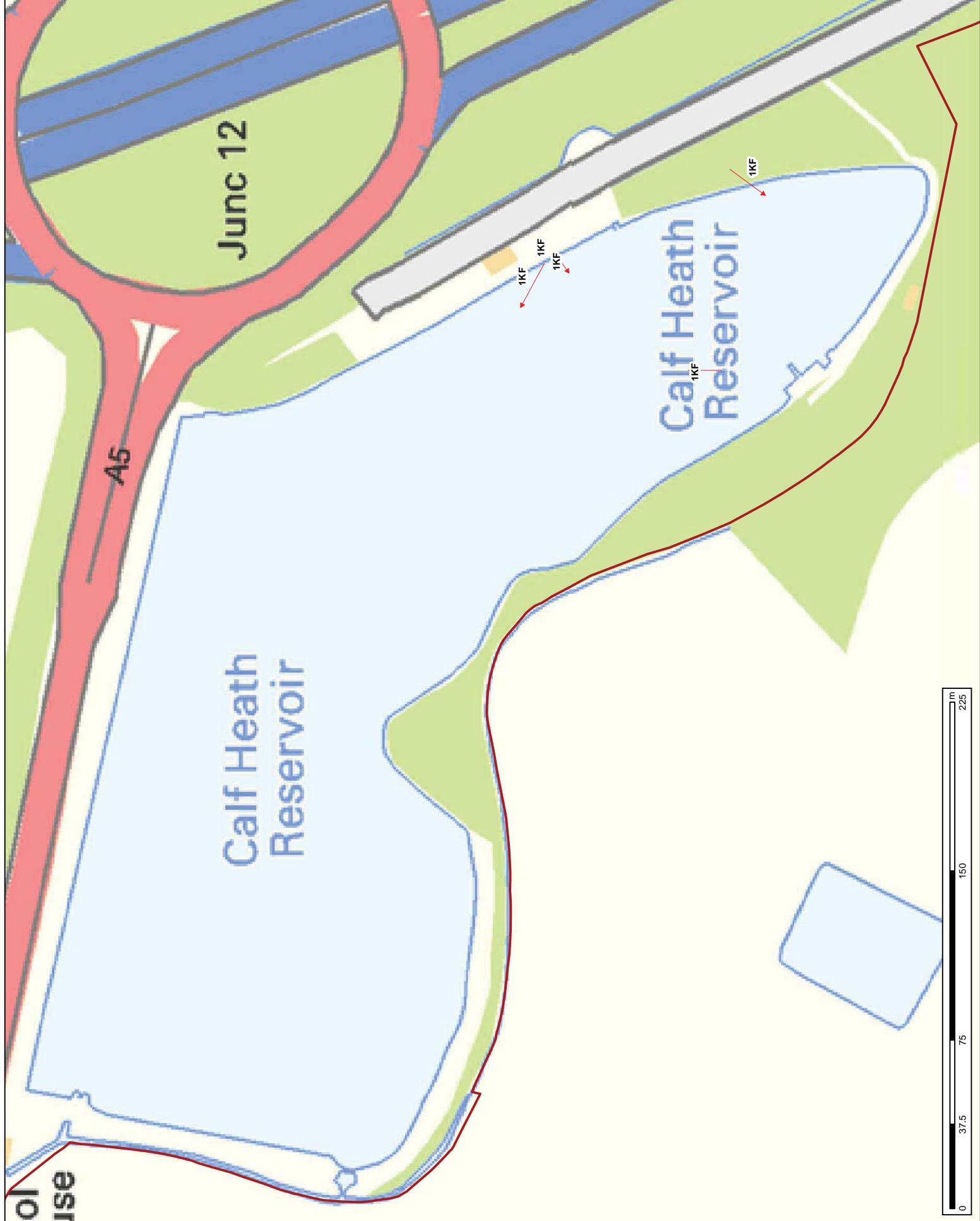
Figure Title Figure 10.1.444  
 Planning and Distribution  
 Calf Heath Reservoir  
 House Sparrow



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Date 06/03/2018

Scale 1:1,500 @A3



Legend



Site boundary

Bird Registration



Flights



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**West Midlands Interchange (WMI)**

Project Number

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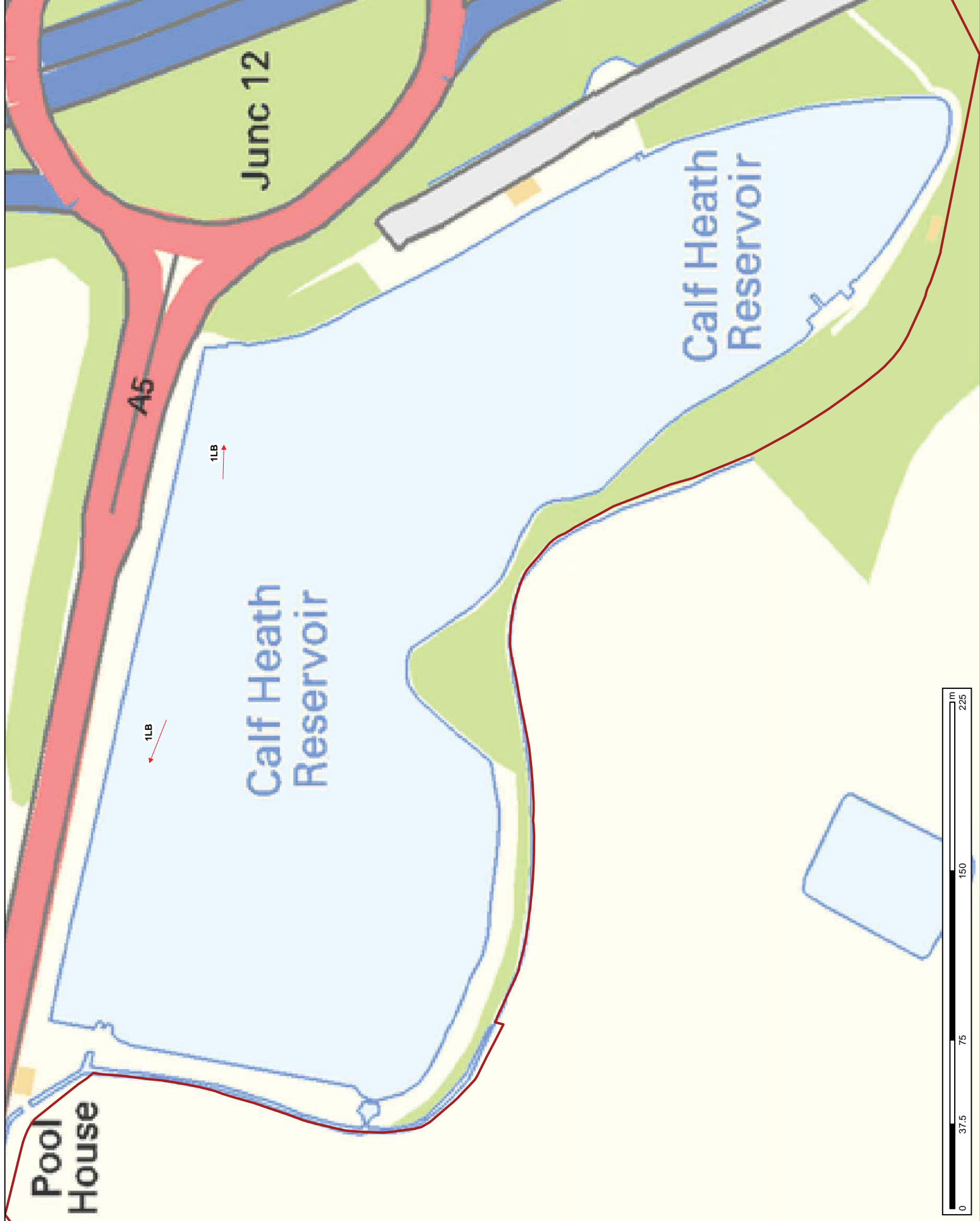
Figure Title Figure 10.1.4.45  
 Proposed Bird Distribution  
 Calf Heath Reservoir  
 Kierifisher



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Scale 1:1,500 @A3



Legend  
 Site boundary  
 Bird Registration  
 Flights

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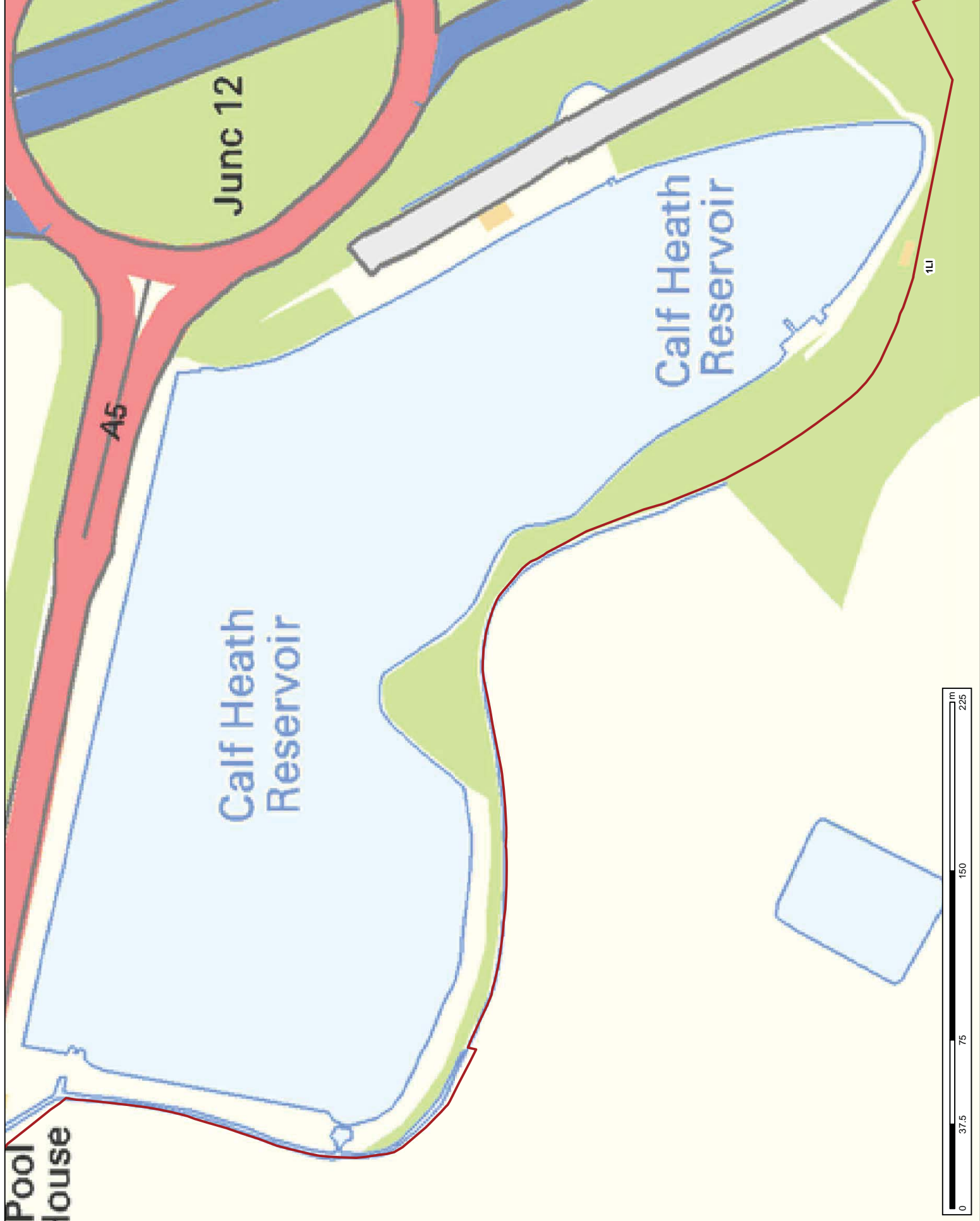
Client  
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Project Title  
**West Midlands Interchange (WMI)**  
 Project Number  
**1620002055**

Figure Title Figure 10.1.446  
 Distribution of  
 Calf Heath Reservoir  
 Lesser black-backed gull

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 Scale 1:1,500 @A3



Legend

- Site boundary
- Bird Registration
- Flights

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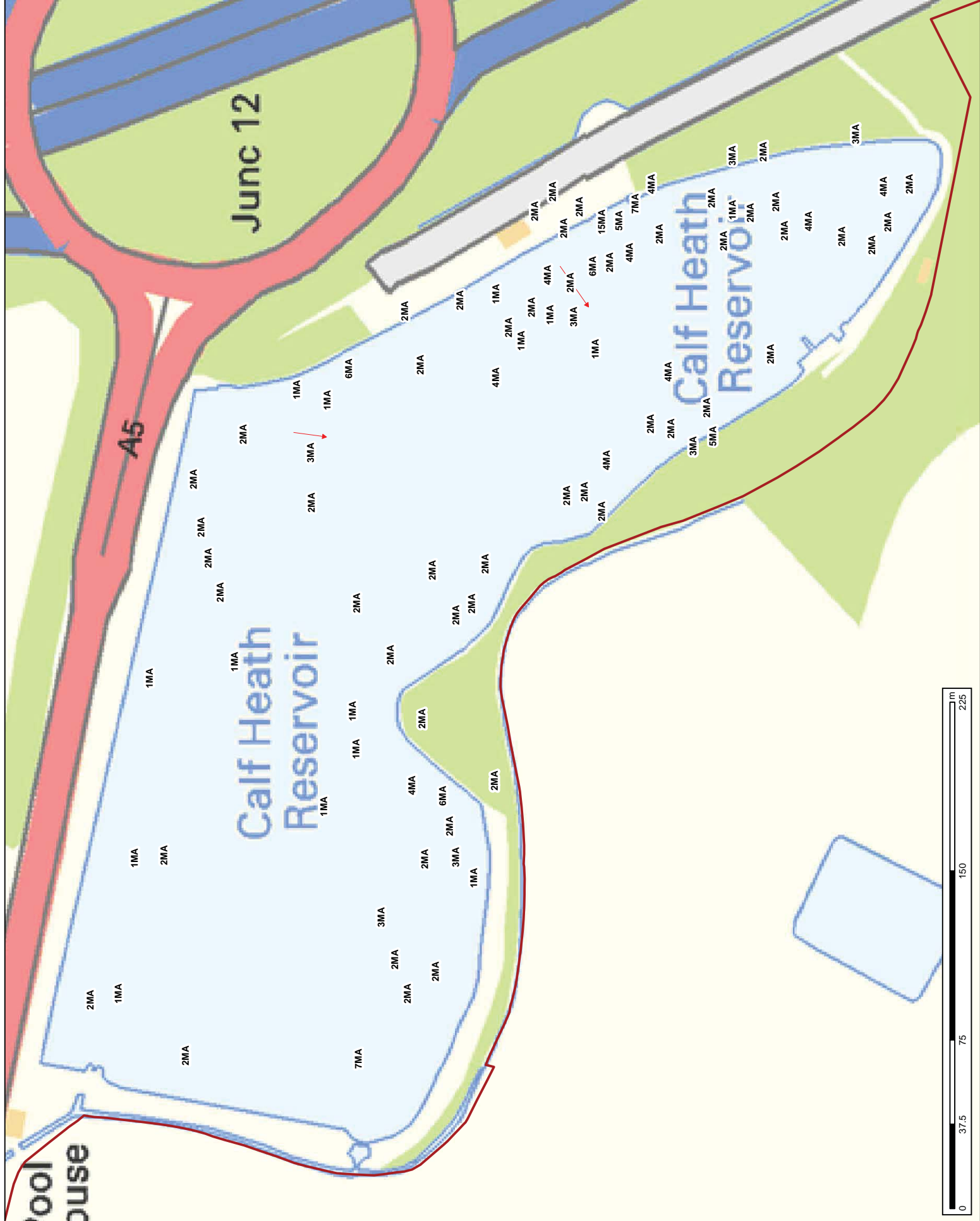
Client  
**Four Ashes Limited (FAL)**

Project Title  
**West Midlands Interchange (WMI)**  
Project Number  
**1620002055**

Figure Title  
**Figure 10.1.447  
Wintering Bird Distribution  
Calf Heath Reservoir  
Limet**

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Scale **1:1,500 @A3**



**Legend**

- Bird Registration
- Flights
- Site boundary

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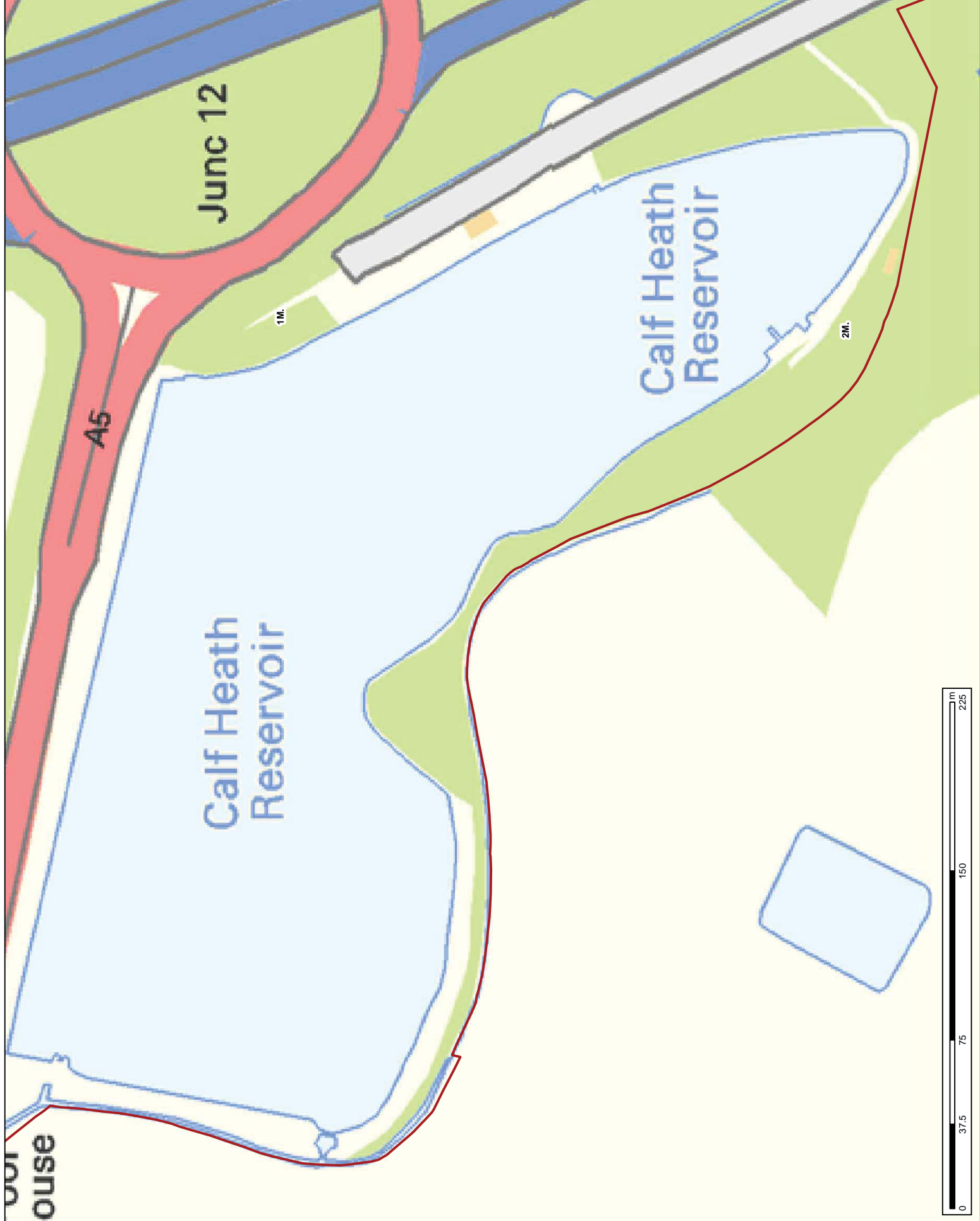
Project Number  
**1620002055**

Figure Title  
**Figure 10.1.448  
Mapping Bird Distributions  
Calf Heath Reservoir -  
Mallard**



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Scale **1:1,500 @A3**



Legend



Site boundary

Bird Registration



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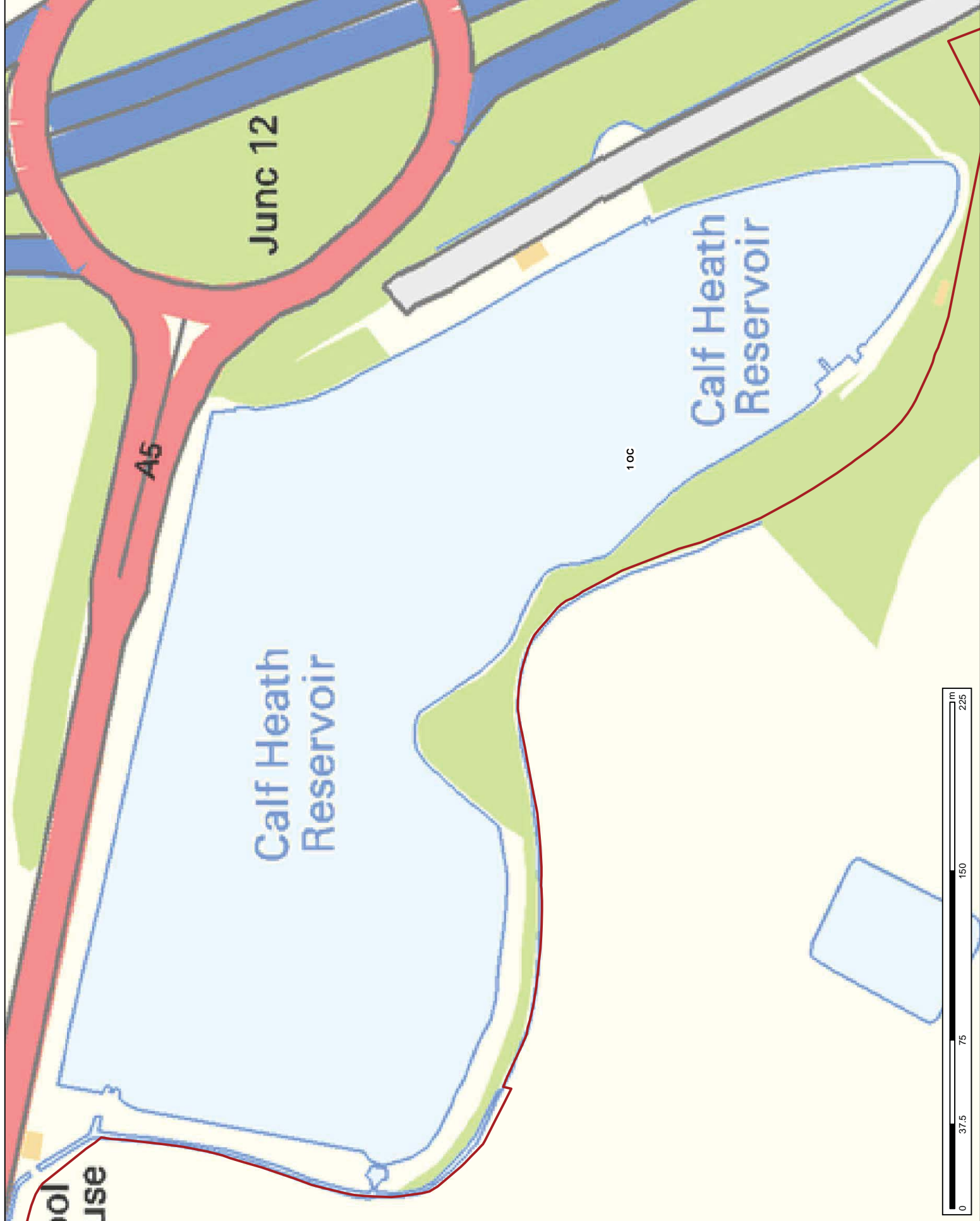
**1620002055**

Figure Title Figure 10.1.448 Distributions of Mistle thrush at Calf Heath Reservoir



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Scale 1:1,500 @A3



Legend



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Bird Registration



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Figure Title Figure 10.1.450  
Map of the Bird Distribution  
at Calf Heath Reservoir  
Oystercatcher



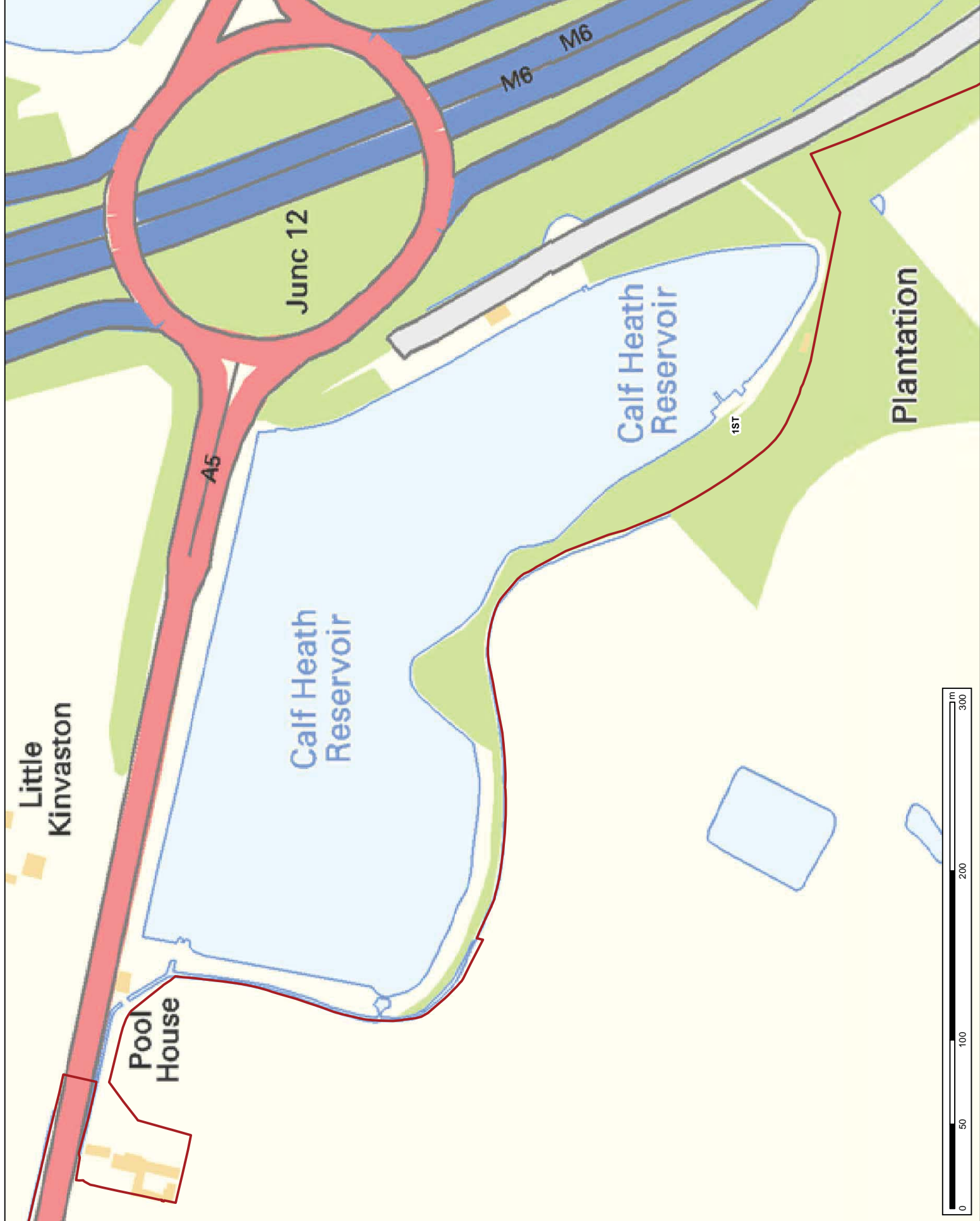
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Scale 1:1,500 @A3







**Legend**  
 Site boundary  
 Bird Registration  
 Flights



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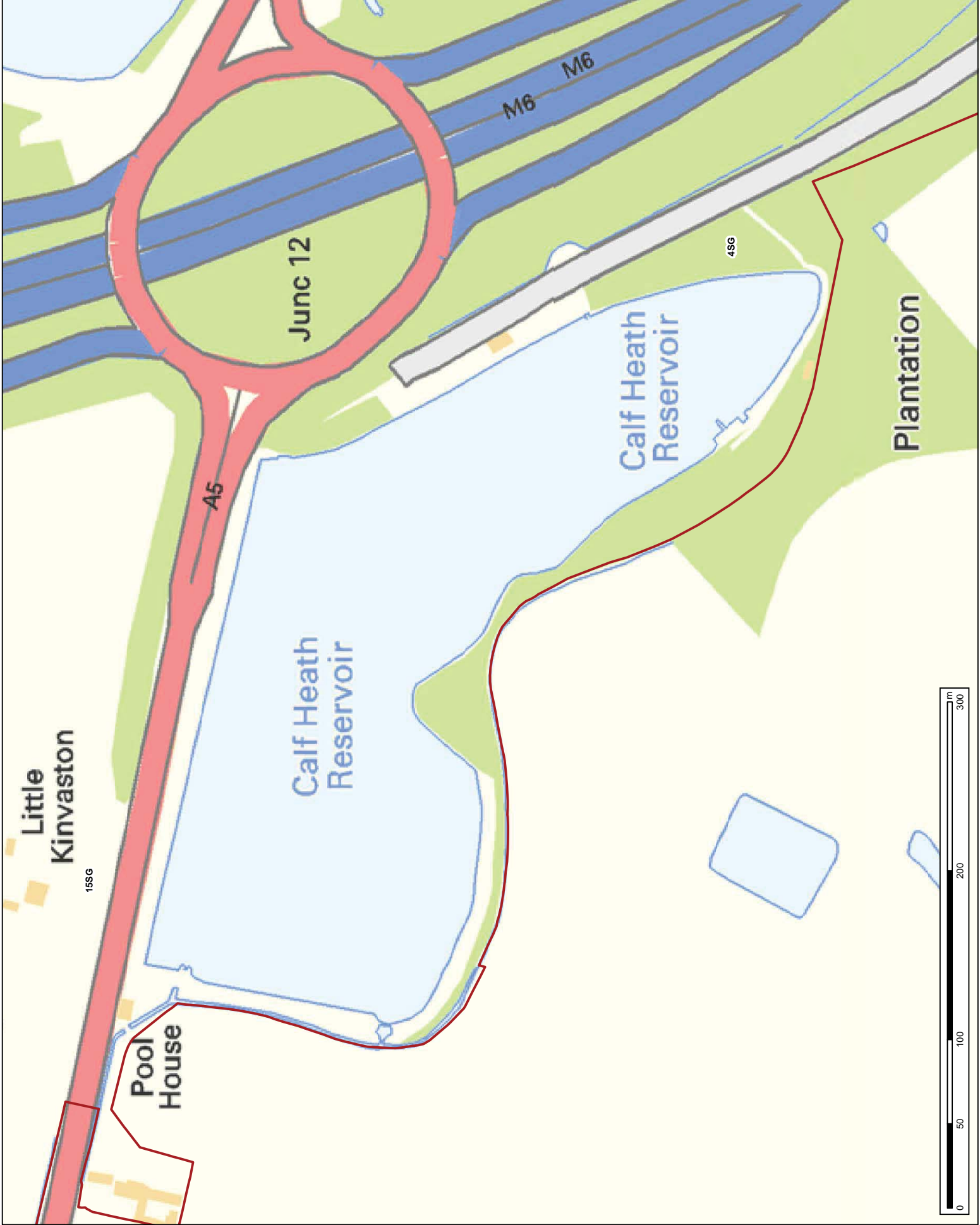
Project Title  
**West Midlands Interchange (WMI)**  
 Project Number  
**1620002055**

Figure Title Figure 10.1.451  
 Distribution of Song Thrushes at Calf Heath Reservoir



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 Scale 1:2,000 @A3





Legend



Site boundary

Bird Registration



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Project Number

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Figure Title Figure 10.1.452  
 West Midlands Interchange  
 Calf Heath Reservoir  
 Starting



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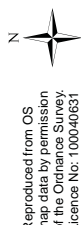
Date 06/03/2018

Scale 1:2,000 @A3



# Legend

- Site boundary
- Bird Registrations
- Flights



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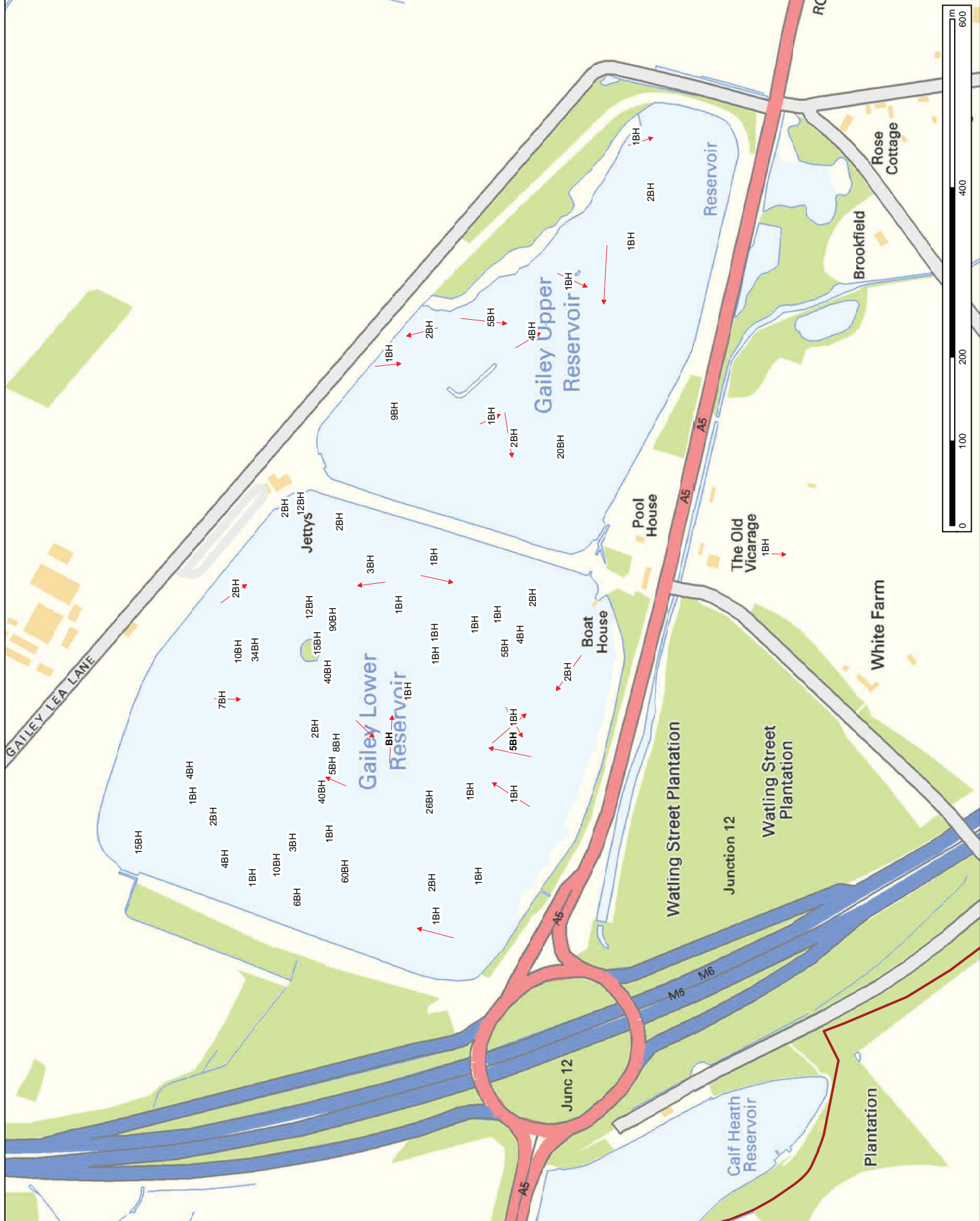
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Figure Title Figure 10.1.453  
Map of Bird Distributions  
Gailey Reservoir,  
Black-headed gull



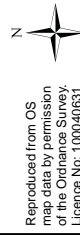
Date 06/03/2018

Scale 1:4,000 @A3



# Legend

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- Bird Registrations
- Flights



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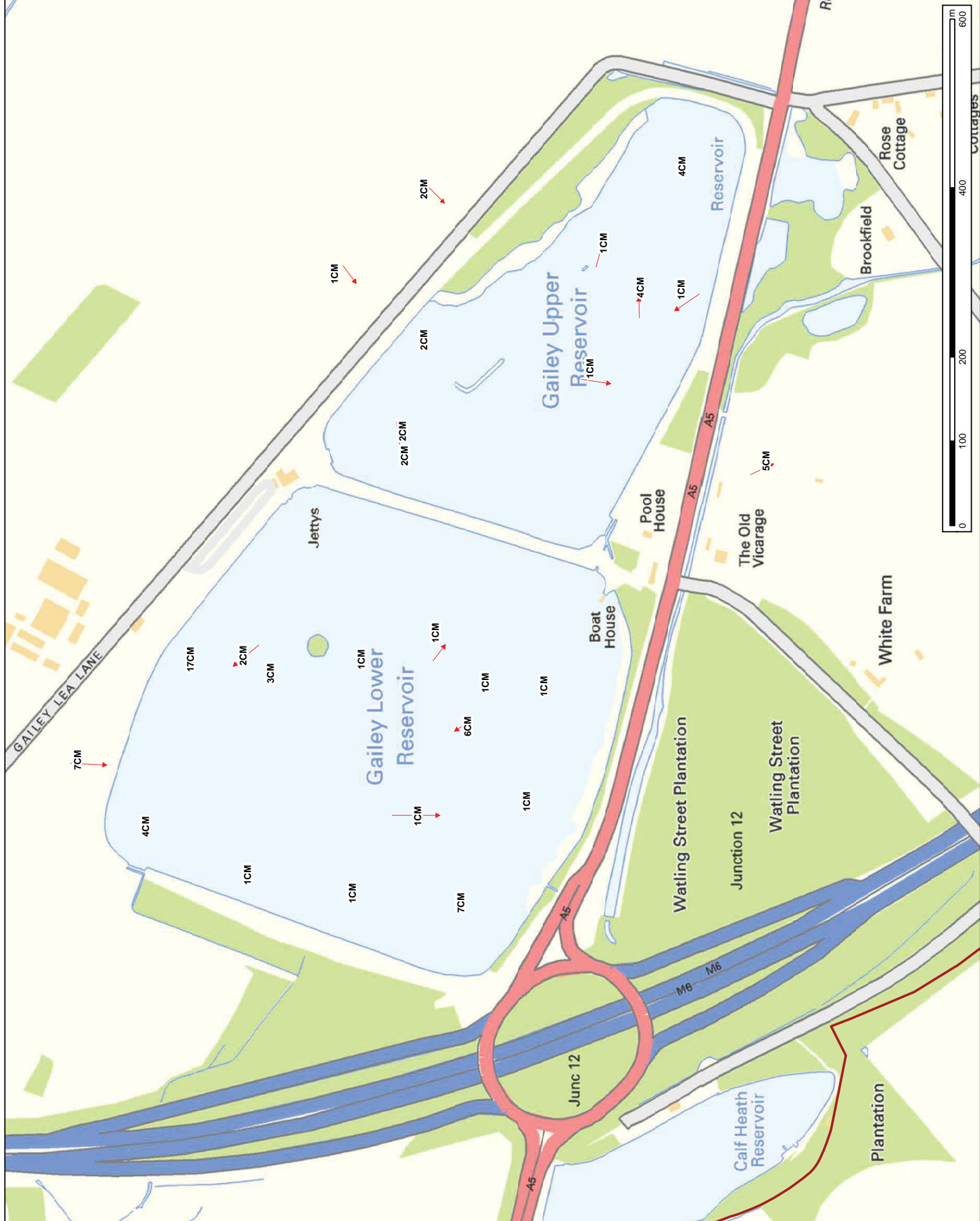
Figure Title Figure 10.1.454  
Map of Bird Registrations  
Gailey Reservoir  
Common gull



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# Legend

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- Flights



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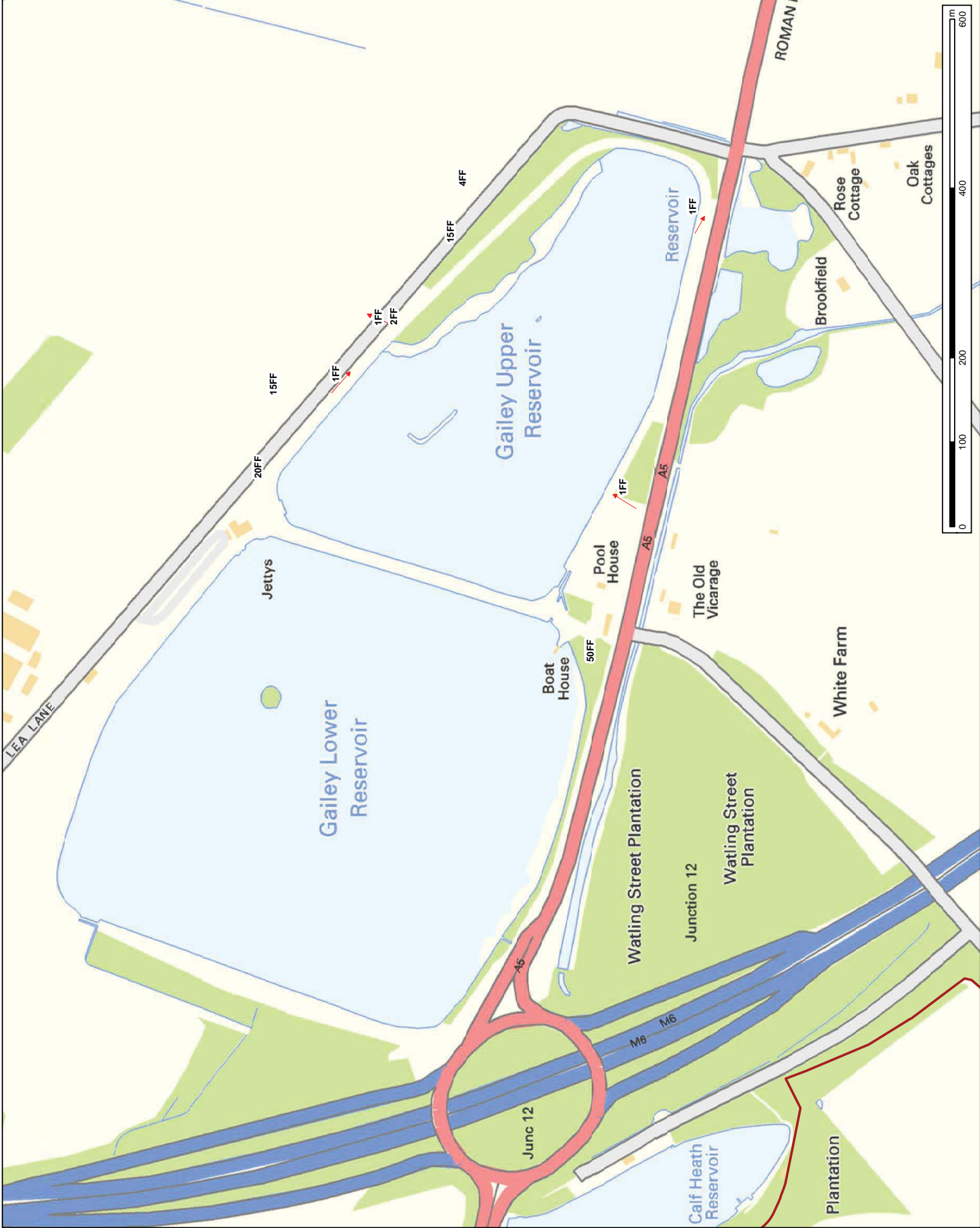
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Figure Title Figure 10.1.455  
Showing Bird Distribution  
Gailey Reservoir  
Fieldfare



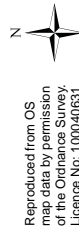
Date 06/03/2018

Scale 1:4,000 @A3



# Legend

- Site boundary
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- Flights



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Figure Title  
**Figure 10.1.455  
Map of Bird Distributions  
Gailey Reservoir-  
Greylag**



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- Flights



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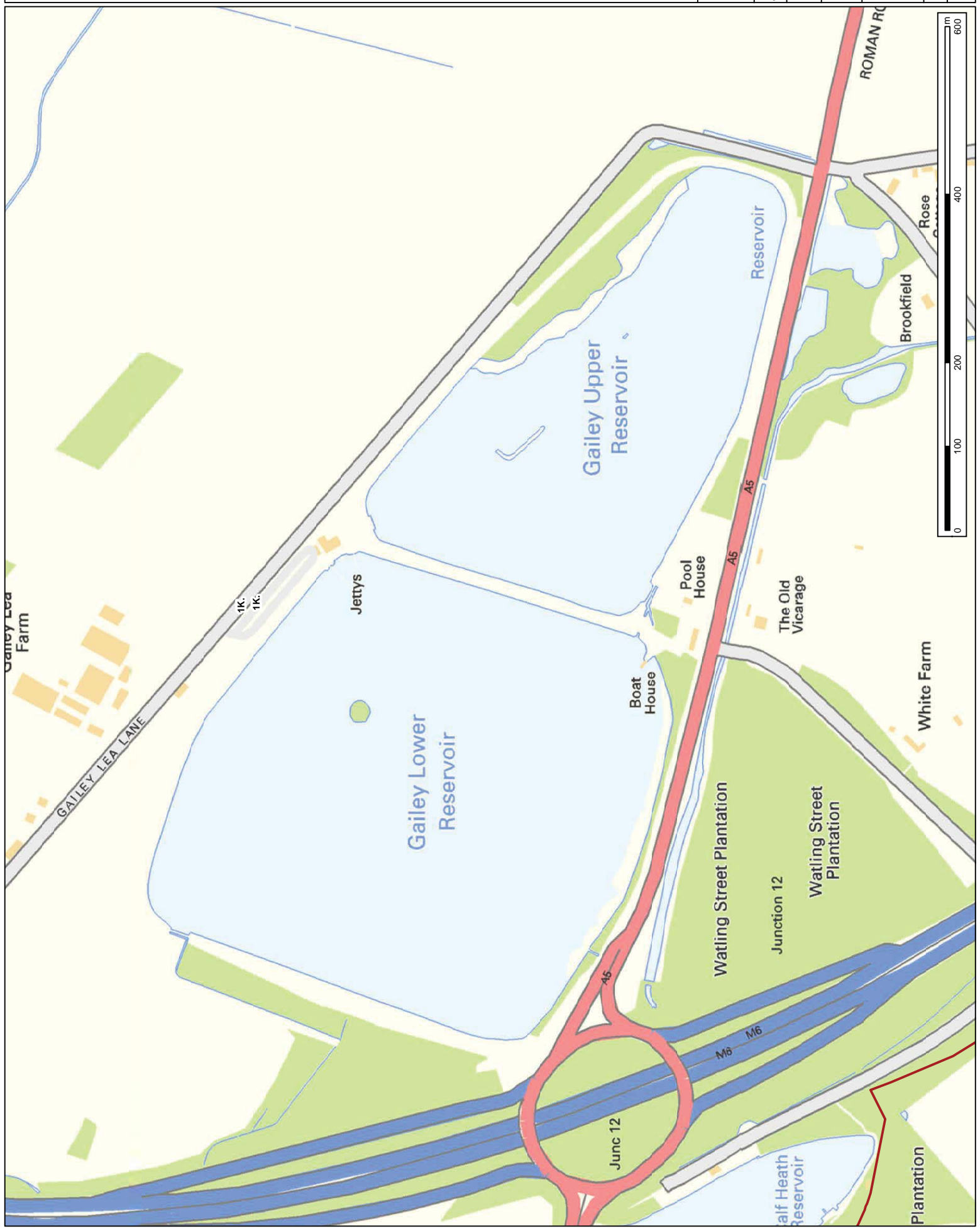
Figure Title Figure 10.1.457  
Wintering Bird Distribution  
at Gailey Reservoir-  
Kestrel



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Figure Title

**Figure 10.1.458**

**Map of Bird Distributions**

**Gailey Reservoir**

**Lapwing**



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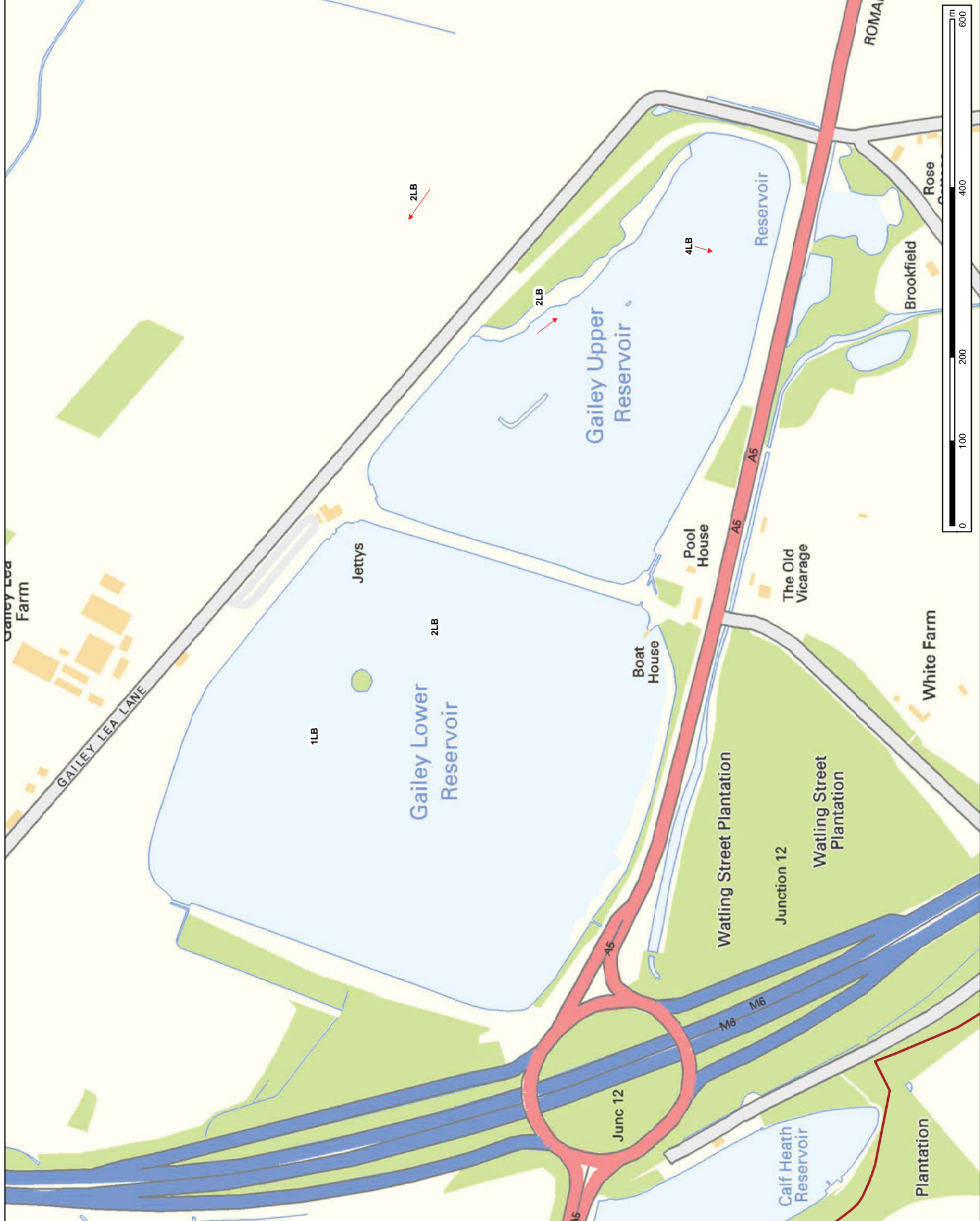
Figure Title Figure 10.1.459  
Map of Bird Distributions  
Gailey Reservoir,  
Lesser black-backed gull



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Figure Title Figure 10.1.460  
Wintering Bird Distribution  
at Reservoir  
Linet



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-  Bird registrations
-  Flights



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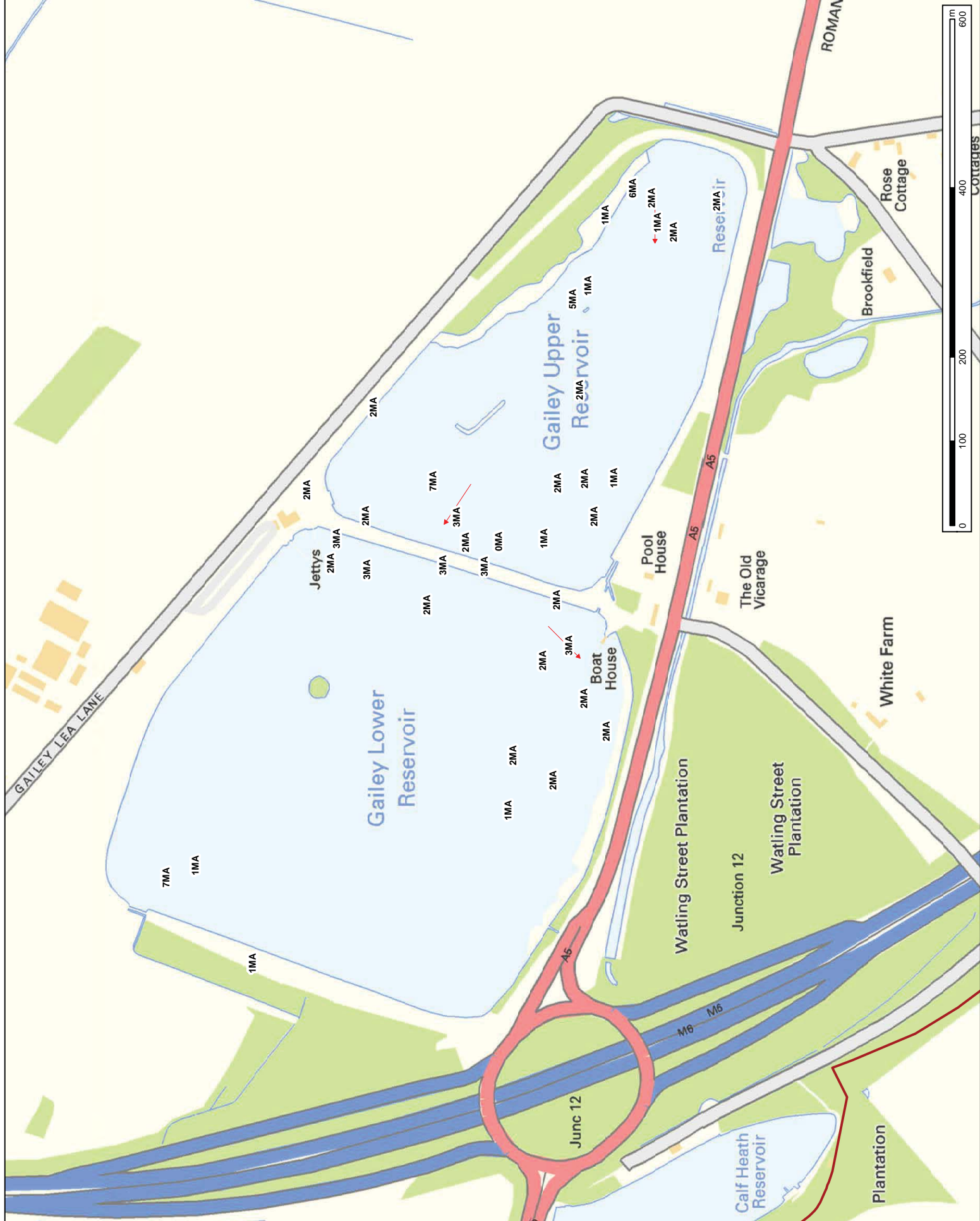
Project Number  
**1620002055**

Figure Title Figure 10.1.461  
Wintering Bird Distribution  
at Gailey Reservoir  
Mallard



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Scale **1:4,000 @A3**



Cottages

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Figure Title

**Figure 10.1.462 Distribution of Mediterranean gull**



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Figure Title Figure 10.1.463

Majoring Bird Distributions  
Gailey Reservoir



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# Legend

- Site boundary
- Bird registrations
- Flights



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Figure Title Figure 10.1.464

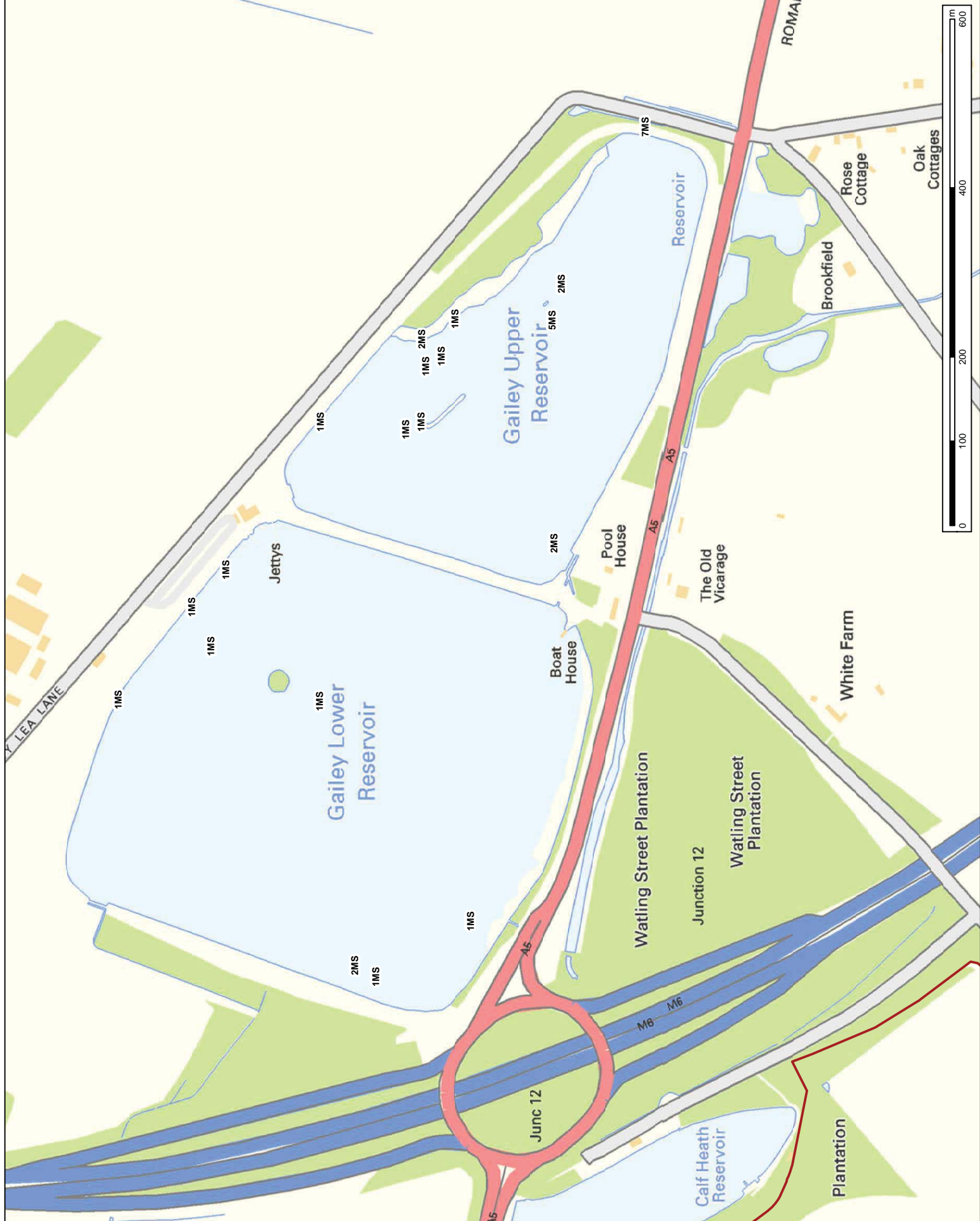
Waterfowl Bird Distribution  
Gailey Reservoir  
Mills Swan



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- Bird registrations
- Flights



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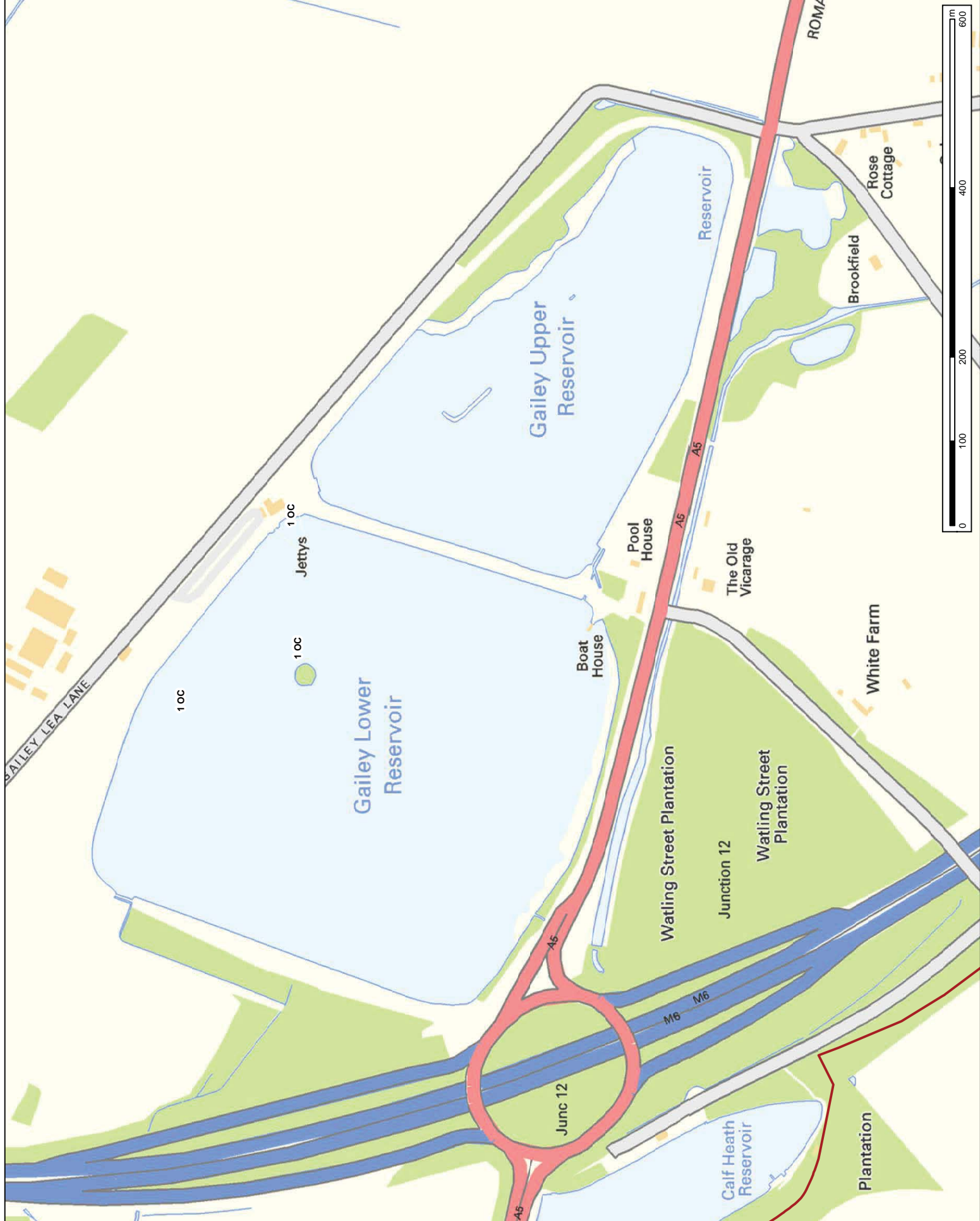
**1620002055**

Figure Title Figure 10.1.465  
Planning Bird Distribution  
Gaugley Reservoirs  
Oystercatcher



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Scale 1:4,000 @A3



BAILEY LEA LANE

10c

Jettys

10c

10c

Gailey Lower Reservoir

Boat House

Gailey Upper Reservoir

Pool House

The Old Vicarage

White Farm

Watling Street Plantation

Junction 12

Watling Street Plantation

Rose Cottage

Brookfield

ROMA

A5

M6

M6

Junc 12

Calf Heath Reservoir

Plantation



**Legend**

- Site boundary
- Bird Registrations



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**West Midlands Interchange (WMI)**

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Figure Title  
**Figure 10.1.468  
Pink-footed Goose  
Registrations  
Gailey Reservoir,  
Pink-footed goose**



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Date **06/03/2018**

Scale **1:4,400 @A3**





# Legend

- Site boundary
- Bird Registrations
- Flights



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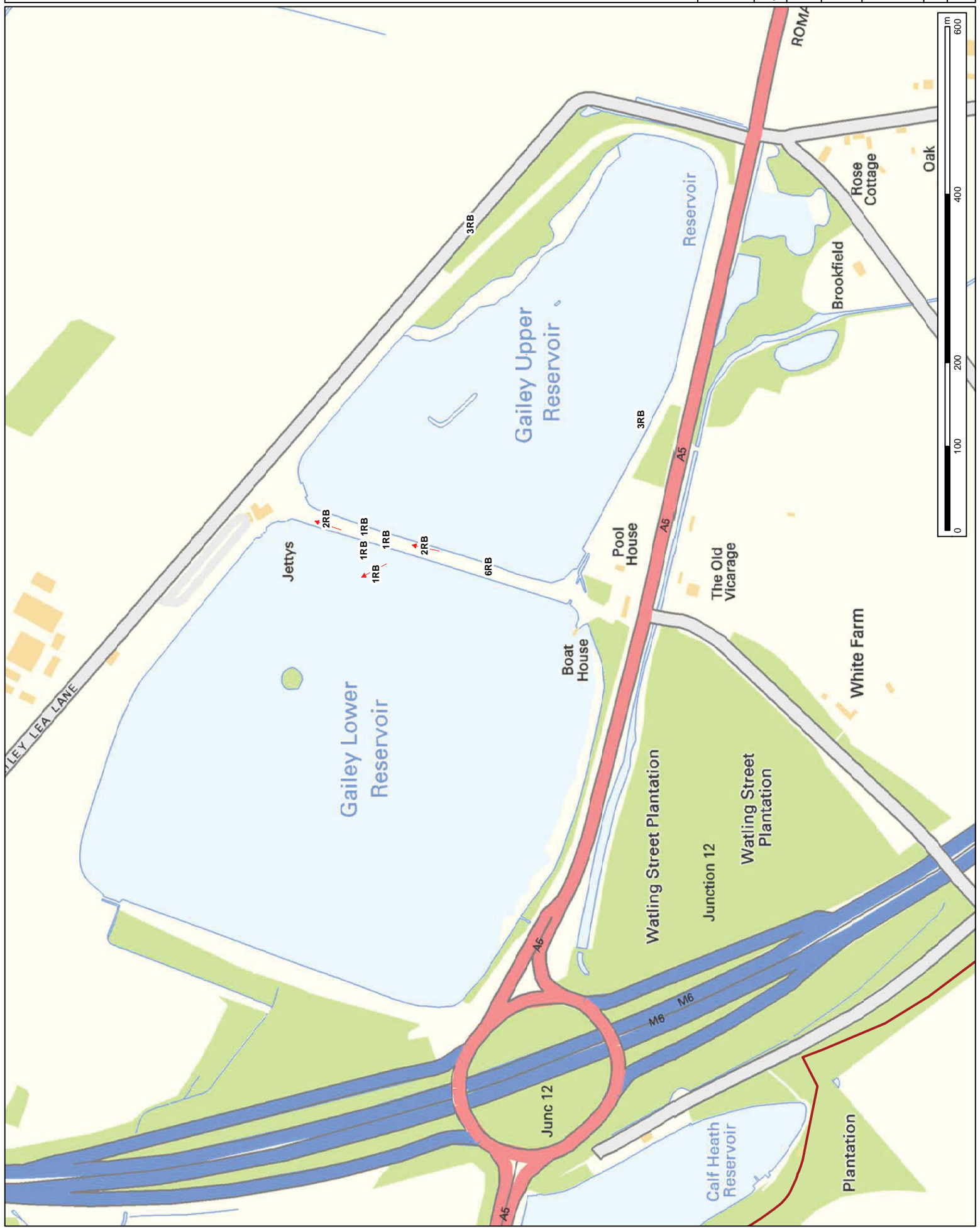
**1620002055**

Figure Title Figure 10.1.467  
Planning Bird Distribution  
Gaugley Reservoir  
Reed hunting.



Date 06/03/2018

Scale 1:4,000 @A3



**Legend**

- Site boundary
- Bird Registrations
- Flights



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**West Midlands Interchange (WMI)**

Project Number

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Figure Title: Figures 10.1.468  
West Midlands Interchange (WMI) -  
Gailey Reservoir -  
Skylark



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- Flights



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Project Number

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Figure Title

**Figure 10.1.469  
Wintering Bird Distribution  
Gailey Reservoir -  
Starling**

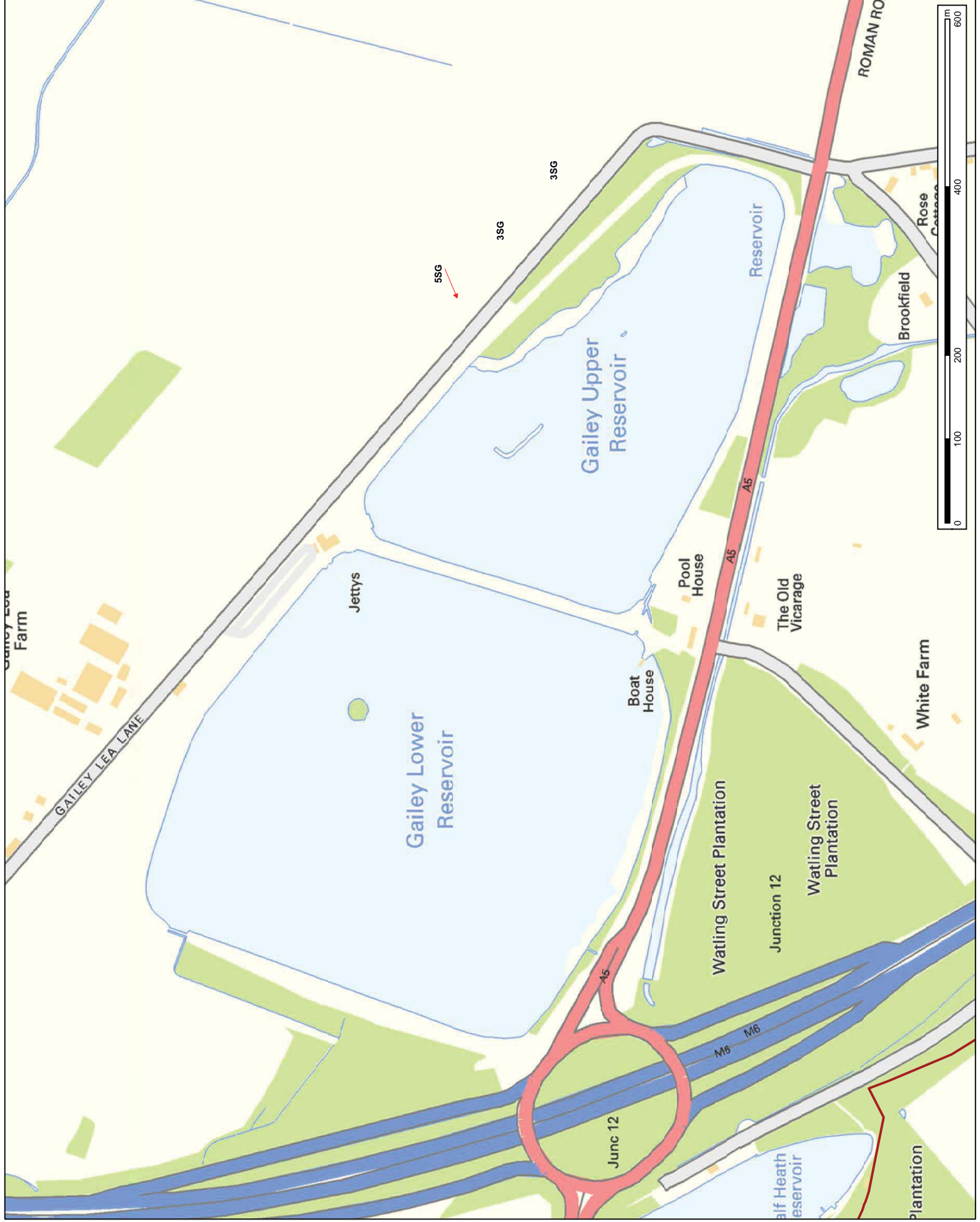


Date

**06/03/2018**

Scale

**1:4,000 @A3**



**Legend**

- Site boundary
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- Flights



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Figure Title Figure 10.1.470

Planning Bird Distribution  
Gailey Reservoirs  
Whitober Swan



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## FIGURE SERIES 600: BATS

10.1.601	Woodside Farmhouse
10.1.602	Woodside Barn
10.1.603	Fir Tree Cottage
10.1.604	Gailey Magazine
10.1.605	Gravelly Way – The Barn
10.1.606	Gravelly Way – The Farmhouse
10.1.607	Gravelly Way – The Stables
10.1.608	Croft House Emergence
10.1.609	Heath Farm Main Farmhouse Emergence
10.1.610	Heath Farm Outbuildings Emergence
10.1.611	Mile End Cottage Emergence
10.1.612	Ash House Emergence
10.1.613	Clovelly Emergence
10.1.614	Stoney Brook Cottage Emergence
10.1.615	Stoney Brook Cottage - Annexe Emergence
10.1.616	Bat Activity Survey Transect
10.1.617	Distribution of Static Bat Detectors
10.1.618	May Static Detector Locations and Species
10.1.619	June Static Detector Locations and Species
10.1.620	July Static Detector Locations and Species
10.1.621	August Static Detector Locations and Species
10.1.622	September Static Detector Locations and Species
10.1.623	October Static Detector Locations and Species
10.1.624	Bat Trapping Locations June 2016
10.1.625	Bat Trapping Locations August 2016
10.1.626	Bat Trapping Locations 2017
10.1.627	Bat Roost Potential of Trees to be Lost
10.1.628	May Bat Activity Survey
10.1.629	June Bat Activity Survey
10.1.630	July Bat Activity Survey
10.1.631	August Bat Activity Survey
10.1.632	September Bat Activity Survey
10.1.633	October Bat Activity Survey
10.1.634	Important Bat Commuting and Foraging Areas
10.1.635	Daubenton's Roosts June 2016
10.1.636	All Bat Roosts June 2016
10.1.637	All Bat Roosts August 2016
10.1.638	All Bat Roosts June 2017
10.1.639	All Bat Roosts August 2017
10.1.640	All on-site bat roosts in buildings
10.1.641	Off-Site Bat Roosts Close to the Red Line Boundary (2016 and 2017)



**Legend**

📍 Surveyor location

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**1620002055**

Figure Title

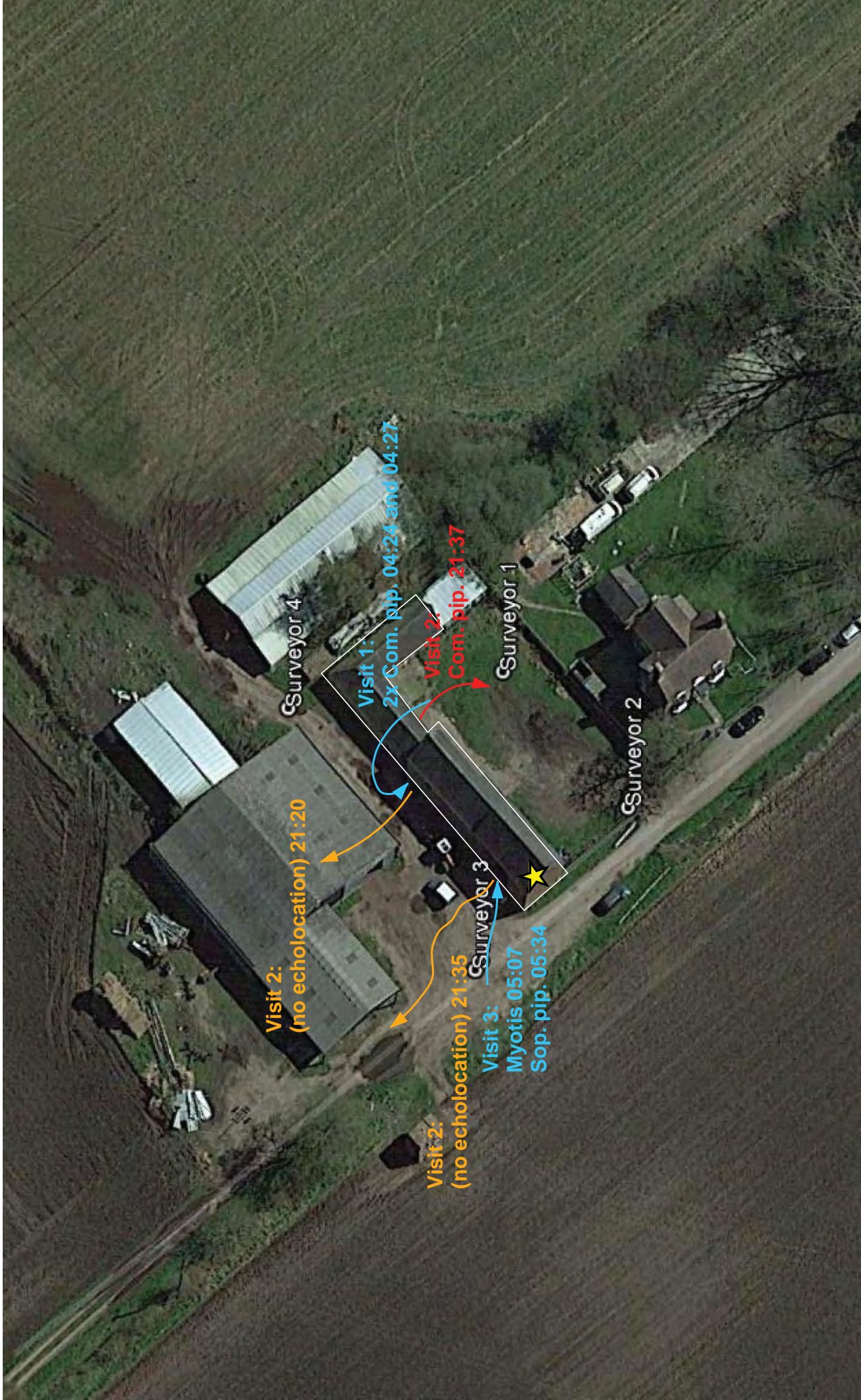
**Figure 10.1.601  
Woodside Farmhouse  
Emergence and Re-entry Surveys**



Tel: 023 8081 7500 southampton@ramboll.co.uk  
www.ramboll.co.uk

Date **06/03/2018**

Scale **Not to Scale**



Visit 2:  
(no echolocation) 21:20

Visit 1:  
2x Com. pip. 04:24 and 04:27

Visit 2:  
(no echolocation) 21:35

Visit 3:  
Myotis 05:07  
Sop. pip. 05:34

Visit 2:  
Com. pip. 21:37

Surveyor 4

Surveyor 1

Surveyor 2

Surveyor 3



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Figure Title

**Figure 10.1.603  
Fir Tree Cottage  
Emergence and Re-entry Surveys**



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Scale Not to Scale





**Legend**

- 📍 Surveyor location
- Bat emergence
- ↩ Bat re-entry
- Access point

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Figure Title  
**Figure 10.1.604  
 Galleys Magazine  
 Emergence and Re-entry Surveys**



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 southampton@ramboll.co.uk  
 www.ramboll.co.uk

Date **06/03/2018**

Scale **Not to Scale**

**August bat activity survey:  
 5 x pip. emergence  
 (com. & sop.) 21:13**

**Visit 2:  
 Sop. pip. 04:38**

**Visit 1:  
 Com. pip. 21:38**

**Visit 2:  
 Sop. pip. 05:01**

**Visit 2:  
 Sop. pip. 04:45**



**Legend**

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Figure Title

**Figure 10.1.605  
Gravelly Way - The Barn  
Emergency and Re-entry Surveys**



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Figure Title

**Figure 10.1.606  
Gravelly Way - The Farmhouse  
Emergence and Re-entry Surveys**



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Scale **Not to Scale**



**Legend**

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Project Number

**1620002055**

Figure Title

**Figure 10.1.607  
Gravelly Way - The Stables  
Emergency and Re-entry Surveys**



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Date **06/03/2018**

Scale **Not to Scale**

**Legend**

- Surveyor location
- Bat re-entry
- Access point
- ★ DNA sample location

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Figure Title

**Figure 10.1.608  
Croft House  
Emergency and Re-entry Surveys**

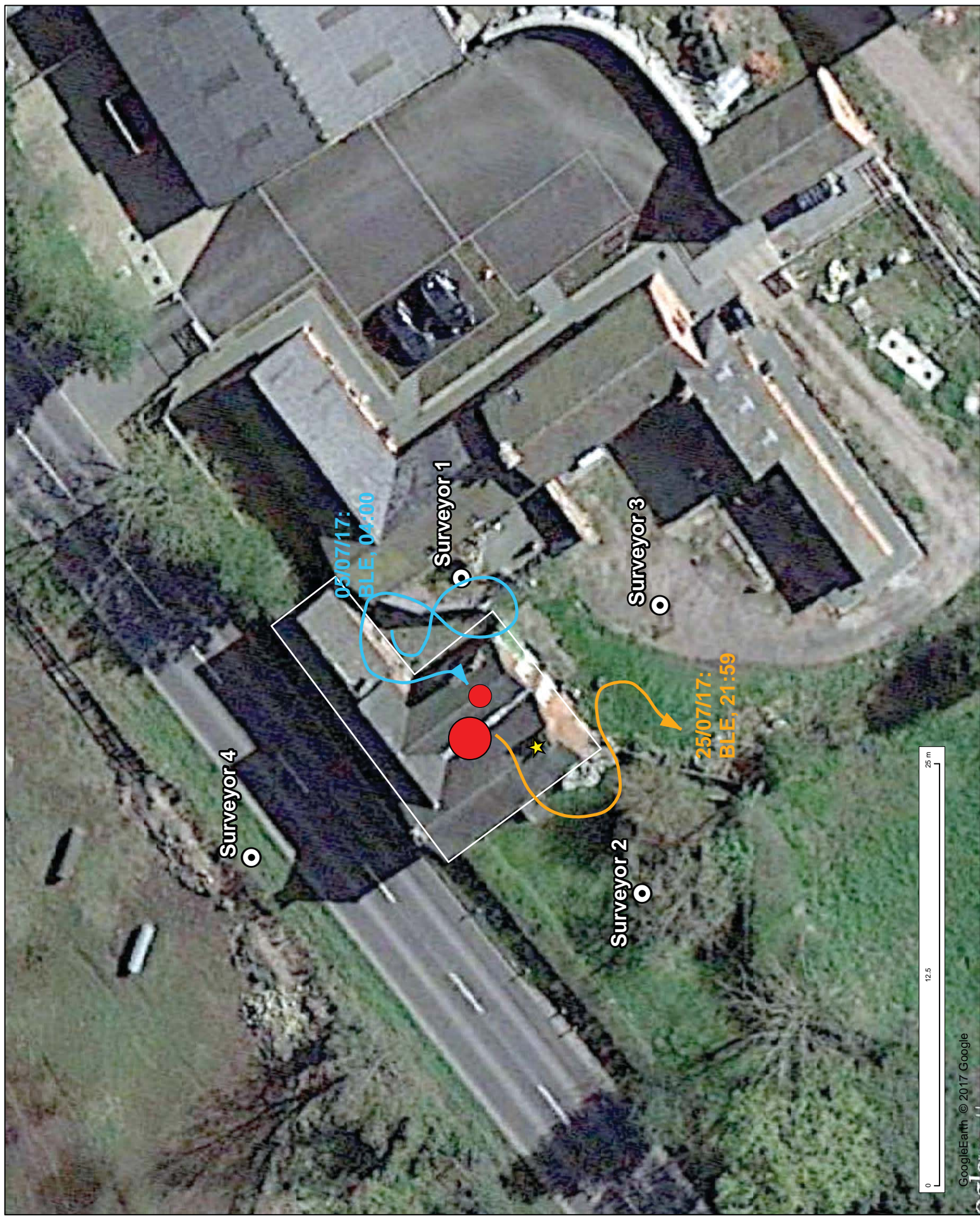


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Scale **1:300 @ A3**





**Legend**

- Surveyor location
- Bat emergence
- Bat re-entry
- Access point
- DNA sample location

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Figure Title  
**Figure 10.1.609  
 Heath Farm - Main Farmhouse  
 Emergence and Re-entry Surveys**

**RAMBOLL**  
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Figure Title

**Figure 10.1.610  
Heath Farm Outbuildings  
Emergency and Re-entry Surveys**

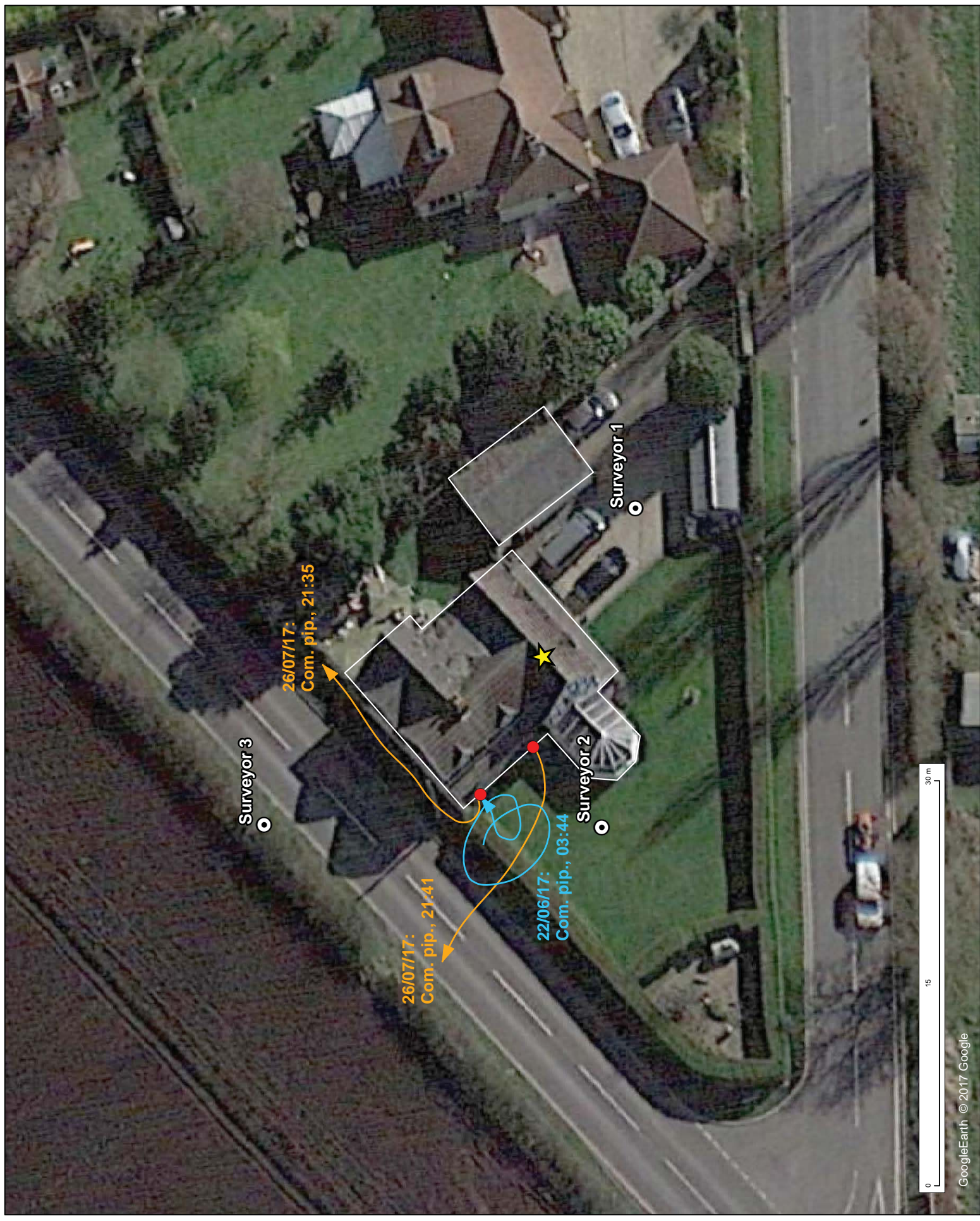


Tel: 023 8081 7500 southampton@ramboll.co.uk  
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Date 06/03/2018

Scale 1:200 @ A3





**Legend**

- Surveyor location
- Bat emergence
- Bat re-entry
- Access point
- ★ DNA sample location

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Project Number

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Figure Title

Figure 10.1.611

Mile End Cottage

Emergence and Re-entry Surveys

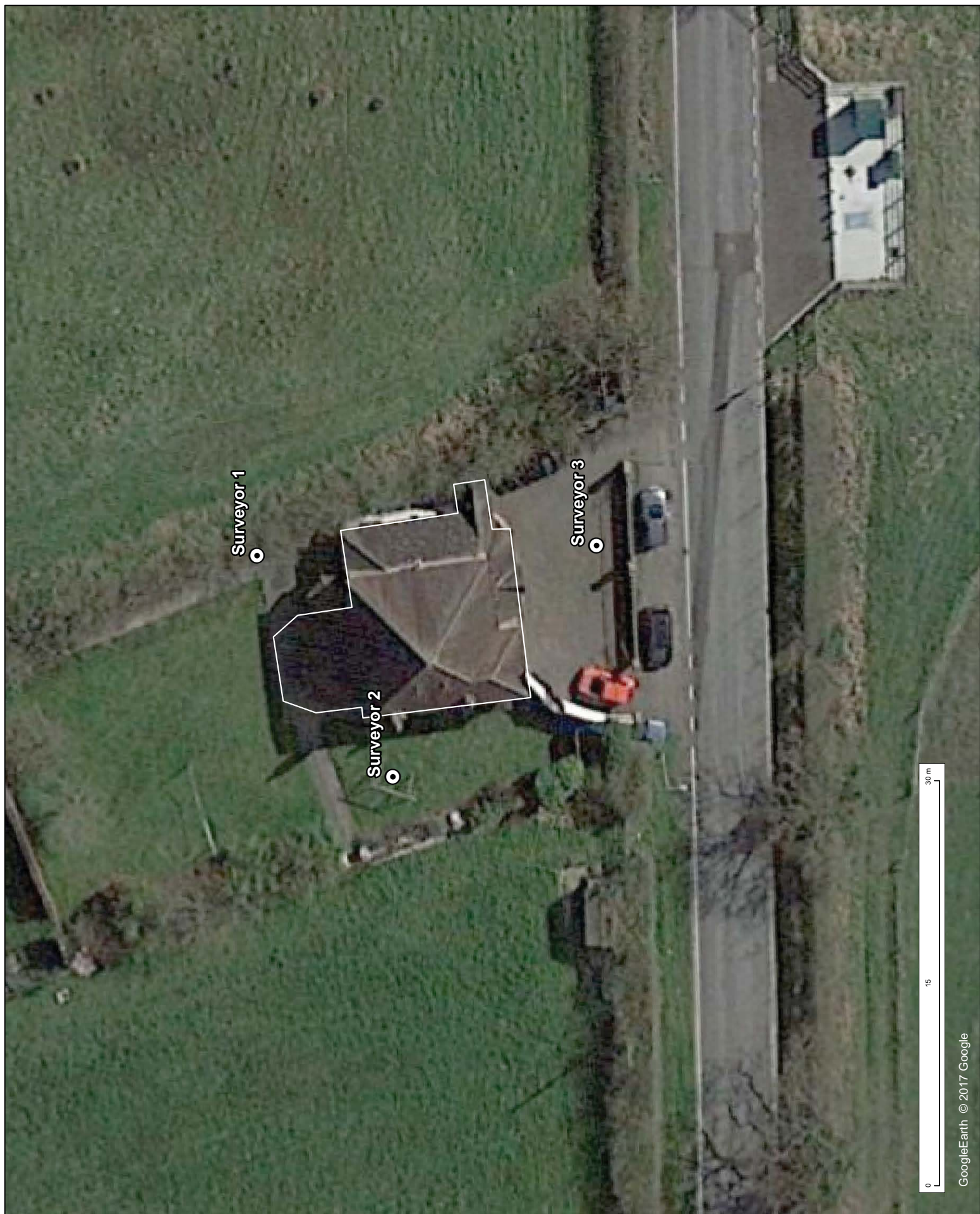


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Figure Title

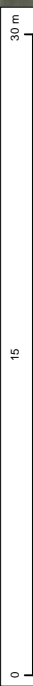
**Figure 10.1.612  
Ash House Emergence and  
Re-entry Surveys**

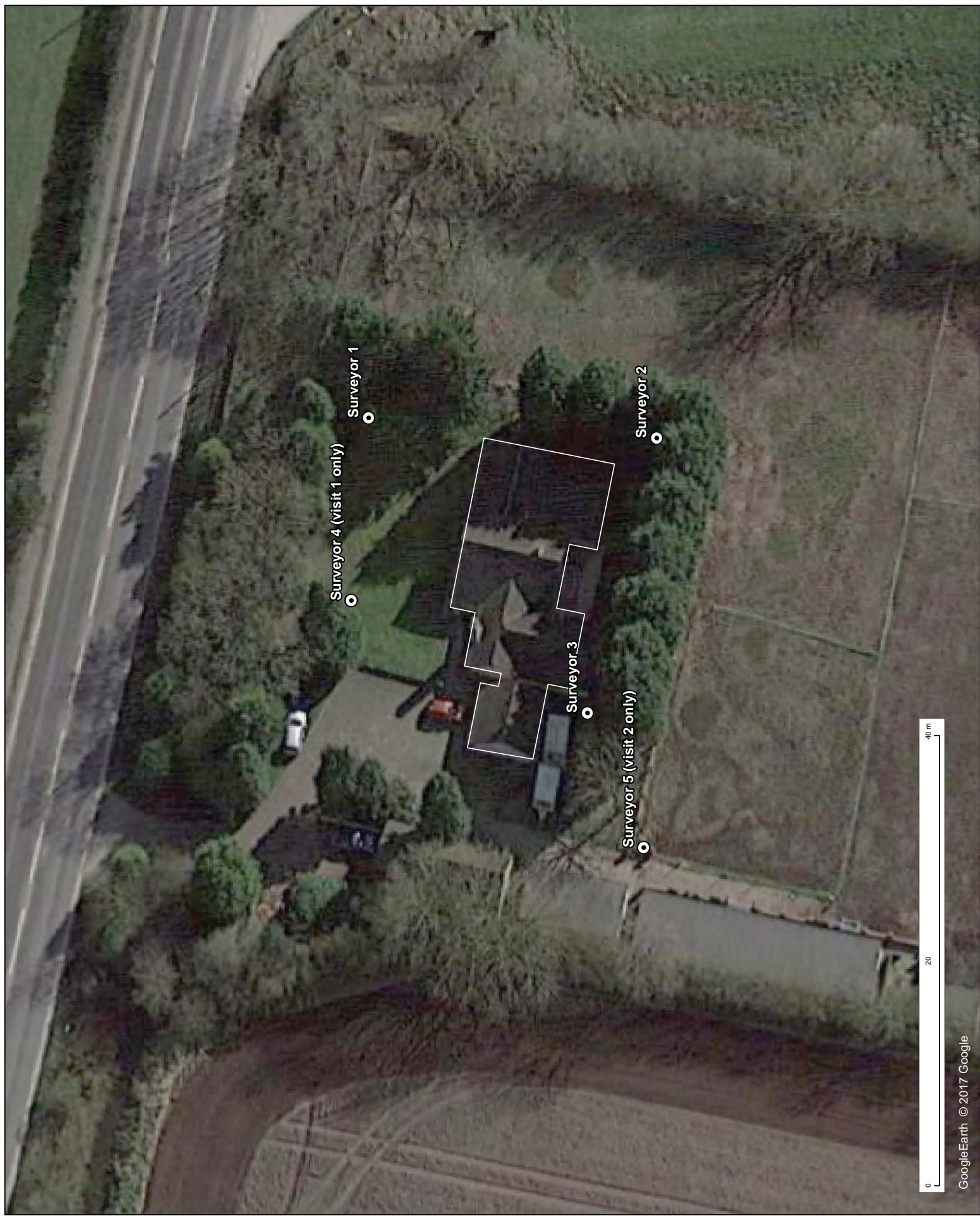


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Figure Title

**Figure 10.1.613  
Cloveally Emergence and  
Re-entry Surveys**



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Figure Title

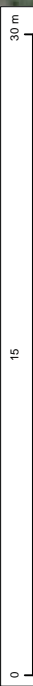
**Figure 10.1.6/14  
Stoney Brook Cottage Emergence  
and Re-entry Surveys**



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Figure Title  
**Figure 10.1.615  
Stoney Brook Cottage - Annexe  
Emergence and Re-entry Surveys**



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Scale **1:250 @ A3**



- Legend**
- Site boundary
  - Transect 1
  - Transect 2
  - Transect 3
  - Transect 4
  - Transect 5
  - Transect 6
  - 1.15 Point count location

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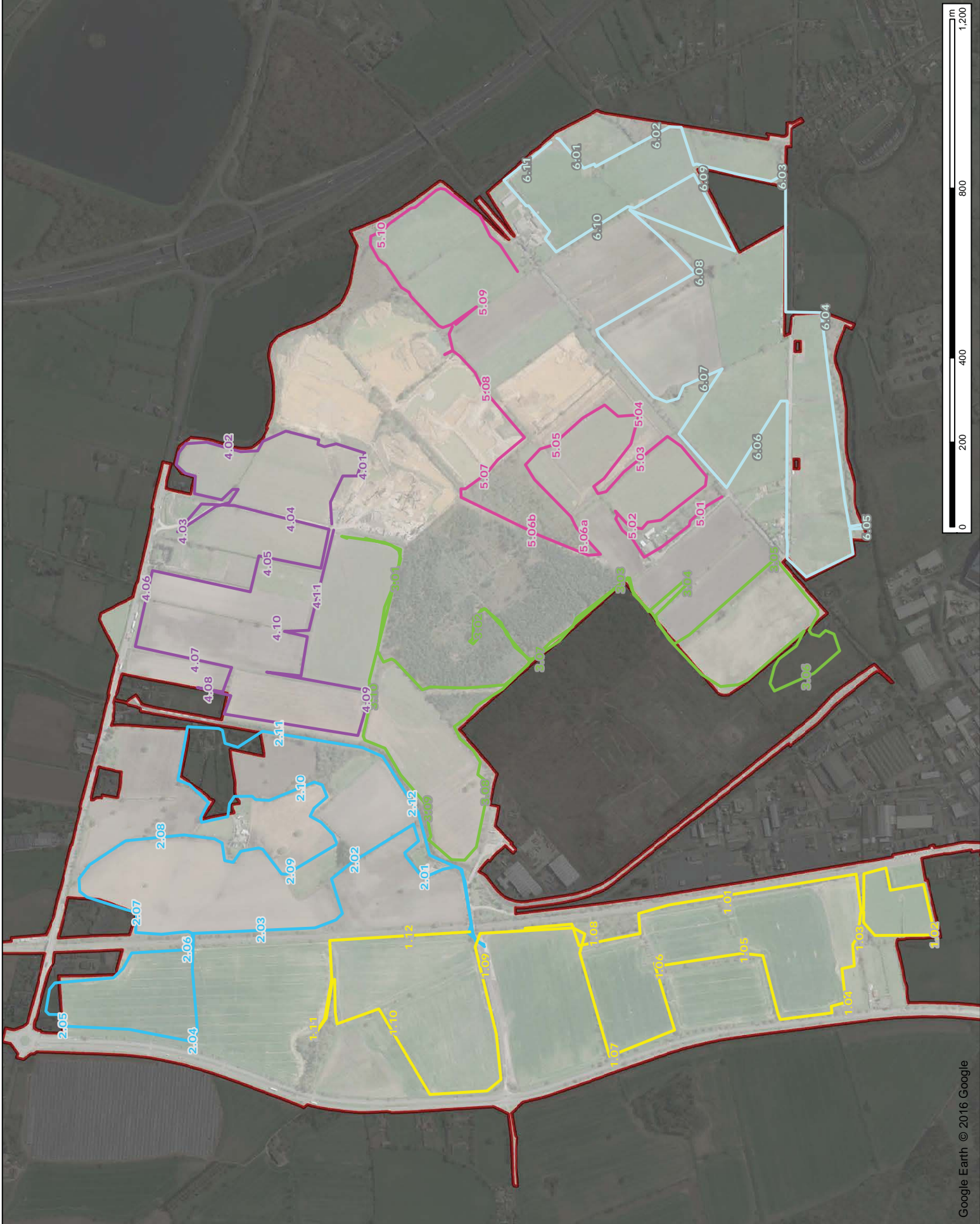
Client  
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Project Title  
**West Midlands Interchange (WMI)**  
 Project Number  
**1620002055**

Figure Title  
**Figure 10.1.616: Bat Activity  
 Survey Transect Routes &  
 Point Count Locations**



Date **06/03/2018**  
 Scale **1:8,000 @A3**



**Legend**

- Site boundary
- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6
- Static detector locations
- ★ June 2016
- ◆ July 2016
- ▲ August 2016
- September 2016
- October 2016
- + May 2017
- ★ June 2017
- ◆ July 2017
- ▲ August 2017
- September 2017
- October 2017

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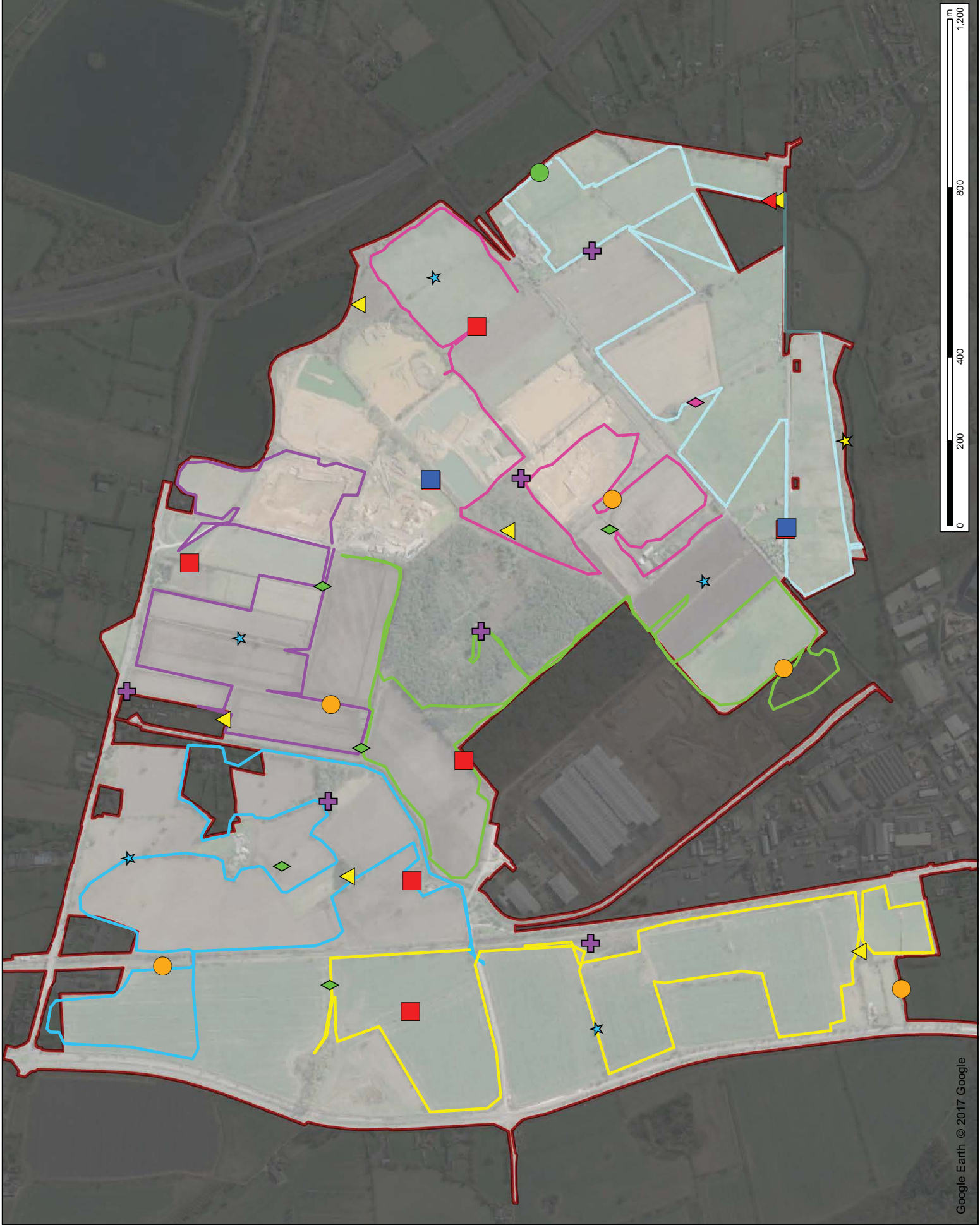
Client  
**Four Ashes Limited (FAL)**

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**West Midlands Interchange (WMI)**  
Project Number  
**1620002055**

Figure Title  
**Figure 10.1.617 Distribution of  
Static Bat Detectors**



Date **06/03/2018**  
Scale **1:8,000 @A3**



May



Dates Deployed:

Transect 1-5  
18/05/2016 to 22/05/2016

Transect 6  
03/05/2017 to 07/05/2017

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Project Number  
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Figure Title  
Figure 10.1.618 May Static  
Detector Locations and Species



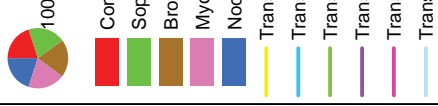
Date 06/03/2018

Scale 1:8,000 @A3



# June

## Legend



- Common pipistrelle
- Soprano pipistrelle
- Brown long-eared
- Myotis
- Noctule
- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6

## Dates Deployed:

Transect 1-5  
17/06/2016 to 21/06/2016

Transect 6  
21/06/2017 to 26/06/2017

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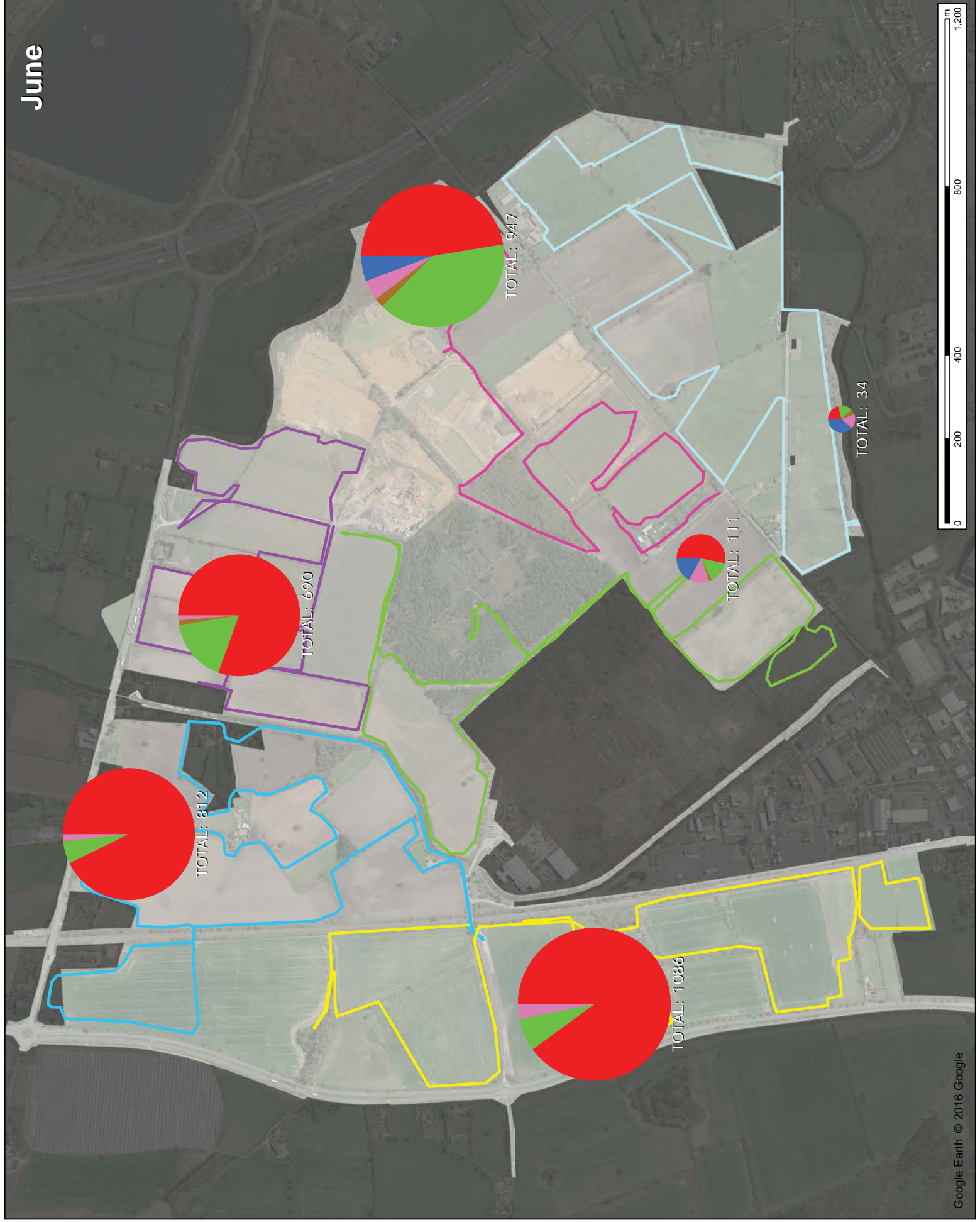
Project Number  
**1620002055**

Figure Title  
**Figure 10.1.619 June Static  
Detector Locations and Species**



Date **06/03/2018**

Scale **1:8,000 @A3**





July

Legend



- Common pipistrelle
- Soprano pipistrelle
- Brown long-eared
- Myotis
- Noctule
- Serotine
- Big bat
- Pipistrelle social call
- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6

Dates Deployed:

- Transect 1-5  
19/07/2016 to 23/07/2016
- Transect 6  
05/07/2017 to 10/07/2017

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West Midlands Interchange (WMI)

Project Number

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Figure Title

Figure 10.1.620 July Static  
Detector Locations and Species



Date 06/03/2018

Scale 1:8,000 @A3



# August

## Legend



## Dates Deployed:

Transect 1-5  
11/08/2016 to 15/08/2016

Transect 6  
16/08/2017 to 21/08/2017

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**1620002055**

Figure Title  
**Figure 10.1.621 August Static  
Detector Locations and Species**



Date **06/03/2018**

Scale **1:8,000 @A3**



# September



**Dates Deployed:**  
**Transect 1-5**  
 06/09/2016 to 10/09/2016  
**Transect 6**  
 14/09/2017 to 19/09/2017

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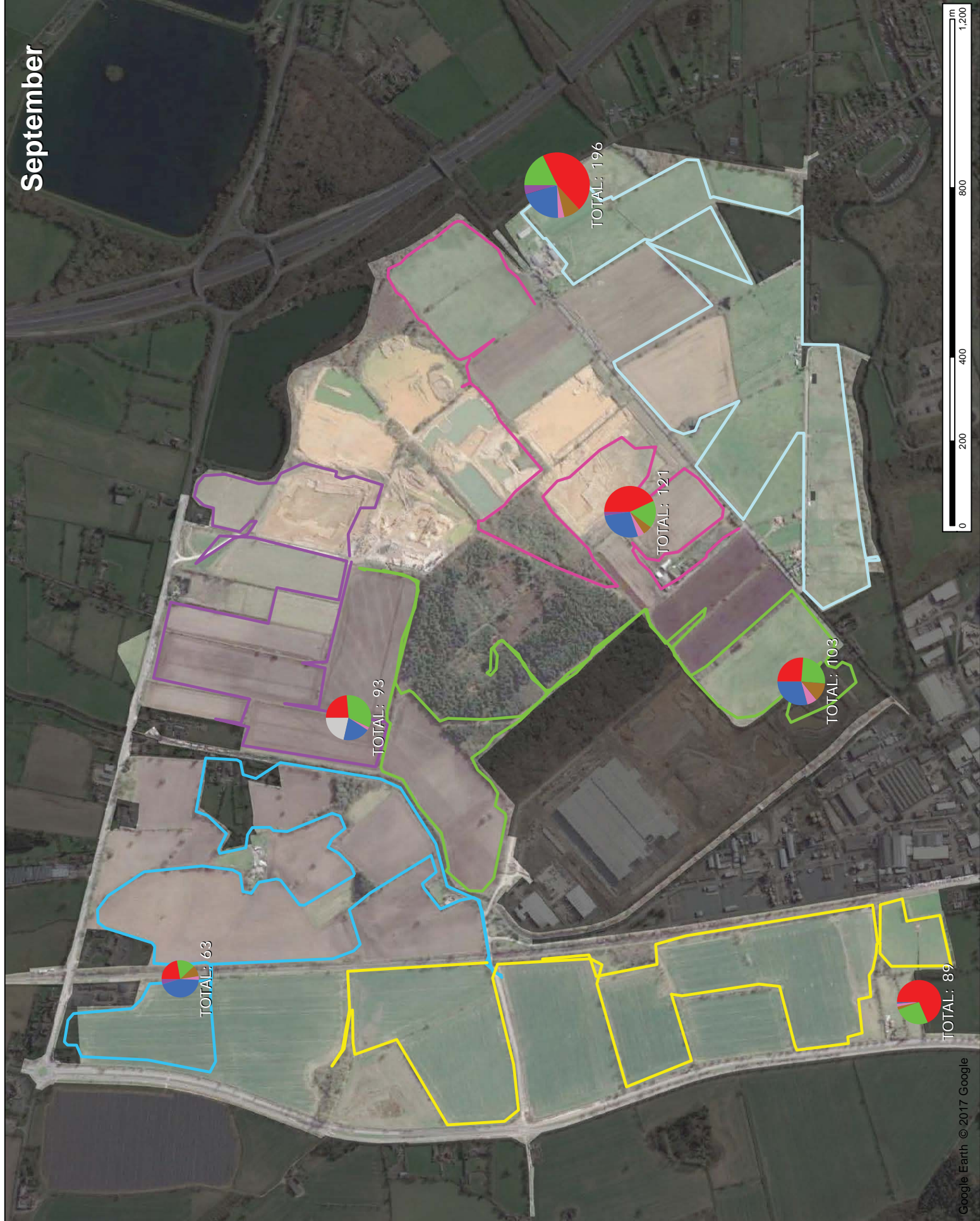
Client  
**Four Ashes Limited (FAL)**

Project Title  
**West Midlands Interchange (WMI)**  
 Project Number  
**1620002055**

Figure Title  
**Figure 10.1.622 September Static  
 Detector Locations and Species**



Date 06/03/2018  
 Scale 1:8,000 @A3



# October



- Common pipistrelle
- Soprano pipistrelle
- Brown long-eared
- Myotis
- Noctule
- Big bat
- Pipistrelle social call
- Brown long-eared social call

- Transect 1
- Transect 2
- Transect 3
- Transect 4
- Transect 5
- Transect 6

**Dates Deployed:**

- Transect 1-5  
19/10/2016 to 23/10/2016
- Transect 6  
11/10/2017 to 15/10/2017

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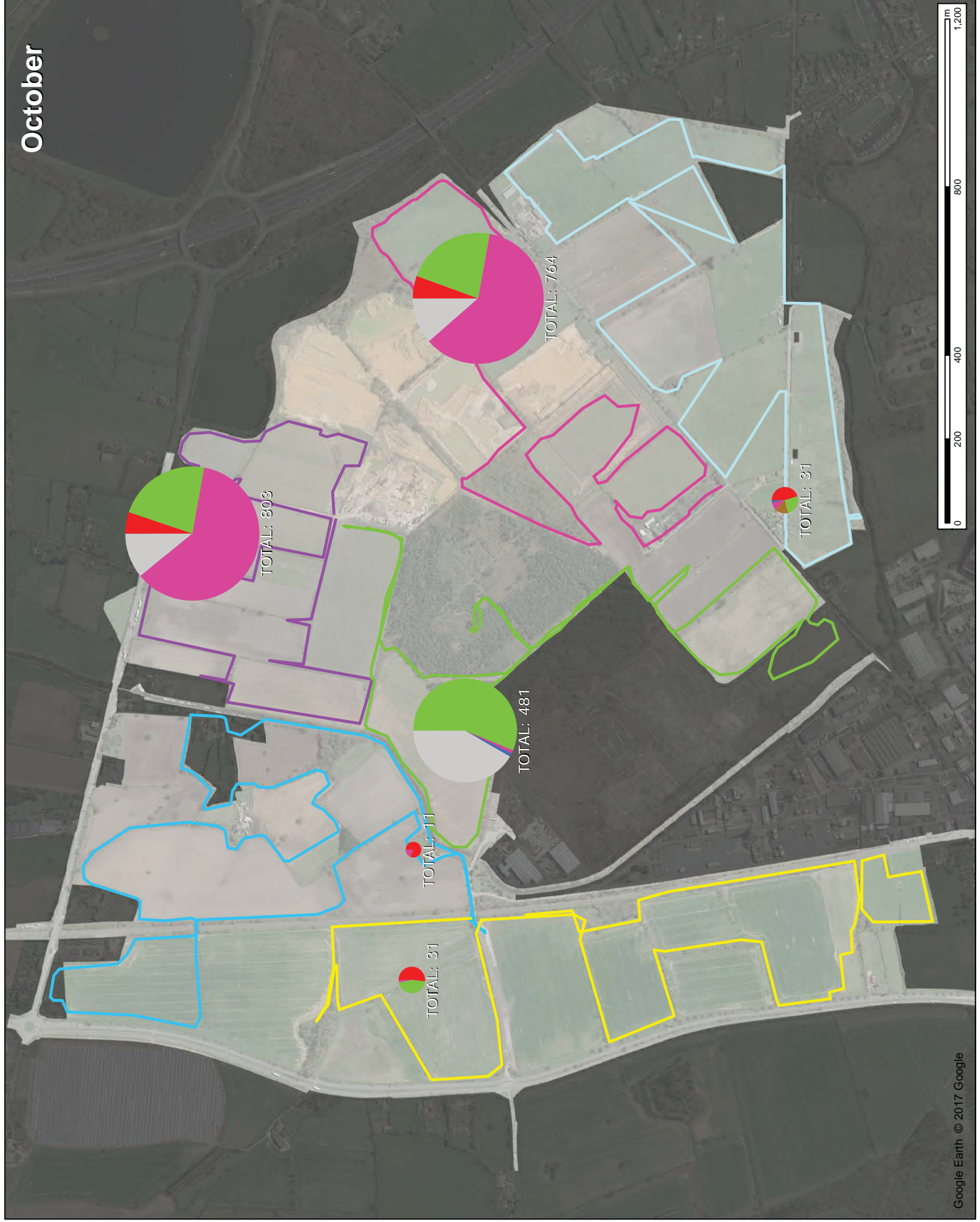
Client  
**Four Ashes Limited (FAL)**

Project Title  
**West Midlands Interchange (WMI)**  
 Project Number  
**1620002055**

Figure Title  
**Figure 10.1.623 October Static Detector Locations and Species**



Date 06/03/2018  
 Scale 1:8,000 @A3



Legend



Trap location June 2016

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Figure Title  
**Figure 10.1.624 Trapping  
locations June 2016**



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Scale **1:8,000 @A3**



Legend



Trap location  
August 2016

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Project Number

**1620002055**

Figure Title

**Figure 10.1.625 Bat Trapping  
Locations August 2016**



Date 06/03/2018

Scale 1:8,000 @A3



Legend

● Trap location 2017

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Figure Title  
**Figure 10.1.626 Trapping  
Locations August 2017**



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Scale **1:8,000 @A3**



# Legend

## Trees lost: Roost Potential

- High
- Moderate

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Project Number  
**1620002055**

Figure Title  
**Figure 10.1.627: Bat Roost Potential of Trees to be Lost**



Date **06/03/2018**  
Scale **1:8,000 @A3**





May

- Legend**
- Observed circling
  - Observed directional movement
  - Heard not seen
- Species**
- Myotis
  - Big bat
  - Common pipistrelle
  - Soprano pipistrelle
  - Noctule
  - Brown long eared
  - Serotine

**DATES OF SURVEYS**

- Transect 1 17/05/2016
- Transect 2 17/05/2016
- Transect 3 16/05/2016
- Transect 4 16/05/2016
- Transect 5 18/05/2016
- Transect 6 03/05/2017

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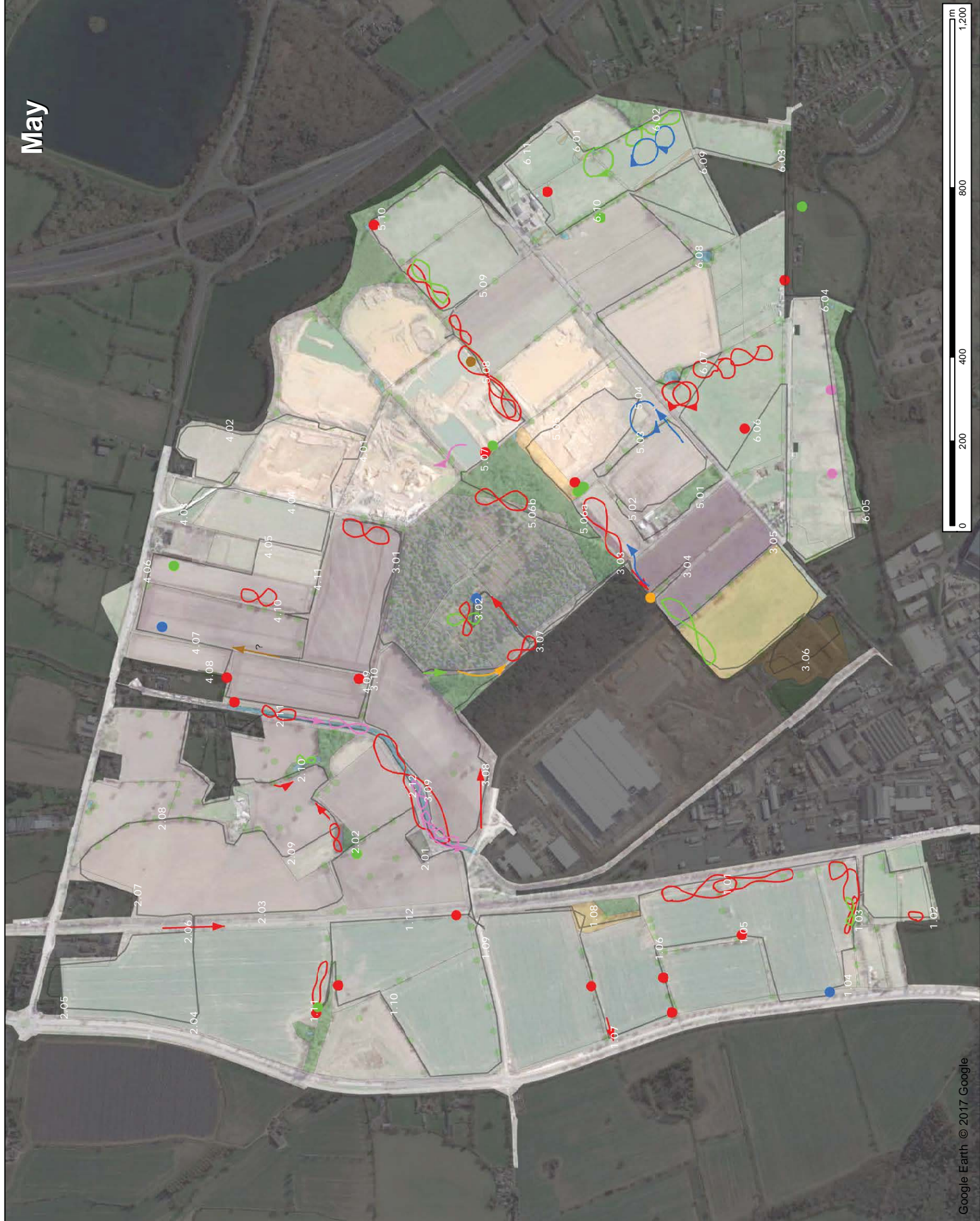
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**West Midlands Interchange (WMI)**

Project Number  
**1620002055**

Figure Title  
**Figure 10.1.628 May  
 Bat Activity Survey**



Date 06/03/2018  
 Scale 1:8,000 @A3



# June

- Legend**
- Observed circling
  - Observed directional movement
  - Heard not seen
- Species**
- Myotis
  - Big bat
  - Common pipistrelle
  - Soprano pipistrelle
  - Noctule
  - Brown long eared
  - Serotine

**DATES OF SURVEYS**

- Transect 1 20/06/2016
- Transect 2 20/06/2016
- Transect 3 21/06/2016
- Transect 4 20/06/2016
- Transect 5 21/06/2016
- Transect 6 21/06/2017

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**West Midlands Interchange (WMI)**

Project Number  
**1620002055**

Figure Title  
**Figure 10.1.629 June Bat Activity Survey**



Date 06/03/2018  
 Scale 1:8,000 @A3



# July

- Legend**
- Observed circling
  - Observed directional movement
  - Heard not seen
- Species**
- Myotis
  - Big bat
  - Common pipistrelle
  - Soprano pipistrelle
  - Noctule
  - Brown long eared

- DATES OF SURVEYS**
- Transect 1 18/07/2016
  - Transect 2 18/07/2016
  - Transect 3 19/07/2016
  - Transect 4 18/07/2016
  - Transect 5 19/07/2016
  - Transect 6 Dusk 05/07/2017
  - Transect 6 Dawn 06/07/2017

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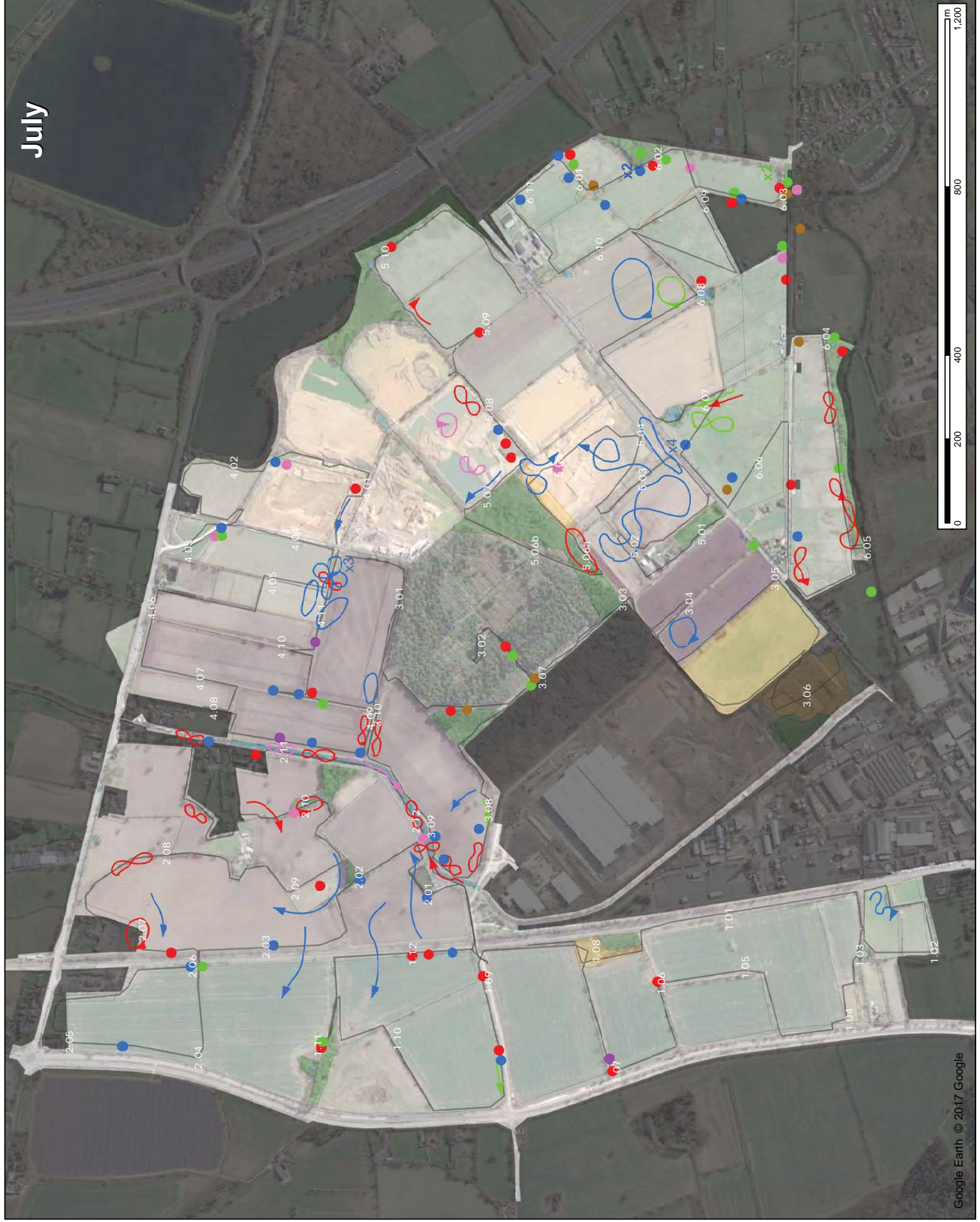
Project Title  
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Project Number  
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Figure Title  
**Figure 10.1.630 July  
 Bat Activity Survey**



Date 06/03/2018  
 Scale 1:8,000 @A3



# August

**Legend**

- Observed ciccling
- Observed directional movement

**Heard not seen**

**Species**

- Myotis
- Big bat
- Common Pipistrelle
- Soprano pipistrelle
- Noctule
- Brown long eared
- Serotine

**DATES OF SURVEYS**

- Transect 1 10/08/2016
- Transect 2 10/08/2016
- Transect 3 11/08/2016
- Transect 4 10/08/2016
- Transect 5 11/08/2016
- Transect 6 15/08/2017

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Client  
**Four Ashes Limited (FAL)**

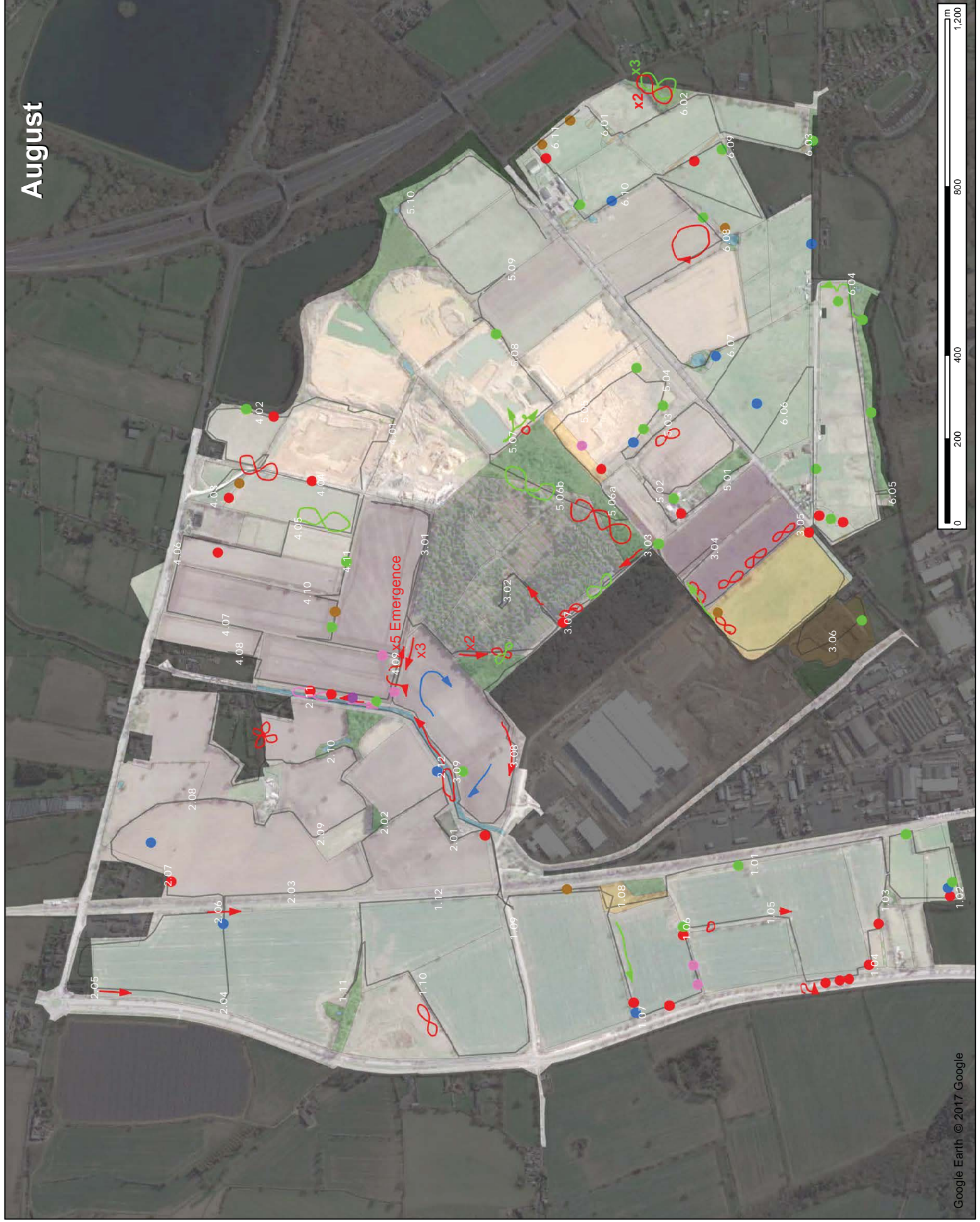
Project Title  
**West Midlands Interchange (WMI)**

Project Number  
**1620002055**

Figure Title  
**Figure 10.1.631 August  
 Bat Activity Survey**



Date 06/03/2018  
 Scale 1:8,000 @A3



# September

- Legend**
- Observed circling
  - Observed directional movement
  - Heard not seen
- Species**
- Myotis
  - Big bat
  - Common pipistrelle
  - Soprano pipistrelle
  - Noctule
  - Brown long eared
  - Serotine

**DATES OF SURVEYS**  
 Transect 1 05/09/2016  
 Transect 2 05/09/2016  
 Transect 3 06/09/2016  
 Transect 4 05/09/2016  
 Transect 5 06/09/2016  
 Transect 6 13/09/2017

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Client  
**Four Ashes Limited (FAL)**

Project Title  
**West Midlands Interchange (WMI)**  
 Project Number  
**1620002055**

Figure Title  
**Figure 10.1.632 September  
 Bat Activity Survey**



Date 06/03/2018  
 Scale 1:8,000 @A3



# October

- Legend**
- Observed circling
  - Observed directional movement
  - Heard not seen**
  - Myotis
  - Big bat
  - Common pipistrelle
  - Soprano pipistrelle
  - Noctule
  - Brown long eared

**DATES OF SURVEYS**

Transect 1 19/10/2016 DUSK  
 20/10/2016 DAWN  
 Transect 2 19/10/2016 DUSK  
 20/10/2016 DAWN  
 Transect 3 20/10/2016 DAWN  
 21/10/2016 DAWN  
 Transect 4 19/10/2016 DUSK  
 20/10/2016 DAWN  
 Transect 5 20/10/2016 DUSK  
 21/10/2016 DAWN  
 Transect 6 12/10/2017

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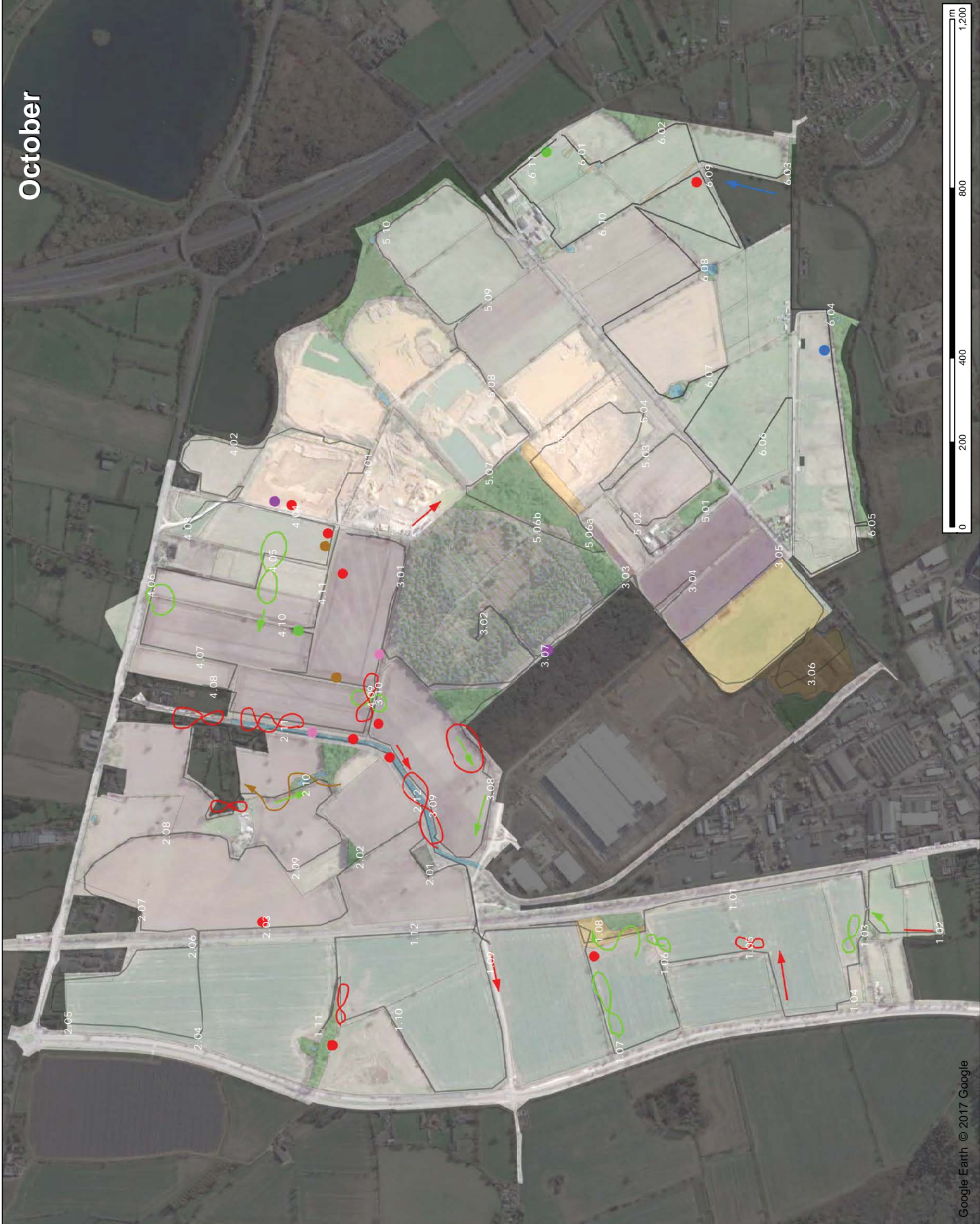
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**Four Ashes Limited (FAL)**

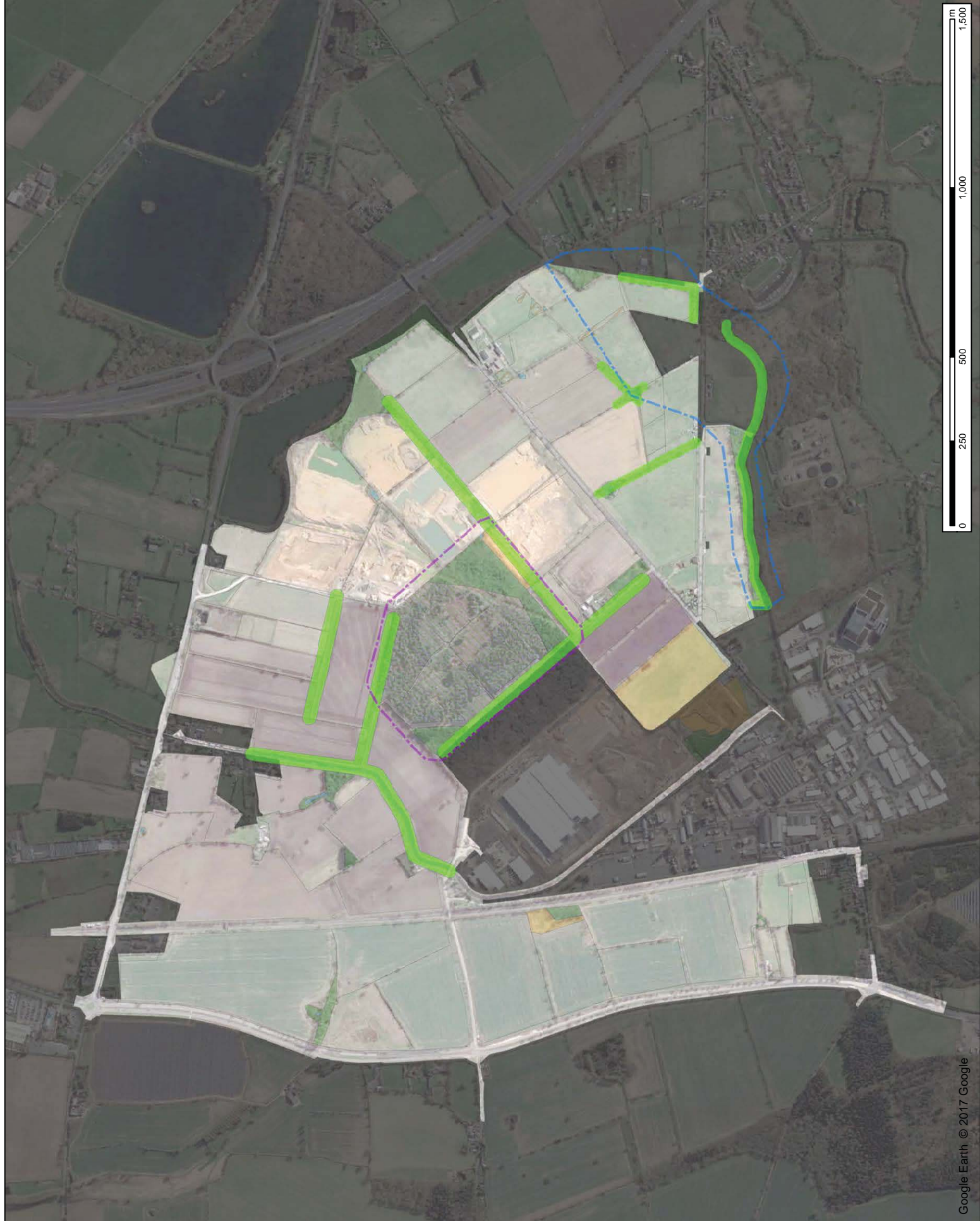
Project Title  
**West Midlands Interchange (WMI)**  
 Project Number  
**1620002055**

Figure Title  
**Figure 10.1.633 October  
 Bat Activity Survey**



Date 06/03/2018  
 Scale 1:8,000 @A3





**Legend**

- Key bat foraging and commuting area
- Canal and woodland of importance to bats
- Woodland of importance to bats

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**Four Ashes Limited (FAL)**

Project Title  
**West Midlands Interchange (WMI)**  
 Project Number  
**1620002055**

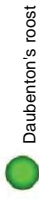
Figure Title  
**Figure 10.1.634 Important Bat Commuting and Foraging Areas**



Date **06/03/2018**  
 Scale **1:10,000 @A3**



Legend



Daubenton's roost

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Client

**Four Ashes Limited (FAL)**

Project Title

**West Midlands Interchange (WMI)**

Project Number

**1620002055**

Figure Title

**Figure 10.1.635 Daubenton's  
Roosts June 2016**



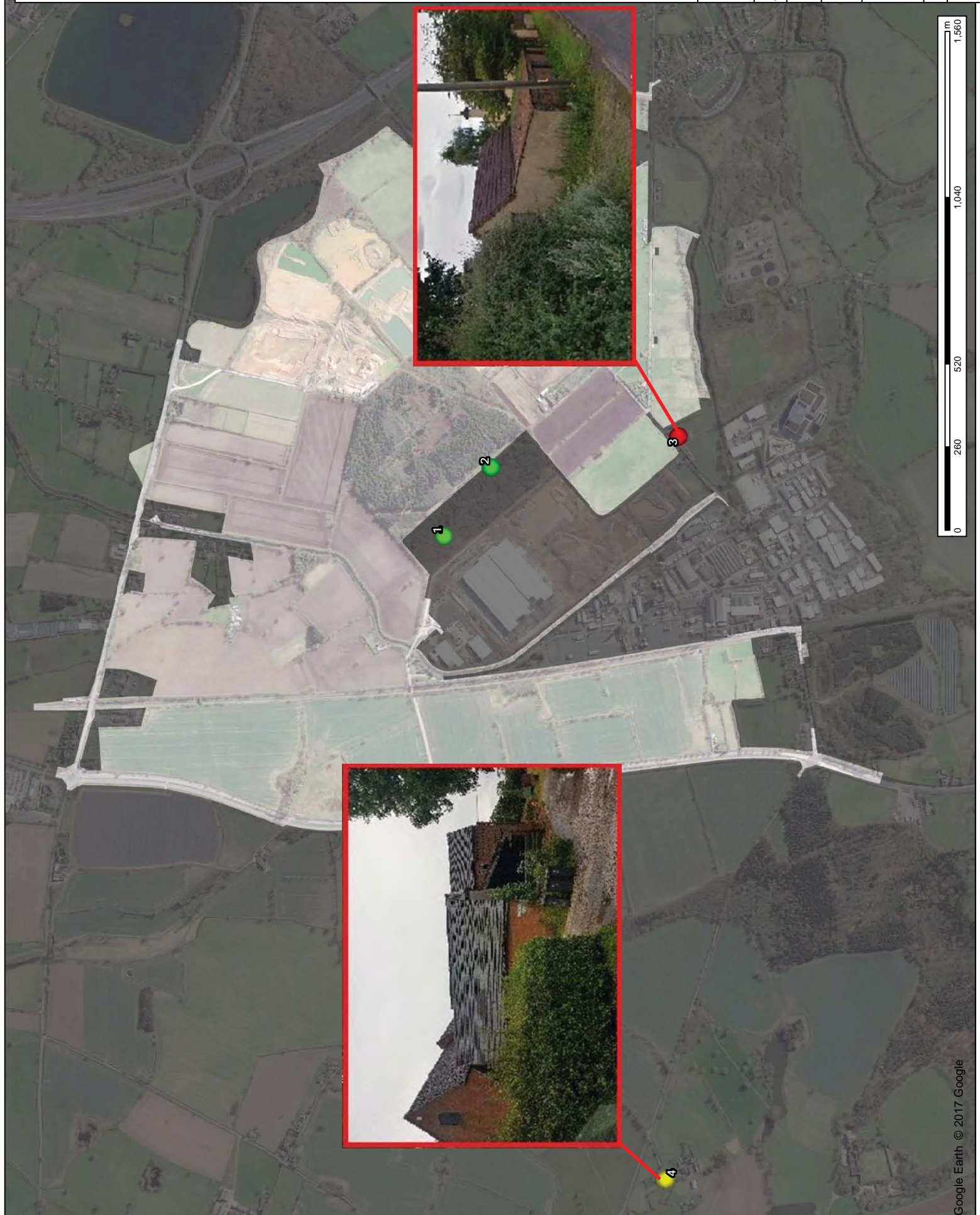
Tel: 023 8081 7500 southampton@ramboll.co.uk  
www.ramboll.co.uk

Date 06/03/2018

Scale 1:8,000 @A3







**Legend**

- Daubenton's
- Brown long eared
- Natterer's

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**Four Ashes Limited (FAL)**

Project Title

**West Midlands Interchange (WMI)**

Project Number

**1620002055**

Figure Title

**Figure 10.1.636 All Bat  
 Roosts June 2016**



Tel: 023 8081 7500 southampton@ramboll.co.uk  
 www.ramboll.co.uk

Date **06/03/2018**

Scale **1:10,500 @A3**





Legend

- Brown long-eared
- Whiskered

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Project Title

**West Midlands Interchange (WMI)**

Project Number

**1620002055**

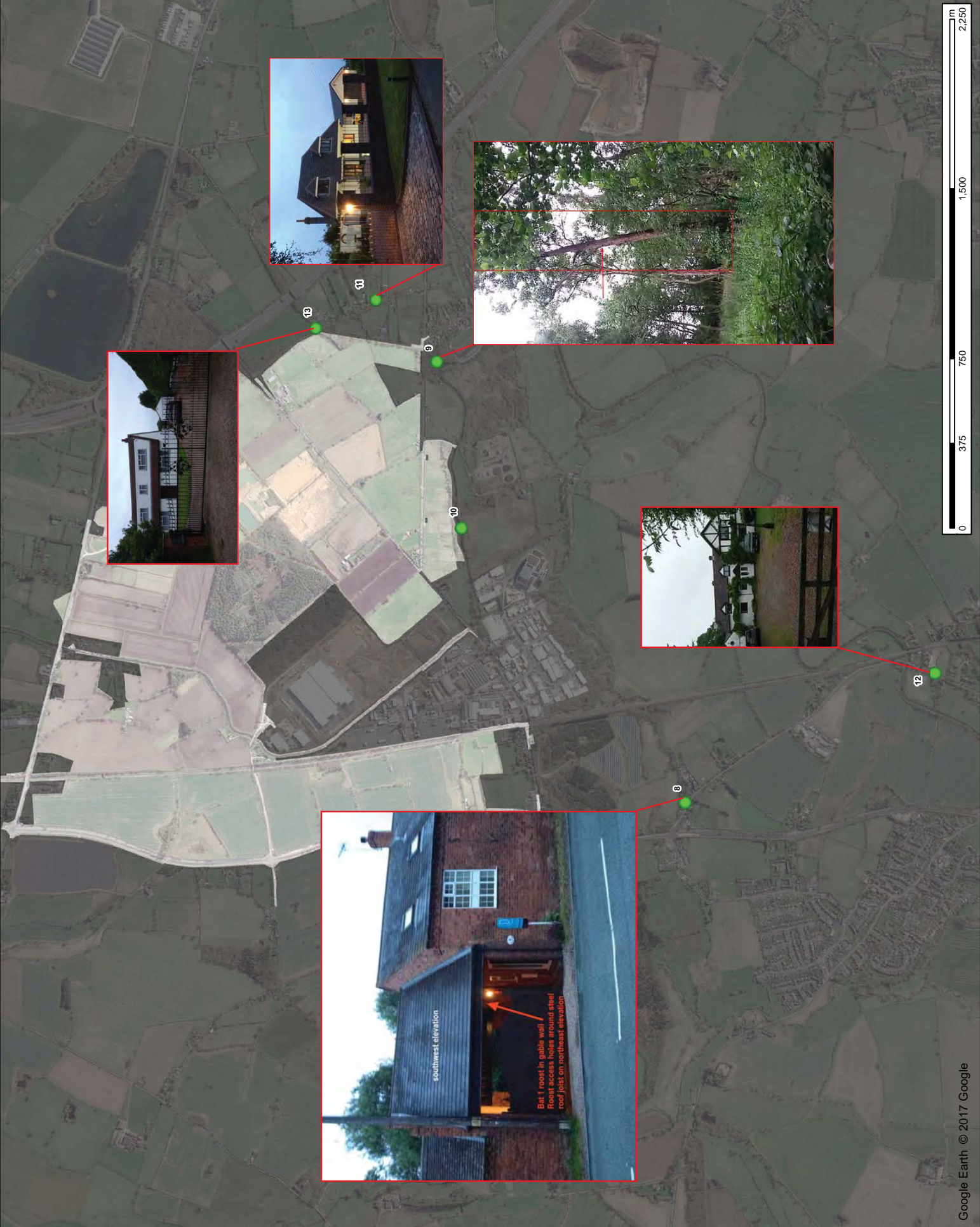
Figure Title

**Figure 10.1.637 All Bat  
Roosts August 2016**



Date 06/03/2018

Scale 1:15,000 @A3





**Legend**

Confirmed on-site  
roost structure



Common pipistrelle



Common pipistrelle, soprano pipistrelle



Brown long-eared

Meath Farm  
Main  
Farmhouse



Common pipistrelle, soprano pipistrelle, Myotis,  
brown long-eared, Natterer's

Woodside Barn

Mile End Cottage



Common pipistrelle



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Client

**Four Ashes Limited (FAL)**

Project Title  
**West Midlands Interchange (WMI)**

Project Number  
**1620002055**

Figure Title  
**Figure 10.1.640 All On-site  
Bat Roosts in Buildings**



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www.ramboll.co.uk

Date **06/03/2018**

Scale **1:10,000 @A3**

Legend

Bat roost close to  
proposed  
development site  
boundary (2016 &  
2017)



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Client

**Four Ashes Limited (FAL)**

Project Title

**West Midlands Interchange (WMI)**

Project Number

**1620002055**

Figure Title

**Figure 10.1.641 Off-Site Bat  
Roosts Close to the West Line  
Boundary (2016 and 2017)**



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www.ramboll.co.uk

Date 06/03/2018

Scale 1:10,000 @A3



**FIGURE SERIES 900: TERRESTRIAL MAMMALS (EXCLUDING BADGER)**

**10.1.901 Camera Trap Locations**

**Legend**

- Site boundary
- 1 Camera Trap 1
- 2 Camera Trap 2
- 3 Camera Trap 3

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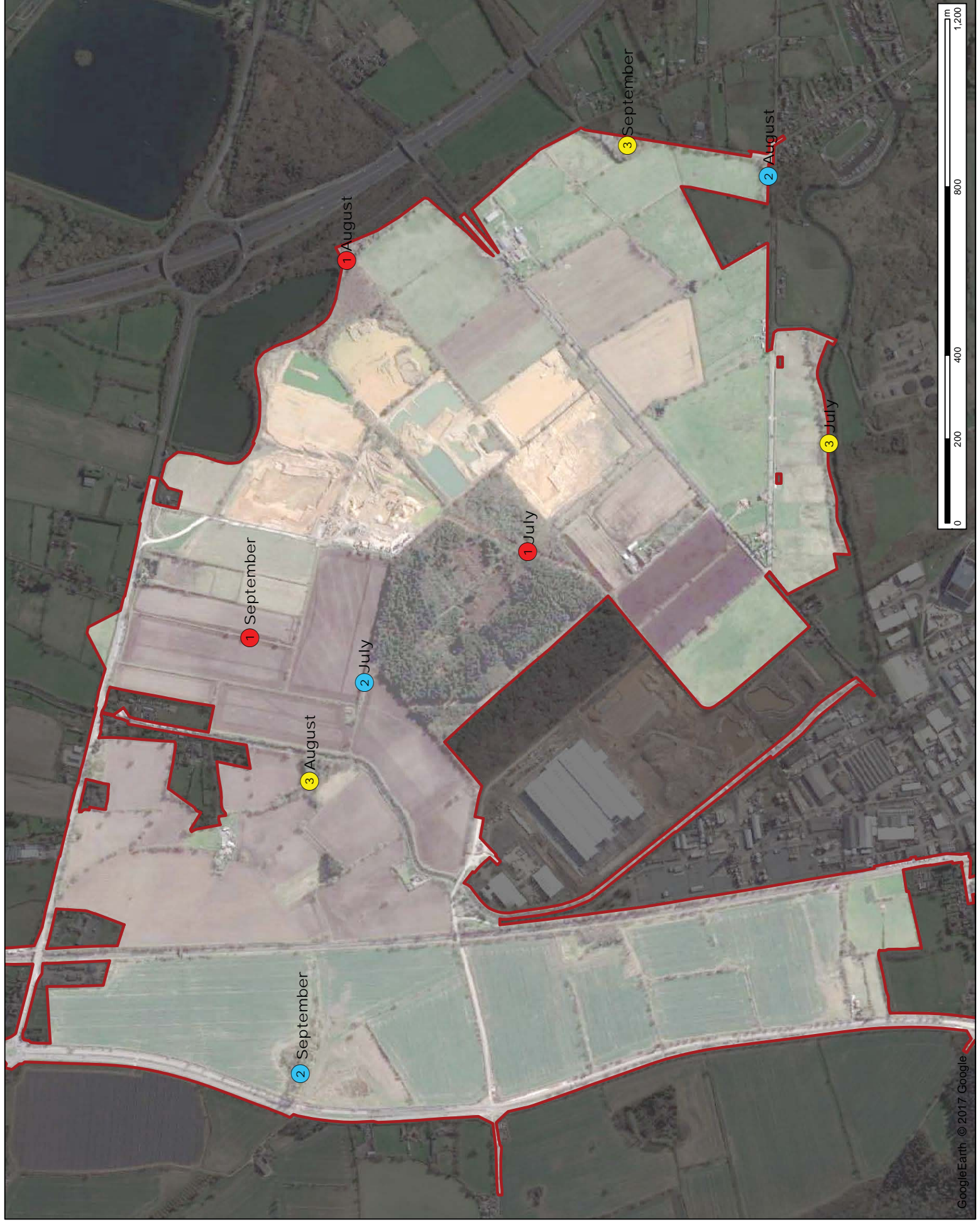
Client  
**Four Ashes Limited (FAL)**

Project Title  
**West Midlands Interchange (WMI)**  
Project Number  
**1620002055**

Figure Title  
**Figure 10.1.901  
Camera Trap Locations**



Date **06/03/2018**  
Scale **1:8,000 @A3**





## **ANNEXES**

### **Annex 10.1.1**

SERC Records

### **Annex 10.1.2**

Target Notes

### **Annex 10.1.3 (A-I)**

Biocensus Hedgerow Survey Reports (2016 & 2017)

### **Annex 10.1.4**

SERC Bird Records and Breeding Assessment

### **Annex 10.1.5**

Biocensus Invertebrate Survey Report

### **Annex 10.1.6 (A-O)**

Bat Roost Assessments for Structures

### **Annex 10.1.7**

Bat Roost Assessment for Treess

### **Annex 10.1.8**

Bat Trapping Details

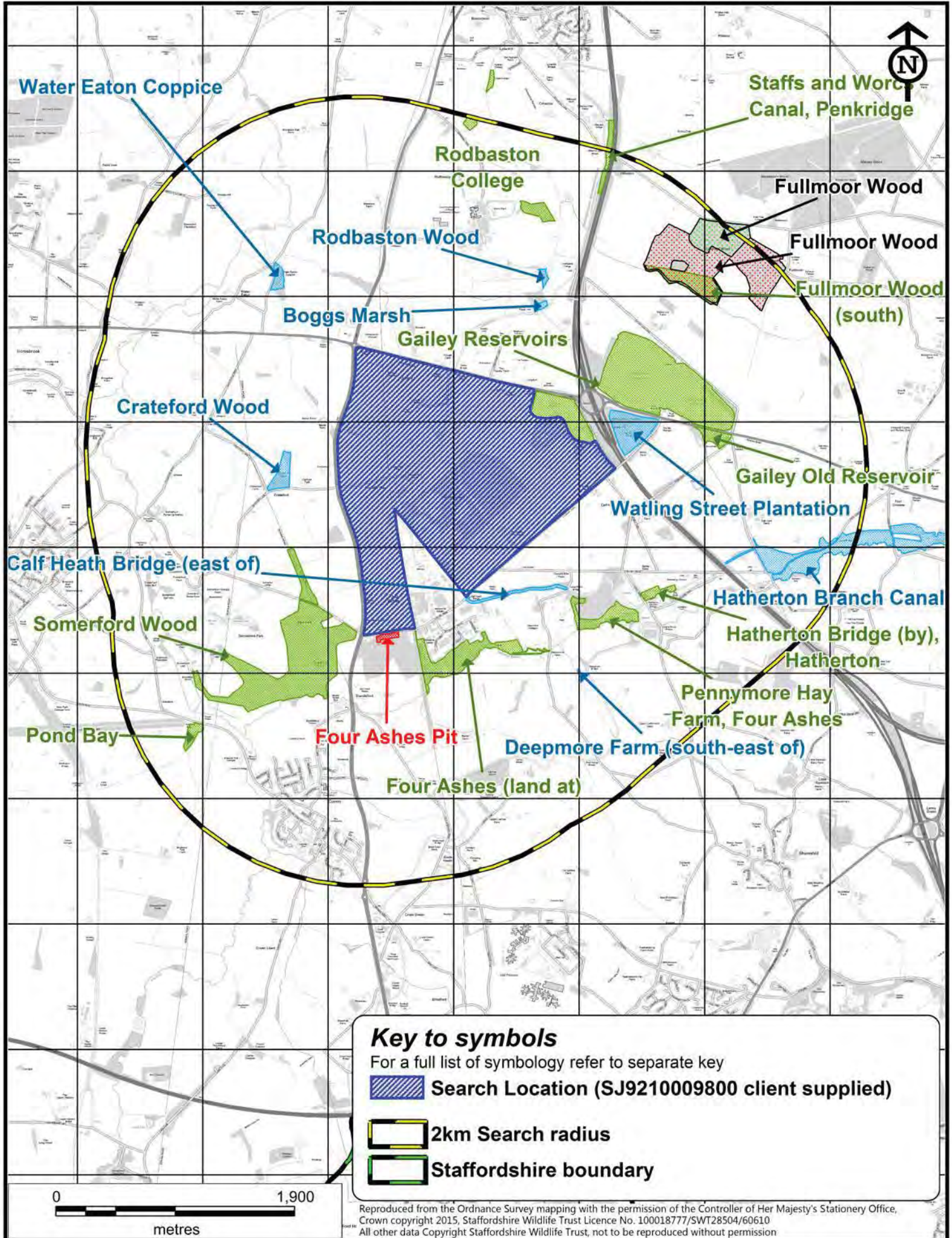
### **Annex 10.1.9**

Bat Dropping DNA Analysis Results

**Annex 10.1.1**

SERC Records

**Nature Conservation Sites  
within 2km of Four Ashes (SJ9210009800)**



Water Eaton Coppice

Staffs and Worcs Canal, Penkridge

Rodbaston College

Fullmoor Wood

Rodbaston Wood

Fullmoor Wood

Boggs Marsh

Gailey Reservoirs

Fullmoor Wood (south)

Crateford Wood

Gailey Old Reservoir

Watling Street Plantation

Calf Heath Bridge (east of)

Hatherton Branch Canal

Somerford Wood

Hatherton Bridge (by), Hatherton

Pond Bay

Four Ashes Pit

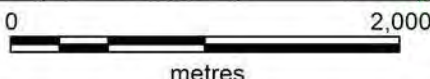
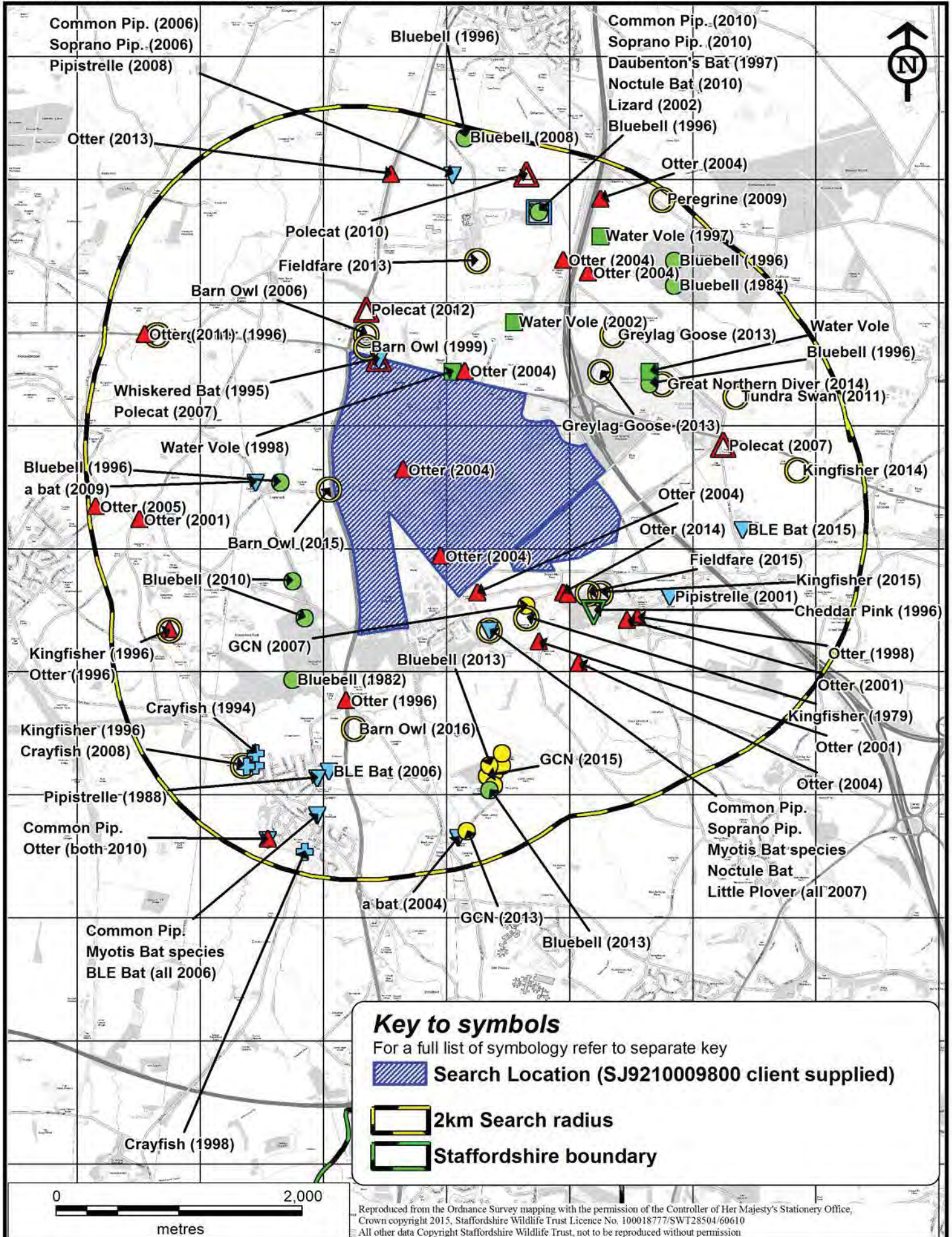
Deepmore Farm (south-east of)

Pennymore Hay Farm, Four Ashes

Four Ashes (land at)

# Protected Species within 2km of Four Ashes (incl extension) (SJ9210009800)

Note: Badger records are excluded, and only 100m precision sightings are plotted



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# Staffordshire Ecological Record

The Wolseley Centre, Wolseley Bridge, Stafford. ST17 0WT e: [info@Staffs-Ecology.org.uk](mailto:info@Staffs-Ecology.org.uk) t: 01889 880100

Enquiry Reference:

SER/16/392

Site Details:

Four Ashes (with extension)

Grid Reference:

392100 309800

Search Radius:

2km

Client Name:

Ramboll

Creation Date:

10/08/2016

Created by:

Craig Slawson

NOTES:

- 1) The 'Composite Species List' is created from 1km sq information, so may include records outside the search area and not included on the individual lists of records - this may result in a slight over-count for some species
- 2) The enclosed data are copyright © Staffordshire Ecological Record, whilst the individual records are the intellectual property of the original recorder(s)
- 3) '\*' at the end of the Location Detail indicates SER holds more detailed location information, but this will not be released under normal circumstances

































**A Composite Species List: 2km of Four Ashes (with extension) (392.100 309800) produced 10/8/2011**

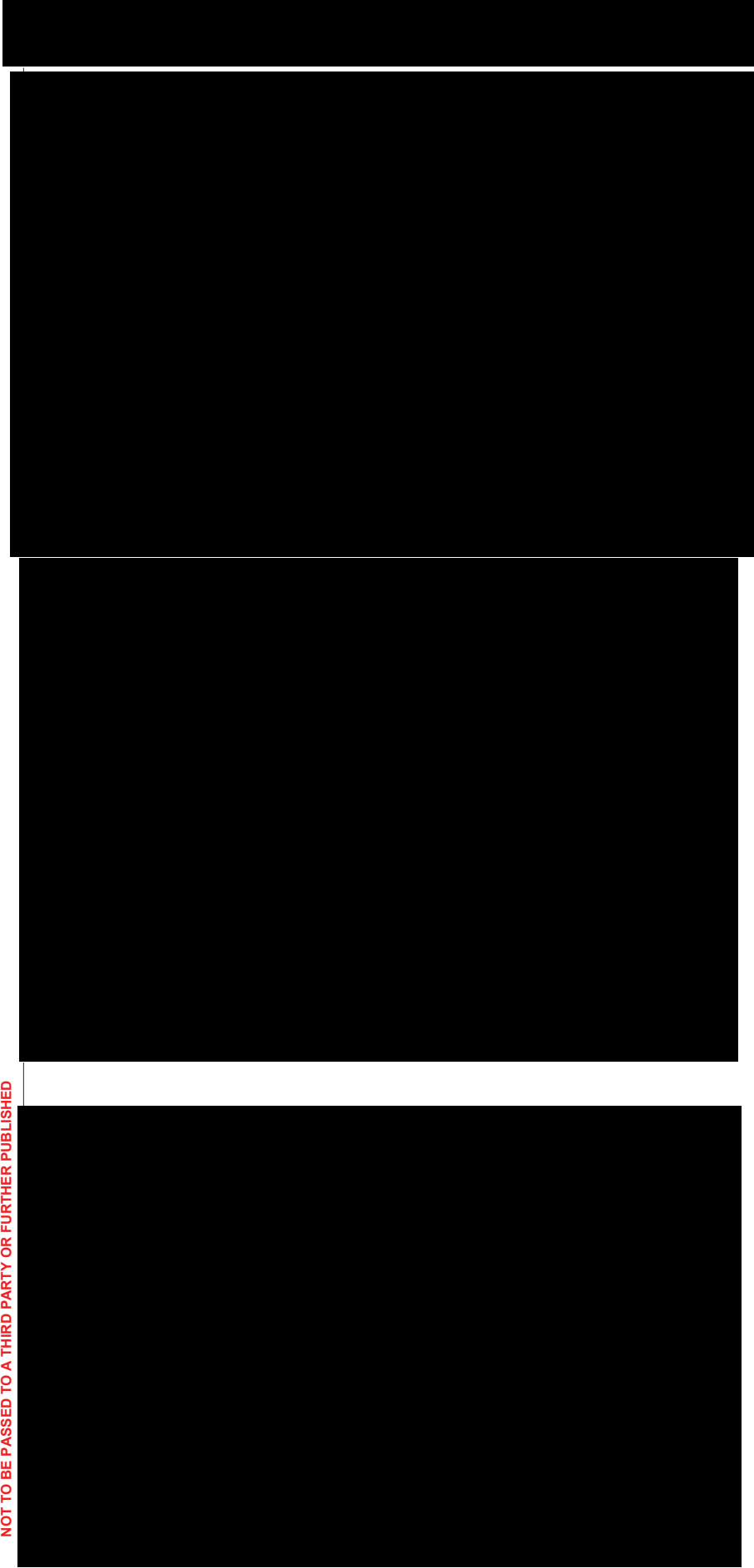
NOTE: This list is created from 1km sq information, so may include records outside the search area and not included on the previous sheets- this may result in a slight over-count for some species

Species Name	Common Name	Common Name	European Invertebrate Atlas	Principle Conservation	Invaded	Shelf	SNIS	Confident	No. of Sites	Most Recent First Record	Historical Preference	Management Recommendation
<i>Caronipha panghalus</i>	Wall	Small Heath	No	Yes	No	No	False	3	2009	1983	Retain and manage grassland	
<i>Lascomata magna</i>	Tree Bumble Bee	Tree Bumble Bee	No	Yes	No	No	False	5	1995	1979	Retain woodland with grassy open clearings and rides	
<i>Bombus hyemalis</i>	Common Bumble Bee	Common Bumble Bee	No	No	No	False	1	2013	2013	No specific recommendations due to range of habitat requirements		
<i>Tyria jacobaeae</i>	Chinabar	Chinabar	No	Yes	No	False	1	1985	1985	No specific recommendations		
<i>Chelisia barbata</i>	a true fly	a true fly	No	No	No	False	2	1985	1983	No specific recommendations		
<i>Cladonia chlorophaea</i>	lichen	lichen	No	No	No	False	1	1999	1984	No specific recommendations		
<i>Arvicola amphibius</i>	European Water Vole	European Water Vole	No	Yes	No	False	7	2012	0	Require well-vegetated water edge habitat, where not occupied by their main predator, mink. Any development likely to affect watercourses in area should protect the watercourse and provide a wide buffer strip of vegetation along the banks		
<i>Erisicavis europaeus</i>	West European Hedgehog	West European Hedgehog	No	Yes	No	False	34	2015	1999	Design is important so that hedgehogs are enabled to move around, e.g. from garden to garden by allowing small gaps in runs		
<i>Lepus europaeus</i>	Brown Hare	Brown Hare	No	Yes	No	False	15	2010	2000	If suitable habitat is likely to be lost, mitigatory habitat should be provided.		
<i>Lutra lutra</i>	European Otter	European Otter	Yes	Yes	No	False	34	2014	1986	Any development likely to affect watercourses in area should provide cover for otters, possibly in the form of artificial otter holes.		
<i>Meles meles</i>	Eurasian Badger	Eurasian Badger	No	Yes	No	False	67	2015	1964	Protect where possible; mitigation will depend on size and location of badger groups affected on any given site.		
<i>Microtus ermineus</i>	Harvest Mouse	Harvest Mouse	No	No	No	True	7	2010	2004	Retain on a buffer suitable habitat, especially marshy grassland		
<i>Microtus agrestis</i>	Field Vole	Field Vole	No	Yes	No	False	11	2015	2001	No specific recommendations		
<i>Chiroptera</i>	a bat	Common Pipistrelle	Yes	Yes	No	False	6	2009	1990	No specific recommendations		
<i>Myotis</i>	Myotis Bat species	Myotis Bat species	Yes	No	No	False	9	2008	2006	Retain hedges and trees, including dead trees. Install bat boxes in young woodlands.		
<i>Myotis daubentonii</i>	Daubenton's Bat	Daubenton's Bat	Yes	No	No	False	10	1998	1997	New housing should ideally have a range of back-friendly roof line within Green Infrastructure		
<i>Myotis mystacinus</i>	Whiskered Bat	Whiskered Bat	Yes	No	No	True	1	1995	1995	New housing should ideally have a range of back-friendly roof line within Green Infrastructure		
<i>Nyctalus noctula</i>	Noctule Bat	Noctule Bat	Yes	Yes	No	False	3	2010	2007	New housing should ideally have a range of back-friendly roof line within Green Infrastructure		
<i>Pipistrellus</i>	Pipistrelle Bat species	Pipistrelle Bat species	Yes	Yes	No	False	18	2009	2000	New housing should ideally have a range of back-friendly roof line within Green Infrastructure		
<i>Pipistrellus pipistrellus sensu lato</i>	Pipistrelle	Pipistrelle	Yes	Yes	No	True	34	2008	1986	New housing should ideally have a range of back-friendly roof line within Green Infrastructure		
<i>Pipistrellus pipistrellus sensu stricto</i>	Common Pipistrelle	Common Pipistrelle	Yes	Yes	No	False	15	2010	2003	New housing should ideally have a range of back-friendly roof line within Green Infrastructure		
<i>Pipistrellus pygmaeus</i>	Soprano Pipistrelle	Soprano Pipistrelle	Yes	Yes	No	False	10	2010	2006	New housing should ideally have a range of back-friendly roof line within Green Infrastructure		
<i>Plecotus auritus</i>	Brown Long-eared Bat	Brown Long-eared Bat	Yes	Yes	No	False	3	2015	2006	New housing should ideally have a range of back-friendly roof line within Green Infrastructure		
<i>Zootoca vivipara</i>	Common Lizard	Common Lizard	No	Yes	No	False	1	2002	2002	Of particular concern where building alterations, including barr conversions are proposed.		

Retain suitable open habitat, preferably with south-facing aspects and including rubble, logs etc.

List of confidential Badger Records for internal use only: 2km of Four Ashes (with extension) (392100 309800) produced 10/8/2016


**THESE RECORDS ARE FOR INTERNAL DECISION MAKING ONLY  
NOT TO BE PASSED TO A THIRD PARTY OR FURTHER PUBLISHED**






**Annex 10.1.2**




Target Notes



## ANNEX 10.1.2 TARGET NOTES

Target Note	Description	Photograph
TN1	Confidential	Confidential
TN2	Confidential	Confidential
TN 3	<p>Group of three derelict building located in the centre of the Site. Two buildings have loose tiles allowing access into structure. Buildings assessed during habitat survey to be of Moderate Bat Roost Suitability.</p>	
TN 4	Confidential	Confidential




Target Note	Description	Photograph
TN 5	Gravelly Way Farm buildings beside the canal. Contains three buildings, two with low and one with moderate bat roost suitability.	
TN 6	Shallow ditch that extends from the centre of the Site to the north of the Site.	
TN 7	Drainage ditch along the Sites northern boundary with potential for water vole.	







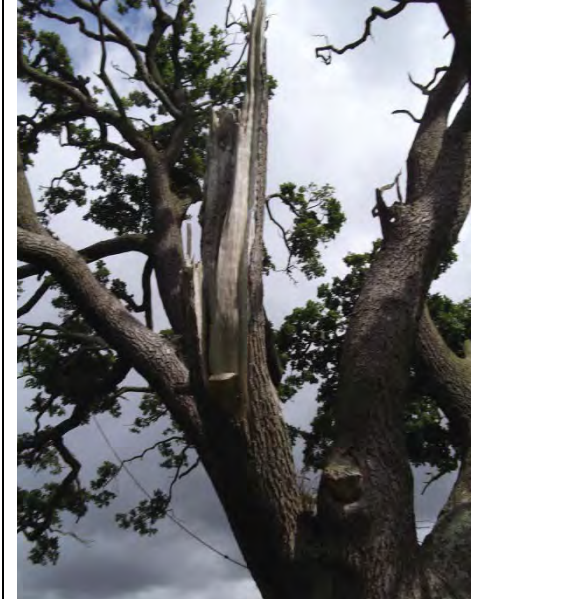
Target Note	Description	Photograph
TN 8	Shallow and isolated drainage ditch towards the west of the Site with limited potential for water vole.	
TN9	Barn and house at Woodside Farm. The barn and the farmhouse were assessed during the habitat survey to be of moderate bat roost Suitability.	 
TN10	Confidential	Confidential
TN11	Confidential	Confidential


Target Note	Description	Photograph
TN12	<p>Firtree Cottage and barn in the south-west of the Site. The barn is of negligible bat roost Suitability and the cottage is of moderate bat roost Suitability.</p>	
TN 13	<p>Two storey Farm House, brick built with clay tiles, gaps in deteriorating mortar. No fascia or soffits. Few gaps under tiles. <math>\frac{3}{4}</math> height wing/block adjacent to driveway – hole in roof, house sparrow nesting – roof here has gaps to ridge tiles and lifted tiles.</p> <p><b>HIGH BAT POTENTIAL</b></p> <p>Garden to farmhouse; amenity grassland, hedge to road dominated by privet, dogwood, hazel. Trees include; cherry (<i>Prunus avium</i>), tree of heaven (<i>Ailanthus altissima</i>), willow (<i>Salix</i>), horse chestnut (<i>Aesculus hippocastanum</i>) and ornamental planting.</p>	



Target Note	Description	Photograph
TN 14	<p>Brick building, partly 1 storey, partly 2 storey, tile roof, timber fascia to single storey, mesh under, limited access under felt. Bird box terrace. Two storey area has converted attic space, some gaps under ridge tiles, bat box on north west and south east elevation. Bat access tile to roof. Swallow nest box under porch. Both parts have attic space conversion.</p> <p>HIGH BAT POTENTIAL</p>	
TN 15	<p>Garage- brick, pitched clay tile roof. Generally in good condition, one lifted ridge tile, lighting on exterior.</p> <p>NEGLIGIBLE BAT POTENTIAL</p>	
TN 16	<p>Large barn, block base, corrugated asbestos walls and ceiling, timber cladding to gable end, sparrow terrace, steel framed. Timber cross beam, lighting on gable end.</p> <p>NEGLIGIBLE BAT POTENTIAL</p>	

Target Note	Description	Photograph
TN 17	<p>Open Barn, steel framed, clad with metal to sides, asbestos cement roof, open to rear.</p> <p>NEGLIGIBLE BAT POTENTIAL</p>	
TN18	<p>End section, barn supported with old telegraph poles, timber cross beams, metal clad, unsuitable for day roost.</p> <p>NEGLIGIBLE BAT POTENTIAL</p>	
TN 19	<p>Steel framed barn, concrete base, timber clad, corrugated concrete, modern timber cross beams.</p> <p>NEGLIGIBLE BAT POTENTIAL</p>	



Target Note	Description	Photograph
TN 20	Intact hedge, species poor, dominated by hawthorn with trees including Oak ( <i>Quercus robur</i> ), field maple ( <i>Acer campestre</i> ), common nettle ( <i>Urtica dioica</i> ), and bramble ( <i>Rubus fruticosus agg.</i> ) cleavers ( <i>Galium sp.</i> ). Dry ditch beyond western side (Stable Lane), appears engineered with concrete.	
TN 21	Woodland dominated by field maple and oak, semi mature, tall ruderal and scrub under, dominated by bramble, nettles. Some open areas dominated by tall ruderal rosebay willowherb ( <i>Chamerion angustifolium</i> ).	No photograph
TN 22	Intact, species poor hedge, hawthorn, field maple (semi mature) nettle understory.	
TN 23	Semi-improved grassland. Yorkshire fog ( <i>Holcus lanatus</i> ) dominant, annual Meadow grass ( <i>Poa annua</i> ), red and white clover ( <i>Trifolium pratense/repens</i> ), yarrow ( <i>Achillea millefolium</i> ), ribwort plantain ( <i>Plantago lanceolata</i> ), willow herb ( <i>Epilobium</i> ), cocksfoot ( <i>Dactylis</i> ), common nettle, creeping buttercup	No photograph


Target Note	Description	Photograph
	<i>(Ranunculus repens)</i> .	
TN 24	Species poor hawthorn ( <i>Crataegus</i> ) hedge with nettle under. Some gaps. Dog rose ( <i>Rosa canina</i> ). Occasional elder ( <i>Sambucus nigra</i> ).	
TN 25	Improved grassland, perennial rye-grass ( <i>Lolium perenne</i> ) dominant, Yorkshire fog, common bent ( <i>Agrostis capillaris</i> ) abundant, cocksfoot, annual meadow grass -margins, scentless mayweed ( <i>Tripleurospermum inodorum</i> ), common thistle ( <i>Cirsium vulgare</i> ), nettle, dock ( <i>Rumex obtusifolius</i> ), ragwort ( <i>Jacobaea vulgaris</i> ), red clover and rosebay willowherb ( <i>Chamerion angustifolium</i> ).	
TN 26	Oak tree, several dead limbs, one fractured with multiple splits, voids and cavities. MODERATE BAT POTENTIAL	


Target Note	Description	Photograph
TN 27	Turkey Oak and English oak tree line, false oat grass understory, cherry occasional.	
TN 28	<ul style="list-style-type: none"> <li>• Oak midway along boundary, from track old damage to lower trunk, hole at top of damage MODERATE BAT POTENTIAL</li> <li>• Adjacent tree similar but LOW BAT POTENTIAL</li> <li>• Tree with cracked limbs and damage MODERATE BAT POTENTIAL</li> <li>• Tree with cavity (has spider webs) MODERATE BAT POTENTIAL</li> <li>• Large oak with large cavity and bird droppings LOW-MODERATE BAT POTENTIAL</li> <li>• Dead cherry tree with woodpecker hole in decline under two oaks, likely to fall LOW-MODERATE BAT POTENTIAL</li> </ul>	No photographs
TN 29	Common toad in tall ruderal margin adjacent pond.	No Photograph



Target Note	Description	Photograph
TN30	Schwegler nest boxes. 1 sparrow terrace, 1 starling box, 1 kestrel box.	
TN31	Intact hedge hawthorn dominant, oak, honeysuckle ( <i>Lonicera periclymenum</i> ), oak sp., bitter-sweet nightshade ( <i>Solanum dulcamara</i> ), elder occasional.	
TN 32	Dry ditch man-made, surrounded by tall ruderal, willowherbs, fox glove ( <i>Digitalis</i> sp.), thistle, wet to southern end	No Photograph
TN 33	Improved grassland, tall perennial rye-grass dominant. Creeping buttercup, broadleaf plantain ( <i>Plantago major</i> ), red clover, bird foot trefoil ( <i>Lotus corniculatus</i> ), occasional. Margins include Yorkshire fog, thistle ( <i>Cirsium</i> sp.), pineapple mayweed ( <i>Matricaria discoidea</i> ), common nettle, broadleaf dock, annual meadow grass, spear thistle ( <i>Cirsium vulgare</i> ), redshank ( <i>Persicaria maculosa</i> ),	No Photograph


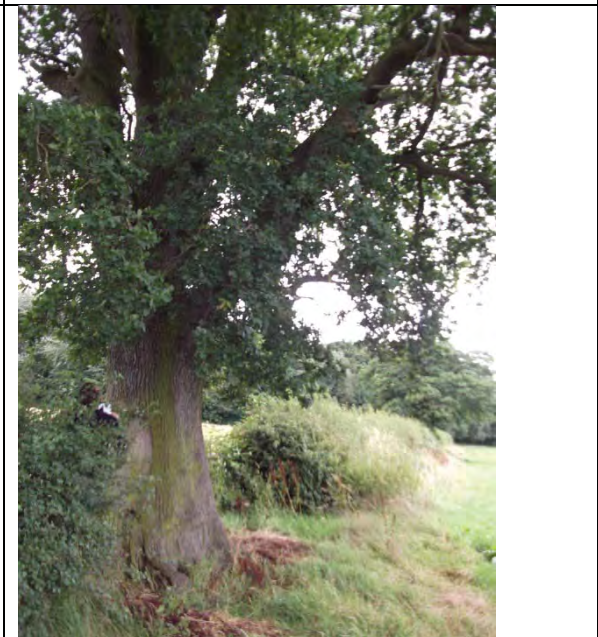





Target Note	Description	Photograph
	chickweed ( <i>Stellaria media</i> ), self heal ( <i>Prunella vulgaris</i> ), wood rush ( <i>Luzula campestris</i> ), meadow foxtail ( <i>Alopecurus pratensis</i> ), forget-me-not ( <i>Myosotis</i> sp.)	
TN 34	Field margin to arable land: wild oat ( <i>Avena</i> sp.) and barley ( <i>Hordeum vulgare</i> ), willow herb, scentless mayweed, scarlet pimpernel ( <i>Anagallis arvensis</i> ), dock, nettle, common vetch ( <i>Vicia sativa</i> ), fumitory ( <i>Fumaria officinalis</i> ), timothy ( <i>Phleum pratense</i> ), redshank, dock.	
TN 35	Confidential	Confidential
TN36	Line of trees: oak, bramble, elder under. Oak nearest pond LOW BAT POTENTIAL	



Target Note	Description	Photograph
TN37	Mature oak, limited inspection possible due to extensive vegetation. LOW/MODERATE BAT POTENTIAL	
TN38	Intact hedgerow, hawthorn, oak, dog rose, hedge bindweed ( <i>Calystegia sepium</i> )	No Photograph
TN39	Abundant species; sweet vernal grass ( <i>Anthoxanthum odoratum</i> ), creeping bent ( <i>Agrostis stolonifera</i> ). Frequent species included; creeping buttercup, meadow foxtail, Yorkshire fog, common sorrel ( <i>Rumex acetosa</i> ), white clover and meadow buttercup ( <i>Ranunculus acris</i> ) (locally abundant). Occasional species included; mouse-ear chickweed ( <i>Cerastium fontanum</i> ), broad-leaved dock, perennial ryegrass, red fescue (locally abundant) ( <i>Festuca rubra</i> ), soft rush ( <i>Juncus effusus</i> ) and marsh foxtail ( <i>Alopecurus geniculatus</i> ). Rare species recorded included; cow parsley ( <i>Anthriscus sylvestris</i> ), soft brome ( <i>Bromus hordeaceus</i> ), ragwort, common nettle, creeping thistle, hogweed, spear thistle, hairy tare ( <i>Vicia hirsuta</i> ), flax ( <i>Linum</i> sp.), thyme leaved speedwell	No Photograph




Target Note	Description	Photograph
	<p>(<i>Veronica serpyllifolia</i>) southern marsh orchid and common spotted orchid.</p> <p>The species composition of the southern margin varied and was less diverse. Frequently recorded species included; dandelion, cow parsley and soft brome. Occasional species recorded included; mouse-ear chickweed, creeping buttercup, meadow foxtail (locally frequent), sweet vernal grass and perennial ryegrass. Rare species recorded included broad leaved dock, ragwort, common nettle, common sorrel, cock's-foot, creeping bent and spear thistle.</p>	
TN 40	<p>Outgrown hedge/trees. Oak, field maple, broom (<i>Cytisus</i> sp.), hawthorn, sycamore (<i>Acer pseudoplatanus</i>), hawthorn, Swedish whitebeam, crack willow, rowan, Corsican pine, hedge bindweed, honey suckle.</p> <p>Moderately high to high value using HEGS.</p>	
TN 41	<p>Mature oak, damaged and with void at approx. 2 metres high. MODERATE BAT POTENTIAL</p>	No Photograph

Target Note	Description	Photograph
TN 42	Defunct hawthorn dominant hedge.	
TN 43	Oak, 2 holes approx. 2-3m height. No cobwebs. MODERATE BAT POTENTIAL	
TN 44	Confidential	Confidential
TN 45	Intact hedge alder dominant hedge, hawthorn, willow	No Photograph
TN 46	Confidential	Confidential

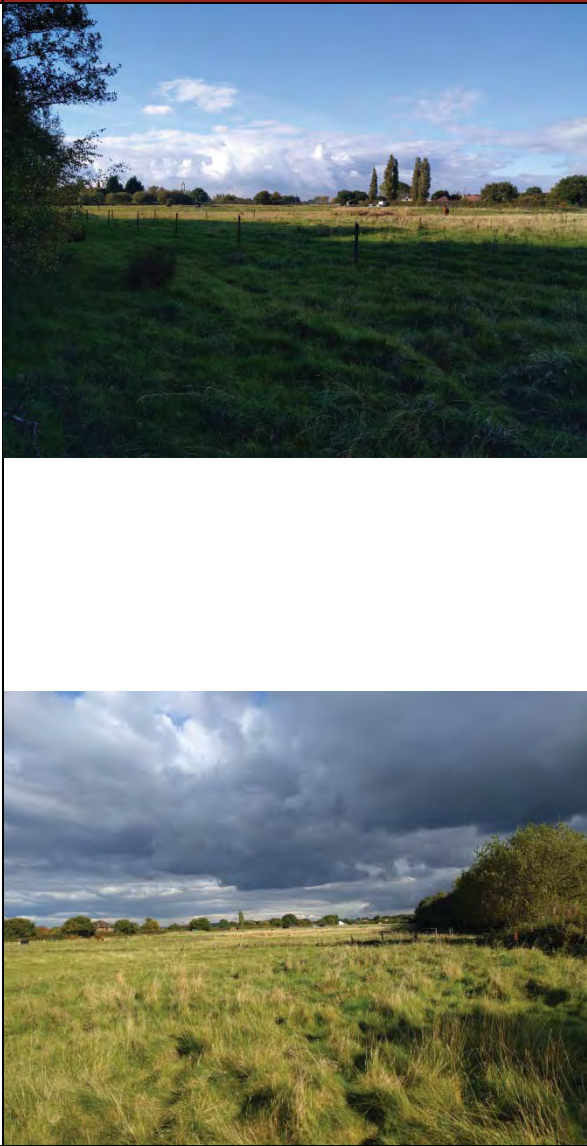

Target Note	Description	Photograph
TN 47	<p>Woodland: sessile oak, hawthorn, sycamore, holly, grey poplar (<i>Populus x canescens</i>), yew (<i>Taxus baccata</i>), rowan, silver birch (<i>Betula pendula</i>), false acacia (<i>Robinia pseudoacacia</i>). Several trees ivy clad limiting inspection, knot hole in poplar 10m high, understory: bramble, nettle, creeping bent, cocksfoot, ivy (<i>Hedera helix</i>).</p> <p>Pond dry</p>	
TN 48	<p>Oak tree wood pecker holes at approx. 5m height, some dead limbs not really suitable for bat roosting. LOW BAT POTENTIAL</p>	



Target Note	Description	Photograph
TN 49	<p>Broadleaved woodland: silver birch, <i>Salix</i> sp., holly, alder, ash, oak, rowan, ivy, hawthorn, elder.</p> <p>Understory of: bramble, soft rush, <i>Carex</i> sp, creeping buttercup, common nettle and floating sweet-grass. Dry during survey in July 2016 but turned into extensive wet woodland over winter and early part of 2017.</p> <p>Smell of fox and rabbit sighted.</p> <p>Three trees with LOW BAT POTENTIAL – ivy restricting view on some.</p>	
TN 50	<p>Pond holding water, 3x1m, 5cm deep. Signs that it may extend to 10x10m during winter. No wildfowl, fish, vegetation.</p>	
TN 51	<p>Defunct species poor hedge, hawthorn dominant. Rabbit digging</p>	




Target Note	Description	Photograph
TN 52	<p>Perennial rye-grass dominant in grassland field, clover and nettle. The southern extent of this field adjacent the woodland was noted to offer a greater diversity and be subject to less grazing pressure. Additional species recorded in this location included hedge bedstraw (<i>Galium mollugo</i>), bird's-foot-trefoil and four marsh orchids (<i>Dactylorhiza praetermissa</i>).</p>	
TN 53	<p>Hedge with trees. Six notable trees and dry ditch behind. One of the trees with moderate bat roosting potential and one with low bat roost potential (rest negligible). Non-native oak (Possibly Turkey oak) present.</p>	



Target Note	Description	Photograph
TN 54	<p>Broadleaved woodland: oak, silver birch, elder, beech, hawthorn, horse chestnut, holly, rowan. Understorey of bramble, soft rush, common nettle, <i>Epilobium</i> sp., <i>Pteridium</i> sp., wood avens.</p> <p>Dense scrub in central understorey caused limited access.</p>	
TN 55	<p>Pond holding water, approximately 5x10, no fish, wildfowl, or emergent vegetation, 100% shaded.</p>	
TN 56	<p>Small circular pond basin within woodland adjacent the canal. The pond was heavily shaded and had significant amounts of leaf litter and woody debris within the basin. Pond was noted to dry annually.</p>	










Target Note	Description	Photograph
TN 57	<p>Large field with temporary fences in place for grazing horses. The main field within the fenced areas was heavily grazed. Species recorded included perennial rye-grass, broadleaf dock, creeping buttercup, <i>Epilobium</i> sp., soft rush, common nettle, spear thistle and cocksfoot. Some orchid rosettes were noted to the southern extent within the fence line. Semi-improved grassland (not grazed recently) around the margins included the species above and also included southern marsh orchid (<i>Dactylorhiza praetermissa</i>), common spotted orchid (<i>Dactylorhiza fuchsii</i>), red clover, hogweed, ribwort plantain, false-oat grass, <i>Geranium</i> sp., common vetch, bird's-foot-trefoil, hedge bedstraw, ladies smock, ragged robin and yarrow.</p>	
TN 58	Veteran tree	No photograph.
TN 59	Intact hedge (species poor): hawthorn dominant, New tree planting along Straight Mile.	
TN 60	Area of arable set aside	No Photograph

Target Note	Description	Photograph
	species present included poppy ( <i>Papaver rhoeas</i> ), violet ( <i>Viola</i> sp.), groundsel ( <i>Senecio vulgaris</i> ), common nettle and rosebay willowherb.	
TN 61	Marsh orchids ( <i>Dactylorhiza praetermissa</i> ) were identified	No Photograph
TN 62	An area of arable set aside including a shallow ditch and bank. This area is seasonally wet, with a high proportion of <i>Juncus</i> noted.	No Photograph
TN 63	Typical arable field and area of broad-leaved woodland in the west of the Site.	
TN 64	Typical arable field in the centre of the Site.	

Target Note	Description	Photograph
TN 65	<p>The woodland comprises semi-mature silver birch interspersed by blocks of early mature Austrian pine (<i>Pinus nigra</i> ssp. <i>Nigra</i>) and Scots pine (<i>Pinus sylvestris</i>). The shrub layer in much of the woodland is formed by dense rhododendron, bramble, bracken or laural (<i>Prunus Laurocerasus</i>). Occasional mature English oak, Turkey oak (<i>Quercus cerris</i>), elder, holly (<i>Ilex aquifolium</i>) and mountain ash (<i>Sorbus aucuparia</i>) are located within the woodland. Several more open areas are situated in the centre of the plantation woodland. The ground flora is poor.</p>	
TN 66	<p>Glade in the centre of the mixed plantation woodland vegetation with bracken.</p>	
TN 67	<p>Track through the mixed plantation woodland in the centre of the Site.</p>	

Target Note	Description	Photograph
TN 68	Quarry and standing water in the north-east of the Site.	
TN 69	<p>Broad-leaved woodland in the far east of the Site. The woodland predominantly comprises a dense stand of early mature silver birch of uniform size and age and occasional semi-mature alder. Marginal areas of the woodland are occupied by scattered mature pedunculate oak and scots pine (<i>Pinus sylvestris</i>). The field layer is predominantly bracken with locally dominant bramble and the occasional hard rush and broad buckler fern (<i>Dryopteris dilatata</i>).</p>	
TN 70	<p>Mature broadleaved woodland dominated by silver birch and pedunculate oak, ranging from small saplings to large late mature specimens. Occasional mature alder and horse chestnut (<i>Aesculus hippocastanum</i>) are also present. The understorey comprises locally dominant stands of bramble or rhododendron, which largely obscure the sparse field layer.</p>	

Target Note	Description	Photograph
TN 71	Arable field in the centre of the Site with mature trees in the middle of the field.	
TN 72	Semi-improved grassland field and hedgerow with mature poplar trees in the south of the Site.	
TN 73	Typical hedgerow and mature trees in the west of the Site.	
TN 74	Dual carriageway and roundabout to the west of the Site.	


Target Note	Description	Photograph
TN 75	Stand of Japanese knotweed on railway embankment, approximately 20m by 5-8m	
TN 76	Stand of Japanese knotweed (limited access) on railway embankment.	
TN 77	Himalayan balsam by the ditch adjacent to the Straight Mile	

Target Note	Description	Photograph
TN78	Improved grassland with generally low species diversity dominated by perennial ryegrass.	No photograph
TN79	Poor semi-improved grassland dominated by false-oat grass, cocksfoot and Yorkshire fog. Also frequently present perennial ryegrass. Sparse herbaceous component including creeping thistle, broad leaved dock and common nettle.	No photograph
TN80	Semi-improved grassland, species present include cocksfoot, false oat grass, smooth meadow grass, creeping buttercup, cleavers, dandelion, yarrow and ribwort plantain. Pignut frequently observed suggesting long history without being ploughed or improved significantly – No other notable species observed.	No photograph
TN81	Hedgerow assessed as being of moderately high to high value using HEGS.	No photograph

Target Note	Description	Photograph
TN82	<p>Broadly triangular shaped mixed woodland dominated by pine including Austrian pine (<i>Pinus nigra</i> ssp. <i>Nigra</i>) and Scots pine (<i>Pinus sylvestris</i>). Other species present include elder (<i>Sambucus nigra</i>), hawthorn and alder (<i>Alnus glutinosa</i>). The understory is predominantly bare with pine needles with areas of dense bramble scrub.</p>	<p>No photograph.</p>
TN83	<p>Small mixed woodland block comprising elder (<i>Sambucus nigra</i>), English Oak (<i>Quercus robur</i>), Sycamore (<i>Acer pseudoplatanus</i>), Sweet Chestnut (<i>Castanea sativa</i>), Austrian Pine (<i>Pinus nigra</i> ssp. <i>Nigra</i>) and Scots Pine (<i>Pinus sylvestris</i>).</p>	<p>No photograph.</p>
TN84	<p>Mature woodland predominantly occupied by oak and alder with abundant silver birch and the occasional horse chestnut. The shrub layer predominantly comprises holly. Parts of the woodland appear to be quite wet and three seasonally connected small shallow ponds are located in low lying depressions.</p>	<p>No photograph</p>



Target Note	Description	Photograph
TN85	Woodland containing several large mature English oak and Lombardy poplar, occasional ash, Norway maple and hornbeam. The shrub layer consists of elder, hawthorn and goat willow, with the occasional bramble. The field layer contains lesser celandine, lords and ladies and common ivy. Parts of the woodland are quite damp and a pond is located in this woodland.	No photograph.
TN86	Woodland containing semi-mature and early mature silver birch, alder, oak, beech, sweet chestnut and holly. The shrub layer contains scattered bramble, gorse and elder amongst a field layer of hard rush and grasses, which extend into the woodland from the adjoining semi-improved grassland habitat.	No photograph.
TN87	Small area of broad-leaved plantation woodland containing a mix of early mature pedunculate oak, silver birch, elder, sycamore, aspen ( <i>Populus tremula</i> ) and hornbeam ( <i>Carpinus betulus</i> ).	No photograph.
TN88	Native black poplar – confirmed via DNA.	No photograph.

Target Note	Description	Photograph
TN89	<p>Large bungalow constructed largely of rendered brick. Concrete roofing tiles on several roof elevations and with modern PVC soffits and fascias. Separate garage building to the west of the main property was present, constructed in largely the same way as the main property.</p> <p>A large outbuilding was also present further west and was of the same construction materials as the garage.</p> <p>A row of horse stables were present to the south west of the main property. They were constructed of brick and render walls with flat bitumen roofing and relatively new PVC soffits and fascias.</p>	
TN90	<p>False acacia (<i>Robinia pseudoacacia</i>) was identified in hedgerow 75 located south of Calf Heath Wood</p>	<p>No photograph.</p>

**Annex 10.1.3**

**Biocensus Hedgerow Survey Report**

**Four Ashes  
Hedgerow Survey 2016**



**Presented to  
Ramboll Environ**

**August 2016**

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## Executive summary

Biocensus were commissioned by Ramboll Environ to undertake a survey of hedgerows within land at Four Ashes, Staffordshire. The study area surrounds an aggregate quarry located to the west of Cannock near Junction 12 of the M6 at National Grid Reference SJ925096.

Of the 97 hedgerows recorded only 11 were considered 'important' under the Hedgerow Regulations 1997. A further 6 were considered borderline, as a result of failing to reach the requisite number of associated features for consideration as 'important' by one. The majority of hedgerows did not meet the criteria.

Many hedgerows with mature trees did not meet the criteria for 'important' under the regulations although presence of trees is considered to increase the likelihood of protected species such as bats which would change the assessment. To date, bat roosts have been identified at two locations, both within Calf Heath Wood.

## 1. Introduction

Biocensus were commissioned by Ramboll Environ to undertake a survey of hedgerows within land at Four Ashes, Staffordshire. The study area surrounds an aggregate quarry located to the west of Cannock near Junction 12 of the M6 at National Grid Reference SJ925096.

## 2. Legislation and Planning Context

The Hedgerow Regulations 1997 set out the properties that make a hedgerow ‘important’ and therefore afforded protection under the legislation. In summary, a hedgerow is considered important if it is more than 30 years old and meets one or more of the following criteria:

### Archaeology and history

- Marks part or all of the boundary of a historic parish or township that existed before 1850;
- Incorporates an archaeological feature (or is associated with one) included in the schedule of monuments compiled by the Secretary of State under section 1 (schedule of monuments) of the Ancient Monuments and Archaeological Areas Act 1979(7) or recorded in a Sites and Monuments Record (dating from 27 March 1997);
- Marks the boundary of a pre-1600 AD estate or manor (or visibly associated with one) and is listed in a Sites and Monuments Record or other such document held at a Records Office since 27 March 1997;
- Forms an integral part of a field system predating the Inclosure Acts;

### Wildlife and landscape

- Contains species listed in part I of Schedule 1 (birds), 5 (animals) or 8 (plants) of the Wildlife and Countryside Act 1981 (as amended), or species considered to be “declining breeders, endangered, extinct, rare or vulnerable” in UK Red Data Books;
- Includes at least a) 7 woody species, b) 6 woody species plus 3 associated features, c) 6 woody species including a black poplar; large-leaved lime, small-leaved lime or wild service tree, d) 5 woody species and 4 associated features or e) is adjacent to a public right of way (byway open to all traffic) and supports at least 4 woody species in addition to 2 associated features.

### Associated features include:

- (a) a bank or wall which supports the hedgerow along at least one half of its length;
- (b) gaps which in aggregate do not exceed 10% of the length of the hedgerow;
- (c) where the length of the hedgerow does not exceed 50 metres, at least one standard tree;
- (d) where the length of the hedgerow exceeds 50 metres but does not exceed 100 metres, at least 2 standard trees;



- (e) where the length of the hedgerow exceeds 100 metres, such number of standard trees (within any part of its length) as would when averaged over its total length amount to at least one for each 50 metres;
- (f) at least 3 woodland species within one metre, in any direction, of the outermost edges of the hedgerow;
- (g) a ditch along at least one half of the length of the hedgerow;
- (h) connections scoring 4 points or more in accordance with sub-paragraph (5);
- (i) a parallel hedge within 15 metres of the hedgerow.

### 3. Methodology

#### 3.1. Site Survey

A walkover of the site was undertaken between the 21<sup>st</sup> and 22<sup>nd</sup> June 2016 and hedgerows assessed using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997. Survey protocol was adapted from guidance of the Hedgerow Survey Handbook<sup>1</sup>. However, given the emphasis on the number of woody species, the following criteria were used:

- (a) where hedgerow length did not exceed 30 metres, all woody species present in the hedgerow were counted;
- (b) where hedgerow length did not exceed 100 metres, woody species in the central 30 metres were counted;
- (c) where hedgerow length fell between 100-200 metres, the hedgerow was divided in half and woody species counted in each central 30 metre section with the aggregate divided by two;
- (d) where the hedgerow length exceeded 200 metres, the hedgerow was divided into three, woody species counted in each central 30 metre section and the aggregate divided by three.

#### 3.2. Surveyor

The surveyor and author of this report was Matthew Pickard (BSc (Hons), MSc.), an ecologist with over 15 years environmental consultancy experience, a Chartered Environmentalist (CEnv) and full member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

#### 3.3. Survey Limitations

Seasonal timing posed a constraint to identification of some plants and in particular was considered late to survey for woodland indicator species. Additional surveys are proposed for 2017 to cover land south of Vicarage Way. This report should be read in conjunction with separate archaeological

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<sup>1</sup> Defra (2007) Hedgerow Survey Handbook. A standard procedure for local surveys in the UK. Defra, London.

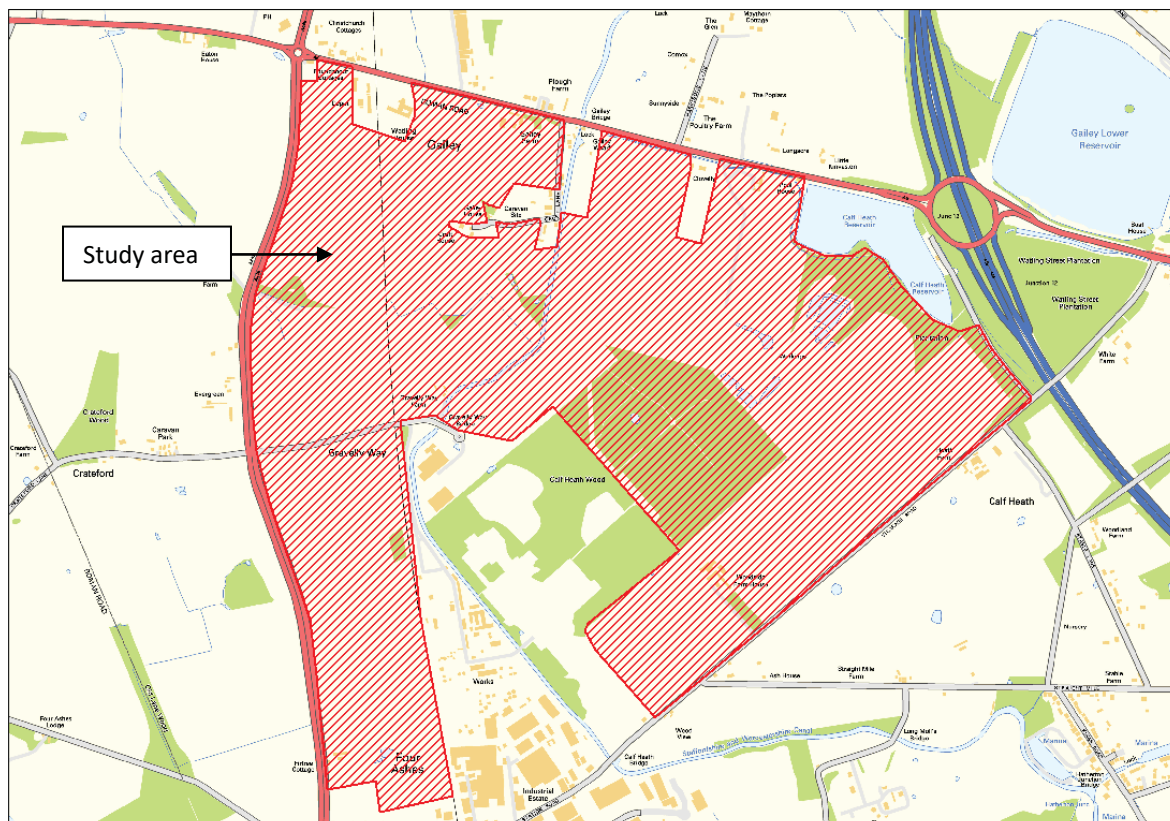
and cultural heritage assessments where reference is made to the archaeology and historical value of hedgerows on-site.

## 4. Existing Conditions

### 4.1. Overview

The study area (see Figure 1 below) is centred on agricultural land in the vicinity of an existing active aggregate quarry to the north of Four Ashes and west of Junction 12 of the M6.

**Figure 1:** Location Plan.

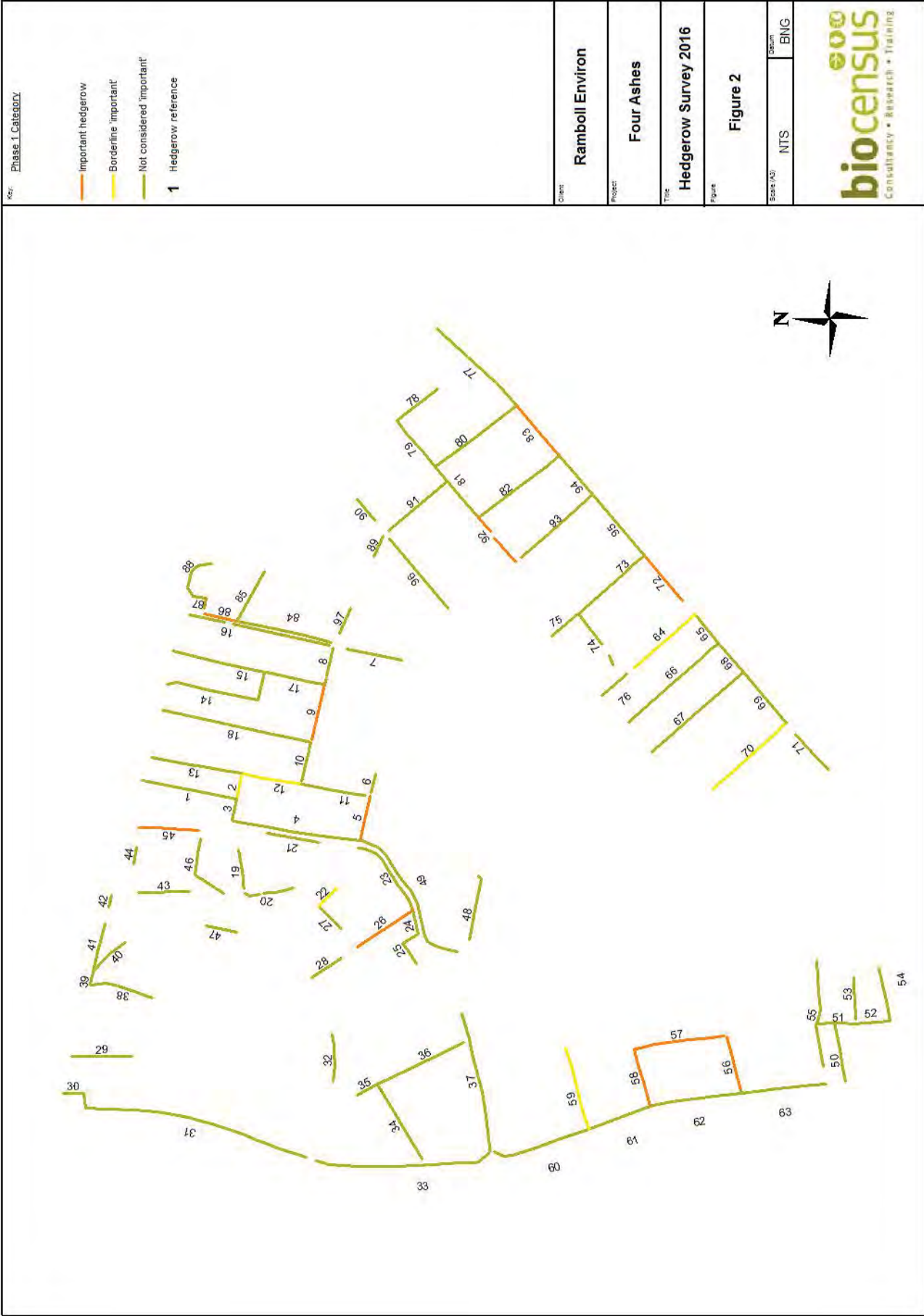


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### 4.2. Hedgerows

The site visit between the 21<sup>st</sup> and 22<sup>nd</sup> June 2016 recorded 97 hedgerow sections of which only 11 were considered 'important' under the Hedgerow Regulations 1997.

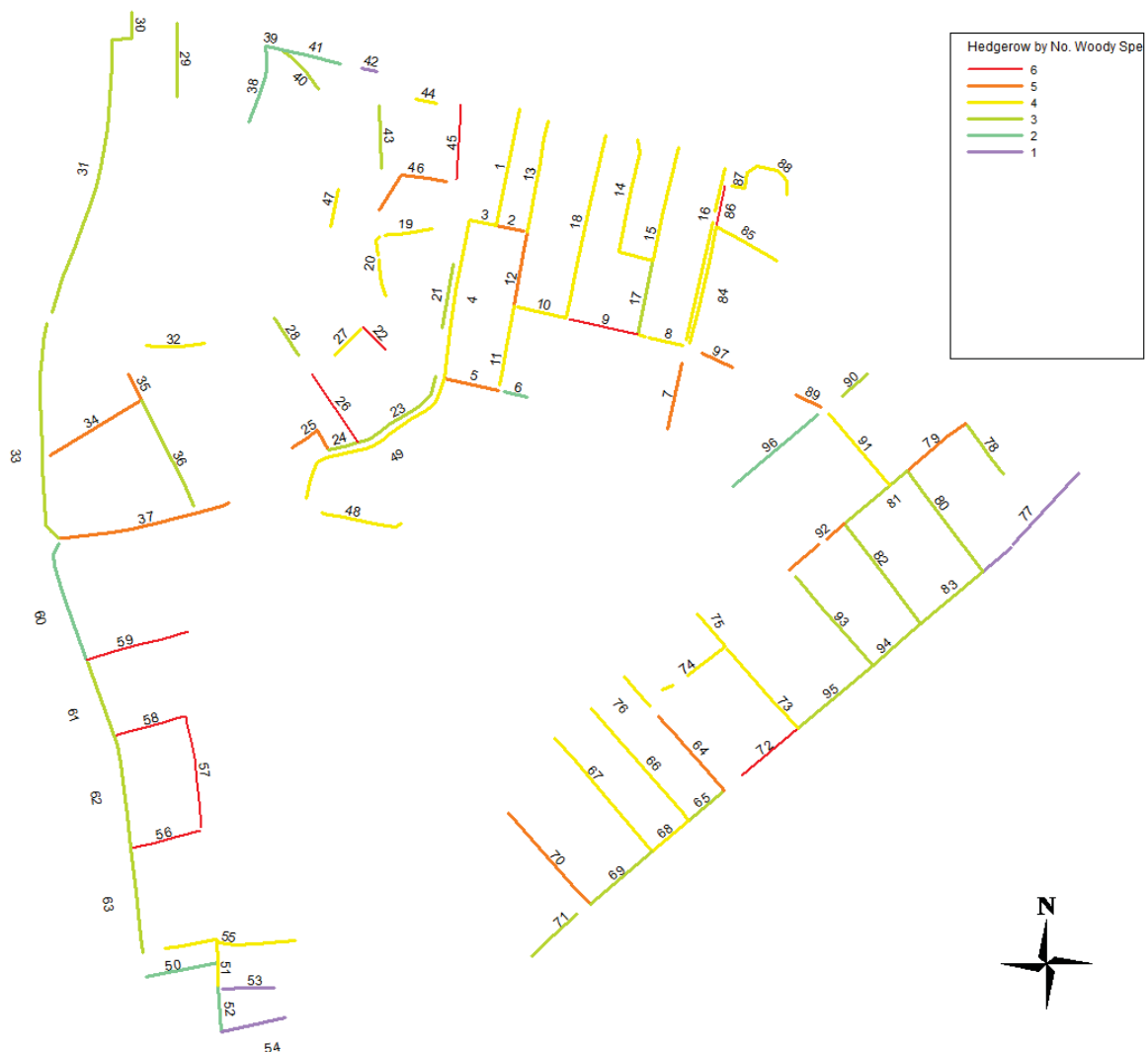
Appendix 1 provides an account of each hedgerow sampled. Figure 2 presents the location of each hedgerow and likely status under the Wildlife and landscape criteria of the Hedgerow Regulation. However, as a note of caution, the presence of protected or RDB species in any of the hedgerows provisionally assessed as 'not considered important' could change their status.









The vast majority of hedgerows assessed during the site visit were relatively species-poor in terms of woody species, none reaching 7 species in any given 30m sample section.

No. of woody sp	Hedgerow references
1	42, 53, 54 & 77
2	6, 38, 39, 41, 50, 52, 60 & 96
3	17, 21, 23, 24, 28, 29-31, 33, 36, 40, 43, 61-63, 65, 69, 71, 78, 80-83, 90 & 93-95
4	1, 3, 4, 8, 10, 11, 13-16, 18-20, 27, 32, 44, 47-49, 51, 55, 66-68, 73-76, 84, 85, 87, 88 & 91
5	2, 5, 7, 12, 25, 34, 35, 37, 46, 64, 70, 79, 83, 89, 92 & 97
6	9, 22, 26, 45, 56-59, 72 & 86

**Figure 3:** Thematic map indicating number of woody species in 30m hedgerow sections



The character of hedgerows varied throughout the study area from intensively managed roadside hedgerows to unmanaged leggy field boundaries and mature trees. The following photographs illustrate examples of hedgerows found within the study area (the number in brackets is the hedge number):

	
<p>Plate 1: Clipped hedge with mature trees (94)</p>	<p>Plate 2: Clipped hedge with retained trees (2)</p>
	
<p>Plate 3: Unmanaged 'leggy' hedgerow (1)</p>	<p>Plate 4: Unmanaged, under-grazed hedge (54)</p>
	
<p>Plate 5: Young trees beside ditch (22)</p>	<p>Plate 6: Unmanaged hedgerow dominated by mature trees (90)</p>

## 5. Assessment

Of the 97 hedgerows recorded only 11 were considered 'important' under the Hedgerow Regulations 1997. A further 6 were considered borderline, as a result of failing to reach the requisite number of associated features for consideration as 'important' by one. The majority of hedgerows did not meet the criteria.

Hedgerows within a central area of the site were dominated by mature trees of Oak some of which were identified as veterans. Hedgerows with such trees included: 81 (T168 & T169), 84 (T153), 86 (T159), 90 (T178) and 91 (T175). An Alder within hedgerow 66 with a DBH of approximately 70cm may also qualify as a veteran tree. Many hedgerows with mature trees did not meet the criteria for 'important' under the regulations although presence of trees is considered to increase the likelihood of protected species such as bats which could change the assessment. To date, bat roosts have been identified at two locations, both within Calf Heath Wood, neither in a hedgerow.

## Appendix 1 – Hedgerow data sheets



## **biocensus**

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Ref: 1

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Tall outgrown hedgerow with two mature Oak (Quercus robur) at the southern end.

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

246

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Elm

Composition: High proportion of Elm

Number of woody species per 30m sample length

- 7 or more
- 6
- 5
- 4
- Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
  - 2 Ditch  for at least half of the hedgerows length
  - 3 Less than 10% gaps  None  1-10%  10-30%  >30
  - 4 Standard tree / 50m
  - 5 At least 3 Woodland Species
  - 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more
- Hedgerow connections  4 or more  Less than 4
- Note:
- 7 Parallel hedge within 15m  Yes  No
  - 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Evidence of historical laying. Species-poor ground flora dominated by Nettle and Cleavers.

Photo1 DSCN8748 Photo2 Photo3 Photo4

Ref: 2

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedge and ditch with standard Oak and young trees

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

60

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Field maple, Whitebeam

Composition:

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
  - 2 Ditch  for at least half of the hedgerows length
  - 3 Less than 10% gaps  None  1-10%  10-30%  >30
  - 4 Standard tree / 50m  Oak
  - 5 At least 3 Woodland Species
  - 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more
- Hedgerow connections  4 or more  Less than 4
- Note:
- 7 Parallel hedge within 15m  Yes  No
  - 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Hawthorn dominated clipped hedgerow interspersed with young trees (largely Sycamore) as well as a mature Oak. Ground flora dominated by Creeping Soft-grass, False Oat-grass and Foxglove. The hedgerow appears to have been gap-filled with planted species.

Photo1 DSCN8749

Photo2

Photo3

Photo4

Ref: 3

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Unmanaged Hawthorn dominated hedgerow

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

60

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Unmanaged Hawthorn dominated hedgerow

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Important hedgerow

Target notes An unmanaged Hawthorn dominated hedgerow with impoverished ground flora dominated by Nettle, Broadleaved Dock, Rough Meadow-grass and occasional Foxglove.

Photo1 DSCN8750 Photo2  Photo3  Photo4

Ref: 4

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Treeline with scrubby outgrowth bordering canal

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

334

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Gorse, Honeysuckle

Composition: Oak, Alder and Silver Birch dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Target notes Scrubby treeline bordering canal.

Photo1 DSCN8751 Photo2 Photo3 Photo4

Ref: 5

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow with standard Oak

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

117

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle

Composition: Hawthorn dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note: Canal and woodland
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Hawthorn dominated hedgerow with Goat Willow, Dogrose, Honeysuckle and mature Oaks. A grassy ground flora supports Red Fescue, False Oat-grass and Lesser Stitchwort.

Photo1 DSCN8752 Photo2 Photo3 Photo4

Ref: 6

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Leggy treeline with low bank and ditch

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

50

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Gorse

Composition: Silver Birch and Oak dominated treeline with occasional Gorse.

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note: Canal and woodland
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Target notes Treeline consisting of young trees of Silver Birch and Oak (Q.robur). The ground flora support Brown Bent (Agrostis vinealis) and Sweet Vernal-grass.

Photo1 DSCN8753 Photo2 Photo3 Photo4

Ref: 7

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Unmanaged outgrown hedgerow bordering quarry.

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

142

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
  - 2 Ditch  for at least half of the hedgerows length
  - 3 Less than 10% gaps  None  1-10%  10-30%  >30
  - 4 Standard tree / 50m
  - 5 At least 3  Woodland Species  Geum urbanum
  - 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more
- Hedgerow connections  4 or more  Less than 4
- Note:  Woodland
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Hawthorn dominated hedgerow with mature Oaks and rank ground cover dominated by Bramble, Nettle, False Oat-grass, Rosebay Willowherb and occasional Foxglove.

Photo1 DSCN8754

Photo2

Photo3

Photo4

Ref: 8

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Dense Hawthorn dominated managed hedgerow

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

90

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Lime

Composition: Hawthorn dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Hawthorn dominated hedgerow with a species-poor ground flora dominated by Nettle and False Oat-grass. A Lime (Tilia x europaea) and occasional Oak (Q.robur) are present.

Photo1 DSCN8755 Photo2 Photo3 Photo4



Ref: 9

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Clipped hedgerow and ditch with small trees

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

145

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Cherry, Field Maple, Lime, Honeys

Composition: Hawthorn and Blackthorn dominated with Dogrose, Goat Willow, Q.robur, Prunus avium and Tilia x europaea

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Yes  No

Target notes

Moderately diverse clipped hedgerow and ditch with small trees. Ground flora supports species indicative of acid conditions including Sheep's Sorrel (Rumex acetosella), Foxglove and Bracken.

Photo1 DSCN8756

Photo2

Photo3

Photo4

Ref: 10

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow and ditch

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

105

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Prunus avium

Composition: Hawthorn and Oak dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Clipped hedgerow with mature Oaks. Species indicative of acidic conditions including Sheep's Sorrel present. Ground flora generally impoverished.

Photo1 DSCN8757 Photo2 Photo3 Photo4

Ref: 11

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow and ditch

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

170

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle,

Composition: Hedgerow dominated by Hawthorn, Q.robur and B.pendula

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Clipped hedgerow and ditch supporting Hawthorn, Silver Birch and Oak with occasional Honeysuckle and Elder. Ground flora largely rank and supporting Nettle, Rosebay Willowherb, False Oat-grass and Cleavers although patches of Foxglove and Wavy Hair-grass were noted.

Photo1 DSCN8758 Photo2 Photo3 Photo4

Ref: 12

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow and ditch

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

157

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle

Composition: Hawthorn, Oak and Honeysuckle constant

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Hedgerow dominated by Hawthorn, Oak and Honeysuckle with occasional Elder, Goat Willow and Holly. Rank grassy ground cover is present with False Oat-grass, Cleavers, Foxglove and Bramble.

Photo1 DSCN8759

Photo2

Photo3

Photo4

Ref: 13

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow and ditch dominated by Hawthorn

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

235

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition:

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
 Not known

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Target notes Clipped hedgerow and ditch with rank ground cover of False Oat-grass, Nettle, Cleavers and Bracken. Ladies Bedstraw and Common Bird's-foot-trefoil present in roadside verge.

Photo1 DSCN8760 Photo2  Photo3  Photo4

Ref: 14

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Outgrown to north but clipped to the south.

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

313

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Target notes

Towards north the hedgerow supports up to six woody species per 30m but becomes species-poor to south. Ground flora is species-poor and largely dominated by False Oat-grass, Cleavers and Nettle.

Photo1 DSCN8762

Photo2

Photo3

Photo4

Ref: 15

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped Hawthorn dominated hedgerow with semi-mature Oaks to the north

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

242

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition:

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Important hedgerow

Not known

Target notes

Hawthorn dominated hedgerow with impoverished ground cover supporting rank grasses.

Photo1 DSCN8763

Photo2

Photo3

Photo4

Ref: 16

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped roadside (quarry) hedgerow.

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

340

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn and Dogrose dominated

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
 Not known

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Target notes Gappy hedgerow beside quarry access road. Hedgerow dominated by Hawthorn and Dogrose with occasional Oak and Ash (mature tree). Ground flora supports False Oat-grass, Nettle, Cleavers and Hogweed.

Photo1 DSCN8764 Photo2  Photo3  Photo4



Ref: 17

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Hawthorn and locally, Elm dominated clipped hedgerow

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

153

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Elm

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Hawthorn and Elm dominated hedgerow with rank ground cover of False Oat-grass, Nettle and Cleavers.

Photo1 DSCN8765 Photo2 Photo3 Photo4

Ref: 18

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow with standard Oaks

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

390

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle

Composition: Hawthorn, Oak, Dogrose and Elder almost constant

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Target notes Clipped hedgerow with mature Oaks toward the south. Ground cover largely rank and dominated by False Oat-grass, Cleavers, Nettle and Rosebay Willowherb.

Photo1 DSCN8766 Photo2 Photo3 Photo4

Ref: 19

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Roadside hedgerow dominated by Hawthorn, Oak and Alder

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

101

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle

Composition: Roadside hedgerow dominated by Hawthorn, Oak and Alder

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Roadside hedgerow dominated by Hawthorn, Alder and Oak with rank ground cover of False Oat-grass, Nettle, Cleavers, Hogweed and Cow Parsley. A mature Oak is present to the east.

Photo1 DSCN8767 Photo2 Photo3 Photo4

Ref: 20

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped to the north and unmanaged to the south (becoming line of trees)

Hedge height	Hedge width	Hedge length (m):
<input type="radio"/> 0-1m	<input type="radio"/> 0-1m	<input type="text" value="120"/>
<input type="radio"/> 1-2m	<input type="radio"/> 1-2m	
<input checked="" type="radio"/> 2-4m	<input checked="" type="radio"/> 2-4m	
<input type="radio"/> >4m	<input type="radio"/> >4m	

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more
 

Hedgerow connections  4 or more  Less than 4

Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Target notes

Photo1  Photo2  Photo3  Photo4

Ref: 21

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow with mature trees beside tow-path of canal

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

137

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Aspen, Honeysuckle

Composition: Hawthorn dominated hedgerow with mature trees of Oak

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note: Woodland and canal
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Target notes Clipped hedgerow dominated by Hawthorn and punctuated by mature Oaks beside the tow-path of the canal. Ground flora includes Red Fescue, False Oat-grass, Meadow Vetchling and Marsh Horsetail. Diversity of woody species was 3-4 sp per 30m.

Photo1 DSCN8770 Photo2 Photo3 Photo4

Ref: 22

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Ditch and bank with outgrown shrubs and trees

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

70

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Gorse, Aspen

Composition: Mix of Oak, Hawthorn, Elder, Silver Birch, Gorse and Goat Willow

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Outgrown shrubs and young trees alongside a ditch. Ground cover includes Reed Canary-grass, False Oat-grass, Nettle, Cleavers and Bracken.

Photo1 DSCN8771

Photo2

Photo3

Photo4

Ref: 23

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow  
 2 - Managed 'gappy' hedgerow  
 3 - Unmanaged 'leggy' hedgerow  
 4 - Hedgebank with occasional shrubs  
 5 - Managed hedgerow with mature trees  
 6 - Treeline  
 7 - New / reinstated hedgerow  
 8 - Fenceline

Note:

Clipped hedgerow beside towpath of canal

Hedge height

0-1m  
 1-2m  
 2-4m  
 >4m

Hedge width

0-1m  
 1-2m  
 2-4m  
 >4m

Hedge length (m):

222

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle

Composition: Hawthorn dominated hedgerow with a low frequency of other woody species

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length  
 2 Ditch  for at least half of the hedgerows length  
 3 Less than 10% gaps  None  1-10%  10-30%  >30  
 4 Standard tree / 50m   
 5 At least 3 Woodland Species  
 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
 Hedgerow connections  4 or more  Less than 4  
 Note: Woodland and canal  
 7 Parallel hedge within 15m  Yes  No  
 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Clipped Hawthorn dominated hedgerow beside towpath of canal. The hedgerow meets a woodland to the north and mature trees are a feature in the immediate vicinity. Ground cover is rank and largely composed of False Oat-grass, Nettle, Cleavers, Creeping thistle and Hogweed.

Photo1 DSCN8772

Photo2

Photo3

Photo4

Ref: 24

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Clipped hedgerow beside tow-path of canal

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

65

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Hawthorn dominated clipped hedgerow with rank ground cover supporting Great Willowherb, Cleavers, Hogweed, False Oat-grass and Couch.

Photo1 DSCN8773 Photo2  Photo3  Photo4



Ref: 25

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow  
 2 - Managed 'gappy' hedgerow  
 3 - Unmanaged 'leggy' hedgerow  
 4 - Hedgebank with occasional shrubs  
 5 - Managed hedgerow with mature trees  
 6 - Treeline  
 7 - New / reinstated hedgerow  
 8 - Fenceline

Note:

Unmanaged shrubs and small trees

Hedge height

0-1m  
 1-2m  
 2-4m  
 >4m

Hedge width

0-1m  
 1-2m  
 2-4m  
 >4m

Hedge length (m):

110

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Laurel

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length  
 2 Ditch  for at least half of the hedgerows length  
 3 Less than 10% gaps  None  1-10%  10-30%  >30  
 4 Standard tree / 50m   
 5 At least 3 Woodland Species  
 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
 Hedgerow connections  4 or more  Less than 4  
 Note:  
 7 Parallel hedge within 15m  Yes  No  
 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes

Unmanaged outgrown hedgerow with small trees surrounding a property. Non-native Laurel (Prunus laurocerasus) present. Ground flora rank and includes Nettle, Cleavers, False Oat-grass and Creeping Thistle.

Photo1 DSCN8774

Photo2

Photo3

Photo4

Ref: 26

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Clipped hedgerow with standard Oak trees

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

173

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn, Blackthorn, Alder and Oak constant

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Important hedgerow

Target notes Clipped hedgerow and ditch with standard Oaks and rank ground cover dominated by Bramble, Nettle, Cleavers, False Oat-grass and Creeping Thistle.

Photo1  Photo2  Photo3  Photo4

Ref: 27

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow and ditch

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

75

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle

Composition:

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
  - 2 Ditch  for at least half of the hedgerows length
  - 3 Less than 10% gaps  None  1-10%  10-30%  >30
  - 4 Standard tree / 50m
  - 5 At least 3 Woodland Species
  - 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more
- Hedgerow connections  4 or more  Less than 4
- Note: Woodland
- 7 Parallel hedge within 15m  Yes  No
  - 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Clipped hedgerow and ditch with ground cover of Ivy, Bramble, False Oat-grass, Cleavers, Great Willowherb and Foxglove.

Photo1 Photo2 Photo3 Photo4

Ref: 28

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Streamside trees grading into a clipped hedgerow to the north

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

94

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:  Woodland

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Target notes

Streamside trees of Alder with occasional Oak and Elder grading into a clipped hedgerow dominated by Goat Willow to the north. Rank ground cover includes False Oat-grass, Cleavers, Nettle and Great Willowherb.

Photo1 DSCN8776

Photo2

Photo3

Photo4

Ref: 29

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Gappy Hawthorn dominated shrub cover beside a palisade fence

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

155

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Norway Maple, Prunus avium

Composition: Hawthorn dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Target notes

Gappy Hawthorn dominated shrub cover beside a palisade fence. Occasional Holly and Dogrose as well as Cherry and Norway Maple to the north. Rank ground cover of Bramble, Nettle, Cleavers and Hogweed.

Photo1 DSCN8777

Photo2

Photo3

Photo4

Ref: 30

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Unmanaged hedgerow with young ash trees

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

94

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?  
 Not known

Target notes Unmanaged Hawthorn dominated hedgerow with young trees of Ash surrounding a property. A rank ground flora is dominated by False Oat-grass and Cleavers.

Photo1 DSCN8778

Photo2

Photo3

Photo4

Ref: 31

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Clipped roadside hedgerow overwhelmingly dominated by Hawthorn

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

587

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated with occasional Elder, Ash and Dogrose

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Clipped Hawthorn dominated hedgerow with rank ground cover of False Oat-grass, Cleavers, Nettle, Hogweed and Cow Parsley. Landscape trees have been planted in a roadside verge to the west.

Photo1 DSCN8779

Photo2

Photo3

Photo4

Ref: 32

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Outgrown hedgerow adjoining small copse

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

123

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Norway Maple, Hornbeam

Composition: Hawthorn dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note: Woodland
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
Not known

Target notes Outgrown hedgerow adjoining small woodland. Nettle forms much of the ground cover.

Photo1 DSCN8780 Photo2 Photo3 Photo4



Ref: 33

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped roadside hedgerow dominated by Hawthorn

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

459

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn and Oak constant

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Important hedgerow

Target notes Hawthorn dominated clipped roadside hedgerow with frequent Oak and occasional Ash. Bramble and Nettle form ground cover with False Oat-grass, Cleavers and Hogweed.

Photo1 DSCN8781 Photo2  Photo3  Photo4

Ref: 34

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Partially managed hedgerow with trees

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

220

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Lime, Sweet Chestnut

Composition: Hawthorn dominated with occasional Tilia x europaea, Quercus robur, Goat Willow, Alder, Elder and Sweet

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
Not known

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Target notes Partially managed hedgerow with trees supporting 4-5 woody species per 30m. Ground cover of Ivy, Nettle, False Oat-grass and Cleavers

Photo1 DSCN8782 Photo2 Photo3 Photo4

Ref: 35

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Outgrown hedgerow (largely a treeline)

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

60

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Sweet Chestnut, Lime, Norway Ma

Composition: Sweet Chestnut, Lime (Tilia x europaea), Norway Maple and Oak (Quercus robur) with Blackthorn

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
  - 2 Ditch  for at least half of the hedgerows length
  - 3 Less than 10% gaps  None  1-10%  10-30%  >30
  - 4 Standard tree / 50m
  - 5 At least 3 Woodland Species
  - 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more
- Hedgerow connections  4 or more  Less than 4
- Note:
- 7 Parallel hedge within 15m  Yes  No
  - 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Unmanaged hedgerow now largely forming a treeline with occasional Blackthorn.

Photo1 DSCN8783 Photo2 Photo3 Photo4

Ref: 36

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Partially managed hedgerow with a mature Oak

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

246

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn, Hazel and Blackthorn dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Target notes

Partially managed hedgerow with ditch. Hazel is dominant to the north, Blackthorn and Hawthorn to the south. A single mature Oak is present. Ground flora is rank. The hedgerow appears to have been subject to relatively recent planting (gap filling?).

Photo1 DSCN8784 Photo2  Photo3  Photo4

Ref: 37

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped roadside hedgerow with occasional young trees of Birch

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

362

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle, Privet

Composition: Hawthorn dominated with frequent Silver Birch, Oak, Rowan and Honeysuckle

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Clipped roadside hedgerow dominated by Hawthorn but supporting a mix of other species including frequent Silver Birch, Oak, Rowan and Honeysuckle.

Photo1 DSCN8785

Photo2

Photo3

Photo4

Ref: 38

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Treeline plus unmanaged Hawthorn dominated hedgerow

Hedge height	Hedge width	Hedge length (m):
<input type="radio"/> 0-1m <input type="radio"/> 1-2m <input type="radio"/> 2-4m <input checked="" type="radio"/> >4m	<input type="radio"/> 0-1m <input type="radio"/> 1-2m <input checked="" type="radio"/> 2-4m <input type="radio"/> >4m	<input type="text" value="165"/>

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Prunus avium, Lime

Composition: Hawthorn dominated

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Target notes Post and rail fence with individual (young) trees of Oak, Lime, Ash to the south which develops into a Hawthorn dominated hedgerow. Rank ground cover comprises False Oat-grass and Nettle.

Photo1 DSCN8787 Photo2 Photo3 Photo4

Ref: 39

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Hawthorn dominated roadside hedgerow.

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

40

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Prunus avium

Composition:

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Target notes Hawthorn dominated hedgerow with occasional Cherry. Rank ground cover comprises Hogweed, False Oat-grass, Nettle, Creeping Thistle and Cleavers.

Photo1 DSCN8788 Photo2 Photo3 Photo4

Ref: 40

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Defunct hedgerow / treeline

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

114

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Lime

Composition:

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Not known

Target notes Short section of unmanaged hedgerow to the north quickly grades into occasional individual trees of Lime beside a stream.

Photo1 DSCN8789 Photo2 Photo3 Photo4



Ref: 41

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

[Empty text box]

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

128

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Gorse

Composition: [Empty text box]

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m  [Empty text box]
- 5 At least 3 Woodland Species [Empty text box]
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more
 

Hedgerow connections  4 or more  Less than 4

Note: Pond [Empty text box]
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Clipped roadside hedgerow with an Ash and Oak. Silver Birch have been planted in the roadside verge to the north of the hedgerow. Gorse and Sycamore are also present and ground cover is rank and dominated by False Oat-grass.

Photo1 DSCN8790 Photo2 [Empty] Photo3 [Empty] Photo4 [Empty]

Ref: 42

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Clipped roadside hedgerow

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

31

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn only (Silver Birch in roadside verge)

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:  Pond

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Target notes Clipped Hawthorn hedgerow with ground cover of False Oat-grass, Nettle and Hogweed.

Photo1  DSCN8791  Photo2  Photo3  Photo4

Ref: 43

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow with mature Oaks

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

132

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Apple

Composition: Hawthorn dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
  - 2 Ditch  for at least half of the hedgerows length
  - 3 Less than 10% gaps  None  1-10%  10-30%  >30
  - 4 Standard tree / 50m
  - 5 At least 3 Woodland Species
  - 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more
- Hedgerow connections  4 or more  Less than 4
- Note:
- 7 Parallel hedge within 15m  Yes  No
  - 8 Have protected species been recorded?

Not known

Target notes

Hawthorn dominated hedgerow with ditch and mature trees of Oak. Other woody species include Blackthorn, Hazel, Alder and Holly. Ground cover is rank and supports False Oat-grass, Nettle, Bramble, Cleavers and Red Campion.

Photo1 DSCN8792 Photo2 Photo3 Photo4

Ref: 44

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Outgrown hedgerow / treeline

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

44

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition:

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Target notes

Outgrown hedgerow and tree cover.

Photo1 DSCN8793 Photo2  Photo3  Photo4

Ref: 45

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Roadside hedge and trees with thick outgrowth of Bracken

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

156

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle,

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Roadside hedgerow with mature trees and thick ground cover of Bracken.

Photo1 DSCN8794 Photo2 Photo3 Photo4

Ref: 46

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Unmanaged outgrown hedgerow with trees

Hedge height	Hedge width	Hedge length (m):
<input type="radio"/> 0-1m <input type="radio"/> 1-2m <input type="radio"/> 2-4m <input checked="" type="radio"/> >4m	<input type="radio"/> 0-1m <input type="radio"/> 1-2m <input checked="" type="radio"/> 2-4m <input type="radio"/> >4m	<input type="text" value="183"/>

Woody species

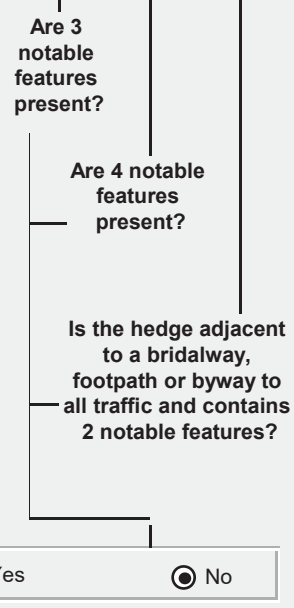
- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4



Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Important hedgerow

Target notes Unmanaged outgrown hedgerow with mature trees (largely Oak). Ground flora supports Ivy, Nettle, Bracken, Cleavers, False Oat-grass and Bramble.

Photo1 DSCN8795 Photo2  Photo3  Photo4

Ref: 47

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Stream with defunct hedgerow / treeline

Hedge height	Hedge width	Hedge length (m):
<input type="radio"/> 0-1m <input type="radio"/> 1-2m <input type="radio"/> 2-4m <input checked="" type="radio"/> >4m	<input type="radio"/> 0-1m <input type="radio"/> 1-2m <input checked="" type="radio"/> 2-4m <input type="radio"/> >4m	<input type="text" value="80"/>

Woody species

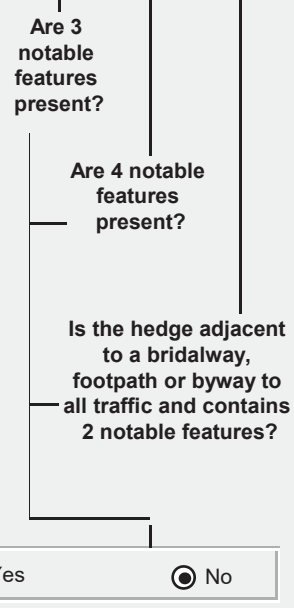
- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4



Notable features

- Bank  or Wall  for at least half of the hedgerows length
- Ditch  for at least half of the hedgerows length
- Less than 10% gaps  None  1-10%  10-30%  >30
- Standard tree / 50m
- At least 3 Woodland Species
- Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- Parallel hedge within 15m  Yes  No
- Have protected species been recorded?

Important hedgerow

Target notes Stream with defunct hedgerow / treeline.

Photo1 DSCN8796 Photo2  Photo3  Photo4

Ref: 48

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Treeline with some infilling of shrubs

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

170

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Oak and Hawthorn dominant

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:  Woodland
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
 Not known

Important hedgerow

Target notes Outgrown hedgerow largely dominated by Oaks. Ground flora included False Oat-grass, Yorkshire-fog and Foxglove as well as some Bracken.

Photo1 DSCN8797 Photo2  Photo3  Photo4



Ref: 49

Date 21/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Trees and scrub beside eastern banks of canal

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

412

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle

Composition: Oak (Q.robur), Alder, Crack Willow and Silver Birch

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Target notes

Riparian tree cover dominated by trees of Oak, Alder, Crack Willow and Silver Birch as well as a thick fringe of Bramble and tall herbs.

Photo1 DSCN8798

Photo2

Photo3

Photo4

Ref: 50

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Hawthorn dominated unmanaged hedgerow

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

152

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Crataegus persimilis

Composition:

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
  - 2 Ditch  for at least half of the hedgerows length
  - 3 Less than 10% gaps  None  1-10%  10-30%  >30
  - 4 Standard tree / 50m
  - 5 At least 3 Woodland Species Pignut in grassland
  - 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more
- Hedgerow connections  4 or more  Less than 4
- Note:
- 7 Parallel hedge within 15m  Yes  No
  - 8 Have protected species been recorded?

Not known

Target notes

A species-poor Hawthorn dominated hedgerow supporting infrequent shrubs of Hazel, Blackthorn and Broad-leaved Cockspurthorn (North American species). Ground flora grassy in character and supporting False Oat-grass, Yorkshire-fog, Sweet Vernal-grass, Creeping Bent as well as Nettle and Foxglove.

Photo1 DSCN8820 Photo2 Photo3 Photo4

Ref: 51

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Unmanaged hedgerow with trees

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

94

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:  Pond

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Unmanaged outgrown hedgerow with trees of Ash and Oak. Rank grassy ground cover present.

Photo1 DSCN8821 Photo2  Photo3  Photo4

Ref: 52

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Unmanaged and outgrown hedgerow bordering tree planting

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

96

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated with Dogrose

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Unmanaged and outgrown hedgerow bordering tree planting. Ground cover of Nettle.

Photo1 DSCN8823 Photo2  Photo3  Photo4

Ref: 53

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Unmanaged and undergrazed

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

107

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Only Hawthorn

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
 Not known

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Target notes Line of unmanaged Hawthorn shrubs supporting ground cover of Nettle and grasses grazed by sheep.

Photo1 DSCN8822 Photo2  Photo3  Photo4

Ref: 54

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Unmanaged Hawthorn

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

137

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn only

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Target notes Line of unmanaged Hawthorn shrubs supporting ground cover of Nettle, Foxglove and grasses grazed by sheep.

Photo1 DSCN8824 Photo2  Photo3  Photo4

Ref: 55

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Unmanaged hedgerow / treeline centred on ditch

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

276

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Lime, Field Maple, White Willow

Composition: Blackthorn and Tilia x europaea dominated

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note: Ponds
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
Not known

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Target notes Unmanaged hedgerow / treeline centred on ditch and adjacent to two sperate ponds. Ground flora of Nettle and Foxglove present.

Photo1 DSCN8826 Photo2 Photo3 Photo4

Ref: 56

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow with small trees of Cherry

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

150

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Prunus avium

Composition:

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Not known

Target notes

Partially managed hedgerow with small Cherry trees. Ground flora is largely rank and supports Ivy, False Oat-grass, Nettle, Foxglove and Hogweed.

Photo1 DSCN8827

Photo2

Photo3

Photo4



Ref: 57

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Partially reinstated hedgerow with small trees

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

234

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Field Maple, Sorbus aria, Elm

Composition: Shrubs plus young trees of Ash, Oak and Field Maple

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note: Pond
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
Not known

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Target notes Young trees of Ash, Oak and Field Maple form the bulk of the hedgerow with shrubs of Blackthorn, Hawthorn, Elder and Elm (some of which have been planted) creating an understorey. Ground flora is dominated by Couch, False Oat-grass, Hogweed, Cleavers and Red Campion.

Photo1 DSCN8828 Photo2 Photo3 Photo4

Ref: 58

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow with small trees

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

154

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Lime, Cherry, Poplar

Composition: Hawthorn, Hazel, Elder as well as Oak (Quercus robur), Lime (Tilia x europaea), Cherry (Prunus avium) and Ash.

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
  - 2 Ditch  for at least half of the hedgerows length
  - 3 Less than 10% gaps  None  1-10%  10-30%  >30
  - 4 Standard tree / 50m
  - 5 At least 3 Woodland Species
  - 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more
- Hedgerow connections  4 or more  Less than 4
- Note:
- 7 Parallel hedge within 15m  Yes  No
  - 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Shrubs of Hawthorn, Hazel, Elder as well as young trees of Oak (Quercus robur), Lime (Tilia x europaea), Cherry (Prunus avium) and Ash. Ground flora is rank and supports False Oat-grass, Hogweed, Cleavers and Nettle.

Photo1 DSCN8829

Photo2

Photo3

Photo4

Ref: 59

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Unmanaged outgrown hedge with trees

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

218

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Poplar

Composition:

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Outgrown hedgerow / treeline with some shrubs between tree trunks. Grassy rank ground cover supports False Oat-grass, Cleavers, Hogweed and Cow Parsley.

Photo1 DSCN8830 Photo2 Photo3 Photo4

Ref: 60

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped roadside hedgerow

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

258

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition:

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
 Not known

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Target notes Clipped roadside hedgerow dominated by Hawthorn. Semi-mature trees of Maple are associated with the adjacent road verge. Ground cover is rank and supports Cleavers, Rosebay Willowherb, Nettle and False Oat-grass.

Photo1 DSCN8831 Photo2  Photo3  Photo4

Ref: 61

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped roadside hedgerow

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

165

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Broadleaved Cockspurthorn

Composition: Hawthorn dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Clipped roadside hedgerow dominated by Hawthorn. Semi-mature trees of Maple are associated with the adjacent road verge. Ground cover is rank and supports Cleavers, Rosebay Willowherb, Nettle and False Oat-grass. Broadleaved Cockspurthorn (Crataegus persimilis) is present.

Photo1 DSCN8832 Photo2 Photo3 Photo4

Ref: 62

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped roadside hedgerow

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

238

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
 Not known

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Target notes Clipped roadside hedgerow dominated by Hawthorn. Semi-mature trees of Maple are associated with the adjacent road verge. Ground cover is rank and supports Cleavers, Rosebay Willowherb, Nettle and False Oat-grass.

Photo1 DSCN8833 Photo2  Photo3  Photo4

Ref: 63

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Clipped roadside hedgerow

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

218

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?  
Not known

Important hedgerow

Target notes Clipped roadside hedgerow dominated by Hawthorn. Semi-mature trees of Maple are associated with the adjacent road verge. Ground cover is rank and supports Cleavers, Rosebay Willowherb, Nettle and False Oat-grass.

Photo1 DSCN8834

Photo2

Photo3

Photo4

Ref: 64

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Clipped hedgerow beside ditch and access track

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

207

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Target notes

Clipped hedgerow dominated by Hawthorn. Rank ground covers supports False Oat-grass, Nettle, Cleavers and Hogweed.

Photo1 DSCN8835 Photo2 Photo3 Photo4



Ref: 65

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Clipped roadside hedgerow

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

95

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Roadside hedgerow dominated by Hawthorn with rank ground cover of False Oat-grass, Cleavers, Nettle and Rosebay Willowherb.

Photo1 DSCN8836 Photo2  Photo3  Photo4

Ref: 66

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Clipped hedgerow with three trees (Oak and Alder)

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

309

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle, Elm

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Target notes

Clipped hedgerow dominated by Hawthorn and supporting occasional Oak, Elder, Elm, Dogrose and Honeysuckle. Three trees are present, an Oak and two Alder. Ground cover consists of rank False Oat-grass and Nettle.

Photo1 DSCN8837

Photo2

Photo3

Photo4

Ref: 67

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Partially managed hedgerow with planted Poplars

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

312

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Poplar, Honeysuckle

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note: Pond

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Partially managed (clipped at sides) hedgerow with planted Poplar trees and rank grassy / Nettle ground cover.

Photo1 DSCN8838 Photo2 Photo3 Photo4

Ref: 68

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Clipped roadside hedgerow

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

100

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle

Composition: Hawthorn dominated

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Clipped hedgerow dominated by Hawthorn and with frequent Honeysuckle. Rank ground covers supports False Oat-grass, Nettle, Cleavers and Hogweed.

Photo1 DSCN8839 Photo2 Photo3 Photo4

Ref: 69

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow  
 2 - Managed 'gappy' hedgerow  
 3 - Unmanaged 'leggy' hedgerow  
 4 - Hedgebank with occasional shrubs  
 5 - Managed hedgerow with mature trees  
 6 - Treeline  
 7 - New / reinstated hedgerow  
 8 - Fenceline

Note:

Clipped roadside hedgerow

Hedge height

0-1m  
 1-2m  
 2-4m  
 >4m

Hedge width

0-1m  
 1-2m  
 2-4m  
 >4m

Hedge length (m):

170

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn with Oak and Dogrose

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length  
 2 Ditch  for at least half of the hedgerows length  
 3 Less than 10% gaps  None  1-10%  10-30%  >30  
 4 Standard tree / 50m    
 5 At least 3 Woodland Species   
 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
 Hedgerow connections  4 or more  Less than 4  
 Note:   
 7 Parallel hedge within 15m  Yes  No  
 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Clipped roadside hedgerow supporting Hawthorn with Oak and Dogrose. The hedgerow adjoins a semi-improved neutral field (with Marsh Orchids) and ground cover at its edge supports Bramble, Cow Parsley and a relatively fine grass sward.

Photo1 DSCN8840

Photo2

Photo3

Photo4

Ref: 70

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Unmanaged hedgerow

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

254

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Elm, Honeysuckle

Composition: Mixed woody cover with Elm dominant to the south. Hawthorn and Elder constants.

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Note:

Not known

Important hedgerow

Target notes: An unmanaged hedgerow supporting a mix of woody species including Elm, Hawthorn, Elder, Alder, Oak, Dogrose, Goat Willow, Silver Birch and Honeysuckle. Ground cover is rank and consist of Bramble, Nettle, False Oat-grass, Cleavers and Red Campion.

Photo1 DSCN8841 Photo2 Photo3 Photo4

Ref: 71

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Unmanaged roadside hedgerow

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

126

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Target notes

Straggly Hawthorn dominated hedgerow with Dogrose and Alder. Goat Willow was noted at a location near the sub-station. Ground cover included Bramble, Nettle and False Oat-grass.

Photo1 DSCN8842

Photo2

Photo3

Photo4

Ref: 72

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow  
 2 - Managed 'gappy' hedgerow  
 3 - Unmanaged 'leggy' hedgerow  
 4 - Hedgebank with occasional shrubs  
 5 - Managed hedgerow with mature trees  
 6 - Treeline  
 7 - New / reinstated hedgerow  
 8 - Fenceline

Note:

Clipped roadside hedgerow

Hedge height

0-1m  
 1-2m  
 2-4m  
 >4m

Hedge width

0-1m  
 1-2m  
 2-4m  
 >4m

Hedge length (m):

153

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle

Composition: Hawthorn with Holly, Dogrose, Elder, Oak and Honeysuckle

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Notable features

1 Bank  or Wall  for at least half of the hedgerows length  
 2 Ditch  for at least half of the hedgerows length  
 3 Less than 10% gaps  None  1-10%  10-30%  >30  
 4 Standard tree / 50m   
 5 At least 3 Woodland Species  
 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
 Hedgerow connections  4 or more  Less than 4  
 Note: Woodland & pond  
 7 Parallel hedge within 15m  Yes  No  
 8 Have protected species been recorded?  
 Not known

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Target notes Mixed roadside hedgerow supporting rank ground cover of False Oat-grass, Hogweed, Nettle and Cleavers.

Photo1 DSCN8843 Photo2 Photo3 Photo4



Ref: 73

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Clipped hedgerow with mature trees to the north

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

222

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note: Pond

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Target notes

Clipped hedgerow with ditch supporting Hawthorn and Oak as well as occasional Dogrose, Elder and Honeysuckle. Mature trees of Oak are present to the north. Ground cover is typically rank and consists of Nettle, Rosebay Willowherb and False Oat-grass.

Photo1 DSCN8844 Photo2 Photo3 Photo4

Ref: 74

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow with a patch of young uncut Oaks to the west

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

124

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition:

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Important hedgerow

Target notes Clipped hedgerow and ditch with missing sections towards west (farm). A patch of uncut young Oaks have been retained. Ground flora is of rank character.

Photo1 DSCN8845 Photo2  Photo3  Photo4

Ref: 75

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Clipped hedgerow with small trees of False Acacia as well as Oak.

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

89

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: False Acacia

Composition: Hawthorn dominated

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Clipped Hawthorn dominated hedgerow beside ditch. False Acacia (non-native species) trees are present and ground cover is formed by Rosebay Willowherb, Nettle, Bramble, False Oat-grass and Foxglove.

Photo1 DSCN8846 Photo2 Photo3 Photo4

Ref: 76

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow with trees

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

83

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Sorbus aria

Composition: Hawthorn dominated with Oak trees

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note: Woodland & pond
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Partly clipped hedgerow with trees of Oak and occasional Elder and Dogrose. Ground cover included Couch, Rosebay Willowherb, Bramble and False Oat-grass.

Photo1 DSCN8847 Photo2 Photo3 Photo4

Ref: 77

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Unmanaged roadside hedgerow in addition to a clipped hedge beside scrub and young trees at edge of an embankment

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

280

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Target notes

Clipped hedgerow at the base of a scrub covered embankment to the north as well as an unmanaged roadside hedgerow to the south. The hedgerows are almost entirely dominated by Hawthorn with the exception of a Dogrose.

Photo1 DSCN8848

Photo2 DSCN8849

Photo3

Photo4

Ref: 78

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow with ditch

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

132

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Target notes

Clipped hedgerow with ditch punctuated by standard Oak trees. Ground cover includes Bramble, False Oat-grass and Nettle with patches of Great Willowherb and occasional Bittersweet.

Photo1 DSCN8850

Photo2

Photo3

Photo4

Ref: 79

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Ditch and scrub cover which may have originated from a defunct outgrown hedgerow

Hedge height	Hedge width	Hedge length (m):
<input type="radio"/> 0-1m	<input type="radio"/> 0-1m	<input type="text" value="156"/>
<input type="radio"/> 1-2m	<input type="radio"/> 1-2m	
<input type="radio"/> 2-4m	<input type="radio"/> 2-4m	
<input checked="" type="radio"/> >4m	<input checked="" type="radio"/> >4m	

Woody species

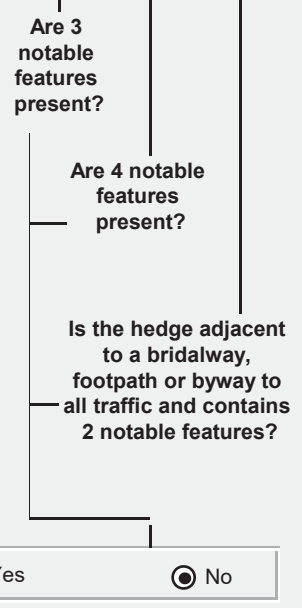
- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4



Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more
 

Hedgerow connections  4 or more  Less than 4

Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Important hedgerow

Target notes

Photo1  Photo2  Photo3  Photo4

Ref: 80

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Clipped hedgerow with occasional standard Oak trees

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

262

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Clipped hedgerow with an Oak tree. Hawthorn dominated with occasional Dogrose, Elder, Oak and Holly. Rank ground cover is dominated by False Oat-grass, Nettle, Hogweed and Nettle.

Photo1 DSCN8852 Photo2  Photo3  Photo4



Ref: 81

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Ditch and scrub cover which may have originated from a defunct outgrown hedgerow

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

171

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle

Composition: Hawthorn, Oak and Goat Willow dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Scrub and tree cover beside a ditch. The feature may have originated from a long abandoned field boundary.

Photo1 DSCN8853 Photo2 Photo3 Photo4

Ref: 82

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Hawthorn dominated clipped hedgerow

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

261

Woody species

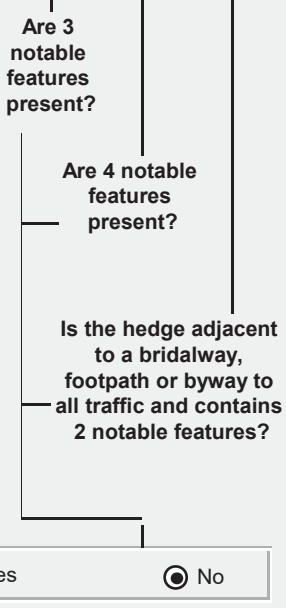
Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle

Composition: Hawthorn dominated

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4



Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Clipped hedgerow dominated by Hawthorn.

Photo1  Photo2  Photo3  Photo4

Ref: 83

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped roadside hedge with Oak tree

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

167

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Cherry, Honeysuckle

Composition:

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
  - 2 Ditch  for at least half of the hedgerows length
  - 3 Less than 10% gaps  None  1-10%  10-30%  >30
  - 4 Standard tree / 50m
  - 5 At least 3 Woodland Species
  - 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more
- Hedgerow connections  4 or more  Less than 4
- Note:
- 7 Parallel hedge within 15m  Yes  No
  - 8 Have protected species been recorded?

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Not known

Target notes Clipped roadside hedgerow with rank ground cover.

Photo1 DSCN8855 Photo2 Photo3 Photo4

Ref: 84

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow beside quarry access road with occasional young trees and one mature Oak

Hedge height	Hedge width	Hedge length (m):
<input type="radio"/> 0-1m <input type="radio"/> 1-2m <input checked="" type="radio"/> 2-4m <input type="radio"/> >4m	<input type="radio"/> 0-1m <input checked="" type="radio"/> 1-2m <input type="radio"/> 2-4m <input type="radio"/> >4m	<input type="text" value="250"/>

Woody species

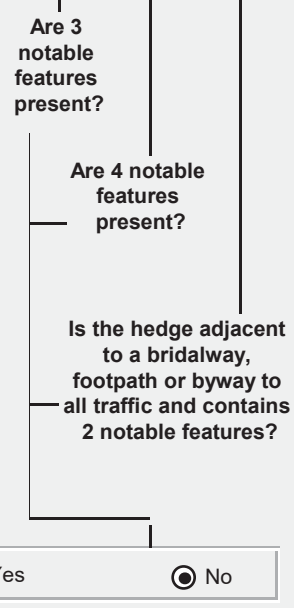
- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Cherry, Norway Maple, Honeysuck

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4



Notable features

- Bank  or Wall  for at least half of the hedgerows length
- Ditch  for at least half of the hedgerows length
- Less than 10% gaps  None  1-10%  10-30%  >30
- Standard tree / 50m
- At least 3 Woodland Species
- Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- Parallel hedge within 15m  Yes  No
- Have protected species been recorded?

Important hedgerow

Target notes Clipped hedgerow beside quarry access road with one mature Oak (100cm DBH) to north. Grassy ground cover with Cleavers.

Photo1 DSCN8855 Photo2  Photo3  Photo4

Ref: 85

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Partly clipped Hedge with young trees and ditch

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

145

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Partly clipped hedgerow with young trees and rank ground cover

Photo1  Photo2  Photo3  Photo4

Ref: 86

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow  
 2 - Managed 'gappy' hedgerow  
 3 - Unmanaged 'leggy' hedgerow  
 4 - Hedgebank with occasional shrubs  
 5 - Managed hedgerow with mature trees  
 6 - Treeline  
 7 - New / reinstated hedgerow  
 8 - Fenceline

Note:

Former trackside hedgerow with scrub infill between parallel hedges

Hedge height

0-1m  
 1-2m  
 2-4m  
 >4m

Hedge width

0-1m  
 1-2m  
 2-4m  
 >4m

Hedge length (m):

86

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle,

Composition: Hawthorn dominated

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Notable features

1 Bank  or Wall  for at least half of the hedgerows length  
 2 Ditch  for at least half of the hedgerows length  
 3 Less than 10% gaps  None  1-10%  10-30%  >30  
 4 Standard tree / 50m   
 5 At least 3 Woodland Species  
 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
 Hedgerow connections  4 or more  Less than 4  
 Note:  
 7 Parallel hedge within 15m  Yes  No  
 8 Have protected species been recorded?

Not known

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Target notes

Former trackside hedgerow with scrub infill between parallel hedges. Ground cover is rank and supports False Oat-grass, Nettle and Hogweed.

Photo1 DSCN8856 Photo2 Photo3 Photo4

Ref: 87

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Tall leggy hedgerow beside domestic property

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

86

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Apple, Damson

Composition: Hawthorn dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Note:

Not known

Important hedgerow

Target notes Hawthorn dominated hedgerow with a rank ground flora beside a domestic property

Photo1 DSCN8857 Photo2 Photo3 Photo4

Ref: 88

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Hedgerow adjoining garden of domestic property

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

100

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Sycamore, Damson

Composition: Hawthorn dominated

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Clipped hedgerow beside domestic property.

Photo1 DSCN8858 Photo2  Photo3  Photo4



Ref: 89

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Unmanaged and leggy trackside hedgerow

Hedge height      Hedge width      Hedge length (m):

0-1m       0-1m     

1-2m       1-2m

2-4m       2-4m

>4m       >4m

Woody species

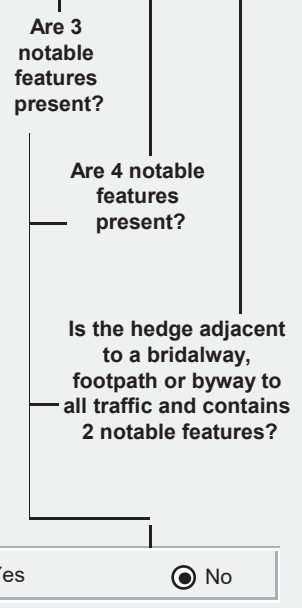
- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Lime (T x europaeus)

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4



Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
  - 2 Ditch  for at least half of the hedgerows length
  - 3 Less than 10% gaps  None  1-10%  10-30%  >30
  - 4 Standard tree / 50m
  - 5 At least 3 Woodland Species
  - 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more
- Hedgerow connections  4 or more  Less than 4
- Note:
- 7 Parallel hedge within 15m  Yes  No
  - 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Unmanaged hedgerow with gaps and Nettle dominated ground cover. Bracken is also present.

Photo1 DSCN8859 Photo2 Photo3 Photo4

Ref: 90

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Unmanaged gappy hedgerow with mature (veteran) Oaks

Hedge height	Hedge width	Hedge length (m):
<input type="radio"/> 0-1m <input type="radio"/> 1-2m <input type="radio"/> 2-4m <input checked="" type="radio"/> >4m	<input type="radio"/> 0-1m <input type="radio"/> 1-2m <input checked="" type="radio"/> 2-4m <input type="radio"/> >4m	<input type="text" value="70"/>

Woody species

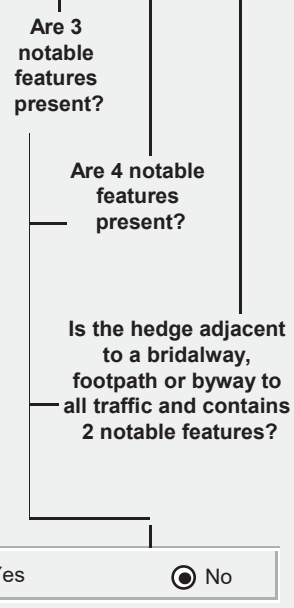
- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4



Notable features

- Bank  or Wall  for at least half of the hedgerows length
  - Ditch  for at least half of the hedgerows length
  - Less than 10% gaps  None  1-10%  10-30%  >30
  - Standard tree / 50m
  - At least 3 Woodland Species
  - Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more
- Hedgerow connections  4 or more  Less than 4
- Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Defunct hedgerow largely comprising old Oaks on a grassy bank surrounded by localised flooding caused by quarrying activity.

Photo1 DSCN8860 Photo2  Photo3  Photo4

Ref: 91

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Unmanaged hedge with mature (veteran) Oaks

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

195

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle

Composition: Oak treeline with understorey of unmanaged shrubs

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Target notes

Unmanaged hedge with mature (veteran) Oaks (>1m DBH) with understorey of unmanaged shrubs and ground cover of Nettle and opportunistic ruderal species.

Photo1 DSCN8861

Photo2

Photo3

Photo4

Ref: 92

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Partly managed hedge with mature Oaks

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

130

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Honeysuckle

Composition: Mature Oaks with mixed understorey

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Well established unmanaged hedgerow and ditch largely comprised of mature Oaks (80cm DBH) with a relatively diverse understorey of woody species. Ground cover is impoverished.

Photo1 DSCN8862 Photo2 Photo3 Photo4

Ref: 93

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Managed hedgerow with semi-mature trees of Oak

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

244

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition:

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Not known

Target notes

Managed hedgerow with occasional semi-mature Oak trees and a rank ground flora dominated by False Oat-grass, Nettle, Bramble and Rosebay Willowherb.

Photo1 DSCN8863

Photo2

Photo3

Photo4

Ref: 94

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Clipped roadside hedge

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

132

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated roadside hedgerow

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Hawthorn dominated roadside hedgerow with a semi-mature Oak. A spoil heap almost reaches the hedgerow to the north and this supports tall herbs and ruderals. The roadside verge supports False Oat-grass and Nettle.

Photo1 DSCN8864 Photo2  Photo3  Photo4

Ref: 95

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Clipped roadside hedgerow

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

205

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Not known

Important hedgerow

Target notes Clipped roadside hedgerow dominated by Hawthorn, Dogrose and occasional Oak.

Photo1 DSCN8865 Photo2  Photo3  Photo4

Ref: 96

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Unmanaged hedgerow located in hollow between spoil mounds

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

232

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Haethorn dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
 Not known

Target notes Unmanaged Hawthorn dominated hedgerow located between spoil mounds. Outgrowth of Hawthorn and Bramble have widened the original feature and rank ground cover of False Oat-grass, Hogweed, Nettle and Rosebay Willowherb add to the cover. Mature Oaks are present at either end of the hedgerow.

Photo1 DSCN8866 Photo2  Photo3  Photo4



Ref: 97

Date 22/06/2016

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Defunct fragment of hedgerow

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

70

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Lime (T x europeus), Honeysuckle

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
Not known

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Target notes: Fragmented section of Hawthorn dominated hedgerow fringed by Bracken. Other woody species included Lime, Dogrose, Honeysuckle, Ash and Poplar.

Photo1 DSCN8867 Photo2 Photo3 Photo4

# **Four Ashes Hedgerow Survey 2017**



**Presented to  
Ramboll Environ**

**August 2017**

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## Executive summary

Biocensus were commissioned by Ramboll Environ to undertake a survey of hedgerows within land at Four Ashes, Staffordshire. The current study area forms an extension to land which was surveyed in 2016, surrounding an aggregate quarry near Junction 12 of the M6. The extended area is centred upon National Grid Reference SJ929091.

The vast majority of hedgerows within the study area were relatively species-poor, with hawthorn forming the dominant woody species.

Of the 31 hedgerows recorded none were considered 'important' under the Hedgerow Regulations 1997. Approximately half of the hedgerows within the study area (15 of 31) were evaluated as *Moderately high to High value* using HEGS. However, only two hedgerows, B26 and B27, were evaluated at the upper end of the scale (2+), all of the others fell at the bottom of the range (2-). Hedgerows B26 and B27 are located towards the south-west of the study area and comprise unmanaged hedgerows with frequent trees.

## 1. Introduction

Biocensus were commissioned by Ramboll Environ to undertake a survey of hedgerows within land at Four Ashes, Staffordshire. The current study area forms an extension to land which was surveyed in 2016, surrounding an aggregate quarry near Junction 12 of the M6. The extended area is centred upon National Grid Reference SJ929091.

## 2. Legislation and Planning Context

The Hedgerow Regulations 1997 set out the properties that make a hedgerow ‘important’ and therefore afforded protection under the legislation. In summary, a hedgerow is considered important if it is more than 30 years old and meets one or more of the following criteria:

### Archaeology and history

- Marks part or all of the boundary of a historic parish or township that existed before 1850;
- Incorporates an archaeological feature (or is associated with one) included in the schedule of monuments compiled by the Secretary of State under section 1 (schedule of monuments) of the Ancient Monuments and Archaeological Areas Act 1979(7) or recorded in a Sites and Monuments Record (dating from 27 March 1997);
- Marks the boundary of a pre-1600 AD estate or manor (or visibly associated with one) and is listed in a Sites and Monuments Record or other such document held at a Records Office since 27 March 1997;
- Forms an integral part of a field system predating the Inclosure Acts;

### Wildlife and landscape

- Contains species listed in part I of Schedule 1 (birds), 5 (animals) or 8 (plants) of the Wildlife and Countryside Act 1981 (as amended), or species considered to be “declining breeders, endangered, extinct, rare or vulnerable” in UK Red Data Books;
- Includes at least a) 7 woody species, b) 6 woody species plus 3 associated features, c) 6 woody species including a black poplar; large-leaved lime, small-leaved lime or wild service tree, d) 5 woody species and 4 associated features or e) is adjacent to a public right of way (byway open to all traffic) and supports at least 4 woody species in addition to 2 associated features.

### Associated features include:

- (a) a bank or wall which supports the hedgerow along at least one half of its length;
- (b) gaps which in aggregate do not exceed 10% of the length of the hedgerow;
- (c) where the length of the hedgerow does not exceed 50 metres, at least one standard tree;
- (d) where the length of the hedgerow exceeds 50 metres but does not exceed 100 metres, at least 2 standard trees;

- (e) where the length of the hedgerow exceeds 100 metres, such number of standard trees (within any part of its length) as would when averaged over its total length amount to at least one for each 50 metres;
- (f) at least 3 woodland species within one metre, in any direction, of the outermost edges of the hedgerow;
- (g) a ditch along at least one half of the length of the hedgerow;
- (h) connections scoring 4 points or more in accordance with sub-paragraph (5);
- (i) a parallel hedge within 15 metres of the hedgerow.

In addition to specific legislation relating to hedgerows, a number of more general evaluation methodologies have been described. For the purpose of this report, an assessment of the ecological value of each hedgerow was also undertaken using the Hedgerow Evaluation and Grading System (HEGS)<sup>1</sup>.

### 3. Methodology

#### 3.1. Site Survey

A walkover of the site was undertaken on the 12<sup>th</sup> July 2017 and hedgerows assessed using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997. Survey protocol was adapted from guidance of the Hedgerow Survey Handbook<sup>2</sup>. However, given the emphasis on the number of woody species, the following criteria were used:

- (a) where hedgerow length did not exceed 30 metres, all woody species present in the hedgerow were counted;
- (b) where hedgerow length did not exceed 100 metres, woody species in the central 30 metres were counted;
- (c) where hedgerow length fell between 100-200 metres, the hedgerow was divided in half and woody species counted in each central 30 metre section with the aggregate divided by two;
- (d) where the hedgerow length exceeded 200 metres, the hedgerow was divided into three, woody species counted in each central 30 metre section and the aggregate divided by three;

---

<sup>1</sup> Clements, D.K. and Tofts, R.J. (1992). *Hedgerow Evaluation and Grading System (HEGS). A Methodology for the Ecological Survey, Evaluation and Grading of Hedgerows – September 1992*. Countryside Planning and Management.

<sup>2</sup> Defra (2007) Hedgerow Survey Handbook. A standard procedure for local surveys in the UK. Defra, London.

In addition, notes were taken describing attributes which are required to undertake the HEGS grading. The following hedgerow attributes were recorded:

- Structure – including width, height and form;
- Connectivity - presence of gaps and end connections;
- Diversity - number of woody and dominance of canopy species; and
- Associated features – presence of banks, ditches and grass verges.

### **3.2. Surveyor**

The surveyor and author of this report was Matthew Pickard (BSc (Hons), MSc.), an ecologist with over 15 years environmental consultancy experience, a Chartered Environmentalist (CEnv) and full member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

### **3.3. Survey Limitations**

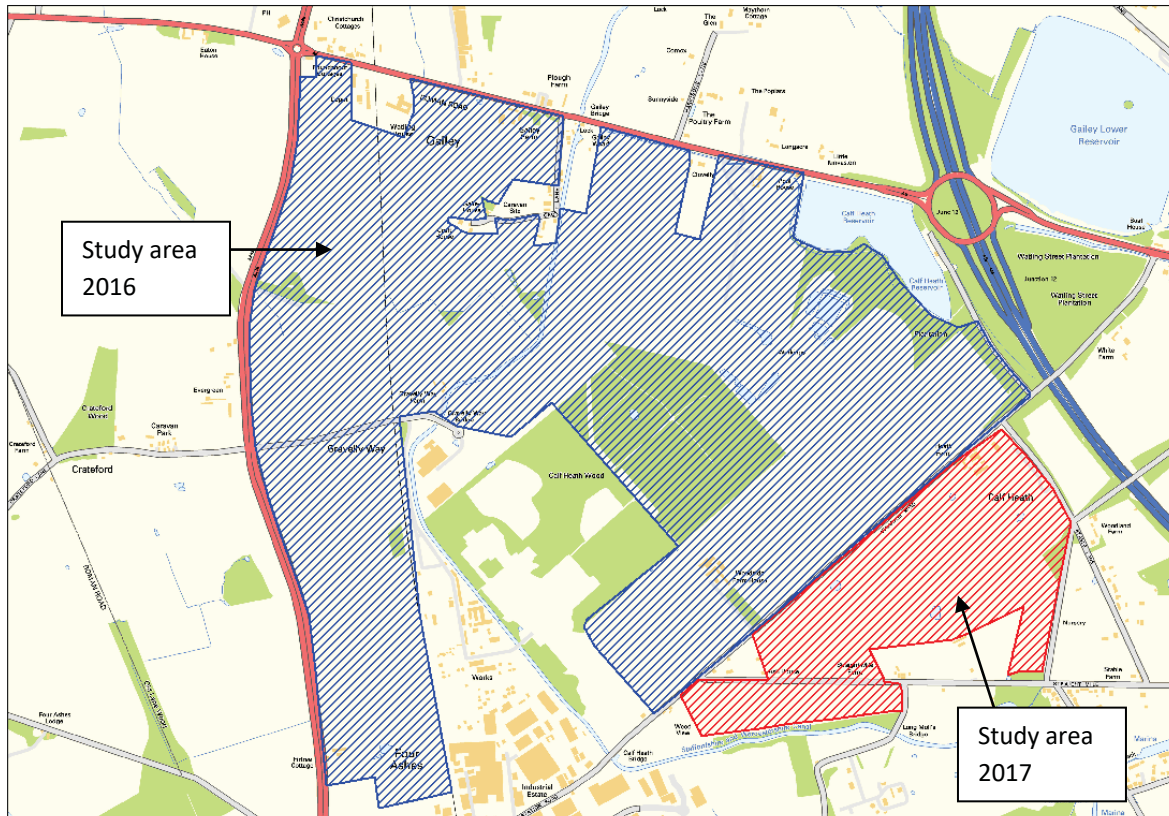
Seasonal timing of survey visits was not considered to pose a significant constraint to hedgerow assessment.

## 4. Existing Conditions

### 4.1. Overview

The study area (see Figure 1) is centred on agricultural land in the vicinity of an existing active aggregate quarry to the north of Four Ashes and west of Junction 12 of the M6.

**Figure 1:** Location Plan.



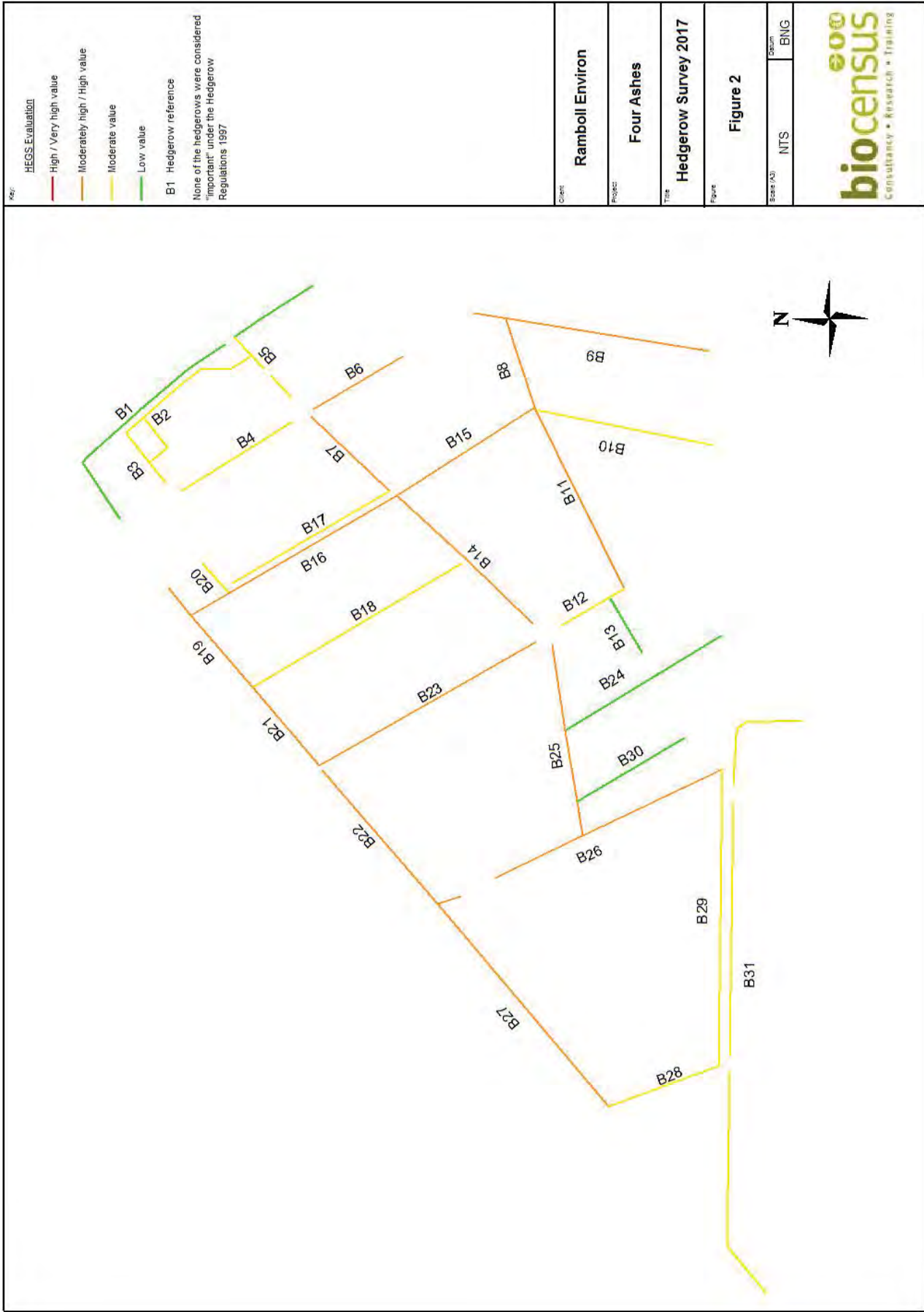
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### 4.2. Hedgerows

The site visit on the 12<sup>th</sup> July 2017 recorded 31 hedgerow sections, none of which were considered ‘important’ under the Hedgerow Regulations 1997.

Appendix 1 provides an account of each hedgerow sampled. Figure 2 presents the location of each hedgerow and provides a HEGS evaluation. None of the hedgerows were considered “important” under the Wildlife and landscape criteria of the Hedgerow Regulation. However, as a note of caution, the presence of protected or Red Data Book species in any of the hedgerows assessed could change their status.





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**Table 1:** HEGS Evaluation Scores

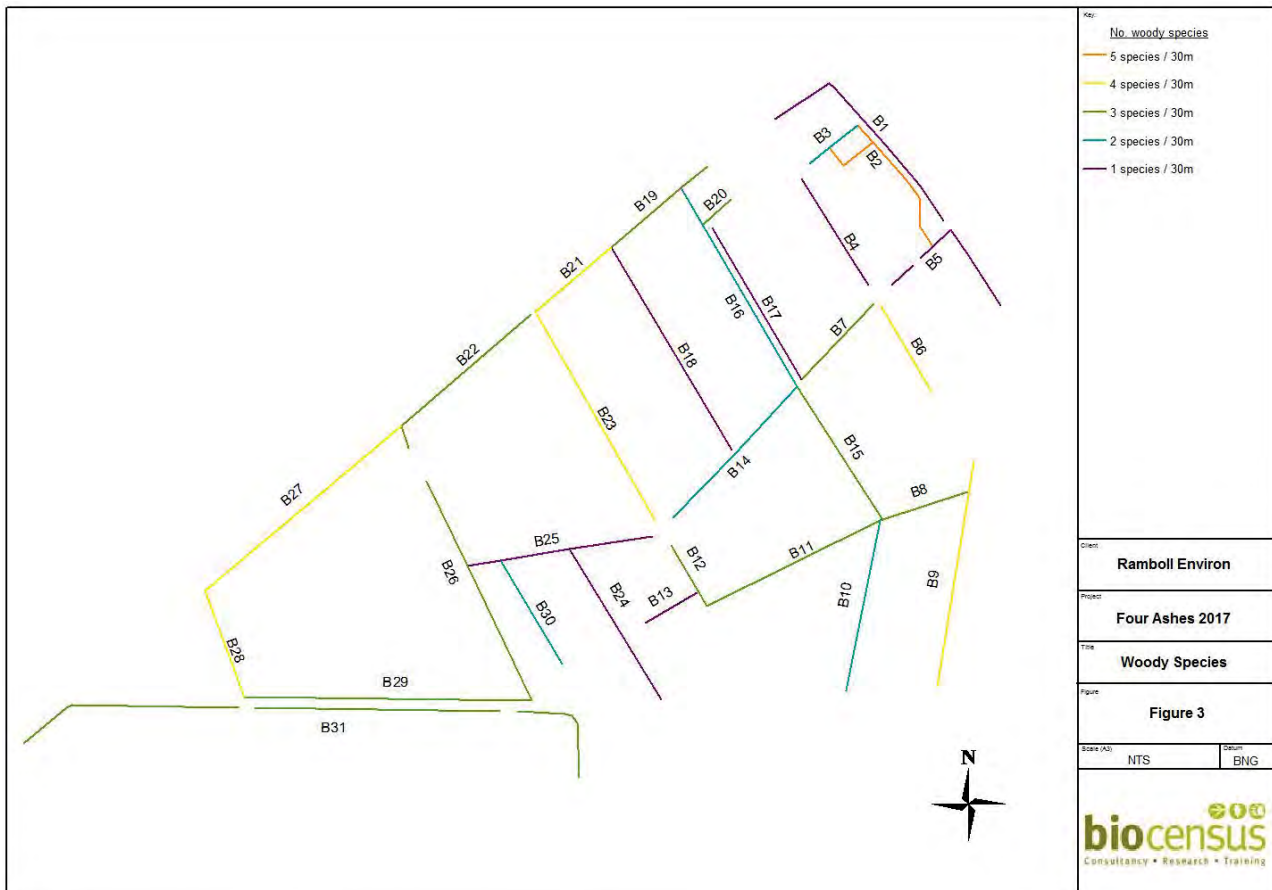
ID	Structural	Connectivity	Diversity	Features	HEGS Grade	HEGS evaluation
B1	6	6	3	-	4-	Low value
B2	3	4	6	-	3-	Moderate value
B3	12	5	3	-	3	Moderate value
B4	7	6	3	-	3+	Moderate value
B5	8	6	3	-	3+	Moderate value
B6	9	7	3	-	2-	Mod high / High value
B7	10	7	3	2	2-	Mod high / High value
B8	9	8	3	4	2-	Mod high / High value
B9	13	4	4	4	2-	Mod high / High value
B10	10	3	4	2	3-	Moderate value
B11	7	8	4	4	2-	Mod high / High value
B12	8	5	3	-	3	Moderate value
B13	5	3	3	-	4-	Low value
B14	9	7	3	6	2-	Mod high / High value
B15	8	8	3	3	2-	Mod high / High value
B16	8	8	3	-	2-	Mod high / High value
B17	12	4	3	-	3	Moderate value
B18	6	8	3	-	3-	Moderate value
B19	9	7	3	-	2-	Mod high / High value
B20	8	6	3	-	3+	Moderate value
B21	9	7	3	-	2-	Mod high / High value
B22	8	8	3	-	2-	Mod high / High value
B23	11	7	3	4	2-	Mod high / High value
B24	6	6	3	-	4+	Low value
B25	8	8	3	-	2-	Mod high / High value
B26	15	7	3	4	2+	Mod high / High value
B27	13	7	4	2	2+	Mod high / High value
B28	12	6	3	-	3+	Moderate value
B29	9	6	3	-	3+	Moderate value
B30	6	6	3	-	4+	Low value
B31	8	6	3	-	3+	Moderate value

The vast majority of hedgerows assessed during the site visit were relatively species-poor in terms of woody species, none reaching 7 species in any given 30m sample section.

**Table 2:** Number of Woody Species / 30m Section of Hedgerow

No. of woody sp	Hedgerow references
1	B1, B4, B5, B13, B17, B18, B24 & B25
2	B3, B10, B14, B16 & B30
3	B7, B8, B11, B12, B15, B19, B20, B22, B26, B29 & B31
4	B6, B9, B21, B23, B27 & B28
5	B2

**Figure 3:** Thematic map indicating number of woody species in 30m hedgerow sections



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The character of hedgerows varied throughout the study area from intensively managed roadside hedgerows to unmanaged 'leggy' field boundaries and mature trees. The following photographs illustrate examples of hedgerows found within the study area:



Plate 1: Newly planted hedge supporting the highest number of woody species within the study area (B2)



Plate 2: Unmanaged hedge with mature tree (B3)



Plate 3: Clipped field hedgerow (B4)



Plate 4: Outgrown hedgerow / treeline (B27)



Plate 5: Clipped hedgerow and shallow ditch (B11)



Plate 6: Fragmented hedgerow (B13)

## 5. Assessment

The vast majority of hedgerows within the study area were relatively species-poor, with hawthorn forming the dominant woody species. The hedgerow with the highest number of woody species per 30m section (5 species) was a newly planted hedgerow (B2) to the north of the site.

Of the 31 hedgerows recorded none were considered 'important' under the Hedgerow Regulations 1997.

Approximately half of the hedgerows within the study area (15 of 31) were evaluated as *Moderately high to High value* using HEGS. However, only two hedgerows, B26 and B27, were evaluated at the upper end of the scale (2+), all of the others fell at the bottom of the range (2-). Hedgerows B26 and B27 are located towards the south-west of the study area and comprise unmanaged hedgerows with frequent trees. All other hedgerows were evaluated as Low value (4 hedgerows) or Moderate value (12 hedgerows).

No rare or notable species were noted during the site visit. A few woody species not normally found in hedgerows included grey alder (*Alnus incana*) in hedgerow B8 and Swedish whitebeam (*Sorbus intermedia*) in B27. A lime (*Tilia europaea*) was also noted from the south-western end of B29.

## Appendix 1 – Hedgerow data sheets



## **biocensus**

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Website: [www.biocensus.co.uk](http://www.biocensus.co.uk)

Ref: B1

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow near farm buildings forming a boundary to a wooded roadside embankment.

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

380

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Note:

No

Important hedgerow

Target notes

Clipped hedgerow forming a boundary to a wooded roadside embankment. The hedgerow appears to have been relatively recently planted as was dominated by Hawthorn. A new track and associated newly planted hedge is present for part of the length. A grassy, shaded and impoverished ground flora is present.

Photo1 DCSN0999

Photo2

Photo3

Photo4



Ref: B2

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

New hedgerow

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

240

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Mix of newly-planted saplings of Hawthorn, Hazel, Elder, Field Maple, Guelder-rose, Cherry and Dogwood

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

No

Important hedgerow

Target notes Newly-planted hedgerow beside post and rail fence. The ground flora supports tall grasses and ruderals.

Photo1 DSCN1000 Photo2  Photo3  Photo4

Ref: B3

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Unmanaged outgrown hedgerow

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

71

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition:

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m  Sycamore

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

No

Important hedgerow

Target notes Outgrown hedgerow dominated by Hawthorn and a Sycamore tree with a DBH of 35-40cm. A 15m section of clipped hedgerow is present at the south-western end. Nettle-dominated ground flora present.

Photo1 DSCN1001

Photo2

Photo3

Photo4

Ref: B4

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Hawthorn dominated

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

143

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

No

Important hedgerow

Target notes Clipped Hawthorn field hedge with a Nettle-dominated ground flora.

Photo1 DSCN1004 Photo2  Photo3  Photo4

Ref: B5

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Hawthorn dominated

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

80

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

No

Target notes

Clipped Hawthorn dominated field hedgerow with a large gap made stock-proof with wire fencing. A mature Oak is present towards the south-west. The ground flora comprised rank grasses and Nettle.

Photo1 DSCN1005

Photo2

Photo3

Photo4

Ref: B6

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Clipped Hedgerow with standard Oaks

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

113

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn interspersed by Elder, Dogrose and mature trees of Oak

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:  Woodland and other hedgerows

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

No

Target notes

Clipped hedgerow with standard Oaks (105cm DBH and 35cm) and a Nettle-dominated ground flora.

Photo1 DSCN1006

Photo2

Photo3

Photo4

Ref: B7

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow with standard Oaks

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

119

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated (3spp/30m)

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m  Oaks
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:  Other hedgerows
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
 No

Important hedgerow

Target notes Clipped hedgerow with two mature Oaks (with a DBH of >100cm). Nettle-dominated ground flora present.

Photo1 DSCN1008 Photo2  Photo3  Photo4

Ref: B8

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

104

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Grey Alder (Alnus incana)

Composition: Hawthorn/Grey Alder mix (3spp/30m)

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

No

Target notes

Clipped hedgerow on slight bank with adjacent shallow ditch. A mix of Hawthorn and Grey Alder dominate the hedgerow. Pepperwort was noted from the northern end of the ditch shallow ditch.

Photo1 DSCN1010

Photo2

Photo3

Photo4

Ref: B9

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Outgrown roadside hedge

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

260

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Oak dominated interspersed by Hawthorn and other occasional woody species (4spp/30m)

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

No

Target notes

Outgrown hedgerow forming a treeline dominated by Oaks. The low bank associated with the feature supports a ground flora of acid character including Sheep's Sorrel, Foxglove and Wavy Hair-grass.

Photo1 DSCN1011

Photo2

Photo3

Photo4



Ref: B10

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Outgrown hedgerow comprising individual shrubs/small trees and fenceline

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

198

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Apple

Composition: Occasional woody shrubs (2spp/30m)

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Note:

No

Important hedgerow

Target notes

Unmanaged hedgerow shrubs interspersed along a low bank and wire fenceline. The ground flora is grazed and of acid character with a fine-grassy sward supporting Harebell and Foxglove.

Photo1 DSCN1013

Photo2

Photo3

Photo4

Ref: B11

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedge and ditch

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

220

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated with frequent Elder and Dogrose (3 spp/30m).

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
 No

Target notes Clipped hedgerow accompanied by a ditch at its eastern end. Where the hedgerow adjoins buildings at its western end it is unmanaged and the shrubs leggy (reaching 4-5m in height). A semi-mature Oak is present at the eastern end.

Photo1 DSCN1014

Photo2

Photo3

Photo4

Ref: B12

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow with standard Oaks

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

80

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m  Oak
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note: Pond to north
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

No

Important hedgerow

Target notes

Clipped Hawthorn hedgerow with two Oaks (75-80cm DBH). A large pond with surrounding trees of Crack Willow is present to the north.

Photo1 DCSN1015

Photo2

Photo3

Photo4

Ref: B13

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Fragmented Hawthorn hedgerow

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

68

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
 No

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Target notes  
Fragmented remnants of a Hawthorn dominated hedgerow.

Photo1 DSCN1016 Photo2  Photo3  Photo4

Ref: B14

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow with occasional mature Oaks on break in slope.

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

205

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated with Oak, Dogrose and Goat Willow

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m  Oaks
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note: Pond and multiple hedgerow connections
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
 No

Target notes

Clipped Hawthorn dominated hedgerow with occasional mature Oaks (75->100cm). The hedgerow sits on a slight break in slope and a ditch at the southern side connects with a pond at the western end. The ditch supports a marshy but grazed ground flora including Creeping Foxtail, Pepperwort and Amphibious Bistort. Nettle is abundant.

Photo1 DSCN1018

Photo2

Photo3

Photo4

Ref: B15

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedge and standard Oaks

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

178

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated with two standard Oaks (3spp/30m)

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note: Multiple hedgerow connections
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

No

Target notes

Clipped Hawthorn dominated hedgerow and ditch with two small oaks (45cm DBH). Rank Nettle-dominated ground flora present.

Photo1 DSCN1019

Photo2

Photo3

Photo4

Ref: B16

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow forming western boundary to a farm track.

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

262

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Cherry

Composition: Hawthorn dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

No

Important hedgerow

Target notes Clipped Hawthorn dominated hedgerow beside farm track. Nettle-dominated ground flora.

Photo1 DSCN1020

Photo2

Photo3

Photo4

Ref: B17

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Treeline dominated by semi-mature Oaks

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

0

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Cherry

Composition:

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
  - 2 Ditch  for at least half of the hedgerows length
  - 3 Less than 10% gaps  None  1-10%  10-30%  >30
  - 4 Standard tree / 50m
  - 5 At least 3 Woodland Species
  - 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more
- Hedgerow connections  4 or more  Less than 4
- Note:
- 7 Parallel hedge within 15m  Yes  No
  - 8 Have protected species been recorded?

No

Important hedgerow

Target notes Oak dominated trackside treeline. Oaks vary in size between 30-70cm DBH but most are relatively young.

Photo1 DSCN1020

Photo2

Photo3

Photo4



Ref: B18

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Hawthorn dominated

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

268

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated with very occasional Dogrose and Elder (1spp/30m)

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Important hedgerow

Target notes Hawthorn dominated hedgerow.

Photo1 DSCN1021

Photo2

Photo3

Photo4

Ref: B19

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped roadside hedgerow

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

143

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Aspen, Cherry

Composition: Hawthorn dominated (3spp/30m)

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

No

Target notes

Roadside hedgerow with young trees of Sycamore and Oak. The hedgerows support Honeysuckle and Black Bryony but are otherwise impoverished.

Photo1 DSCN1022

Photo2 DSCN1024

Photo3

Photo4

Ref: B20

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Hawthorn dominated

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

42

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

No

Important hedgerow

Target notes Hawthorn dominated hedgerow with Hazel and Goat Willow at the western end.

Photo1 DSCN1023

Photo2

Photo3

Photo4

Ref: B21

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

1 - Intact managed hedgerow

2 - Managed 'gappy' hedgerow

3 - Unmanaged 'leggy' hedgerow

4 - Hedgebank with occasional shrubs

5 - Managed hedgerow with mature trees

6 - Treeline

7 - New / reinstated hedgerow

8 - Fenceline

Note:

Roadside hedgerow with standard Oaks

Hedge height

0-1m

1-2m

2-4m

>4m

Hedge width

0-1m

1-2m

2-4m

>4m

Hedge length (m):

113

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

1 Bank  or Wall  for at least half of the hedgerows length

2 Ditch  for at least half of the hedgerows length

3 Less than 10% gaps  None  1-10%  10-30%  >30

4 Standard tree / 50m  Oaks

5 At least 3 Woodland Species

6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more

Hedgerow connections  4 or more  Less than 4

Note:

7 Parallel hedge within 15m  Yes  No

8 Have protected species been recorded?

No

Important hedgerow

Target notes Hawthorn dominated roadside hedgerow with occasional Elder and Dogrose as well as two mature Oaks (60-75cm DBH).

Photo1 DSCN1025 Photo2  Photo3  Photo4

Ref: B22

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Roadside hedgerow with standard Oaks

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

194

Woody species

Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated with occasional Dogrose and Oak (2-3 spp/30m)

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
 No

Target notes Hawthorn dominated roadside hedgerow (continuation of B19 & 21). Oaks with a DBH of 80cm and >100cm DBH are present at the eastern end. A rank Nettle-dominated ground flora is present.

Photo1 DSCN1026

Photo2

Photo3

Photo4

Ref: B23

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped hedgerow with standard Oaks

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

274

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated with occasional Oak, Alder and Elder.

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m  Oaks
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note: Pond and hedgerows
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
 No

Target notes Hedgerow and ditch with a number of standard Oaks (35-100cm DBH). Hawthorn is the dominant species although frequent Oaks form a conspicuous presence.

Photo1 DSCN1027

Photo2

Photo3

Photo4

Ref: B24

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Hawthorn dominated

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

200

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated (1sp/30m)

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Important hedgerow

No

Target notes

Clipped hedgerow dominated by Hawthorn and with a number of significant gaps along its length.

Photo1 DSCN1028

Photo2

Photo3

Photo4

Ref: B25

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Hawthorn dominated

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

212

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn with infrequent Elder and Dogrose (1sp/30m)

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

Important hedgerow

Target notes Clipped Hawthorn hedgerow with bramble outgrowth on parts of its north-east side but grazed to the south.

Photo1 DSCN1029

Photo2

Photo3

Photo4



Ref: B26

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Unmanaged outgrown hedgerow with standard Oaks

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

303

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn and Oak dominated with Blackthorn and occasional Willow (3spp/30m)

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:  Pond to north
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
 No

Target notes Leggy unmanaged hedgerow with trees of Oak. Goat Willow are also present (and a pond to the north supports Crack Willow and Alder).

Photo1 DSCN1030

Photo2

Photo3

Photo4

Ref: B27

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Outgrown roadside hedgerow and shrubs

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

292

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Whitebeam, Broom, Pine

Composition: Outgrown hedgerow/treeline of Hawthorn, Oak, Sorbus aria/intermedia, Rowan as well as Brom and Corsican Pine.

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m  Oaks
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

No

Target notes

Treeline and shrubs dominated by Hawthorn and Oaks but including two trees of Swedish Whitebeam as well as Rowan and Corsican Pine.

Photo1 DSCN1031

Photo2

Photo3

Photo4

Ref: B28

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Leggy unmanaged hedgerow with gap near domestic property

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

129

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other:

Composition: Hawthorn dominated

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?  
 No

Important hedgerow

Target notes Unmanaged hedgerow dominated by Hawthorn with occasional Oak, Elder, Holly and Crack Willow.

Photo1 DSCN1034

Photo2

Photo3

Photo4

Ref: B29

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Clipped roadside hedgerow with occasional standard trees

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

329

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Lime

Composition: Hawthorn dominated with occasional Dogrose and Elder (3 spp/30m)

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m  Oak
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

No

Important hedgerow

Target notes Hawthorn dominated roadside hedgerow with occasional standard trees of Oak (20-30cm DBH) as well as a multi-stemmed Lime (Tilia x europaea) at the western end.

Photo1 DSCN1035

Photo2

Photo3

Photo4

Ref: B30

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

[Empty text box for notes]

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

137

Woody species

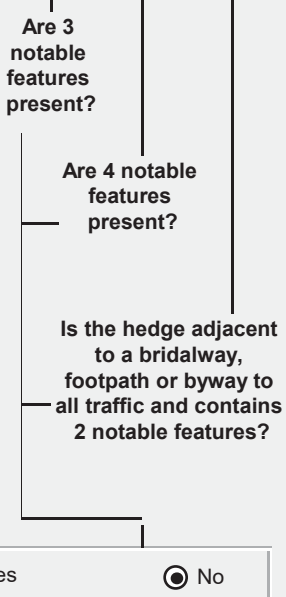
- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: [Empty text box]

Composition: Hawthorn with occasional Holly and Dogrose

Number of woody species per 30m sample length

7 or more  6  5  4  Less than 4



Notable features

- Bank  or Wall  for at least half of the hedgerows length
- Ditch  for at least half of the hedgerows length
- Less than 10% gaps  None  1-10%  10-30%  >30
- Standard tree / 50m  [Empty text box]
- At least 3 Woodland Species [Empty text box]
- Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more
 

Hedgerow connections  4 or more  Less than 4

Note: [Empty text box]
- Parallel hedge within 15m  Yes  No
- Have protected species been recorded?
 

[Empty text box]

No

Important hedgerow

Target notes Clipped Hawthorn dominated hedgerow with occasional Dogrose and Holly.

Photo1 DSCN1037 Photo2 [Empty] Photo3 [Empty] Photo4 [Empty]

Ref: B31

Date 12/07/2017

Surveyors MP

Using the Wildlife and Landscape criteria of the Hedgerow Regulations 1997, is the hedgerow considered to be 'important'?

Yes  Likely  No

Hedgerow category

- 1 - Intact managed hedgerow
- 2 - Managed 'gappy' hedgerow
- 3 - Unmanaged 'leggy' hedgerow
- 4 - Hedgebank with occasional shrubs
- 5 - Managed hedgerow with mature trees
- 6 - Treeline
- 7 - New / reinstated hedgerow
- 8 - Fenceline

Note:

Hawthorn and locally Elm dominated

Hedge height

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge width

- 0-1m
- 1-2m
- 2-4m
- >4m

Hedge length (m):

674

Woody species

- Oak  Birch  Rowan  Sycamore  Alder  Ash  Beech  Hawthorn  Hazel  Blackthorn  Elder  Willow  Rose  Holly

Other: Elm, Lombardy Poplar

Composition: Largely Hawthorn or Elm dominated with occasional Oak, Elder, Dogrose and Lombardy Poplar (2-3spp/30m)

Number of woody species per 30m sample length

- 7 or more  6  5  4  Less than 4

Are 3 notable features present?

Are 4 notable features present?

Is the hedge adjacent to a bridalway, footpath or byway to all traffic and contains 2 notable features?

Yes  No

Important hedgerow

Notable features

- 1 Bank  or Wall  for at least half of the hedgerows length
- 2 Ditch  for at least half of the hedgerows length
- 3 Less than 10% gaps  None  1-10%  10-30%  >30
- 4 Standard tree / 50m  Oak, Poplar
- 5 At least 3 Woodland Species
- 6 Connections with another hedge (1 point), pond (2 points) or woodland (2 points) scoring 4 points or more  
Hedgerow connections  4 or more  Less than 4  
Note:
- 7 Parallel hedge within 15m  Yes  No
- 8 Have protected species been recorded?

No

Target notes

Clipped roadside hedgerow largely dominated by Hawthorn and Elm but supporting occasional Elder and Dogrose as well as trees of Oak and Lombardy Poplar towards the west (DBH of 20-40cm). A section of unmanaged and leggy hedgerow dominated by Elm is present at the eastern end where it borders Deepmore Lane.

Photo1 DSCN1038

Photo2 DSCN1040

Photo3 DSCN1041

Photo4 DSCN1042

**Annex 10.1.4**

SERC Bird Records and Breeding Assessment

## **ANNEX 10.1.4 BIRD LISTS**

This annex to the West Midlands Interchange Ecology Baseline Report and should be read in conjunction with the report. The annex presents two tables.

The first table presents desk study information received from Staffordshire Environmental Records Centre (SERC) and provides general comments on whether suitable breeding habitat for the birds recorded by SERC occurs on the site.

The second table presents a list of the birds recorded in the breeding and wintering bird surveys carried out in 2016 and 2017. The birds of conservation concern are summarised in the main text of the Ecology Baseline Report.



**Birds records from SERC and notes on whether suitable breeding habitat occurs on site**

Latin Name	Common Name	Schedule 1 WCA	Number of Records	Most Recent Record	First Record	Habitat Preference	Suitable Breeding Habitat on Site *
<i>Acanthis cabaret</i>	Lesser Redpoll	No	7	2015	2007	Woodland species that may also visit gardens. Eat seeds of tree and herbaceous plants	Y
<i>Alauda arvensis</i>	Sky Lark	No	23	2014	1966	Farmland in large open blocks	Y
<i>Alcedo atthis</i>	Common Kingfisher	Yes	17	2015	1979	Found in wetland, canals, rivers etc, always near open water. Eats fish.	N
<i>Anas acuta</i>	Northern Pintail	Yes	1	2011	2011	Wintering species only. Water edge species.	N
<i>Anas clypeata</i>	Northern Shoveler	No	17	2015	2002	Breeds on shallow lakes with rich vegetation cover with sufficient areas of open water	N
<i>Anas crecca</i>	Eurasian Teal	No	10	2015	1979	Mainly wintering species but does breed. Uses wide variety of well vegetated waterbodies to nest	N
<i>Anas platyrhynchos</i>	Mallard	No	109	2014	1979	Common widespread species	Y
<i>Anas querquedula</i>	Garganey	Yes	2	2008	2006	Schedule 1 species. Rare breeding species. Breeds on shallow lakes nesting in surrounding grassland	N
<i>Anas strepera</i>	Gadwall	No	61	2015	2004	Breeds on reedbed lined pools. Widespread wintering species	N
<i>Anser albifrons</i>	Greater White-fronted Goose	No	4	2013	2005	Rare winter migrant	N
<i>Anser albifrons subsp. albifrons</i>	European White-fronted Goose	No	16	2013	2013	Rare winter migrant	N
<i>Anser anser</i>	Greylag Goose	Yes	47	2015	2000	Mainly feral population in Staffordshire, some genuine wild migrants possible in winter	N

Latin Name	Common Name	Schedule 1 WCA	Number of Records	Most Recent Record	First Record	Habitat Preference	Suitable Breeding Habitat on Site*
<i>Anser brachyrhynchus</i>	Pink-footed Goose	No	1	2014	2014	Uncommon winter migrant, small number of feral birds in Staffordshire	N
<i>Anthus pratensis</i>	Meadow Pipit	No	10	2014	2000	Widespread breeding species. Breeds on open habitats including grassland, heathland, moorland	Y
<i>Anthus trivialis</i>	Tree Pipit	No	6	2015	2006	Breeding species. Breeds mainly on heathland, open woodland glades and scrubby grassland	Y
<i>Apus apus</i>	Common Swift	No	27	2015	1966	Widespread breeding species. Breeds almost exclusively in manmade structures	Y
<i>Arenaria interpres</i>	Ruddy Turnstone	No	2	2009	2000	Accidental occurrence	N
<i>Asio flammeus</i>	Short-eared Owl	No	1	2004	2004	Breeding restricted to upland habitats in Staffordshire. Widespread wintering species on wetlands, rank grassland, heathlands. Very difficult to survey for breeding activity and susceptible to disturbance	N
<i>Aythya ferina</i>	Common Pochard	No	67	2015	1995	Widespread wintering species. Open water species	N
<i>Aythya fuligula</i>	Tufted Duck	No	98	2015	1979	Widespread open water species	N
<i>Aythya marila</i>	Greater Scaup	Yes	52	2014	2001	Uncommon winter migrant. Open water species	N
<i>Aythya nyroca</i>	Ferruginous Duck	No	4	2005	1960	Rare vagrant, small number of feral birds in UK	N
<i>Branta bernicla</i>	Brent Goose	No	1	1987	1987	Rare winter migrant	N
<i>Branta bernicla</i> subsp. <i>bernicla</i>	Dark-bellied Brent Goose	No	1	2014	2014	Rare winter migrant	N

Latin Name	Common Name	Schedule 1 WCA	Number of Records	Most Recent Record	First Record	Habitat Preference	Suitable Breeding Habitat on Site*
<i>Branta leucopsis</i>	Barnacle Goose	No	1	2003	2003	Rare winter migrant. Large wintering population in Scotland	N
<i>Bucephala clangula</i>	Common Goldeneye	Yes	66	2015	1995	Wintering on lakes and reservoirs in Staffordshire	N
<i>Callidris alpina</i>	Dunlin	No	4	2014	2004	Passage migrant to wetlands and reservoirs	N
<i>Callidris canutus</i>	Red Knot	No	1	2001	2001	Passage migrant to wetlands and reservoirs	N
<i>Callidris pugnax</i>	Ruff	Yes	2	2013	2013	Passage migrant	N
<i>Charadrius dubius</i>	Little Plover	Yes	8	2011	2006	Schedule 1 species. Uncommon, requires shingle or gravel near to water. Will breed in active quarries, waste ground, reservoir shorelines	U
<i>Charadrius hiaticula</i>	Ringed Plover	No	5	2015	2011	Passage migrant to wetlands and reservoirs	N
<i>Chlidonias niger</i>	Black Tern	Yes	29	2012	2000	Passage migrant.	N
<i>Chroicocephalus ridibundus</i>	Black-headed Gull	No	77	2014	2004	Widely distributed. Range of habitats and food	N
<i>Circus aeruginosus</i>	Eurasian Marsh Harrier	Yes	5	2015	2009	Uncommon passage migrant. Not yet confirmed breeding in Staffordshire. Breeds in large reedbeds, but will feed across wetlands/rank grassland	N
<i>Circus cyaneus</i>	Hen Harrier	Yes	1	2002	2002	Rare winter migrant. Occasionally summering birds. Not believed to breed in Staffordshire	N
<i>Clangula hyemalis</i>	Long-tailed Duck	Yes	2	2015	1996	Rare winter migrant	N
<i>Columba oenas</i>	Stock Dove	No	29	2015	1995	Widespread breeding species. Nests in tree cavities	Y
<i>Crex crex</i>	Corn Crake	Yes	1	1980	1980	Rare passage migrant	N

Latin Name	Common Name	Schedule 1 WCA	Number of Records	Most Recent Record	First Record	Habitat Preference	Suitable Breeding Habitat on Site*
<i>Cuculus canorus</i>	Common Cuckoo	No	8	2014	1966	Wide range of habitats, usually nesting in woodland, woodland edges, scrub and wetlands. Declining.	Y
<i>Cygnus columbianus</i>	Tundra Swan	Yes	25	2011	2010	Rare winter migrant	N
<i>Cygnus cygnus</i>	Whooper Swan	Yes	2	2013	2011	Rare winter migrant	N
<i>Delichon urbicum</i>	House Martin	No	23	2015	1985	Widespread breeding species, mainly on manmade structures	Y
<i>Dendrocopos minor</i>	Lesser Spotted Woodpecker	No	6	2012	2006	Rare breeding species in woodland. Serious decline	Y
<i>Egretta garzetta</i>	Little Egret	No	19	2015	2002	Widespread and increasing at wetlands. Not yet confirmed breeding in Staffordshire	N
<i>Emberiza calandra</i>	Corn Bunting	No	1	2009	2009	Farmland bird in arable land and other habitats. Declining and now rare in Staffordshire	Y
<i>Emberiza citrinella</i>	Yellowhammer	No	21	2014	1966	Open habitats, hedges and scrub	Y
<i>Emberiza schoeniclus</i>	Reed Bunting	No	20	2014	1966	Wetland and farmland habitats.	Y
<i>Falco columbarius</i>	Merlin	Yes	7	2015	2005	Mainly wintering species but does breed in moorland habitat	N
<i>Falco peregrinus</i>	Peregrine Falcon	Yes	38	2015	2002	Schedule 1 species. Nests on cliffs and tall buildings	N
<i>Falco subbuteo</i>	Eurasian Hobby	Yes	52	2015	2004	Tree nesting species, in a range of habitats. Widespread breeding species, although believed to be declining. Range of nest sites and habitats. Eat small mammals and birds.	Y
<i>Falco tinnunculus</i>	Common Kestrel	No	26	2013	1966		Y
<i>Fringilla montifringilla</i>	Brambling	Yes	24	2013	2006	Wintering species only.	N

Latin Name	Common Name	Schedule 1 WCA	Number of Records	Most Recent Record	First Record	Habitat Preference	Suitable Breeding Habitat on Site*
<i>Gallinago gallinago</i>	Common Snipe	No	25	2015	1966	Now a rare breeding species in wetland habitats. Very localised. Wetland habitats. Ground nesting so vulnerable to disturbance and to predation by crows etc., so avoid nesting near trees and other perching posts.	N
<i>Gavia arctica</i>	Black-throated Diver	Yes	3	1958	1948	Rare winter migrant	N
<i>Gavia immer</i>	Great Northern Diver	Yes	29	2014	1992	Occasional winter migrant to reservoirs	N
<i>Gavia stellata</i>	Red-throated Diver	Yes	5	2005	1990	Rare winter migrant	N
<i>Haematopus ostralegus</i>	Eurasian Oystercatcher	No	47	2015	2002	Widespread species, uncommon breeder mainly on reservoirs/gravel pits but also wetlands	N
<i>Hirundo rustica</i>	Barn Swallow	No	40	2015	1966	Nest on ledges in buildings or outbuildings. Feed on insects over grassland, usually near water.	Y
<i>Larus argentatus</i>	Herring Gull	No	12	2014	2000	Widespread wintering species. Does breed	N
<i>Larus canus</i>	Common Gull	No	4	2010	2008	Winter resident, usually near large lakes.	N
<i>Larus fuscus</i>	Lesser Black-backed Gull	No	30	2014	2004	Widespread wintering species. Does breed	N
<i>Larus glaucooides</i>	Iceland Gull	No	1	2009	2009	Uncommon winter migrant, usually roosting on large reservoirs	N
<i>Larus hyperboreus</i>	Glaucous Gull	No	3	2013	2013	Uncommon winter migrant, usually roosting on large reservoirs	N
<i>Larus marinus</i>	Great Black-backed Gull	No	4	2014	2007	Uncommon winter migrant	N
<i>Larus melanocephalus</i>	Mediterranean Gull	Yes	78	2015	2005	Uncommon passage and winter migrant	N
<i>Larus michahellis</i>	Yellow-legged Gull	No	25	2015	2009	Uncommon winter migrant	N

Latin Name	Common Name	Schedule 1 WCA	Number of Records	Most Recent Record	First Record	Habitat Preference	Suitable Breeding Habitat on Site*
<i>Limosa lapponica</i>	Bar-tailed Godwit	No	3	2015	2013	Mainly coastal species although will occur inland on passage	N
<i>Limosa limosa</i>	Black-tailed Godwit	Yes	8	2015	2004	Passage migrant.	N
<i>Linaria cannabina</i>	Linnet	No	19	2015	1966	Heathland, grassland and scrub habitats	Y
<i>Locustella naevia</i>	Common Grasshopper Warbler	No	3	2011	1966	Breeds in scrub, marshes and dense vegetation. Eats mainly insects. Declining.	U
<i>Loxia curvirostra</i>	Common Crossbill	Yes	1	2012	2012		N
<i>Melanitta fusca</i>	Velvet Scoter	Yes	2	1934	1896	Accidental occurrence	N
<i>Melanitta nigra</i>	Common Scoter	Yes	12	2013	2006	Uncommon passage migrant	N
<i>Mergellus albellus</i>	Smew	No	1	1988	1988	Rare winter migrant, mainly to reservoirs	N
<i>Milvus milvus</i>	Red Kite	Yes	9	2015	2007	Rare but increasing vagrant to Staffordshire from nearby breeding populations (mainly Wales)	N
<i>Morus bassanus</i>	Northern Gannet	No	2	2003	2001	Accidental occurrence	N
<i>Motacilla cinerea</i>	Grey Wagtail	No	22	2015	1995	Widespread breeding species. Breeds on fast flowing rocky shallow watercourses	Y
<i>Motacilla flava</i>	Yellow Wagtail	No	28	2015	1966	Grassland and wetland habitats	Y
<i>Muscicapa striata</i>	Spotted Flycatcher	No	54	2015	2004	Mature trees, especially in open areas. Woodland edges, parks and garden habitats.	Y
<i>Numenius arquata</i>	Eurasian Curlew	No	11	2015	1966	Very localised. Wetland, grassland and moorland habitats. Ground nesting so vulnerable to disturbance and to predation by crows etc., so avoid nesting near trees and other perching posts.	U

Latin Name	Common Name	Schedule 1 WCA	Number of Records	Most Recent Record	First Record	Habitat Preference	Suitable Breeding Habitat on Site*
<i>Numenius phaeopus</i>	Whimbrel	Yes	7	2013	2011	Uncommon passage migrant	N
<i>Oceanodroma leucorhoa</i>	Leach's Storm-petrel	Yes	1	1989	1989	Accidental occurrence	N
<i>Oenanthe oenanthe</i>	Northern Wheatear	No	26	2014	2004	Passage migrant to wide variety of habitats, except woodland. Breeds in moorland and fringe habitats	N
<i>Pandion haliaetus</i>	Osprey	Yes	6	2012	2002	Passage migrant	N
<i>Panurus biarmicus</i>	Bearded Tit	Yes	2	2007	1991	Rare vagrant from UK breeding populations	N
<i>Passer domesticus</i>	House Sparrow	No	25	2014	1966	Range of habitats, including gardens, grassland and scrub, usually near human habitation	Y
<i>Passer montanus</i>	Eurasian Tree Sparrow	No	18	2013	2001	Fairly widespread but uncommon. Open woodland and gardens.	Y
<i>Perdix perdix</i>	Grey Partridge	No	12	2011	1966	Ground nesting in arable and other habitats, including rushy pastures.	Y
<i>Pernis apivorus</i>	European Honey-buzzard	Yes	1	2006	2006	Rare passage migrant	N
<i>Phalacrocorax aristotelis</i>	European Shag	No	11	2011	1984	Rare winter vagrant, accidental occurrence	N
<i>Phalaropus lobatus</i>	Red-necked Phalarope	Yes	1	2002	2002	Rare passage migrant	N
<i>Phoenicurus ochruros</i>	Black Redstart	Yes	47	2012	2011	Urban species, breeding in Birmingham and possibly Stoke and other areas.	N
<i>Phoenicurus phoenicurus</i>	Common Redstart	No	2	2015	2008	Widespread but uncommon breeding species in woodland	N
<i>Phylloscopus trochilus</i>	Willow Warbler	No	13	2014	1966	Found in open woodland and scrub, eating insects and berries.	Y
<i>Picus viridis</i>	Green Woodpecker	No	11	2013	1990	Parkland type habitat, with grassland and trees / woodland edge. Feed on insects in grassland, nest in dead wood.	Y

Latin Name	Common Name	Schedule 1 WCA	Number of Records	Most Recent Record	First Record	Habitat Preference	Suitable Breeding Habitat on Site*
<i>Platalea leucorodia</i>	Eurasian Spoonbill	Yes	1	1966	1966	Rare migrant, rare breeding species in eastern England	N
<i>Pluvialis apricaria</i>	European Golden Plover	No	29	2015	2002	Winter species of farmland, eating seeds. Breeds on moorland in Peak District.	N
<i>Pluvialis squatarola</i>	Grey Plover	No	1	2012	2012	Uncommon passage migrant	N
<i>Podiceps auritus</i>	Slavonian Grebe	Yes	6	2011	2008	Rare winter migrant	N
<i>Podiceps grisegena</i>	Red-necked Grebe	No	25	2011	1996	Rare passage migrant	N
<i>Podiceps nigricollis</i>	Black-necked Grebe	Yes	86	2014	2005	Uncommon passage migrant. Potential to breed in Staffordshire but not yet confirmed	N
<i>Poecile montana</i>	Willow Tit	No	17	2015	2005	Usually in willow scrub in damp places, around gravel pits and marshes. Feed on insects, seeds and berries. Serious decline	U
<i>Poecile palustris</i>	Marsh Tit	No	11	2015	2006	Mainly woodland and scrub species.	Y
<i>Prunella modularis</i>	Dunnock	No	48	2014	2005	Range of habitats, including grassland and scrub.	Y
<i>Pyrrhula pyrrhula</i>	Common Bullfinch	No	14	2014	2005	Woodlands, orchards and hedges. Eat seeds, buds and insects.	Y
<i>Regulus ignicapilla</i>	Firecrest	Yes	1	2013	2013	Rare winter migrant, usually seen in conifer plantations. Possibly breeds in Staffordshire	U
<i>Riparia riparia</i>	Sand Martin	No	30	2015	2004	Nests in riverbanks but also artificial sites provided	N
<i>Rissa tridactyla</i>	Black-legged Kittiwake	No	11	2013	2010	Accidental occurrence	N
<i>Saxicola rubetra</i>	Whinchat	No	17	2014	2006	Uncommon passage migrant, any breeding restricted to Staffordshire moorlands	N
<i>Scolopax rusticola</i>	Eurasian Woodcock	No	12	2013	2008	Widespread wintering species, breeds in woodland, scrub, conifer plantation	Y



Latin Name	Common Name	Schedule 1 WCA	Number of Records	Most Recent Record	First Record	Habitat Preference	Suitable Breeding Habitat on Site*
<i>Somateria mollissima</i>	Common Eider	No	1	2011	2011	Accidental occurrence	N
<i>Sterna hirundo</i>	Common Tern	No	88	2015	2004	Open water species, breeds on gravel pits	N
<i>Sterna paradisaea</i>	Arctic Tern	No	56	2015	2004	Passage migrant. Species of open water	N
<i>Sterna sandvicensis</i>	Sandwich Tern	No	4	2011	2004	Uncommon passage migrant	N
<i>Streptopelia turtur</i>	European Turtle Dove	No	2	1990	1966	Found in woodland edges and hedgerows and more open habitats with scrub. Serious decline and very restricted breeding species in Staffordshire	U
<i>Sturnus vulgaris</i>	Common Starling	No	48	2014	1966	Found in woodland, reedbeds and gardens throughout the county; less frequent in moorland areas.	Y
<i>Sylvia communis</i>	Common Whitethroat	No	11	2014	1966	Widespread breeding species in scrub	Y
<i>Tachybaptus ruficollis</i>	Little Grebe	No	100	2015	1998	Widespread breeding species of open water with well vegetated margins	N
<i>Tadorna ferruginea</i>	Ruddy Shelduck	No	4	2013	2006	Possibly genuine wild vagrants but most records believed to be feral birds	N
<i>Tringa erythropus</i>	Spotted Redshank	No	1	1980	1980	Uncommon passage migrant	N
<i>Tringa nebularia</i>	Common Greenshank	Yes	3	2009	2007	Passage migrant.	N
<i>Tringa ochropus</i>	Green Sandpiper	Yes	3	2015	1996	Uncommon passage migrant, some overwintering birds	N
<i>Tringa totanus</i>	Common Redshank	No	5	2015	1981	Very localised. Wetland habitats. Ground nesting so vulnerable to disturbance and to predation by crows etc., so avoid nesting near trees and other perching posts.	N
<i>Turdus iliacus</i>	Redwing	Yes	18	2014	2005	Winter visitor, feeding in fields, hedges and orchards.	N

Latin Name	Common Name	Schedule 1 WCA	Number of Records	Most Recent Record	First Record	Habitat Preference	Suitable Breeding Habitat on Site*
<i>Turdus philomelos</i>	Song Thrush	No	20	2014	1966	Woods, hedgerows, parks and gardens in shrubs and trees. Feed on invertebrates and fruit.	Y
<i>Turdus pilaris</i>	Fieldfare	Yes	19	2015	2005	Winter visitor, feeding in a range of habitats.	N
<i>Turdus torquatus</i>	Ring Ouzel	No	4	2005	2005	Rare passage migrant, any breeding restricted to Staffordshire moorlands	N
<i>Turdus viscivorus</i>	Mistle Thrush	No	24	2014	1982	Widespread breeding and wintering species	Y
<i>Tyto alba</i>	Barn Owl	Yes	29	2015	1998	Very local, especially outside Staffs Moorlands. Feeds over rough grassland, often along verges/hedges. Usually nests on ledges in buildings	Y
<i>Uria aalge</i>	Common Guillemot	No	2	1901	1889	Accidental occurrence	N
<i>Vanellus vanellus</i>	Northern Lapwing	No	77	2015	1966	Fairly widespread. Wetland and farmland habitats, usually near water. Ground nesting so vulnerable to disturbance and to predation by crows etc., so avoid nesting near trees and perching posts.	Y

Note: \* Y = Yes, N = No, U = Unlikely

### Birds recorded during Breeding Bird and Wintering Bird Surveys

Common name	Species	s.41	LBAP	Red	Amber	Sch. 1	Breeding status / notes	Wintering Birds
Mute Swan	Cygnus olor				*		N/A	Present on Gailey Reservoirs throughout the winter season. One adult pair were noted each time with 4-5 juveniles. One adult Black Swan Cygnus atratus was recorded on two visits (Nov-Dec).
Whooper Swan	Cygnus cygnus				*	*	N/A	One individual recorded feeding on Gailey Lower reservoir in wintering survey.
Pink-footed Goose	Anser brachyrhynchus				*		N/A	A pair recorded in November feeding in fields parallel to the reservoirs, SE of Gailey Lea Farm. 46 noted in February 2017 on Gailey Lower Reservoir.
Greylag Goose	Anser anser				*	*	Two in flight over site heading east. Presumed nesting off site.	Six were recorded during the November 2016 visit on main site; three in the north westerly section flying north, two more recorded nearby flying west and an individual in flight heading west from the south east corner of the site parallel to Vicarage road. Individuals also recorded Jan- Mar 2017 feeding on Gailey Reservoirs and Calf Heath Reservoir. A pair was also recorded roosting on pools within the quarry area north east of Calf Heath Woods.

Common name	Species	s.41	LBAP	Red	Amber	Sch. 1	Breeding status / notes	Wintering Birds
Canada goose	<i>Branta canadensis</i>						All records 2016: Two in flight over site, Two on the ground in the east of the site near Calf Heath Reservoir. Two with four juveniles there on a separate occasion. Unknown whether breeding was on site or on adjacent reservoir site.	Common on Gailey Reservoirs, possibly resident population. Individuals were also recorded feeding in fields along the northern border of the Reservoirs. A pair was recorded within the main site roosting at the pools located within the quarry site.
Mallard	<i>Anas platyrhynchos</i>				*		At least seven pairs on site, widespread across site.  Calf Heath Reservoir 2017: Several pairs breeding; 16 males maximum counted. Adults with groups of 10, 5 and 5 juveniles recorded.	Widespread across the main site, common on all Reservoirs. Pairs recorded on pools within the quarry area. Hybrid mallards were present on Calf Heath Reservoir (likely domestic escapees).
Tufted Duck	<i>Aythya fuligula</i>						N/A	A large population present each month on the Gailey Reservoirs.
Pheasant	<i>Phasianus colchicus</i>						Common in Calf Heath Wood where there are rearing pens and feeders. Occasional elsewhere. Probable breeder supplemented by releases.	Common throughout the main site and in areas surrounding Calf Heath and Gailey Reservoirs.
Red legged partridge	<i>Alectoris rufa</i>						One bird seen at Gravelly Way in 2016. Possible breeder.	None recorded on Main site or Reservoirs during survey period.

Common name	Species	s.41	LBAP	Red	Amber	Sch. 1	Breeding status / notes	Wintering Birds
Cormorant	Phalacrocorax carbo						N/A	Common on Calf Heath and Gailey Reservoirs during all visits. Large numbers noted using heronry (grid reference SJ 93567 10456) on Gailey upper Reservoir as a drying perch.
Grey heron	Ardea cinerea						2016: Bird seen in flight over quarry towards Calf Heath Reservoir/eastwards and one seen next to water in quarry excavation north of Vicarage Road. Presumed nesting offsite.	Common throughout survey period on Gailey Reservoirs. Possible heronry located in Lower Gailey Reservoir; grid reference SJ 93567 10456. Individuals also recorded each month fishing on Calf Heath Reservoir in smaller numbers.
Little Grebe	Tachybaptus ruficollis						N/A	Recorded each month in small numbers feeding on the Gailey Reservoirs.
Great Crested Grebe	Podiceps cristatus						Calf Heath Reservoir 2017: Up to four pairs displaying, one seen with nesting material in south on visit 2 and up to three family groups seen (max three chicks in each family).	Common on Calf Heath and Gailey Reservoirs each month. Two pairs observed building/ sitting on nests on Calf Heath Reservoir in March. Grid references; SJ 92814 10088 and SJ 93047 09852.
Sparrowhawk	Accipiter nisus						2016: Seen carrying prey into Calf Heath Wood and in flight over wood on separate occasion. Probable breeder there.	Adult female recorded perching nearby Gravelly Way Farm. Pluckings recorded approx. 150m nearby at grid reference SJ 915 096. Another female recorded flying north east from Croft Lane within the main site boundary. Another female was recorded perching north east of Calf Heath Bridge, just outside the main site boundary.

Common name	Species	s.41	LBAP	Red	Amber	Sch. 1	Breeding status / notes	Wintering Birds
Buzzard	Buteo buteo						2016: Singles and twos seen across the site, seen close to Calf Heath Wood, Reservoir Plantation and woodland close to Woodside Farm. Probable breeder.	Commonly recorded over the main site. Possible territory in Calf Heath woods, near quarry site. A nest is known to locals. <sup>1</sup>
Hobby	Falco subbuteo					*	Calf Heath Reservoir 2017: One bird high over flying north-east on the third visit.	N/A
Moorhen	Gallinula chloropus						2016: Single bird on northern boundary near Gailey Wharf in survey visit 2.	Common on Calf Heath and Gailey Reservoirs. Individuals also recorded within the Main site boundary along Gailey Canal and Wharf.
Coot	Fulica atra						Adult and two juveniles seen south of Vicarage Road in visit 3 2017	Common each month in large numbers on the Gailey Reservoirs. Individuals also recorded each month along Gailey Canal within the Main site boundary.
Oystercatcher	Haematopus ostralegus				*		N/A	Few individuals recorded on Calf Heath and Gailey Reservoirs. Also recorded feeding in fields surrounding Gailey Farm. A pair recorded in March within the main site boundary roosting in pools north east of Calf Heath Woods.

<sup>1</sup> Pers. Comm. (Anglers on Calf Heath Reservoir have noted there to be Buzzards nesting in Calf Heath Woods).

Common name	Species	s.41	LBAP	Red	Amber	Sch. 1	Breeding status / notes	Wintering Birds
Lapwing	Vanellus vanellus	*	*	*			Five to six pairs, one west of railway, remainder in fields north and south of Vicarage Road	Large group (~50) recorded in February flocking above Gailey Reservoirs. Individuals noted occasionally in arable fields within the main site boundary. Forty lapwings were recorded in a field south of the A5 on the 11 <sup>th</sup> October 2017 during bat survey fieldwork
Snipe	Gallinago gallinago		*		*		One flushed from set aside on first visit. Likely late wintering bird.	None recorded on Main site or Reservoirs during survey period.
Black-Headed Gull	Chroicocephalus ridibundus				*		Party of six on second survey visit to Calf Heath Reservoir in 2017. Not breeding.	Common over all sites. Largest numbers recorded each month on Gailey Reservoir.
Mediterranean Gull	Larus melanocephalus				*	*	N/A	One individual recorded on Gailey Lower Reservoir (Feb), had red ring. Roosting with Black-headed Gulls on heronry (grid reference SJ 93567 10456).
Common Gull	Larus canus				*		N/A	Common on Gailey Reservoirs. Flights recorded over main sites and Calf Heath Reservoirs.
Lesser Black-backed Gull	Larus fuscus				*		Birds in flight over site on all three visits in 2016, not nesting.	Recorded throughout all sites, greatest numbers recorded on Gailey Reservoirs.
Feral pigeon / fancy pigeon	Columba livia domestica						Noted in proximity to houses (e.g. seven near quarry entrance on one visit in 2016). Probably nesting off site.	Roosting behaviour recorded circling Pool House at north west corner of Calf Heath Reservoir.

Common name	Species	s.41	LBAP	Red	Amber	Sch. 1	Breeding status / notes	Wintering Birds
Stock dove	Columba oenas				*		Display seen and pairs/small groups noted. At least 6 pairs.	None recorded on Main site or Reservoirs during survey period.
Wood pigeon	Columba palumbus						Probably breeding throughout site, seen in display, common.	Common over all sites.
Collared dove	Streptopelia decaocto						Pair seen on one occasion at Croft Lane in 2016. Possible breeder.	Recorded on main site, one record.
Cuckoo	Cuculus canorus	*		*			2016: Two birds seen on one occasion south of canal, one calling off site in adjacent land on separate visit. Possible breeder, duncock most likely host.	None recorded on Main site or Reservoirs during survey period.
Tawny owl	Strix aluco				*		2016: One bird near Woodside Farm (also seen/heard during bat work). Probable breeder, at least one pair.	Not record however present in area. Local birder noted a roosting pair in woodland surrounding the Galley Reservoirs (Feb). <sup>2</sup>
Barn owl	Tyto alba					*	Single bird hunting over field south of Station Road on two occasions in 2017 (recorded during bat surveys).	
Little owl	Athene noctua						Adults and juveniles at Heath Farm in 2017 in association with large tree with hole in and seen leaving a barn. Probable breeder.	
Swift	Apus apus				*		Four records of single birds in flight in 2016. Unlikely to be nesting on site.	None recorded on Main site or Reservoirs during survey period.
Kingfisher	Alcedo atthis				*	*	Calf Heath Reservoir 2017: Two sightings of single bird (one calling) along south-eastern bank of reservoir. Possible breeder.	Various registrations on Calf Heath Reservoir.

<sup>2</sup> Pers Comm.



Common name	Species	s.41	LBAP	Red	Amber	Sch. 1	Breeding status / notes	Wintering Birds
Green woodpecker	<i>Picus viridis</i>						Single bird south of Station Road on one occasion in 2017. Possible breeder.	An individual recorded in woodland west of Stable Farm- within Main site boundary.
Greater spotted woodpecker	<i>Dendrocopos major</i>						Birds drumming and seen in flight. Probable breeder.	Recorded each month within woodland area alongside canal within Main site boundary, south of Croft Lane.
Kestrel	<i>Falco tinnunculus</i>				*		Two birds seen at Woodside Farm in vicinity of suitable building (2016). Two birds flushed from open barns in Heath Farm (2017). Possible nester (1 or 2 pairs).	Uncommon throughout survey period. Individual observed on two occasions perched on telephone wire across Gailey Lea Lane.
Magpie	<i>Pica pica</i>						Common, probable breeder, juvenile seen at Firtree Cottage in 2016.	Common throughout main site over entire survey period. Individuals also recorded in lesser numbers around Calf Heath and Gailey Reservoirs.
Jay	<i>Garrulus glandarius</i>						Common, most frequently recorded from in and near Calf Heath Wood in 2016. Probable breeder.	Recorded in woodland area within Main site boundary west of Woodland farm.
Jackdaw	<i>Corvus monedula</i>						Recorded across the site, often close to buildings. Three birds seen to enter a property north of A5 (off site) in 2016; assumed nesting.	Common throughout all sites.
Rook	<i>Corvus frugilegus</i>						Rookery in the eastern part of the site south of Station Road, with approximately 25 nests recorded in woodland there in 2017. Further nests in woodland south of Straight Mile (off site).	Rookery located at grid reference SJ 93421 09244.

Common name	Species	s.41	LBAP	Red	Amber	Sch. 1	Breeding status / notes	Wintering Birds
Carrion crow	Corvus corone						Common. 2016: Old nests recorded in several locations, medium size, assumed corvid nests for instance on boundary of railway line and in woodland north of Gravelly Way and east of the A449.	Common throughout. Rookery at SJ 93421 09244 appeared to be populated by Carrion Crow but had been 'taken over' by Rook population by March.
Raven	Corvus corax						2016: Seen over Calf Heath Wood, and heard calling from a perch (unseen) in the wood. Also recorded over quarry. Probable breeder.	Recorded flying from/near Calf Heath woods. Thought to be nesting in this area <sup>3</sup> .
Goldcrest	Regulus regulus						2016: Recorded in coniferous northern section of Calf Heath Wood where common, probable breeder.	None recorded on Main site or Reservoirs during survey period.
Blue tit	Cyanistes caeruleus						Common. 2016: Bird seen entering a bird box on a building in Firtree Cottage property. Subsequently juvenile bird noted at same location. Family groups recorded in hedge around Police Station on A5, in hedge east of Gailley Wharf, in Reservoir Plantation, south of the quarry workings, two families south of the Quarry entrance and three families at eastern tip of Calf Heath Wood.	Common throughout wooded areas of main sites and woodlands surrounding reservoirs.

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<sup>3</sup> Pers. Comm.

Common name	Species	s.41	LBAP	Red	Amber	Sch. 1	Breeding status / notes	Wintering Birds
Great tit	<i>Parus major</i>						Common. 2016: Bird seen entering a hole in a tree west of Gailey Magazine, east of the canal. Assumed nest site. Juveniles recorded nearby on subsequent visit and family groups recorded east of Gailey Wharf and in hedge north of Vicarage Road.	Common throughout wooded areas of main sites and woodlands surrounding reservoirs.
Coal tit	<i>Pariparus ater</i>						2016: Recorded in Calf Heath Wood in coniferous parts of the wood, not common. Probable breeder.	Recorded throughout woodland areas within main site boundary.
Skylark	<i>Alauda arvensis</i>	*	*	*			At least 14 territories, largely west of the canal and in set aside north of Calf Heath Wood.	Individuals recorded in farmland (Feb-Mar) within the main site, parallel to Vicarage Road. One flight recorded over farmland north of Gailey Reservoirs.
Swallow	<i>Hirundo rustica</i>				*		Four birds in and out of barns at Woodside Farm in 2016 (assumed nesting). Other birds associated with Avenue Cottages and Gailey Farm (2016) and seen entering/ suspected of entering two buildings north of Straight Mile (2017) and probable breeders at these properties. Other birds in flight over site.	None recorded on Main site or Reservoirs during survey period.
Long tailed tit	<i>Aegithalos caudatus</i>						Seen at Gravelly Way and the quarry. Flock north of Calf Heath Wood. Probable breeder.	Common within Main site along Gailey Canal/Wharf and at edges of Calf Heath woods and quarry site.

Common name	Species	s.41	LBAP	Red	Amber	Sch. 1	Breeding status / notes	Wintering Birds
Chiffchaff	<i>Phylloscopus collybita</i>						Widespread, typically in woodland/scrub. Probable breeder.	Recorded in wooded areas surrounding Calf Heath Reservoir.
Willow warbler	<i>Phylloscopus trochilus</i>				*		Two clusters and one singing record suggests three pairs north of Station Road (2016). A further signing male south of Station Road in 2017	None recorded on Main site or Reservoirs during survey period.
Garden warbler	<i>Sylvia borin</i>						Two records west of Woodside Farm adjacent to Bericote Land 2017. Probable breeder.	None recorded on Main site or Reservoirs during survey period.
Blackcap	<i>Sylvia atricapilla</i>						Recorded in small numbers. Probable breeder in woodland/scrub.	None recorded on Main site or Reservoirs during survey period.
Lesser whitethroat	<i>Sylvia curruca</i>						Single record in the south east of the site adjacent to Vicarage Road in 2016. Possible breeder.	None recorded on Main site or Reservoirs during survey period.
Whitethroat	<i>Sylvia communis</i>						Widespread, typically recorded in hedges across the site. Probable breeder.	None recorded on Main site or Reservoirs during survey period.

Common name	Species	s.41	LBAP	Red	Amber	Sch. 1	Breeding status / notes	Wintering Birds
Nuthatch	<i>Sitta europaea</i>						Recorded in Reservoir Plantation and small woodland north of Gravelly Way adjacent to the A449 in 2016. Possible breeder.	None recorded on Main site or Reservoirs during survey period.
Tree creeper	<i>Certhia familiaris</i>						Single birds calling in two locations in Calf Heath Wood (2016). Possible breeder.	An individual recorded in wooded areas surrounding Calf Heath Reservoir.
Wren	<i>Troglodytes troglodytes</i>						Common breeder.	Individuals common throughout wooded areas within the Main site and woodland surrounding Reservoirs.
Starling	<i>Sturnus vulgaris</i>	*		*			At least two pairs likely breeding in buildings off site (2016); all 2016 records near Croft Lane including five with two juveniles on the second visit. 2017: flock on third visit close to southern boundary of the site, not suspected of breeding in land south of Station Road.	Relatively common over the main site in groups, feeding in farmland areas within the Main site boundary. Two groups recorded feeding in farmland north of Gailey Reservoirs, 1 flight recorded here also. Group of 4 recorded within wooded perimeter of Calf Heath Reservoir.
Blackbird	<i>Turdus merula</i>						Common breeder. Juveniles seen, for instance east of the canal, south of the A5 in 2016. Pair with juveniles in hedge north of Vicarage Road in 2016.	Common throughout all sites.

Common name	Species	s.41	LBAP	Red	Amber	Sch. 1	Breeding status / notes	Wintering Birds
Fieldfare	Turdus pilaris			*			N/A	Large groups commonly recorded Nov-Feb. Flocks were observed feeding in woodland areas surrounding Calf Heath Reservoir and within hedgerows and fields along Gailey Lea Lane. Flocks were also recorded throughout the main site boundary, namely in fields and woodlands to the north west near Croft Lane. None recorded in March.
Song thrush	Turdus philomelos	*		*			c. 12 territories with several in Calf Heath Wood, although widespread across whole site. Seen carrying food into wood on one visit in 2016.	Recorded in small numbers over the main site feeding in farmland fields. 1 record at Calf Heath within wooded perimeter.
Redwing	Turdus iliacus			*			N/A	Large flocks recorded within main site boundaries in Jan-Feb. Groups noted feeding in tree-lines and fields between Stable Land and the M6, also in farmland west of Stable Lane.
Mistle thrush	Turdus viscivorus			*			Three to four pairs; pair with two juvenile seen on northern boundary of Calf Heath Wood in 2016.	Relatively common in farmland throughout the main site. Two recorded within wooded perimeter of Calf Heath Reservoir. 1 recorded feeding along Gailey Lea Lane.
Robin	Erithacus rubecula						Common breeder. Juvenile seen south of Gravelly Way in 2016.	Common throughout wooded areas within each site.
Dunmock	Prunella modularis	*			*		Widespread although mostly in the west of the site. At least 20 pairs.	Common in wooded areas throughout all sites.

Common name	Species	s.41	LBAP	Red	Amber	Sch. 1	Breeding status / notes	Wintering Birds
House sparrow	Passer domesticus	*	**	*			Seven locations/colonies recorded of which three probably involve nesting off site. Birds noted at Fir Tree Cottage and Woodside Farm (where seen to enter building, assumed to be visiting nest in 2016). Number of pairs involved is unknown, but no more than 5 pairs suspected north of Station Road. South of Station Road two locations with significant concentration at Heath Farm which has several nest boxes (2017).	Recorded in Calf Heath woodland and once within wooded areas surrounding Gailey reservoirs. Various registrations within hedgerows along Straight Mile Road. Larger groups of 10-30 individuals located within hedgerows lining Croft lane at the NW corner of the site. Individuals were also recorded scattered throughout the main site in smaller numbers.
Yellow wagtail	Motacilla flava	*		*			Pair noted north of Gravelly Way on second visit in 2016, male plus possible other bird at Gailey on visit 3 2016. Probable breeder, 1-2 pairs.	None recorded on Main site or Reservoirs during survey period.
Pied wagtail	Motacilla alba						2016: Birds seen in quarry and at Woodside Farm. Juvenile seen east of Firtree Cottage, west of railway line.	Individuals noted at Gailey Reservoirs feeding along division bank.
Chaffinch	Fringilla coelebs						Common. 2016: Pair seen with nesting material by Canal east of Gravelly Way Farm. Pair with juveniles in hedge north of Vicarage Road.	Common throughout wooded areas within each site.
Bullfinch	Pyrrhula pyrrhula	*	**		*		2016: Possible breeder in two locations (potentially off site).	Individual male recorded feeding in hedgerows along Gailey Canal during February and March visits.
Greenfinch	Chloris chloris						Not common. 2016: Recorded in the north of the site and next to the railway line. Possible breeder.	None recorded on Main site or Reservoirs during survey period.

Common name	Species	s.41	LBAP	Red	Amber	Sch. 1	Breeding status / notes	Wintering Birds
Linnet	<i>Linaria cannabina</i>	*	**	*			Four colony locations; at least seven pairs in 2016. Concentration of records in set aside fields north of Calf Heath Wood.	Small groups and individuals recorded in wooded areas throughout the main site. No sightings in Jan or Mar. 1 record within woodland at the edge of Calf Heath Reservoir. 1 flight recorded over Gailey Lower Reservoir.
Goldfinch	<i>Carduelis carduelis</i>						Small groups recorded across the site. Probable breeder.	Recorded across the main site and along Gailey Canal (attracted by feeders).
Yellowhammer	<i>Emberiza citrinella</i>	*	**	*			At least 13 pairs, notable concentrations north of Calf Heath Wood and fields north of Vicarage Road (2016) and south of Station Road (2017).	None recorded on Main site or Reservoirs during survey period.
Reed bunting	<i>Emberiza schoeniclus</i>	*	**		*		Singing birds in two locations on single dates in 2016 (one just off site), calling bird in third location. Probable breeder, 1-2 pairs.	Recorded along marsh areas of division bank between Gailey Upper and Lower Reservoirs. 1 record near pools near Calf Heath woods. 2 recorded east of the Gailey Canal and Croft Lane.

\*\* : part of 'Farmland seed eating birds' local BAP



**Annex 10.1.5**

**Biocensus Invertebrate Survey Report**



# **An Invertebrate survey and assessment of Four Ashes, Staffordshire**

**Presented to Ramboll Environ**

**Date: September 2017**

**Version: 1.0**

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## Executive Summary

### ***Purpose of the report***

This report details an assessment of the invertebrate interest at Four Ashes, Staffordshire. The survey undertaken is to appraise the key habitats and/or features and assess the conservation value of the habitats for key assemblage and scarce species.

### ***Context of the project***

This report is part of a wider suite of ecological surveys being undertaken at Four Ashes prior to a proposed development.

### ***Key findings***

The site includes a quarry, woodland, grassland, wetland features and tree-lined boundary features. The overall assemblage of invertebrates utilising this landscape is one represented by common and largely ubiquitous species. There are suites of higher fidelity species associated with the key areas of the site including those that require bare ground, deadwood or wet ground, including marshes, wet woodland and pools. There are eight species of genuine rarity associated with the site and one Staffordshire Biodiversity Action Plan (SBAP) representative.

### ***Conclusions***

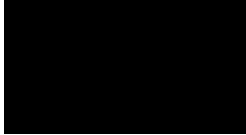
The site is a landscape-scale proposed development that includes a range of habitats. The habitat diversity is broadly poor with only a few invertebrate assemblage types noted. The principal assemblages relate to woodland, wood edge and trees, bare ground and early succession and wetlands. The niches of value are few and not particularly well-developed, as highlighted by the ISIS analyses.

There are only a few species with a national status that supports the assessment of the habitat being of low to moderate quality and lacking significant niche development, being largely populated by common and localised species indicative of a broad suite of preferences rather than a tight set of habitat criteria.

Although the resource of invertebrates of the landscape is generally considered of low conservation value, the footprint of the site is large and therefore impacts across large areas of the site could affect local populations of species. However, through suitable mitigation there are no species recorded in the area that would be considered to be at risk by the proposed development.

I confirm the information provided in this document is truthful and accurate at the time of completion.

**Andy Jukes (BCs (Hons) FRES MIEEM**



**Date:** 03.09.17

**Biocensus QA: Gavin Wilson**



**Date:** 04/09/2017

## Introduction

### 1.1. Background

The survey was carried out by Andy Jukes, (B.Sc. (Hons), CIEEM, FRES.).

The survey was commissioned by Malcolm Robertson of Ramboll UK.

The site comprises a number of specific survey locations, surveyed in 2016:

- Calf Heath wood (central grid reference SJ922095)

An area of coniferous plantation and secondary broad-leaved woodland. The majority of the broad-leaved woodland is birch (*Betula pendulus*) with smaller areas of oak (*Quercus* spp). The woodland is bisected by two wide rides. Surveyed in 2016.

- Calf Heath quarry (central grid reference: SJ928097)

An active sand and gravel extraction site with areas of disuse that includes mounds of aggregate and regenerating flora. Surveyed in 2016.

- Calf Heath 'landscape' (grid reference: SJ914099)

The landscape of the site is broadly arable with hedgerows with trees and small units of woodlands or clusters and lines of trees. Surveyed in 2016.

- Sample area 1 (central grid reference: SJ91840984)

Area of woodland fringe against tall grassland and wet ditch.

- Sample area 2 (central grid reference: SJ91360856)

A small grassland bordered by tree lines and unmanaged hedgerows. It includes a spring blossom resource and pignut-rich (*Conopodium majus*) grassland. Surveyed in 2016.

- Sample area 3 (central grid reference: SJ91120988)

An area of marshy grassland, arable weeds and wet ditch.



Figure 1 Map of site surveyed in 2016

Key to figure 1:

Thick black line boundary demarcates the area assessed

Points 1-3 are the focal survey points

Land south of Vicarage Road was surveyed in 2017 and comprises of a further two sample areas.

- Sample area 4 (central grid reference: SJ93290883)

A small part of a larger wet woodland that is separated by a road (Straight Mile). Surveyed in 2017.

- Sample area 5 (central grid reference: SJ92800898)

A mosaic of tall grassland, arable margins, pond and unmanaged hedges with mature trees.



Figure 2 Map of Land south of Vicarage Road surveyed in 2017

Key to figure 2:

Thick black line boundary demarcates the area assessed

Points 4-5 are the focal survey points



## 2. Methods

### 2.1. Field methods

The methods utilised for the assessment are those recommended in the Natural England guidance document 'Surveying terrestrial and freshwater invertebrates for conservation evaluation' (Drake, 2007). In some instances the method has been made bespoke for the site assessment but still retains the overall approach to assessing features and habitats for conservation assessment.

- Sweep netting  
This method provides the main proportion of the survey element, and is the most efficient method of cataloguing a site's invertebrate resource.
- Spot sampling  
Spot sampling is employed to collect large, conspicuous invertebrates such as bees and wasps from flowering plants, and to supplement the sweep samples. Spot sampling is often the most effective method of recording species from high-fidelity niches.
- Grubbing  
Fallen deadwood, piles of rotting timber (for deadwood beetles), short turf (for surface running beetles) and bare ground are fingertip searched for any hiding or crawling invertebrates, principally beetles.
- Pitfall traps  
Pitfall traps set in a grid pattern were placed in two locations; sample area 4 and sample area 5.

### 2.2 Taxonomic groups covered

The groups that formed the assessment are those that are widely used and accepted as of greatest value to site assessment and appraisal and the key indicator groups used in the Natural England Invertebrate assessment software programme ISIS (Lott *et al.*, 2010) and recommended by Drake *et al.* (2007) The principal groups are likely to include:

- Bees and wasps (early succession, bare ground, flowery habitats and structural variation);
- Various fly families including hoverflies (range of habitats types, especially structural habitats);
- Butterflies and day-flying moths (particularly early succession, short swards and woodland fringe);
- Heteropteran bugs (range of habitats including bare ground, scrub fringe and grasslands);
- Beetles including leaf beetles, ground beetles and water beetles (range of habitats including bare ground, structural habitats and flowering plants);
- Orthoptera (grasshoppers and crickets); and
- Odonata (dragonflies and damselflies).

Other incidental records from other groups were also included.

Specimens were identified to species level.

Details of the survey coverage and dates undertaken is presented in Table 1.

Table 1. Survey dates

Date	Environmental conditions	Calf Heath wood	Calf Heath quarry	Calf Heath landscape	Sample area 1	Sample area 2	Sample area 3	Sample area 4	Sample area 5
24.05.16	Sunny, 19°C	*							
05.06.16	Sunny 16-23°C		*	*	*	*	*		
06.06.16	Sunny, 19°C	*	*						
22.06.16	Sunny 16-19°C		*						
23.06.16	Sunny, 18-23°C		*						
04.07.16	Cloudy-sunny, 16-19°C	*	*		*	*	*		
05.07.16	Sunny, 19-21°C		*						
04.08.16	Light cloud-sun, breezy 16-18°C	*			*		*		
05.08.16	Light cloud-sun 17-18°C			*					
09.08.16	Cloud and sun 16-18°C	*	*						
09.09.16	Sunny 15-19°C		*		*		*		
23.09.16	Light cloud and sun 17-19°C	*							
22.05.17	Sunny 16-20°C							*	*
17.06.17	Sunny 22-28°C							*	*
22.07.17	Sunny 17-20°C							*	*

### 2.1.1. Analysis of data

ISIS (Invertebrate Species–habitat Information System) is used in the analysis of invertebrate data to assist the specialist in the appraisal of any features or habitats of potential value to invertebrates. ISIS is a computer application that can be used to identify assemblages of importance when species lists are inputted into the computer software. This is particularly useful for identifying key areas of

interest and importance and monitoring site changes as management alters habitat structure and species composition. A full explanation of ISIS can be found in Appendix V.

### 2.1.2. Interpretation of data

Rarity scores for each BAT (Broad Assemblage Type) generated by ISIS have a favourable condition threshold. This threshold is a benchmark used for the condition assessments (Common Standards Monitoring - CSM) of Sites of Special Scientific Interest (SSSI) but can also be used as a guide to the value of sites outside of the SSSI system. There is no national guidance on benchmarking wider countryside sites but a professional judgement can be made on the quality of an assemblage based on the scores returned by ISIS. The judgement is translated into a valuation on the assemblages though using the broad categories of 'low', 'moderate' or 'high' based on the returned ISIS scores and interpretation by the specialist.

Table 2. Threshold scores table

BAT code	BAT name	Favourable condition threshold score
A1	Arboreal canopy	170
A2	Wood decay	190
F1	Unshaded early successional mosaic	160
F2	Grassland and scrub matrix	160
F3	Shaded field and ground layer	150
W1	Flowing water	160
W2	Mineral marsh and open water	150
W3	Permanent wet mire	180

Specific Assemblage Types (SAT) are characterised by stenotopic species (those that can only withstand a narrow range of environmental conditions). These sit within a parent BAT as presented in the table above and provide additional detail and definition. More than one SAT can sit within a parent BAT.

Table 3. Table of SAT threshold scores

SAT code	SAT name	Number of scoring species to reach favourable condition
A211	Heartwood decay	6
A212	Bark and sapwood decay	19
F111	Bare sand and chalk	18
F112	Open short sward	12
F001	Scrub edge	12
F002	Rich flower resource	14
F003	Scrub-heath and moorland	8

SAT code	SAT name	Number of scoring species to reach favourable condition
W122	Riparian sand	4
W312	Sphagnum bog	7
W314	Reedfen and pools	10

### 2.1.3. Limitations

The site includes areas that could not be sampled for health and safety reasons including the silt lagoon areas, bank sides of the quarry and horse paddocks.

## 3. Results

### 3.1. General

420 species were recorded during the survey across the study area as shown in Figure 1 and Figure 2.

A dedicated ISIS (2010) analysis table and species list was prepared for each component of the study area as shown in Figure 1 and Figure 2 including:

- Calf Heath wood;
- Calf Heath quarry;
- Calf Heath 'landscape' which includes:
  - Sample area 1;
  - Sample area 2;
  - Sample area 3;
- Land south of Vicarage Road which includes:
  - Sample area 4;
  - Sample area 5.

The results of the ISIS analysis are presented in Appendices I-III.

Table 4. Species of importance identified during survey

Scientific name	Vernacular name	National status	Habitat preferences and species notes	Sample location
<i>Bombus rupestris</i>	Cuckoo bumblebee	NS B	No specific habitat preferences. More common than status suggests.	Calf Heath wood.

Scientific name	Vernacular name	National status	Habitat preferences and species notes	Sample location
<i>Chiasmia clathrata</i>	Latticed Heath	S41	Dry grassland, brownfields and heaths with trefoils.	Found across the landscape along sparse, fine-leaved grass track verges with trefoils. Specifically along the edges of arable fields.
<i>Diogma glabrata</i>	A crane fly	NS	Damp woodlands	Calf Heath wood.
<i>Rhamphomyia micropyga</i>	A dance fly	NS	Shaded woodland floor	Specific to sample area 4
<i>Rhaphium albomaculatum</i>	A doly fly	NS	Wetlands on peat	Specific to sample area 4
<i>Rhaphium lanceolatum</i>	A doly fly	NS	Wetlands on peat	Specific to sample area 4
<i>Tyria jacobaeae</i>	Cinnabar	S41	Open habitats where there is ragwort.	Found across the landscape.
Aculeate hymenoptera	Ground-nesting solitary bees and wasps	Staffordshire Biodiversity Action Plan (SBAP)	Bare ground and flowery swards. Structured sites.	Quarry (19 species – all common or local) and, to a lesser extent, landscape (6 species – all common or local).

### 3.2. Calf Heath wood

133 species of invertebrates from the target groups were recorded in Calf Heath Wood.

The woodland is represented by a range of common and ubiquitous invertebrate species synonymous with low quality woodlands as noted by the poor ISIS scores in Appendix I. The typical woodland assemblage ‘shaded field and ground layer’ scores 140 which can be described as a moderate score and the arboreal canopy (BAT: A1) has a score of 119, a low score, although this assemblage is difficult to sample effectively.

The SAT scores are also poor but do present species from typical assemblages associated with woodlands including the scrub edge (F001) with 3 species of association, heartwood decay (A211) and barkwood decay (A212) both with two species of association.

The majority of the woodland is birch dominated or coniferous plantation. There are however small areas of oak woodland with mature trees and also a series of mature beech trees (*Fagus sylvatica*).

There is one genuinely scarce species recorded from the woodland. *Diogma glabrata* is normally associated with calcareous sites but can be found in other locations that are damp. There are damp features within this woodland and it was along the shaded damp rides at SJ 92341 09614 on 4 July that this species was swept from.

*Bombus rufsestris* was recorded from a visual observation on 4 July 2016 from the south east-northwest ride of the woodland (SJ 92176 09351). It is still listed as being Nationally Scarce B but has expanded its range significantly and sustainably over the past 20 years and it is likely to be downgraded in the upcoming aculeate hymenoptera review.

See Appendix I for the ISIS table.

### **3.3. Calf Heath quarry**

90 species from the targeted groups were recorded from the quarry, including solitary bees and wasps (principal survey requirement).

The quarry includes a large component of bare ground, including unshaded areas with a southerly exposure. However, results of the survey have shown the fauna associated with bare ground to be limited and it includes only common and local species.

The ISIS results for the quarry illustrate this low value of the site with a low rarity score (119), favourable status threshold being 160, for the key unshaded early successional mosaic BAT (BAT code: F1). See Appendix II for ISIS table.

The range of species recorded from the quarry does however include typical species of open bare ground sites. This suite of species includes spider-hunting wasps and mining bees such as *Lasioglossum parvulum*, all indicative of open, sparsely vegetated ground.

### **3.4. Calf Heath landscape**

172 species from the targeted groups were recorded across the landscape, including the three sample points (Sample Areas 1 -3).

The strongest rarity score and most representative invertebrate assemblage in terms of extent across the site is the F2 grassland and scrub matrix. This has a score of 127 and can be described as a moderate score with 160 being the threshold for 'favourable status'. The assemblages across the landscape are the unshaded early successional mosaic BAT with a rarity score of 120 (threshold = 160), permanent wet mire with 125 (threshold = 180) and the arboreal canopy with a rarity score of 129 (threshold = 170).

The landscape around the quarry and woodland is predominately arable fields with a variety of boundary features such as hedgerows, lines of deciduous trees, to gravelly tracks and verges with flowers.

This is reflected in the species recorded whose habitat preferences range from woodland and wood edge species to those more characteristic of open, sparse swards on heathlands and brownfield

sites. On a landscape scale, the ISIS results (see Appendix III) have a set of scores that can be described as moderate in their value with respect to the rarity scores.

There are very few species of high conservation value in the landscape. These are listed in Table 1. Most are common in open or shaded habitats. There are suites of species though more selective in their requirements and a range of niche 'high fidelity' species are present. The most obvious is the scrub edge assemblage (F001). Although only six species were recorded from the feature including the speckled wood butterfly it is thought to be a stronger SAT (Specific Assemblage Type) than this analysis suggests, as the presence of unmanaged boundary tree lines and woodland fringes are present across the site. See Appendix IV for a description of SATs.

The bark and sapwood decay SAT (A212) is also present at a moderate level across the site found at most wooded areas, including tree lines but as there is not a significant deadwood component at each location, the resource of invertebrate species appears to be small. Seven species are recorded from this SAT (threshold for favourable status = twelve). The site includes a number of large oak trees that exhibit some deadwood including rot on the trunks or prominent limbs.

The rich flower resource (F002) includes four species including hoverflies, which is not a high number relative to the threshold for favourable condition (14) but does suggest that there is a resource of flowering plants around the site that support pollinators.

### **3.5. Land South of Vicarage Road**

179 species from the targeted groups were recorded from sample areas 4 and 5.

The most representative invertebrate assemblage in terms of extent across the site is the F2 grassland and scrub matrix. This has a score of 120, which can be described as a low to moderate score, with 160 being the threshold for 'favourable status'.

The assemblage with the greatest value was the permanent wet mire with 169 (threshold = 180) and is largely restricted to the wet woodland of sample area 4. Three species of national significance were identified, which were not recorded elsewhere across the application area (*Rhamphomyia micropyga*, *Rhaphium albomaculatum* and *Rhaphium lanceolatum*).

The arboreal canopy element is not strong or well developed, with a low score of 114 (threshold = 170). The value for invertebrates of the woodlands, and specifically the trees, is in the deadwood element. Eleven species were recorded that have a fidelity to deadwood, mainly from the A212 bark and sapwood decay SAT.

Generally, across the Calf Heath Extension area, the landscape presents a range of features from rich flower resources to open short swards. However none of these specific assemblages were strong on the basis of species lists, where common species only were recorded on the open habitats.

## 4. Discussion and assessment of invertebrates at Four Ashes

### 4.1. General

Overall, the varying sites, features and landscape are of low to moderate quality mainly being represented by common and local species that have a broad habitat preference such as 'open grassland', 'scrub fringe' or 'tree cover'.

There is however a suite of species that have a higher demand from a landscape or site and if not catered for could be lost from the area if all the resources are impacted through a proposed development.

### 4.2. Woodland and trees

The key areas of the woodland habitats, including Calf Heath Wood, identified to be of value to invertebrates include deadwood that is either on the tree or has fallen. Some of the fallen deadwood that was recorded as being utilised was in a sunny exposed situation which was shown to be favoured by solitary bees and wasps. Deadwood that was noted to be present in semi-shaded and sometimes damp situation was observed to be favoured by flies and beetles. The mature beech and oak trees within Calf Heath Wood offer the most important or potentially important features in the woodland, however, they are shaded heavily from surrounding lower value trees. Haloing of these trees to expose them to greater levels of sunlight would increase the chances of them getting to a veteran age and state and be utilised by the corresponding fauna.

The landscape includes a number of trees that are of some current interest to invertebrates. The value and interest of these trees to invertebrates will increase in the future as they become veteran and exhibit more deadwood and other rotting features.

Trees with deadwood growing in open situations and exposed to strong sunlight are the source location of a suite of solitary wasps and bees.

### 4.3. Wet areas

Permanent wet mire was recorded on site in both open situations and also in a wet woodland situation. These habitats were not considered to be prominent features in the landscape but were present at a small spatial extent across the application site. The wet woodland of sample area 4 is notable due to the presence of three species of national significance not recorded elsewhere across the application area (*Rhamphomyia micropyga*, *Rhaphium albomaculatum* and *Rhaphium lanceolatum*). Outside the wet woodland, wetland invertebrate fauna included a number of common and also local species such as the localised soldierflies *Oxycera rara*, *Oplodontha viridula* and a suite of snail-killing flies (Sciomyzidae) that have fidelity to wet grasslands, marshes and pond/wet ditch margins.



#### 4.4. Quarry (bare ground and early succession)

The quarry does not support a significant early successional mosaic assemblage but does contain species that are localised and require a mosaic of habitats including; bare ground, short sward flowery grassland that includes a range of herbs including yellow composites and Fabaceae, and scrub/rough grassland to survive. This resource is mainly contained in the quarry but there is a landscape scale presence of bees and wasps including *Andrena synadelpha* a local species of mining bee.

There is no single reason for the lack of aculeates (bees, wasps and ants) at the quarry site. It is considered that the relatively short list of species recorded may be attributable to a cumulative set of factors including:

- The quarry area lacks the early successional swards that include plentiful flowers such as common bird's-foot trefoil (*Lotus corniculatus*) and especially yellow composites including common cat's-ear (*Hypochoeris radicata*); and
- The consistency of the waste material that forms the bare ground. At the quarry this material is hard and compacted, possibly too hard for many species that prefer a more friable substrate.

## 5. Conclusions

The site is a landscape-scale proposed development site that includes a range of habitats. The habitat diversity is broadly poor in terms of invertebrate assemblage types. The principal assemblages relate to woodland, wood edge and trees, bare ground and early succession and wetlands. The niches of value are few and not particularly well-developed as highlighted by the ISIS analyses.

Seven species with a national status and one Staffordshire Biodiversity Action Plan species group were identified. These findings support the assessment of the habitat being of low to moderate quality and lacking significant niche development, with the exception of the small wet woodland area of sample area 4, which is of true value despite being a small fragmented wet woodland unit. The habitats identified are largely populated by common and localised species indicative of a broad suite of preferences rather than a specialised set of habitat criteria.

## 6 Valuation

All of the sample locations that form the landscape-scale survey have very few species of high or moderate value pertaining to it and those that are recorded are likely to be found at other similar sites as the landscape of the site is representative of the local area.

The valuation of the site takes into consideration all of the preceding information and discussion, the range of species recorded, including the few scarce species but also the overall quality of the assemblages discovered and analysed using ISIS (2010). This valuation also considers the potential for other scarce species to be present.

Based on the experience of the surveyor, his knowledge of invertebrates and specific knowledge of Staffordshire's invertebrate fauna, and also by consulting the guidance notes prepared by Colin Plant

Associates for CIEEM (Chartered Institute of Environmental Managers and Ecologists) (Appendix V) it is suggested that the site, as a landscape-scale site should be considered to be of **Local (low) importance** (Plant, 2009). See Appendix VI for an explanation of Plant (2009).

The site is not thought to be of a higher value due to the generic species lists the sample sites produce and the likelihood that these locations are replicated repeatedly in other similar field systems of the area.

The only exceptions include the following species:

The nationally scarce *Diogma glabrata*, a species of crane fly recorded from Calf Heath Wood and not often seen but has been recorded from Cannock Chase by the author of this report and is likely to be in other damp woodlands and shaded stream courses of the area.

The suite of species only recorded from sample area 4 (wet woodland). These nationally scarce species (*Rhamphomyia micropyga*, *Rhaphium albomaculatum* and *Rhaphium lanceolatum*) are likely to be recorded on the adjacent larger wet woodland unit and at other wet woodland situations on Cannock Chase.

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## Appendices

### Appendix I

#### *Calf Heath Wood ISIS output tables and species list*

SAT code	SAT name	No. spp.	Condition	Percentage of national species pool	Related BAT rarity score
F001	scrub edge	3		2	
F002	rich flower resource	3		1	
A211	heartwood decay	2		1	
W312	Sphagnum bog	1		1	
F003	scrub-heath & moorland	2		1	
A212	bark & sapwood decay	2		0	

All SATs scoring more than zero are listed

The broad assemblage types represented in this list are as follows:

BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F2	grassland & scrub matrix	25	119		32	
F3	shaded field & ground layer	15	140		20	
A1	arboreal canopy	12	119		16	
W3	permanent wet mire	12			15	
A2	wood decay	8			11	0
F1	unshaded early successional mosaic	8			10	
W1	flowing water	5			6	
W2	mineral marsh & open water	5			6	

Rarity scores are shown only for BATS represented by more than 15 species in the assemblage / fauna being analysed

<b>Scientific name</b>	<b>Vernacular name</b>	<b>Date first recorded</b>
<i>Acanthosoma haemorrhoidale</i>	Hawthorn Shieldbug	23-Sep-16
<i>Aeshna grandis</i>	Brown Hawker	04-Aug-16
<i>Aglais io</i>	Peacock	24-May-16
<i>Agriotes acuminatus</i>	a click beetle	24-May-16
<i>Agriotes pallidulus</i>	a click beetle	06-Jun-16
<i>Anaspis thoracica</i>	a beetle	04-Aug-16
<i>Ancistrocerus gazella</i>	a mason wasp	04-Jul-16
<i>Anthocharis cardamines</i>	Orange-tip	24-May-16
<i>Anthocoris confusus</i>	a true bug	24-May-16
<i>Anthocoris nemorum</i>	a true bug	24-May-16
<i>Aphantopus hyperantus</i>	Ringlet	04-Jul-16
<i>Argyra diaphana</i>	a dolyfly	06-Jun-16
<i>Athous haemorrhoidalis</i>	a click beetle	24-May-16
<i>Austrolimnophila ochracea</i>	a crane fly	04-Jul-16
<i>Baccha elongata</i>	a hoverfly	24-May-16
<i>Beris clavipes</i>	a soldierfly	24-May-16
<i>Beris geniculata</i>	a soldierfly	04-Jul-16
<i>Betulapion simile</i>	a weevil	04-Aug-16
<i>Bombus hortorum</i>	Small Garden Bumble Bee	06-Jun-16
<i>Bombus hypnorum</i>	a bumblebee	04-Jul-16
<i>Bombus lapidarius</i>	Large Red Tailed Bumble Bee	24-May-16
<i>Bombus pascuorum</i>	Common Carder Bee	24-May-16
<i>Bombus pratorum</i>	Early Bumble Bee	24-May-16
<i>Bombus rupestris</i>	a cuckoo bumblebee	04-Jul-16
<i>Bombus terrestris</i>	Buff-tailed Bumble Bee	06-Jun-16
<i>Bombus vestalis</i>	a bumblebee	04-Jul-16
<i>Campyloneura virgula</i>	a true bug	04-Aug-16
<i>Cantharis livida</i>	a soldier beetle	24-May-16
<i>Cantharis nigra</i>	a soldier beetle	06-Jun-16
<i>Cantharis rustica</i>	a soldier beetle	24-May-16
<i>Cheilosia albitarsis sens. str.</i>	a hoverfly	24-May-16
<i>Cheilosia proxima</i>	a hoverfly	04-Jul-16
<i>Cheilosia variabilis</i>	a hoverfly	24-May-16
<i>Chrysogaster solstitialis</i>	a hoverfly	04-Jul-16
<i>Chrysopilus cristatus</i>	a snipefly	06-Jun-16
<i>Clytus arietis</i>	Wasp Beetle	06-Jun-16
<i>Crepidodera aurata</i>	a leaf beetle	24-May-16
<i>Dalopius marginatus</i>	a click beetle	24-May-16

<i>Deporaus betulae</i>	Birch Leaf Roller	04-Jul-16
<i>Dicranomyia chorea</i>	a crane fly	23-Sep-16
<i>Dioctria rufipes</i>	a robber fly	04-Jul-16
<i>Diogma glabrata</i>	a crane fly	04-Jul-16
<i>Dolichocephala guttata</i>	a hybotid fly	24-May-16
<i>Dolichopus campestris</i>	a doly fly	24-May-16
<i>Dolichopus discifer</i>	a doly fly	24-May-16
<i>Dolichopus festivus</i>	a doly fly	04-Jul-16
<i>Dolichopus griseipennis</i>	a doly fly	04-Jul-16
<i>Dolichopus longicornis</i>	a doly fly	05-Jul-16
<i>Elasmostethus interstinctus</i>	Birch Shieldbug	23-Sep-16
<i>Epiphragma ocellare</i>	a crane fly	04-Jul-16
<i>Erioptera fuscipennis</i>	a crane fly	23-Sep-16
<i>Eristalis horticola</i>	a hover fly	06-Jun-16
<i>Eristalis pertinax</i>	a hover fly	24-May-16
<i>Eristalis tenax</i>	a hover fly	24-May-16
<i>Eupeodes corollae</i>	a hover fly	04-Jul-16
<i>Ferdinandea cuprea</i>	a hover fly	06-Jun-16
<i>Graphocephala fennahi</i>	a frog hopper	23-Sep-16
<i>Habrocerus capillaricornis</i>	a rove beetle	06-Jun-16
<i>Haematopota pluvialis</i>	a horse fly	04-Jul-16
<i>Harpocera thoracica</i>	a true bug	24-May-16
<i>Helophilus hybridus</i>	a hover fly	04-Jul-16
<i>Helophilus trivittatus</i>	a hover fly	04-Jul-16
<i>Hercostomus aerosus</i>	a doly fly	04-Jul-16
<i>Homoneura biumbrata</i>	a fly	06-Jun-16
<i>Hybos grossipes</i>	a hybotid fly	04-Jul-16
<i>Lasioglossum villosulum</i>	Shaggy Mining Bee	06-Jun-16
<i>Leptophyes punctatissima</i>	Speckled Bush Cricket	04-Aug-16
<i>Leucozona glaucia</i>	a hover fly	04-Jul-16
<i>Leucozona lucorum</i>	a hover fly	24-May-16
<i>Libellula depressa</i>	Broad-bodied Chaser	24-May-16
<i>Limonia nubeculosa</i>	a crane fly	06-Jun-16
<i>Limonia phragmitidis</i>	a crane fly	24-May-16
<i>Liocoris tripustulatus</i>	a true bug	24-May-16
<i>Lygocoris pabulinus</i>	a true bug	04-Aug-16
<i>Meiosimyza rorida</i>	a fly	04-Jul-16
<i>Melangyna lasiophthalma</i>	a hover fly	24-May-16
<i>Melanostoma mellinum</i>	a hover fly	24-May-16
<i>Minettia longipennis</i>	a fly	04-Aug-16
<i>Monalocoris filicis</i>	a true bug	06-Jun-16
<i>Myathropa florea</i>	a hover fly	06-Jun-16
<i>Neoitamus cyanurus</i>	a robber fly	06-Jun-16
<i>Neolimnomyia batava</i>	a crane fly	24-May-16

<i>Neolimonia dumetorum</i>	a crane fly	06-Jun-16
<i>Nephrotoma quadrifaria</i>	a crane fly	06-Jun-16
<i>Nephrotoma scurra</i>	a crane fly	04-Aug-16
<i>Nomada flava</i>	a cuckoo bee	06-Jun-16
<i>Nomada leucophthalma</i>	a cuckoo bee	24-May-16
<i>Notiophilus biguttatus</i>	a ground beetle	06-Jun-16
<i>Ochlodes sylvanus</i>	Large Skipper	04-Jul-16
<i>Ocydromia glabricula</i>	a hybotid fly	06-Jun-16
<i>Osmia leaiana</i>	a mason bee	06-Jun-16
<i>Otiorhynchus singularis</i>	Raspberry Weevil	24-May-16
<i>Pararge aegeria</i>	Speckled Wood	24-May-16
<i>Parydra coarctata</i>	a shore fly	06-Jun-16
<i>Pemphredon lethifera</i>	a digger wasp	04-Jul-16
<i>Phylidorea squalens</i>	a crane fly	06-Jun-16
<i>Phyllobius argentatus</i>	Silver-green Leaf Weevil	24-May-16
<i>Phyllobius pyri</i>	Common Leaf Weevil	24-May-16
<i>Phytocoris ulmi</i>	a true bug	04-Aug-16
<i>Pieris napi</i>	Green-veined White	24-May-16
<i>Plagioderma versicolora</i>	a leaf beetle	24-May-16
<i>Plagiognathus arbustorum</i>	a true bug	04-Aug-16
<i>Platycheirus manicatus</i>	a hoverfly	24-May-16
<i>Polydesmus angustus</i>	Common Flat-backed Millipede	06-Jun-16
<i>Polydrusus cervinus</i>	a weevil	24-May-16
<i>Polygonia c-album</i>	Comma	04-Jul-16
<i>Propylea quattuordecimpunctata</i>	14-spot Ladybird	24-May-16
<i>Pyrrosoma nymphula</i>	Large Red Damselfly	24-May-16
<i>Rhagio lineola</i>	a snipe fly	04-Jul-16
<i>Rhagio scolopaceus</i>	a snipe fly	06-Jun-16
<i>Rhagonycha fulva</i>	a soldier beetle	04-Jul-16
<i>Rhagonycha lignosa</i>	a soldier beetle	24-May-16
<i>Rhamphomyia nigripennis</i>	a dance fly	06-Jun-16
<i>Rhamphomyia tarsata</i>	a dance fly	24-May-16
<i>Rhaphium crassipes</i>	a doly fly	24-May-16
<i>Rhipidia maculata</i>	a crane fly	23-Sep-16
<i>Saldula saltatoria</i>	a true bug	04-Jul-16
<i>Sargus iridatus</i>	a soldier fly	24-May-16
<i>Scolopostethus thomsoni</i>	a true bug	04-Aug-16
<i>Sericomyia silentis</i>	a hoverfly	23-Sep-16
<i>Sphaerophoria scripta</i>	a hoverfly	04-Jul-16
<i>Sybistroma crinipes</i>	a doly fly	06-Jun-16
<i>Sympetrum striolatum</i>	Common Darter	04-Jul-16
<i>Syrphus ribesii</i>	a hoverfly	04-Jul-16



<i>Tachyporus solutus</i>	a rove beetle	24-May-16
<i>Tipula fascipennis</i>	a crane fly	04-Aug-16
<i>Tipula oleracea</i>	a crane fly	23-Sep-16
<i>Tipula scripta</i>	a crane fly	04-Jul-16
<i>Tricholauxania praeusta</i>	a fly	24-May-16
<i>Trixagus dermestoides</i>	a beetle	24-May-16
<i>Volucella bombylans</i>	a hoverfly	24-May-16
<i>Volucella pellucens</i>	a hoverfly	06-Jun-16
<i>Xylota segnis</i>	a hoverfly	06-Jun-16

Appendix II

Calf Heath Quarry ISIS output tables and species list

SAT code	SAT name	No. spp.	Condition	Percentage of national species pool	Related BAT rarity score
W122	riparian sand	1		2	
F111	bare sand & chalk	3		1	119
A211	heartwood decay	1		1	

All SATs scoring more than zero are listed

The broad assemblage types represented in this list are as follows:

BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F1	unshaded early successional mosaic	37	119		32	
F2	grassland & scrub matrix	25	105		22	
W3	permanent wet mire	11			10	
W2	mineral marsh & open water	10			9	
W1	flowing water	6			5	
A2	wood decay	2			2	0

Rarity scores are shown only for BATS represented by more than 15 species in the assemblage / fauna being analysed

Scientific name	Vernacular name	Date first recorded
<i>Adonia variegata</i>	Adonis' Ladybird	04-Jul-16
<i>Adrastus pallens</i>	a click beetle	04-Jul-16
<i>Aeshna mixta</i>	Migrant Hawker	09-Sep-16
<i>Agabus bipustulatus</i>	a water beetle	06-Jun-16
<i>Agabus nebulosus</i>	a water beetle	06-Jun-16
<i>Aglais urticae</i>	Small Tortoiseshell	23-Jun-16
<i>Amara aenea</i>	a ground beetle	23-Jun-16

<i>Amara plebeja</i>	a ground beetle	23-Jun-16
<i>Amara similata</i>	a ground beetle	23-Jun-16
<i>Ancistrocerus parietum</i>	Wall Mason Wasp	05-Jul-16
<i>Andrena bicolor</i>	Gwynne's Mining Bee	23-Jun-16
<i>Anisodactylus binotatus</i>	a ground beetle	23-Jun-16
<i>Anoplius concinnus</i>	a spider-hunter wasp	05-Jun-16
<i>Anoplius nigerrimus</i>	a spider-hunter wasp	23-Jun-16
<i>Arachnospila anceps</i>	a spider-hunter wasp	23-Jun-16
<i>Argyra argentina</i>	a dolyfly	23-Jun-16
<i>Bembidion lampros</i>	a ground beetle	23-Jun-16
<i>Bembidion tetracolum</i>	a ground beetle	23-Jun-16
<i>Bombus hortorum</i>	Small Garden Bumble Bee	23-Jun-16
<i>Bombus lapidarius</i>	Large Red Tailed Bumble Bee	23-Jun-16
<i>Bombus pascuorum</i>	Common Carder Bee	23-Jun-16
<i>Bombus sylvestris</i>	a bumblebee	04-Jul-16
<i>Bombus vestalis</i>	a bumblebee	06-Jun-16
<i>Cantharis nigra</i>	a soldier beetle	05-Jul-16
<i>Cantharis nigricans</i>	a soldier beetle	23-Jun-16
<i>Capsus ater</i>	a true bug	05-Jul-16
<i>Cheilosia illustrata</i>	a hoverfly	23-Jun-16
<i>Cheilosia proxima</i>	a hoverfly	05-Jul-16
<i>Chloromyia formosa</i>	a soldierfly	23-Jun-16
<i>Chrysogaster solstitialis</i>	a hoverfly	23-Jun-16
<i>Chrysotus gramineus</i>	a dolyfly	05-Jul-16
<i>Cicindela campestris</i>	Green Tiger Beetle	06-Jun-16
<i>Closterotomus norwegicus</i>	a true bug	04-Jul-16
<i>Colletes daviesanus</i>	a mining bee	05-Jul-16
<i>Crossocerus elongatulus</i>	Slender Digger Wasp	05-Jul-16
<i>Crossocerus ovalis</i>	a digger wasp	05-Jul-16
<i>Dioctria baumhaueri</i>	a robberfly	04-Jul-16
<i>Dolichopus griseipennis</i>	a dolyfly	09-Aug-16
<i>Dolichopus longicornis</i>	a dolyfly	23-Jun-16
<i>Enallagma cyathigerum</i>	Common Blue Damselfly	23-Jun-16
<i>Entomognathus brevis</i>	a digger wasp	23-Jun-16
<i>Eristalinus sepulchralis</i>	a hoverfly	23-Jun-16
<i>Eristalis arbustorum</i>	a hoverfly	23-Jun-16
<i>Eristalis intricaria</i>	a hoverfly	23-Jun-16
<i>Eristalis pertinax</i>	a hoverfly	23-Jun-16
<i>Eristalis tenax</i>	a hoverfly	23-Jun-16
<i>Eupeodes corollae</i>	a hoverfly	06-Jun-16
<i>Eupeodes luniger</i>	a hoverfly	23-Jun-16
<i>Halictus rubicundus</i>	a mining bee	06-Jun-16
<i>Halictus tumulorum</i>	a mining bee	06-Jun-16

<i>Helophilus pendulus</i>	a hoverfly	23-Jun-16
<i>Helophilus pendulus</i>	a hoverfly	04-Jul-16
<i>Ischnura elegans</i>	Blue-tailed Damselfly	06-Jun-16
<i>Lasioglossum minutissimum</i>	Least Mining Bee	05-Jul-16
<i>Lasioglossum parvulum</i>	a mining bee	23-Jun-16
<i>Lasioglossum rufitarse</i>	a mining bee	05-Jun-16
<i>Lasioglossum villosulum</i>	Shaggy Mining Bee	23-Jun-16
<i>Leptopterna dolabrata</i>	a true bug	05-Jul-16
<i>Libellula depressa</i>	Broad-bodied Chaser	06-Jun-16
<i>Lindenius albilabris</i>	a digger wasp	05-Jul-16
<i>Lygus rugulipennis</i>	a true bug	23-Jun-16
<i>Maniola jurtina</i>	Meadow Brown	23-Jun-16
<i>Meligethes aeneus</i>	Common Pollen Beetle	23-Jun-16
<i>Myathropa florea</i>	a hoverfly	04-Jul-16
<i>Nephrotoma flavescens</i>	a crane fly	05-Jul-16
<i>Nephrotoma submaculosa</i>	a crane fly	23-Jun-16
<i>Notiophilus biguttatus</i>	a ground beetle	23-Jun-16
<i>Notiphila dorsata</i>	a shore fly	09-Aug-16
<i>Ochlodes sylvanus</i>	Large Skipper	04-Jul-16
<i>Oedemera lurida</i>	a flower beetle	22-Jun-16
<i>Oedemera nobilis</i>	Swollen-thighed Beetle	22-Jun-16
<i>Orthetrum cancellatum</i>	Black-tailed Skimmer	04-Jul-16
<i>Oxybelus uniglumis</i>	Common Spiny Digger Wasp	23-Jun-16
<i>Pipizella viduata</i>	a hoverfly	23-Jun-16
<i>Platycheirus albimanus</i>	a hoverfly	09-Sep-16
<i>Platycheirus manicatus</i>	a hoverfly	23-Jun-16
<i>Platycheirus rosarum</i>	a hoverfly	09-Aug-16
<i>Poecilus cupreus</i>	a ground beetle	23-Jun-16
<i>Polyommatus icarus</i>	Common Blue	06-Jun-16
<i>Rhagio tringarius</i>	a snipe fly	23-Jun-16
<i>Saldula orthochila</i>	a true bug	09-Sep-16
<i>Scellus notatus</i>	a dolyfly	06-Jun-16
<i>Sphaerophoria scripta</i>	a hoverfly	23-Jun-16
<i>Sphecodes Geoffrellus</i>	a cuckoo bee	05-Jun-16
<i>Sympetrum striolatum</i>	Common Darter	23-Jun-16
<i>Syntormon denticulatum</i>	a dolyfly	09-Aug-16
<i>Syrirta pipiens</i>	a hoverfly	23-Jun-16
<i>Tiphia femorata</i>	a solitary wasp	05-Jul-16
<i>Vanessa cardui</i>	Painted Lady	09-Aug-16
<i>Volucella pellucens</i>	a hoverfly	23-Jun-16

Appendix III

Landscape (including sample locations 1,2 and 3) ISIS output tables and species list

SAT code	SAT name	No. spp.	Condition	Percentage of national species pool	Related BAT rarity score
F001	scrub edge	6		3	
F002	rich flower resource	4		2	
A212	bark & sapwood decay	7		1	
F112	open short sward	1		1	120
F003	scrub-heath & moorland	1		0	
F111	bare sand & chalk	1		0	120

All SATs scoring more than zero are listed

The broad assemblage types represented in this list are as follows:

BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F2	grassland & scrub matrix	36	127		81	
F1	unshaded early successional mosaic	11	120		25	
W3	permanent wet mire	9	125		20	
A1	arboreal canopy	8	129		17	
F3	shaded field & ground layer	6			14	
A2	wood decay	5			12	1
W2	mineral marsh & open water	4			8	
W1	flowing water	2			5	

Rarity scores are shown only for BATS represented by more than 15 species in the assemblage / fauna being analysed

<b>Scientific name</b>	<b>Vernacular name</b>	<b>Specific location first recorded</b>	<b>Date first recorded</b>
<i>Aeshna grandis</i>	Brown Hawker	CalfHeathSample3	04-Aug-16
<i>Aglais io</i>	Peacock	CalfHeathSample2	05-Jun-16
<i>Altica lythri</i>	a leaf beetle	CalfHeathSample3	09-Sep-16
<i>Amara plebeja</i>	a ground beetle	CalfHeathSample3	05-Jun-16
<i>Andrena haemorrhoa</i>	Early Mining Bee	CalfHeathSample2	05-Jun-16
<i>Andrena minutula</i>	a mining bee	CalfHeathSample3	04-Jul-16
<i>Andrena nigroaenea</i>	a mining bee	CalfHeathSample2	05-Jun-16
<i>Andrena scotica</i>	a mining bee	CalfHeathSample2	05-Jun-16
<i>Andrena synadelpha</i>	a mining bee	CalfHeathSample2	05-Jun-16
<i>Andrena wilkella</i>	a mining bee	CalfHeathSample2	05-Jun-16
<i>Aphantopus hyperantus</i>	Ringlet	CalfHeathSample3	05-Jul-16
<i>Athous haemorrhoidalis</i>	a click beetle	CalfHeath_Sample1	05-Jun-16
<i>Beris chalybata</i>	a soldierfly	CalfHeath_Sample1	05-Jun-16
<i>Beris geniculata</i>	a soldierfly	CalfHeath_Sample1	04-Aug-16
<i>Bicellaria subpilosa</i>	a hybotid fly	CalfHeathSample2	05-Jun-16
<i>Bombus hortorum</i>	Small Garden Bumble Bee	CalfHeathSample3	05-Jun-16
	Large Red Tailed Bumble		
<i>Bombus lapidarius</i>	Bee	CalfHeathSample2	05-Jun-16
<i>Bombus pratorum</i>	Early Bumble Bee	CalfHeathSample3	05-Jul-16
<i>Bombus rupestris</i>	a cuckoo bumblebee	CalfHeathSample3	05-Jun-16
<i>Bombus vestalis</i>	a bumblebee	CalfHeath_Sample1	05-Jul-16
<i>Calopteryx splendens</i>	Banded Demoiselle	CalfHeath_Sample1	05-Jun-16
<i>Cantharis pallida</i>	a soldier beetle	CalfHeathSample3	05-Jun-16
<i>Cantharis rustica</i>	a soldier beetle	CalfHeathSample3	05-Jun-16
<i>Capsus ater</i>	a true bug	CalfHeathSample3	04-Jul-16
<i>Cercopis vulnerata</i>	a froghopper	CalfHeath_Sample1	05-Jun-16
<i>Ceutorhynchus obstrictus</i>	a weevil	CalfHeath_Sample1	04-Aug-16
<i>Chaetorellia jaceae</i>	a fruitfly	CalfHeathSample2	05-Jun-16
<i>Chalcosyrphus nemorum</i>	a hoverfly	CalfHeathSample3	05-Jun-16
<i>Cheilosia albitarsis sens. str.</i>	a hoverfly	CalfHeathSample3	05-Jun-16
<i>Cheilosia bergenstammi</i>	a hoverfly	CalfHeathSample3	05-Jun-16
<i>Cheilosia illustrata</i>	a hoverfly	CalfHeath_Sample1	04-Aug-16
<i>Cheilosia pagana</i>	a hoverfly	CalfHeath_Sample1	04-Aug-16
<i>Chorthippus albomarginatus</i>	Lesser Marsh Grasshopper	CalfHeath_Sample1	04-Aug-16
<i>Chorthippus parallelus</i>	Meadow Grasshopper	CalfHeathSample3	04-Aug-16
<i>Chrysogaster solstitialis</i>	a hoverfly	CalfHeath_Sample1	04-Aug-16

<i>Chrysopilus cristatus</i>	a snipefly	CalfHeathSample2	05-Jun-16
<i>Chrysotoxum bicinctum</i>	a hoverfly	CalfHeathSample3	04-Aug-16
<i>Chrysotus gramineus</i>	a dolyfly	CalfHeathSample3	05-Jul-16
<i>Closterotomus norwegicus</i>	a true bug	CalfHeath_Sample1	04-Aug-16
<i>Coccinella septempunctata</i>	7-spot Ladybird	CalfHeath_Sample1	05-Jul-16
<i>Conocephalus discolor</i>	Long-winged Conehead	CalfHeath_Sample1	04-Aug-16
<i>Coreus marginatus</i>	Dock Bug	CalfHeathSample3	05-Jul-16
<i>Crepidodera aurata</i>	a leaf beetle	CalfHeathSample3	05-Jun-16
<i>Cyllecoris histrionius</i>	a true bug	CalfHeath_Sample1	05-Jun-16
<i>Dalopius marginatus</i>	a click beetle	CalfHeath_Sample1	05-Jun-16
<i>Dioctria atricapilla</i>	a robberfly	CalfHeathSample2	05-Jun-16
<i>Dolichopus campestris</i>	a dolyfly	CalfHeath_Sample1	05-Jun-16
<i>Dolichopus latilimbatus</i>	a dolyfly	CalfHeathSample2	09-Sep-16
<i>Dolichopus pennatus</i>	a dolyfly	CalfHeathSample2	04-Jul-16
<i>Dolichopus planitarsis</i>	a dolyfly	CalfHeath_Sample1	05-Jun-16
<i>Dolichopus trivialis</i>	a dolyfly	CalfHeathSample3	05-Jul-16
<i>Dolichopus ungulatus</i>	a dolyfly	CalfHeath_Sample1	05-Jun-16
<i>Dolycoris baccarum</i>	Hairy Shieldbug	CalfHeathSample3	05-Jun-16
<i>Dorytomus taeniatus</i>	a weevil	CalfHeath_Sample1	05-Jun-16
<i>Ectemnius continuus</i>	a digger wasp	CalfHeath_Sample1	04-Aug-16
<i>Elasmucha grisea</i>	Parent Bug	CalfHeath_Sample1	04-Aug-16
<i>Empis livida</i>	a dancefly	CalfHeathSample2	04-Jul-16
<i>Empis tessellata</i>	a dancefly	CalfHeathSample2	05-Jun-16
<i>Empis trigramma</i>	a dancefly	CalfHeath_Sample1	05-Jun-16
<i>Episyrphus balteatus</i>	a hoverfly	CalfHeathSample2	05-Jun-16
<i>Eristalinus sepulchralis</i>	a hoverfly	CalfHeathSample2	05-Jun-16
<i>Eristalis arbustorum</i>	a hoverfly	CalfHeathSample3	04-Aug-16
<i>Eristalis horticola</i>	a hoverfly	CalfHeathSample3	04-Aug-16
<i>Eristalis interruptus</i>	a hoverfly	CalfHeathSample2	04-Jul-16
<i>Eristalis intricaria</i>	a hoverfly	CalfHeathSample2	05-Jun-16
<i>Eristalis pertinax</i>	a hoverfly	CalfHeath_Sample1	04-Aug-16
<i>Eristalis tenax</i>	a hoverfly	CalfHeathSample3	05-Jun-16
<i>Eupeodes corollae</i>	a hoverfly	CalfHeathSample3	05-Jul-16
<i>Eupeodes luniger</i>	a hoverfly	CalfHeathSample3	05-Jul-16
<i>Haematopota pluvialis</i>	a horsefly	CalfHeathSample3	05-Jul-16
<i>Helophilus hybridus</i>	a hoverfly	CalfHeathSample2	05-Jun-16
<i>Helophilus pendulus</i>	a hoverfly	CalfHeath_Sample1	05-Jun-16
<i>Hercostomus aerosus</i>	a dolyfly	CalfHeathSample2	09-Sep-16
<i>Hilara submaura</i>	a dancefly	CalfHeathSample3	05-Jul-16
<i>Hypera zoilus</i>	a weevil	CalfHeathSample3	04-Aug-16
<i>Ischnopterapion modestum</i>	a weevil	CalfHeath_Sample1	04-Aug-16
<i>Kibunea minuta</i>	a click beetle	CalfHeath_Sample1	05-Jun-16
<i>Lema cyanella</i>	a leaf beetle	CalfHeath_Sample1	04-Aug-16
<i>Leptogaster cylindrica</i>	a robberfly	CalfHeathSample2	05-Jun-16

<i>Leptopterna dolabrata</i>	a true bug	CalfHeath_Sample1	04-Aug-16
<i>Leucozona lucorum</i>	a hoverfly	CalfHeathSample2	05-Jun-16
<i>Limonia nubeculosa</i>	a cranefly	CalfHeath_Sample1	05-Jun-16
<i>Liocoris tripustulatus</i>	a true bug	CalfHeathSample3	04-Aug-16
<i>Lygus rugulipennis</i>	a true bug	CalfHeathSample3	04-Aug-16
<i>Malachius bipustulatus</i>	Malachite Beetle	CalfHeathSample2	05-Jun-16
<i>Maniola jurtina</i>	Meadow Brown	CalfHeath_Sample1	05-Jul-16
<i>Medetera impigra</i>	a dolyfly	CalfHeathSample2	04-Jul-16
<i>Melanostoma mellinum</i>	a hoverfly	CalfHeath_Sample1	04-Aug-16
<i>Melanostoma scalare</i>	a hoverfly	CalfHeath_Sample1	05-Jul-16
<i>Meligethes aeneus</i>	Common Pollen Beetle	CalfHeath_Sample1	04-Aug-16
<i>Merodon equestris</i>	a hoverfly	CalfHeathSample2	05-Jun-16
<i>Metrioptera roeselii</i>	Roesel's Bush Cricket	CalfHeath_Sample1	04-Aug-16
<i>Minettia inusta</i>	a fly	CalfHeath_Sample1	04-Aug-16
<i>Minettia longipennis</i>	a fly	CalfHeath_Sample1	05-Jun-16
<i>Minettia rivosa</i>	a fly	CalfHeath_Sample1	04-Aug-16
<i>Nabis flavomarginatus</i>	a true bug	CalfHeath_Sample1	04-Aug-16
<i>Neoascia podagrica</i>	a hoverfly	CalfHeathSample2	05-Jun-16
<i>Neoascia tenur</i>	a hoverfly	CalfHeathSample2	09-Sep-16
<i>Neocrepidodera transversa</i>	a leaf beetle	CalfHeathSample2	04-Jul-16
<i>Neoitamus cyanurus</i>	a robberfly	CalfHeath_Sample1	05-Jun-16
<i>Nephrotoma flavescens</i>	a cranefly	CalfHeath_Sample1	05-Jun-16
<i>Nephrotoma quadrifaria</i>	a cranefly	CalfHeath_Sample1	05-Jun-16
<i>Ochlodes sylvanus</i>	Large Skipper	CalfHeath_Sample1	05-Jul-16
<i>Ocydromia glabricula</i>	a hybotid fly	CalfHeath_Sample1	05-Jun-16
<i>Odezia atrata</i>	Chimney Sweeper	CalfHeathSample2	05-Jun-16
<i>Oedalea flavipes</i>	a hybotid fly	CalfHeath_Sample1	05-Jun-16
<i>Oedemera lurida</i>	a flower beetle	CalfHeathSample2	05-Jun-16
<i>Oedemera nobilis</i>	Swollen-thighed Beetle	CalfHeathSample2	05-Jun-16
	Common Green		
<i>Omocestus viridulus</i>	Grasshopper	CalfHeathSample2	09-Aug-16
<i>Oulema melanopus</i>	a leaf beetle	CalfHeathSample2	04-Jul-16
<i>Oxycera rara</i>	a soldierfly	CalfHeathSample2	04-Jul-16
<i>Palloptera modesta</i>	a fly	CalfHeath_Sample1	05-Jun-16
<i>Parydra coarctata</i>	a shorefly	CalfHeathSample3	05-Jun-16
<i>Pherbellia cinerella</i>	a snail-killing fly	CalfHeathSample3	05-Jun-16
<i>Pherbina coryleti</i>	a snail-killing fly	CalfHeathSample3	05-Jun-16
<i>Philonthus cruentatus</i>	a beetle	CalfHeath_Sample1	04-Aug-16
<i>Phyllopertha horticola</i>	Bracken Chafer	CalfHeath_Sample1	05-Jul-16
<i>Pieris brassicae</i>	Large White	CalfHeathSample2	09-Aug-16
<i>Pieris napi</i>	Green-veined White	CalfHeath_Sample1	05-Jun-16
<i>Pieris rapae</i>	Small White	CalfHeathSample3	05-Jun-16
<i>Pipizella viduata</i>	a hoverfly	CalfHeathSample2	05-Jun-16
<i>Plagiodera versicolora</i>	a leaf beetle	CalfHeathSample2	04-Aug-16



<i>Plagiognathus arbustorum</i>	a true bug	CalfHeath_Sample1	04-Aug-16
<i>Platycheirus albimanus</i>	a hoverfly	CalfHeath_Sample1	05-Jun-16
<i>Platycheirus clypeatus</i>	a hoverfly	CalfHeathSample3	09-Sep-16
<i>Platycheirus granditarsus</i>	a hoverfly	CalfHeathSample3	05-Jun-16
<i>Poecilus versicolor</i>	a ground beetle	CalfHeathSample3	09-Sep-16
<i>Polydrusus cervinus</i>	a weevil	CalfHeath_Sample1	05-Jun-16
<i>Polyommatus icarus</i>	Common Blue	CalfHeathSample2	05-Jun-16
<i>Propylea</i>			
<i>quattuordecimpunctata</i>	14-spot Ladybird	CalfHeathSample3	04-Aug-16
<i>Rhagio lineola</i>	a snipefly	CalfHeath_Sample1	04-Aug-16
<i>Rhagio scolopaceus</i>	a snipefly	CalfHeathSample2	05-Jun-16
<i>Rhagio tringarius</i>	a snipefly	CalfHeath_Sample1	05-Jun-16
<i>Rhagonycha fulva</i>	a soldier beetle	CalfHeathSample2	09-Aug-16
<i>Rhagonycha lignosa</i>	a soldier beetle	CalfHeath_Sample1	05-Jun-16
<i>Rhamphomyia albohirta</i>	a dancefly	CalfHeathSample3	04-Jul-16
<i>Rhamphomyia nigripennis</i>	a dancefly	CalfHeathSample2	04-Aug-16
<i>Rhopalus subrufus</i>	a true bug	CalfHeathSample3	09-Sep-16
<i>Rivellia syngenesiae</i>	a fruitfly	CalfHeath_Sample1	05-Jul-16
<i>Rutpela maculata</i>	a longhorn beetle	CalfHeath_Sample1	05-Jul-16
<i>Sapromyza sexpunctata</i>	a fly	CalfHeathSample2	04-Aug-16
<i>Sciapus platypterus</i>	a dolyfly	CalfHeath_Sample1	05-Jun-16
<i>Sicus ferrugineus</i>	a thick-headed fly	CalfHeath_Sample1	05-Jul-16
<i>Sitona lineatus</i>	a seed beetle	CalfHeath_Sample1	04-Aug-16
<i>Sitona lineatus</i>	a seed beetle	CalfHeathSample3	04-Aug-16
<i>Sphaerophoria interrupta</i>	a hoverfly	CalfHeathSample2	04-Jul-16
<i>Sphaerophoria scripta</i>	a hoverfly	CalfHeathSample3	05-Jul-16
<i>Stenodema calcarata</i>	a true bug	CalfHeath_Sample1	04-Aug-16
<i>Strophosoma melanogrammum</i>	Nut Leaf Weevil	CalfHeath_Sample1	04-Aug-16
<i>Syrirta pipiens</i>	a hoverfly	CalfHeathSample3	05-Jun-16
<i>Syrphus ribesii</i>	a hoverfly	CalfHeathSample2	04-Jul-16
<i>Syrphus torvus</i>	a hoverfly	CalfHeath_Sample1	05-Jun-16
<i>Systemus pallipes</i>	a dolyfly	CalfHeathSample2	09-Sep-16
<i>Tachyporus dispar</i>	a rove beetle	CalfHeath_Sample1	05-Jun-16
<i>Tachyporus hypnorum</i>	a beetle	CalfHeathSample3	05-Jun-16
<i>Tephritis leontodontis</i>	a fruitfly	CalfHeathSample3	05-Jun-16
<i>Tetanocera elata</i>	a snail-killing fly	CalfHeathSample3	05-Jul-16
<i>Tetanocera hyalipennis</i>	a snail-killing fly	CalfHeathSample2	04-Aug-16
<i>Tetrix subulata</i>	Slender Ground Hopper	CalfHeathSample3	09-Sep-16
<i>Tetrix undulata</i>	Common Ground Hopper	CalfHeathSample3	09-Sep-16
<i>Thereva nobilitata</i>	a stilettofly	CalfHeathSample3	05-Jun-16
<i>Thymelicus sylvestris</i>	Small Skipper	CalfHeath_Sample1	04-Aug-16
<i>Tipula fascipennis</i>	a snail-killing fly	CalfHeathSample2	05-Jun-16
<i>Tipula oleracea</i>	a crane fly	CalfHeath_Sample1	05-Jun-16
<i>Tyria jacobaeae</i>	Cinnabar	CalfHeath_Sample1	05-Jul-16

<i>Vanessa atalanta</i>	Red Admiral	CalfHeath_Sample1	04-Aug-16
<i>Vanessa cardui</i>	Painted Lady	CalfHeathSample3	09-Sep-16
<i>Vespa crabro</i>	The Hornet	CalfHeathSample3	05-Jun-16
<i>Vespula germanica</i>	German Wasp	CalfHeathSample3	04-Aug-16
<i>Volucella pellucens</i>	a hoverfly	CalfHeath_Sample1	05-Jul-16
<i>Xanthogramma pedissequum</i>	a hoverfly	CalfHeathSample2	05-Jun-16
<i>Zicrona caerulea</i>	Blue Shieldbug	CalfHeathSample3	04-Aug-16

Appendix IV

Calf Heath extension (including sample locations 4 and 5) ISIS output tables and species list

SAT code	SAT name	No. spp.	Condition	Percentage of national species pool	Related BAT rarity score
F002	rich flower resource	6		2	
F001	scrub edge	4		2	
A212	bark & sapwood decay	10		2	
W126	seepage	1		2	
W314	reedfen and pools	1		1	169
A211	heartwood decay	1		1	
F112	open short sward	1		1	
F003	scrub-heath & moorland	1		0	

All SATs scoring more than zero are listed

The broad assemblage types represented in this list are as follows:

BAT code	BAT name	Representation (1-100)	Rarity score	Condition	BAT species richness	IEC
F2	grassland & scrub matrix	41	120		91	
W3	permanent wet mire	12	169		27	
A1	arboreal canopy	9	114		21	
F1	unshaded early successional mosaic	7			15	
A2	wood decay	5			12	1
W2	mineral marsh & open water	5			10	
F3	shaded field & ground layer	4			9	
W1	flowing water	4			8	

Rarity scores are shown only for BATS represented by more than 15 species in the assemblage / fauna being analysed

Scientific name	Vernacular name	Date first
<i>Acronicta psi</i>	Grey Dagger	22-Jul-17
<i>Adalia decempunctata</i>	10-spot Ladybird	22-Jul-17
<i>Agriotes pallidulus</i>	a ground beetle	22-May-17
<i>Anania hortulata</i>	Small Magpie	17-Jun-17
<i>Anaspis frontalis</i>	a beetle	17-Jun-17
<i>Anaspis maculata</i>	a beetle	22-May-17
<i>Andrena bicolor</i>	Gwynne's Mining Bee	17-Jun-17
<i>Andrena cineraria</i>	Grey Mining Bee	17-Jun-17
<i>Andrena haemorrhoa</i>	Early Mining Bee	17-Jun-17
<i>Andrena minutula</i>	a mining bee	22-Jul-17
<i>Anobium punctatum</i>	Woodworm	22-Jul-17
<i>Anthrenus fuscus</i>	a beetle	17-Jun-17
<i>Aphantopus hyperantus</i>	Ringlet	17-Jun-17
<i>Argyra leucocephala</i>	a dolyfly	22-Jul-17
<i>Athous haemorrhoidalis</i>	a click beetle	22-May-17
<i>Beris vallata</i>	a soldierfly	17-Jun-17
<i>Bombus lapidarius</i>	Large Red Tailed Bumble	17-Jun-17
<i>Bruchus rufimanus</i>	Bean Beetle	22-May-17
<i>Byturus ochraceus</i>	a beetle	22-May-17
<i>Byturus tomentosus</i>	Raspberry Beetle	22-May-17
<i>Calvia quattuordecimguttata</i>	Cream-spot Ladybird	22-May-17
<i>Cantharis cryptica</i>	a soldier beetle	22-May-17
<i>Cantharis decipiens</i>	a soldier beetle	22-May-17
<i>Cantharis nigra</i>	a soldier beetle	17-Jun-17
<i>Cantharis nigricans</i>	a soldier beetle	22-May-17
<i>Capsus ater</i>	a true bug	17-Jun-17
<i>Chalcosyrphus nemorum</i>	a hoverfly	22-Jul-17
<i>Cheilosia albitarsis sens. str.</i>	a hoverfly	22-May-17
<i>Cheilosia longula</i>	a hoverfly	17-Jun-17
<i>Cheilosia proxima</i>	a hoverfly	22-Jul-17
<i>Chloromyia formosa</i>	a soldierfly	17-Jun-17
<i>Chorisops tibialis</i>	a soldierfly	22-Jul-17
<i>Chorthippus parallelus</i>	Meadow Grasshopper	22-Jul-17
<i>Chrysogaster solstitialis</i>	a hoverfly	17-Jun-17
<i>Chrysoperla carnea sens. str.</i>	a lacewing	17-Jun-17
<i>Chrysotoxum festivum</i>	a hoverfly	22-Jul-17
<i>Chrysotus blepharosceles</i>	a dolyfly	22-Jul-17
<i>Chrysotus gramineus</i>	a dolyfly	22-Jul-17
<i>Closterotomus norwegicus</i>	a true bug	17-Jun-17
<i>Coccidula rufa</i>	a beetle	22-May-17
<i>Coenia palustris</i>	a shorefly	17-Jun-17
<i>Conocephalus discolor</i>	Long-winged Conehead	22-Jul-17
<i>Crepidodera aurata</i>	a leaf beetle	22-Jul-17

<i>Curculio glandium</i>	Acorn Weevil	22-May-17
<i>Cyphon ochraceus</i>	a beetle	17-Jun-17
<i>Deraeocoris flavilinea</i>	a true bug	17-Jun-17
<i>Dicranomyia chorea</i>	a crane fly	22-May-17
<i>Dicranomyia fusca</i>	a crane fly	22-May-17
<i>Dioctria atricapilla</i>	a robber fly	17-Jun-17
<i>Dioctria baumhaueri</i>	a robber fly	17-Jun-17
<i>Dioctria rufipes</i>	a robber fly	17-Jun-17
<i>Dolichopus griseipennis</i>	a doly fly	22-Jul-17
<i>Dolichopus plumipes</i>	a doly fly	22-May-17
<i>Dolichopus popularis</i>	a doly fly	17-Jun-17
<i>Dolichopus unguatus</i>	a doly fly	17-Jun-17
<i>Dolichopus wahlbergi</i>	a doly fly	22-Jul-17
<i>Dryophilocoris</i>	a true bug	22-May-17
<i>Empis digramma</i>	a dance fly	22-May-17
<i>Empis grisea</i>	a dance fly	17-Jun-17
<i>Empis livida</i>	a dance fly	17-Jun-17
<i>Empis tumida</i>	a dance fly	22-May-17
<i>Eristalinus sepulchralis</i>	a hover fly	22-Jul-17
<i>Eristalis arbustorum</i>	a hover fly	22-Jul-17
<i>Eristalis pertinax</i>	a hover fly	22-Jul-17
<i>Eristalis tenax</i>	a hover fly	17-Jun-17
<i>Eupeodes luniger</i>	a hover fly	22-Jul-17
<i>Eurygaster testudinaria</i>	Tortoise Shieldbug	22-Jul-17
<i>Forficula auricularia</i>	Common Earwig	22-Jul-17
<i>Grypocoris stysi</i>	a true bug	17-Jun-17
<i>Gymnopternus metallicus</i>	a doly fly	22-May-17
<i>Haematopota pluvialis</i>	a horse fly	17-Jun-17
<i>Harmonia axyridis</i>	Harlequin Ladybird	17-Jun-17
<i>Harpocera thoracica</i>	a true bug	22-May-17
<i>Helophilus pendulus</i>	a hover fly	22-Jul-17
<i>Hemerobius humulinus</i>	a lacewing	17-Jun-17
<i>Hilara discoidalis</i>	a dance fly	22-May-17
<i>Hydroporus memnonius</i>	a water beetle	22-May-17
<i>Hylaeus communis</i>	Common Yellow Face Bee	17-Jun-17
<i>lassus lanio</i>	a true bug	22-Jul-17
<i>Ischnoptera pium virens</i>	a weevil	22-Jul-17
<i>Lasioglossum albipes</i>	a mining bee	22-Jul-17
<i>Lasioglossum villosulum</i>	Shaggy Mining Bee	22-May-17
<i>Leptogaster cylindrica</i>	a robber fly	17-Jun-17
<i>Leptopterna dolabrata</i>	a true bug	22-Jul-17
<i>Leptura quadrifasciata</i>	a longhorn beetle	17-Jun-17
<i>Leucozona lucorum</i>	a hover fly	17-Jun-17
<i>Liocoris tripustulatus</i>	a true bug	22-May-17

<i>Lonchoptera bifurcata</i>	a pointed-winged fly	22-Jul-17
<i>Lycaena phlaeas</i>	Small Copper	22-Jul-17
<i>Lygocoris pabulinus</i>	a true bug	17-Jun-17
<i>Machimus atricapillus</i>	a robberfly	22-Jul-17
<i>Maniola jurtina</i>	Meadow Brown	17-Jun-17
<i>Meconema thalassinum</i>	Oak Bush Cricket	22-Jul-17
<i>Melanostoma mellinum</i>	a hoverfly	22-Jul-17
<i>Melanostoma scalare</i>	a hoverfly	22-Jul-17
<i>Meligethes aeneus</i>	Common Pollen Beetle	22-Jul-17
<i>Meligethes nigrescens</i>	a pollen beetle	22-May-17
<i>Merodon equestris</i>	a hoverfly	17-Jun-17
<i>Metrioptera roeselii</i>	Roesel's Bush Cricket	22-Jul-17
<i>Microcara testacea</i>	a beetle	22-May-17
<i>Microchrysa flavicornis</i>	a soldierfly	17-Jun-17
<i>Microchrysa polita</i>	a soldierfly	22-Jul-17
<i>Nabis flavomarginatus</i>	a true bug	22-Jul-17
<i>Nedyus quadrimaculatus</i>	Small Nettle Weevil	22-May-17
<i>Neoitamus cyanurus</i>	a robberfly	17-Jun-17
<i>Neolygus contaminatus</i>	a true bug	17-Jun-17
<i>Nephrotoma quadrifaria</i>	a crane fly	17-Jun-17
<i>Neria cibaria</i>	a stilt-legged fly	22-May-17
<i>Neria femoralis</i>	a stilt-legged fly	17-Jun-17
<i>Notostira elongata</i>	a true bug	22-Jul-17
<i>Ochlerotatus annulipes</i>	a mosquito	22-Jul-17
<i>Ochlodes sylvanus</i>	Large Skipper	17-Jun-17
<i>Ocydromia glabricula</i>	a dancefly	22-May-17
<i>Oedemera lurida</i>	a beetle	22-Jul-17
<i>Oedemera nobilis</i>	Swollen-thighed Beetle	17-Jun-17
<i>Omocestus viridulus</i>	Common Green	17-Jun-17
<i>Oplodontha viridula</i>	a soldierfly	17-Jun-17
<i>Opomyza florum</i>	a seedfly	22-Jul-17
<i>Oulema melanopus sens. str.</i>	a leaf beetle	17-Jun-17
<i>Oxystoma pomonae</i>	a weevil	22-Jul-17
<i>Pachygaster atra</i>	a soldierfly	22-Jul-17
<i>Pararge aegeria</i>	Speckled Wood	17-Jun-17
<i>Parhelophilus versicolor</i>	a hoverfly	17-Jun-17
<i>Parydra coarctata</i>	a shorefly	22-May-17
<i>Pentatoma rufipes</i>	Red-legged Shieldbug	22-Jul-17
<i>Philonthus carbonarius</i>	a rove beetle	17-Jun-17
<i>Philophylla caesio</i>	a fruitfly	17-Jun-17
<i>Phylidorea fulvonervosa</i>	a crane fly	17-Jun-17
<i>Phyllobius glaucus</i>	a weevil	22-May-17
<i>Phyllobius maculicornis</i>	Green Leaf Weevil	22-May-17
<i>Phyllobius pyri</i>	Common Leaf Weevil	17-Jun-17

<i>Phyllobius virideaeris</i>	Green Nettle Weevil	17-Jun-17
<i>Phyllopertha horticola</i>	Bracken Chafer	17-Jun-17
<i>Pieris brassicae</i>	Large White	22-Jul-17
<i>Pieris napi</i>	Green-veined White	17-Jun-17
<i>Pieris rapae</i>	Small White	22-Jul-17
<i>Platycheirus angustatus</i>	a hoverfly	22-Jul-17
<i>Platycheirus clypeatus</i>	a hoverfly	22-Jul-17
<i>Platycheirus peltatus</i>	a hoverfly	22-Jul-17
<i>Platycheirus rosarum</i>	a hoverfly	22-Jul-17
<i>Polyommatus icarus</i>	Common Blue	22-Jul-17
<i>Ptilinus pectinicornis</i>	Fan-bearing Wood-borer	22-Jul-17
<i>Pyronia tithonus</i>	Gatekeeper	22-Jul-17
<i>Rhabdomiris striatellus</i>	a true bug	22-May-17
<i>Rhagio lineola</i>	a snipefly	17-Jun-17
<i>Rhagio scolopaceus</i>	a snipefly	17-Jun-17
<i>Rhagio tringarius</i>	a snipefly	17-Jun-17
<i>Rhagonycha fulva</i>	a soldier beetle	22-Jul-17
<i>Rhagonycha limbata</i>	a soldier beetle	22-May-17
<i>Rhamphomyia longipes</i>	a dancefly	22-May-17
<i>Rhamphomyia micropyga</i>	a dancefly	22-May-17
<i>Rhaphium albomaculatum</i>	a dolyfly	22-May-17
<i>Rhaphium appendiculatum</i>	a dolyfly	22-May-17
<i>Rhaphium lanceolatum</i>	a dolyfly	17-Jun-17
<i>Rhipidia maculata</i>	a crane fly	17-Jun-17
<i>Rutpela maculata</i>	a longhorn beetle	17-Jun-17
<i>Sphaerophoria interrupta</i>	a hoverfly	22-Jul-17
<i>Sphaerophoria scripta</i>	a hoverfly	17-Jun-17
<i>Stenodema calcarata</i>	a true bug	22-May-17
<i>Stenodema laevigata</i>	a true bug	17-Jun-17
<i>Stenus bifoveolatus</i>	a rove beetle	22-May-17
<i>Stenus cicindeloides</i>	a rove beetle	22-May-17
<i>Stigmus solskyi</i>	a digger wasp	17-Jun-17
<i>Syritta pipiens</i>	a hoverfly	17-Jun-17
<i>Syrphus ribesii</i>	a hoverfly	22-Jul-17
<i>Tachyporus solutus</i>	a rove beetle	22-May-17
<i>Tatianaerhynchites aequatus</i>	Apple Fruit Rhynchites	17-Jun-17
<i>Tetanocera elata</i>	a snail-killing fly	22-Jul-17
<i>Thrypticus pollinosus</i>	a dolyfly	22-Jul-17
<i>Thymelicus lineola</i>	Essex Skipper	22-Jul-17
<i>Thymelicus sylvestris</i>	Small Skipper	22-Jul-17
<i>Tipula oleracea</i>	a crane fly	22-Jul-17
<i>Tortrix viridana</i>	Green Oak Tortrix	17-Jun-17
<i>Tricholauxania praeusta</i>	a fly	22-May-17
<i>Tyria jacobaeae</i>	Cinnabar	22-Jul-17

<i>Vespula germanica</i>	German Wasp	22-Jul-17
<i>Vespula vulgaris</i>	Common Wasp	17-Jun-17
<i>Volucella pellucens</i>	a hoverfly	17-Jun-17
<i>Xanthostigma xanthostigma</i>	a snakefly	22-May-17



## Appendix V: ISIS explanation

**ISIS (Invertebrate Species–habitat Information System)** is a computer application that can be used to identify assemblages of importance when species lists are inputted into the computer software. This is particularly useful for identifying key areas of interest and importance and monitoring site changes as management alters habitat structure and species composition.

ISIS was developed by Natural England as a way of assessing sites for their invertebrate value. Although initially developed for assessing the condition of Sites of Special Scientific Interest (SSSI), it has been adopted for a wider use in habitat assessments. As it uses values (numbers) to score sites or features on a site, the computer application is very useful for providing baseline scores to sites and therefore a means of comparing a site either ‘intra’spectively (comparing an individual site against itself, normally how it changes with time or after management regime changes) or ‘inter’spectively (comparing one site against another or a suite of similar sites).

ISIS provides scores for two types of ‘assemblage’ (an assemblage is a group of invertebrates that use a similar habitat or feature):

- Broad assemblage type (BAT) – often a landscape-scale habitat type that is affected by various environmental factors such as light/shade, hydrology and disturbance factors such as poaching, drainage, drought and water level fluctuation. This is a useful assemblage type, as it provides an overview of habitat quality and, by using it to monitor sites, can help highlight issues that may affect them over time such as over- and under-grazing, drainage and poaching.
- Specific assemblage type (SAT) – characterised by stenotopic species (those that can only withstand a narrow range of environmental conditions). SATs are therefore more tightly defined than BATs and sit within a parent BAT. More than one SAT can sit within a parent BAT.

Example:

BAT:

F2 – grassland and scrub matrix

SAT:

F211 – herb-rich dense sward

F212 – dense scrub

Invertebrate species that are associated with a specific assemblage are known as ‘fidelity species’ and these are the species that score highly and elevate an assemblage’s status in the ISIS analysis. The highest fidelity species tend to be those associated with SATs, as these are the most scarce and

restricted assemblage types and, by association, the species using them tend to also be scarce and restricted in distribution.

The site quality score (SQS), also known as the ‘rarity score’, is a total score of all the species recorded at the site. Each national designation (Red Data Book, Nationally Scarce through to common species) receives a different level of score. The system is not reliant on exhaustive sampling of a site but is more useful for singular surveys or a limited range of closely related surveys.

Fowles *et al* (1999<sup>1</sup>) scoring for SQS is:

- 32 – RDB 1
- 32 – RDB 2
- 24 – RDB 3
- 16 – RDB ‘K’
- 16 – NS A
- 8 – NS B
- 4 – Regional NS/very local
- 2 – Local
- 1 – Common

These scores can be used as a baseline for the monitoring of sites post-mitigation if required. The higher the score, the ‘better’ the site.

Key to BAT and SAT output table	
BAT code	Invertebrate habitat code
BAT name	Invertebrate habitat name
Representation	% of species recorded associated with that BAT
Rarity score	Site quality score (SQS) – the combined score of all species recorded for that BAT  BATs with no score are those that are below a threshold of 15 species present for that BAT

<sup>1</sup> Fowles, A.P., Alexander, K.N.A. and Key, R.R. (1999). The Saproxylic Quality Index: evaluating wooded habitats for conservation of deadwood Coleoptera. *The Coleopterist* 8:121-141.

Condition	Used in SSSI condition assessment – not relevant
BAT species richness	Total number of species recorded associated with BAT
Index of ecological continuity (IEC)	Used for deadwood sites such as parklands

BAT code	BAT name	Representation (1–100)	Rarity score	Condition	BAT species richness	IEC
F2	grassland & scrub matrix	42	136		56	
W3	permanent wet mire	18	167		24	
F1	unshaded early successional mosaic	10			13	
A1	arboreal canopy	7			9	
W2	mineral marsh & open water	3			4	
F3	shaded field & ground layer	2			2	
A2	wood decay	1			1	0

Example BAT ISIS results (ISIS, 2010)

Appendix VI: *Criteria for defining invertebrate sites of significance. Taken from Plant (2009)*

<b>Importance</b>	<b>Description</b>	<b>Minimum qualifying criteria</b>
International (high) importance	European important site (i.e. SAC)	Internationally important invertebrate populations present or containing RDB 1 (Endangered) species or containing any species protected under European legislation or containing habitats that are threatened or rare at the European level (including, but not exclusively so, habitats listed on the EU Habitats Directive).
National (high) importance	UK important site (SSSI)	Achieving SSSI invertebrate criteria (NCC, 1989) or containing RDB 2 (Vulnerable) or containing viable populations of RDB 3 (Rare) species or containing viable populations of any species protected under UK legislation or containing habitats that are threatened or rare nationally (Great Britain).
Regional (medium) importance (for border sites, both regions must be taken into account)	Site with populations of invertebrates or invertebrate habitats considered scarce or rare or threatened in south-east England	Habitat that is scarce or threatened in the region or that has, or is reasonably expected to have, the presence of an assemblage of invertebrates including at least 10 Nationally Notable species or at least 10 species listed as Regionally Notable for the English Nature region in question in the Recorder database or elsewhere or a combination of these categories amounting to 10 species in total.
County (medium) importance (for border sites, both counties must be taken into account)	Site with populations of invertebrates or invertebrate habitats considered scarce or rare or threatened in the county in question	Habitat that is scarce or threatened in the county and/or that contains, or is reasonably expected to contain, an assemblage of invertebrates that includes viable populations of at least five Nationally Notable species or viable populations of at least five species regarded as Regionally Scarce by the county records centres and/or field club.
District (low) importance	Site with populations of invertebrates or invertebrate habitats considered scarce or rare or threatened in the administrative district	A rather vague definition of habitats falling below county significance level, but which may be of greater significance than merely Local. They include sites for which Nationally Notable species in the range from one to four examples are reasonably expected but not yet necessarily recorded and where this omission is considered likely to be partly due to under-recording.
Local (low) importance	Site with populations of invertebrates or invertebrate habitats considered scarce or rare or threatened in the affected and neighbouring parishes	Habitats or species unique or of some other significance within the local area.

	(except Scotland, where the local area may best be defined as being within a radius of 5 km)	
Importance within the context of the site only (low importance)	—	Although almost no area is completely without significance, these are the areas with nothing more than expected 'background' populations of common species and the occasional Nationally Local species.

**Annex 10.1.6**

Bat Roost Assessment for Structures

## **ANNEX 10.1.6 A BAT ROOST ASSESSMENT FOR STRUCTURES**

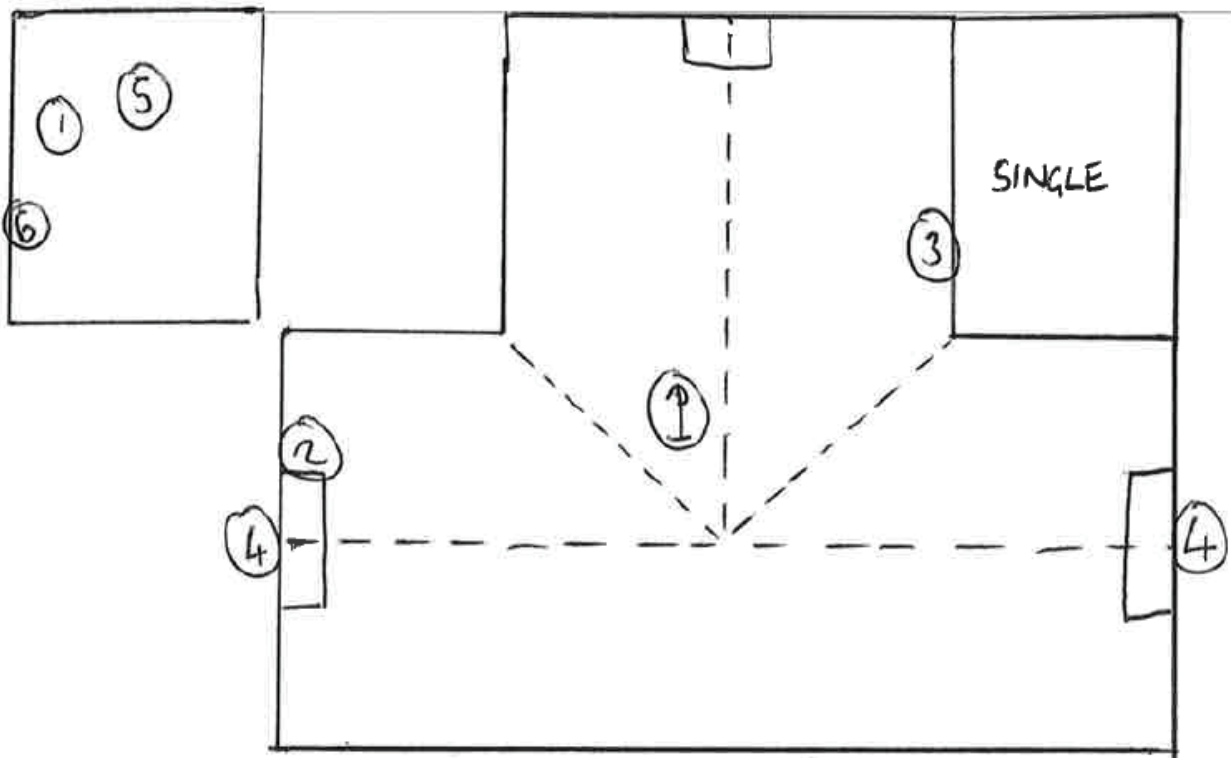
<b>Structure Reference:</b>	Woodside Farmhouse
<b>Structure Location</b>	SJ 92402 09099 – Vicarage Road
<b>Approximate Structure Age:</b>	1900
<b>Current Structure Use:</b>	Residential Care Home
<p><b>Construction materials:</b></p> <p>The dwelling is arranged over three storeys and is of red brick construction with a pitched clay tiled roof. There are no soffits or fascias, the roof overhangs brickwork which extends up to the roof, the gap is mortar filled. The building mortar is in generally good condition with a few localised areas of deterioration. There are two chimneys present, one over each gable end, both with lead flashing present. A single storey extension is present to the rear of the property.</p> <p>Two bay windows are present on the front (west elevation) of the property, these have slate roof with lead flashing to brickwork.</p> <p>A small single storey outbuilding is present to the rear mirroring the construction of the main dwelling.</p> <p>The roof space has been converted but is not currently resided in. There is a plasterboard ceiling with a small (70-80cm) void above up to the apex. The roof is timber 'A' frame with timber battening supporting the clay tiled roof. The void above the hallway on the 2<sup>nd</sup> floor has a larger void (circa 1m high) which was accessed via an area of damage to the ceiling. The area was full of cobwebs.</p> <p>Floodlights were noted as present to the rear elevations and two further exterior lights (not motion sensitive) to the front (west) elevation.</p> <p>The building was in generally sound condition.</p>	
<p><b>Potential access points and assessment of roost suitability:</b></p> <ol style="list-style-type: none"> <li>1) Minor slipped tile.</li> <li>2) Very small gap under lead flashing.</li> <li>3) Damage/gaps in brickwork noted.</li> <li>4) Security Lights.</li> <li>5) Gap to ridge tile.</li> <li>6) Potential access gap between brickwork and roof.</li> </ol>	



The building is next to arable fields and a large mixed woodland block within 150m (to the north west).

**Potential to support roosting bats: MODERATE**

**Drawing:**



**Front (west) elevation**



**Front (west) elevation**

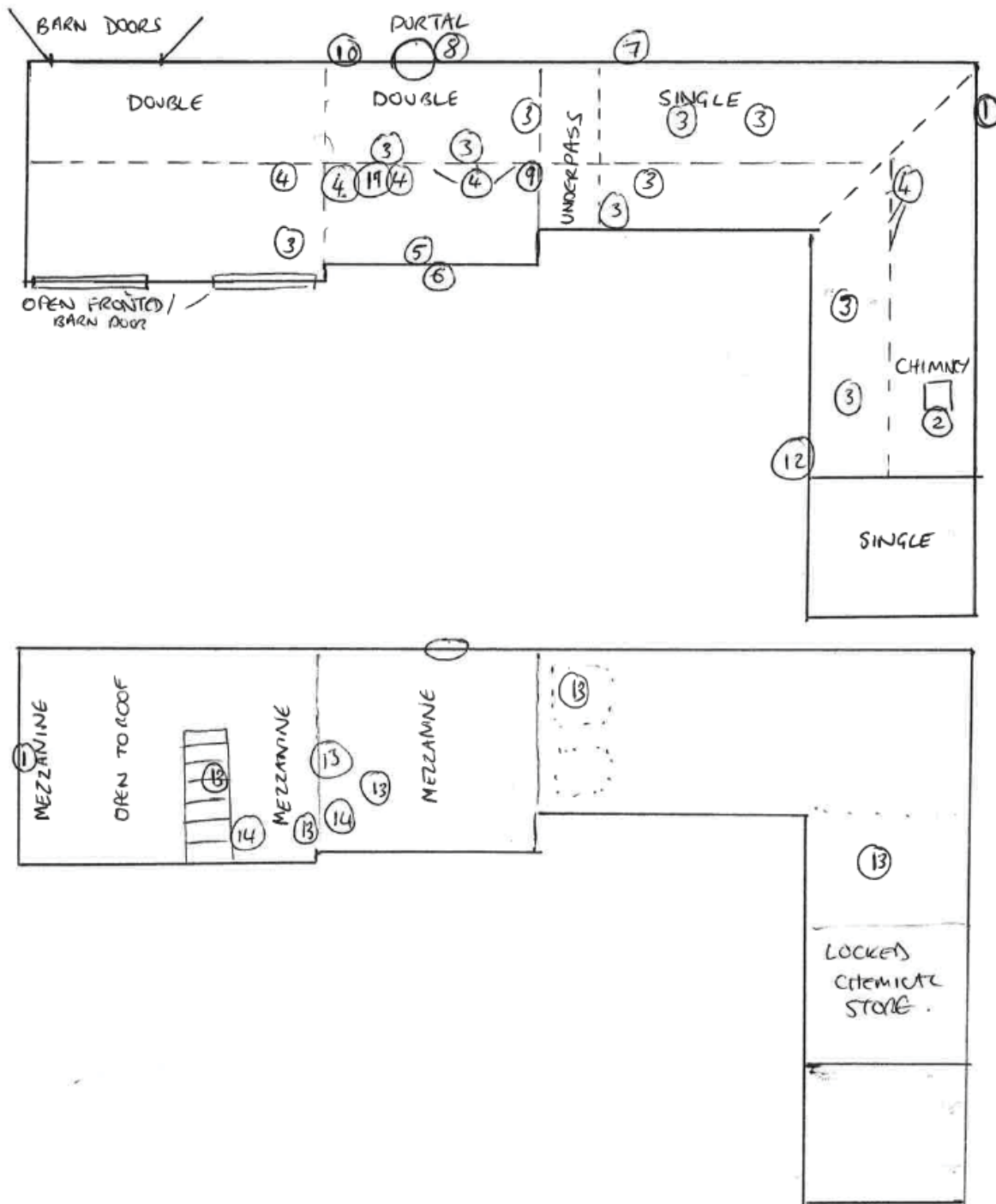
## **ANNEX 10.1.6 B BAT ROOST ASSESSMENT FOR STRUCTURES**

<b>Structure Reference:</b>	Woodside Barn
<b>Structure Location</b>	SJ 92378 09121 – Vicarage Road
<b>Approximate Structure Age:</b>	1880
<b>Current Structure Use:</b>	Barn for storage and workshop
<b>Construction materials:</b>	
<p>The main barn is of red brick construction with a pitched slate and clay tiled roof with clay ridge tiles. The building comprises single and double storey elements. There are no soffits or fascias. Two mezzanine areas are present within the barn. The barn is timber framed (all exposed). The building has large timber barn doors (open at time of survey) and a large brick portal on the north elevation and some glazed windows, most of which are smashed. Building mortar is in generally poor deteriorated condition.</p> <p>Brick and block lean-to with corrugated metal flat roof adjoining. There are several further barns which are of open construction with a mixture of timber and metal frames with single skin corrugated roofs. These barns are open fronted.</p>	
<b>Potential access points and assessment of roost suitability:</b>	
<ol style="list-style-type: none"> <li>1) Semi-mature ivy to wall.</li> <li>2) Gaps in mortar to redundant chimney.</li> <li>3) Lifted/missing/slipped tiles.</li> <li>4) Open access to building via barn doors, portal and smashed windows.</li> <li>5) Gaps under ridge tiles.</li> <li>6) Gaps between exposed timber support beams (to open fronted section) and brickwork.</li> <li>7) Timber doors in poor condition with openings.</li> <li>8) Large portal (circa 1.5m diameter) to mezzanine.</li> <li>9) 'Gappy' tiles suggesting gable end movement.</li> <li>10) 3 x holes through brickwork – circa 6cm in diameter.</li> <li>11) Hole in roof, series of adjacent slipped/missing tiles.</li> <li>12) Gap between door frame and brickwork.</li> <li>13) Bat droppings</li> <li>14) Feeding remains – butterfly wings.</li> </ol> <p>The interior of the buildings provides ample roost potential for free hanging and crevice dwelling bats on exposed timbers, in timber joints and in gaps and cracks in the brickwork. These features are too numerous to depict. The</p>	

building is next to arable fields and a large mixed woodland block.

**Potential to support roosting bats on the basis of inspection: HIGH - Roost confirmed**

**Drawing:**





**Rear (north) elevation with portal and barn doors**



**Front (south) elevation with open fronted areas.**



**Rear east single storey elevation.**



**Front west elevation – chemical store.**



**West and north elevations.**

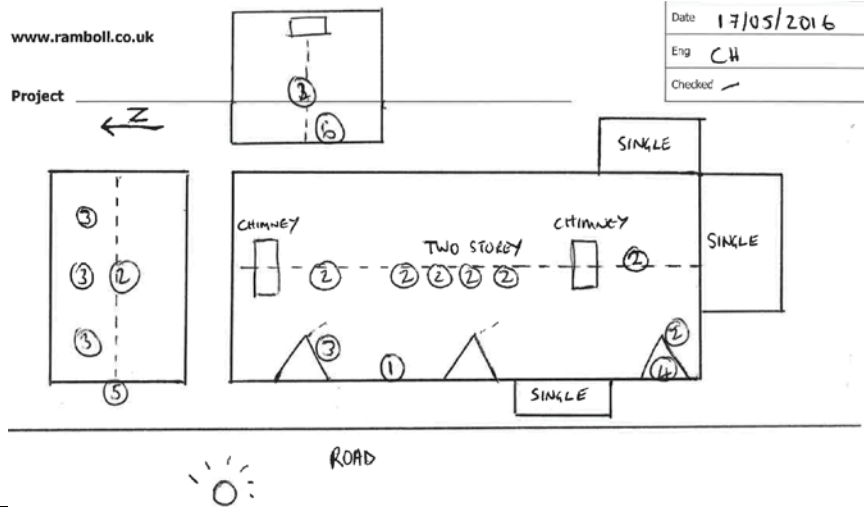


**Barn roof structure**

## ANNEX 10.1.6 C BAT ROOST ASSESSMENT FOR STRUCTURES

<b>Structure Reference:</b>	Fir Tree Cottage
<b>Structure Location:</b>	SJ 91296 08600 – Stafford Road
<b>Approximate Structure Age:</b>	1900
<b>Current Structure Use:</b>	Residential Dwelling and associated outbuildings.
<b>Construction materials:</b>	
<p>The main two storey residential dwelling is of red brick construction with a pitched clay tiled roof with clay ridge tiles. There is a single storey extension of similar construction on the southern aspect. There are wooden fascias and soffits to the (3x) dormer windows to the western elevation. Timber lintels are present to the first floor windows. Brick chimneys are present at either end of the building. A single storey timber and glazed porch with a flat bitumen roof is present on the west elevation. Lead flashing to chimney and dormer windows in good condition.</p> <p>Two outbuildings of similar construction are present. Both have pitched roofs. No fascias or soffits. The outbuilding to the rear has a redundant chimney. Further single skin corrugated metal sheds and wooden sheds are present on the property.</p>	
<b>Potential access points and assessment of roost suitability:</b>	
<ol style="list-style-type: none"> <li>1) Direct access under tiles where brickwork meets roof. No soffit. True of all parts of the two storey building. House sparrow recorded accessing.</li> <li>2) Gap present under ridge tile.</li> <li>3) Raised/missing tile.</li> <li>4) Gap in mortar above timber lintel.</li> <li>5) Circular air bricks.</li> <li>6) Edge tiles missing – evidence of birds nesting.</li> </ol> <p>Next to busy well-lit dual carriageway with streetlight outside front of property illuminating whole aspect. Roof void present, loft hatch too small to safely access.</p>	
<b>Potential to support roosting bats: MODERATE</b>	

**Drawing:**



**Front (west) elevation with 3\* dormer windows**



**Rear (east) elevation and outbuildings.**



**Outbuilding west elevation to road. Circular airbricks.**



**Outbuilding to rear of property. Slipped tiles and gap to ridge tiles. Redundant chimney.**



**Dormer window to west elevation. Gap above timber lintel.**



**Single storey extension to east elevation.**

## **ANNEX 10.1.6 D BAT ROOST ASSESSMENT FOR STRUCTURES**

<b>Structure Reference:</b>	Gailey Magazine
<b>Structure Location</b>	SJ 92008 09818
<b>Approximate Structure Age:</b>	1900 - 1980
<b>Current Structure Use:</b>	Secure Store
<b>Construction materials:</b>	
<p>Gailey Magazine includes three buildings located in the centre of the Site.</p> <p>Building 1 (See Pictures) is a single storey store of brick construction with a (half) pitched slate tiled roof. A timber fascia is present to the rear (west) elevation.</p> <p>Building 2 is another single storey store of brick construction with a flat concrete and bitumen roof. The building was noted to be in sound condition.</p> <p>Building 3 is of brick construction with a pitched tile roof. The building is surrounded by a bund and is significantly overgrown. The building is in an advanced state of decay.</p> <p>No access was gained internally as the buildings have been deemed to be unsafe.</p>	
<b>Potential access points and assessment of roost suitability:</b>	
<p>Building 1:</p> <ol style="list-style-type: none"> <li>1) Missing / slipped tiles;</li> <li>2) Missing ridge tiles to half of roof;</li> <li>3) Gap above timber frame of door;</li> <li>4) Wooden fascia to west elevation is in a deteriorated condition offering a void between the timber and the brickwork.</li> </ol> <p>Building 2:</p> <ol style="list-style-type: none"> <li>1) None noted – sound and well maintained.</li> </ol> <p>Building 3:</p> <ol style="list-style-type: none"> <li>1) Missing / slipped tiles;</li> <li>2) Hole in roof exposing decaying timber roof beams;</li> <li>3) No roof to 'porch';</li> <li>4) Door to front of building open;</li> <li>5) Mortar and brickwork in deteriorated condition.</li> </ol>	



The buildings are next to arable fields and proximal to (within 80m) a canal. The buildings are approximately 100m from the edge of Calf Heath Wood.

**Potential to support roosting bats on the basis of inspection:**

Building 1: **MODERATE**

Building 2: **NEGLIGIBLE**

Building 3: **MODERATE**



**Building 1 (left) and Building 2 (right)**



**Building 3**



**Building 1 – Timber Fascia**



**Building 3**

**ANNEX 10.1.6 E BAT ROOST ASSESSMENT FOR STRUCTURES**

<b>Structure Reference:</b>	The Barn – Gravelly Way
<b>Structure Location</b>	SJ 91630 09659 – Gravelly Way
<b>Approximate Structure Age:</b>	1900 – Refurbished 2008 approximately.
<b>Current Structure Use:</b>	Residential property.
<b>Construction materials:</b>	
<p>The dwelling is arranged over two storeys and is of red brick construction with a pitched clay tiled roof. There are no soffits or fascias, brickwork extends up to the roof with gaps being infilled with mortar. There is no roof void, this is part of the living space, 'Velux' windows are present to the roof. The building was in generally sound condition having been recently renovated.</p>	
<b>Potential access points and assessment of roost suitability:</b>	
<p>1) Small gaps around Velux windows</p> <p>The building is next to arable fields and proximal to (within 10m) a canal.</p>	
<b>Potential to support roosting bats: LOW</b>	
<b>Drawing:</b>	



**Front (west) and side (north) elevations**

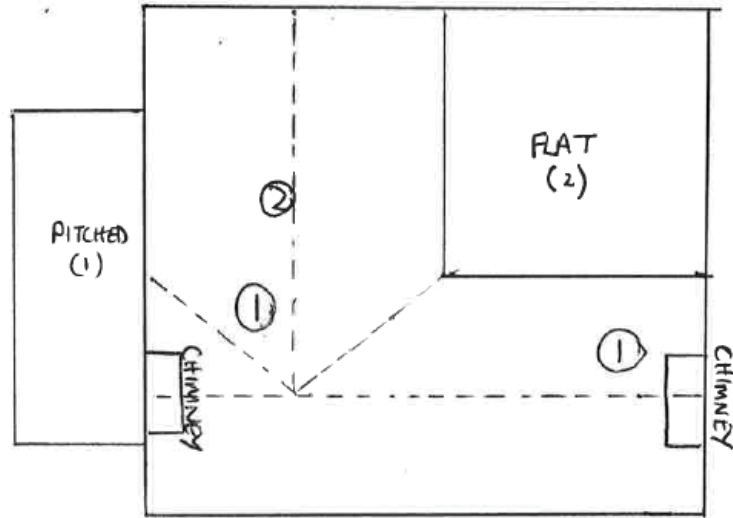


**Rear (east) and side (south) elevations**

**ANNEX 10.1.6 F BAT ROOST ASSESSMENT FOR STRUCTURES**

<b>Structure Reference:</b>	The Farmhouse – Gravelly Way
<b>Structure Location</b>	SJ 91630 09659 – Gravelly Way
<b>Approximate Structure Age:</b>	1900
<b>Current Structure Use:</b>	Residential property.
<b>Construction materials:</b>	
<p>The dwelling is arranged over two storeys. The building is rendered with a pitched clay tiled roof. There are no soffits or fascias, the render extends up to the roof with brickwork edging. Gaps are infilled with mortar. The building had two brick chimneys with lead flashing. A flat roofed extension is present to the rear (north) elevation. A single storey 'lean to' extension is present on the west elevation, the construction of which is consistent with the main house. Tiles are interlocking concrete rather than clay tile. A security light (functional) was present to the single storey extension.</p> <p>Mortar was noted between the roof tiles and the rendered walls at the gable end. This appeared recent and was in good condition.</p> <p>The building was in generally sound condition having been recently renovated.</p>	
<b>Potential access points and assessment of roost suitability:</b>	
<ol style="list-style-type: none"> <li>1) Slipped tiles</li> <li>2) Small bit of mortar missing from ridge tile.</li> </ol> <p>The building is next to arable fields and proximal to (within 10m) a canal.</p>	
<b>Potential to support roosting bats: MODERATE</b>	

**Drawing:**



**Front (south) and side (west) elevations**

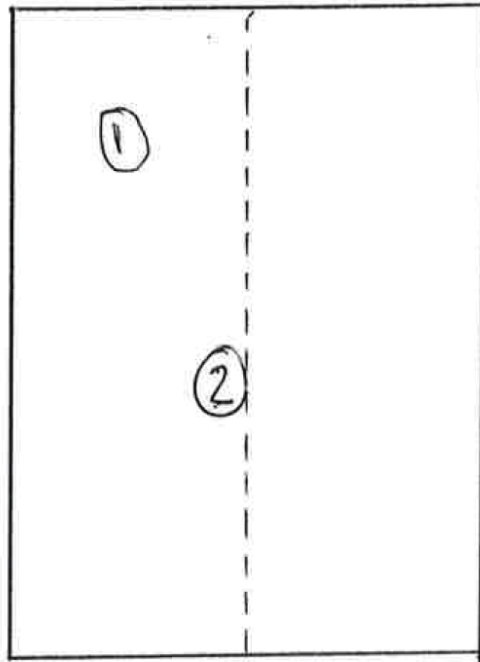


**Rear (north) and side (east) elevations**

**ANNEX 10.1.6 G BAT ROOST ASSESSMENT FOR STRUCTURES**

<b>Structure Reference:</b>	The Stables – Gravelly Way
<b>Structure Location</b>	SJ 91630 09659 – Gravelly Way
<b>Approximate Structure Age:</b>	1900 – Refurbished 2008 approximately.
<b>Current Structure Use:</b>	Residential property.
<b>Construction materials:</b>	
<p>The dwelling is arranged over two storeys and is of red brick construction with a pitched clay tiled. There are no soffits or fascias, brickwork extends up to the roof with gaps being infilled with mortar. There is no roof void, this is part of the living space, ‘Velux’ windows are present to the roof.</p> <p>A metal framed and clad barn building is attached.</p> <p>The building was in generally sound condition.</p>	
<b>Potential access points and assessment of roost suitability:</b>	
<ul style="list-style-type: none"> <li>1) Minor slipped tile.</li> <li>2) Small gap to ridge tile.</li> </ul> <p>The building is next to arable fields and proximal to (within 35m) a canal.</p>	
<b>Potential to support roosting bats: LOW</b>	

**Drawing:**



**Rear (west) elevation**



**Front (east) and side (south) elevations**

## ANNEX 10.1.6 H BAT ROOST ASSESSMENT FOR STRUCTURES

<b>Structure Reference:</b>	Heath Farm – Main Farmhouse
<b>Structure Location</b>	SJ 93086 09441 – Vicarage Road
<b>Approximate Structure Age:</b>	1900
<b>Current Structure Use:</b>	Residential
<p><b>Construction materials:</b></p> <p>The property is a traditionally constructed 5 bedroom brick built detached farmhouse over two floors with a pitched clay tiled roof with multiple aspects and pitches. No soffits or fascias, brickwork extends up to roof. Stone lintels and window sills. Three chimneys with mortar bed around base to roof tiles.</p> <p>An internal inspection of the main Heath Farmhouse building was possible and access was gained into a pitched roof void, approximately 2.5m in height. The construction inside was of timber ridge beams with one side of the building open directly to the tiles above and one side of the same construction but with bituminous sarking felt lining the tiles on the inside.</p> <p>The property has a cellar however, this was entirely waterlogged at the time of the survey and no access was made.</p> <p>Further barns and outbuildings are present associated with the farmhouse. A summary description for each is provided below.</p> <ol style="list-style-type: none"> <li>1. Garage- brick, pitched clay tile roof. Generally in good condition, one lifted ridge tile, lighting on exterior. Negligible bat potential.</li> <li>2. Large barn, block base, corrugated asbestos walls and ceiling, timber cladding to gable end, sparrow terrace, steel framed. Timber cross beam, lighting on gable end. Negligible bat potential.</li> <li>3. Open Barn, steel framed, clad with metal to sides, asbestos cement roof, open to rear. Negligible bat potential.</li> <li>4. End section, 'Lean-to barn supported with old telegraph poles, timber cross beams, metal clad, unsuitable for day roost. Negligible bat potential.</li> <li>5. Steel framed barn, concrete base, timber clad, corrugated concrete, modern timber cross beams. Negligible bat potential.</li> </ol>	
<p><b>Potential access points and assessment of roost suitability (Heath Farmhouse):</b></p> <ol style="list-style-type: none"> <li>1) Gaps in deteriorating mortar;</li> <li>2) Multiple gaps under tiles and slipped/missing tiles;</li> <li>3) ¾ height wing/block adjacent to driveway – hole in roof, house sparrow nesting – roof here has gaps to ridge tiles and lifted tiles.</li> <li>4) Gaps to mortar on apex of gable end (south elevation).</li> <li>5) Gaps in mortar surrounding chimney</li> </ol>	



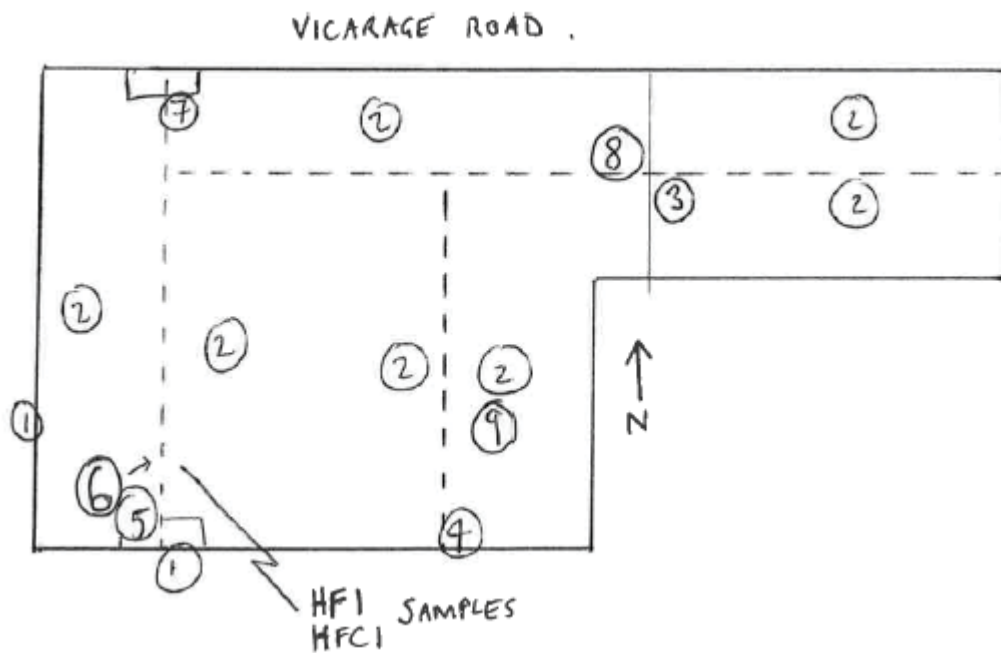
- 6) Lots of droppings (>100) including fresh and degraded on discarded items in roof void. Focused along ridge beam area and chimney. Sample taken (HF1) and Control (HF1C).
- 7) Chimney. 2 areas of missing brickwork providing access adjacent. Multiple potential access points noted with light shining through the walls, the roof and from lead flashing round the chimney. Droppings also present in this location but less numerous.
- 8) Lots of cobwebs. Evidence of birds nesting. No appreciable evidence of current use by bats. Some limited but aged droppings noted.
- 9) As 8.

**Potential to support roosting bats:**

**HIGH – Farmhouse**

**NEGLIGIBLE – Remaining Outbuildings**

**Drawing:**





**Farmhouse side (west) elevation**



**Farmhouse rear (south) elevation**



**1. Garage outbuilding – Negligible potential**



**2. Barn – Negligible potential**



**3. Barn - Negligible potential**



**4. 'Lean-to' barn – Negligible potential**



**5. Barn – Negligible potential**



**6. Brown long-eared bat droppings concentrated in south west elevation by chimney.**

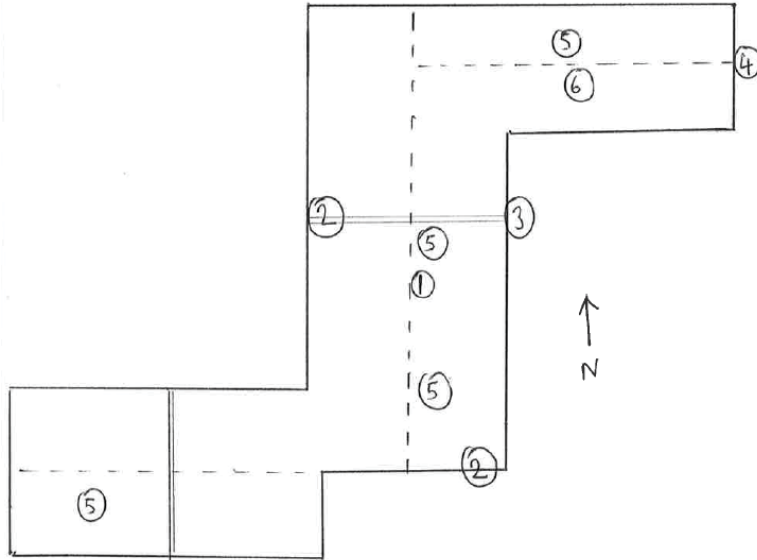


**7. Typical roof structure**

**ANNEX 10.1.6 I BAT ROOST ASSESSMENT FOR STRUCTURES**

<b>Structure Reference:</b>	Heath Farm Converted Outbuilding
<b>Structure Location</b>	SJ 93086 09441 – Vicarage Road
<b>Approximate Structure Age:</b>	1900 – Renovated 2011
<b>Current Structure Use:</b>	Residential Property
<b>Construction materials:</b>	
<p>This former outbuilding was converted into two residential units in 2011. The building is of brick construction with a pitched tiled roof.</p> <p>The building is partly 1 storey, partly 2 storeys. A timber fascia is present to the single storey with mesh installed under, and limited access under felt. Single storey section is in sound condition. The two storey and parts of the building of one storey appearance has a converted attic space. Purpose built ecological enhancements are built into / onto building fabric including bird and bat boxes.</p> <p>The building was in generally sound condition.</p>	
<b>Potential access points and assessment of roost suitability:</b>	
<ol style="list-style-type: none"> <li>1) Some gaps noted under ridge tiles;</li> <li>2) Bat box present integral to the building fabric;</li> <li>3) Bird boxes – sparrow terraces present which have potential to be used by bats;</li> <li>4) Purpose built bird / bat access points to wall/roof void on eastern elevation.</li> <li>5) Bat access tiles.</li> <li>6) Roof void – heavily insulated to roof, brick wall, no gaps, daylight or evidence of bats noted. Timber roof structure sealed with expanding foam. Ceiling height circa 2.5m.</li> </ol> <p>The building is next to arable fields.</p>	
<b>Potential to support roosting bats: HIGH</b>	

**Drawing:**



**Side (east) elevation**



**Rear (south) elevation showing bat box**



**Rear (south) elevation**



**Rear (south) elevation**



**Sparrow terrace**



**Holes for birds/bats into wall/roof cavity – east elevation**



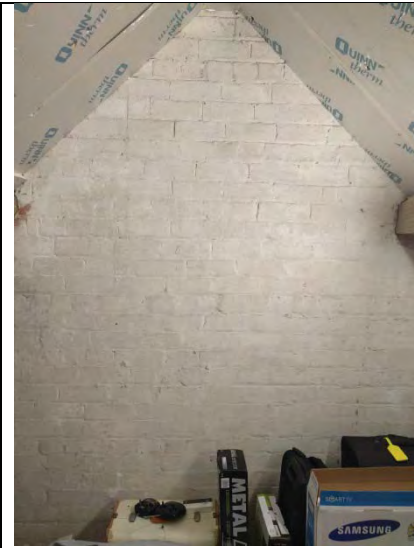
**Bat access tiles in roof**



**Bat access tiles in roof**



**Roof Void**



**Roof Void**

## **ANNEX 10.1.6 J BAT ROOST ASSESSMENT FOR STRUCTURES**

<b>Structure Reference:</b>	Clovelly
<b>Structure Location</b>	SJ 92362 10289 – Off A5 to the south
<b>Approximate Structure Age:</b>	1970s
<b>Current Structure Use:</b>	Residential property
<b>Construction materials:</b>	
<p>Large bungalow constructed largely of rendered brick. Concrete roofing tiles on several roof elevations and with modern PVC soffits and fascias.</p> <p>Separate garage building to the west of the main property was present, constructed in largely the same way as the main property i.e. brick base, rendered upper walls, concrete roof tiles and PVC soffits and fascias. The garage was open to the roof inside with timber batons and sarking felt visible and had negligible bat potential.</p> <p>A large outbuilding was also present further west and was of the same construction materials as the garage. This building had a rood void approximately 2.5m in height and 20+ old bat droppings were found, although no obvious points of entry were observed. It was not possible to take bat dropping samples from this area as they had degraded badly. No fresh or recent evidence of bats was noted.</p> <p>A row of horse stables were present to the south west of the main property. They were constructed of brick and render walls with flat bitumen roofing and relatively new PVC soffits and fascias. One dropped soffit board was noted. This was of negligible to low potential.</p> <p>TN1 - Access was possible into a large roof void in the bungalow building, allowing access over most of the property over a boarded floor. The middle of the roof void ran approximately north to south and was approximately 2m in height. TN2 - Breeze block gable ends were present to the north and the south and sarking cloth, secured by timber batons was present throughout under the roof tiles. Scattered degraded droppings noted – Sample taken CV1.</p> <p>The middle roof void area had two roof voids, in 'L' shapes, running off it (TN3), approximately to the east and west. These areas were approximately 1.5m in part and rising to 2m in height for a section towards the end of the 'L' (TN4). These areas had a timber ridge boards and timber beams over sarking felt. Around ten scattered degraded droppings were found in this</p>	



area (Sample CV2) No light was showing through the roof structure in this area.

The western 'L' had an area of ripped sarking felt and fallen mortar, giving potential access from the roof. Some daylight was visible in this area, but the structure was still generally tight. Scattered bat droppings were also found in this area, though most were degraded.

There was a smaller void space running off of the main roof space towards the north west, approximately 0.75m in height.

Rat, mice and bat droppings were in evidence throughout the roof space.

**Potential access points and assessment of roost suitability:**

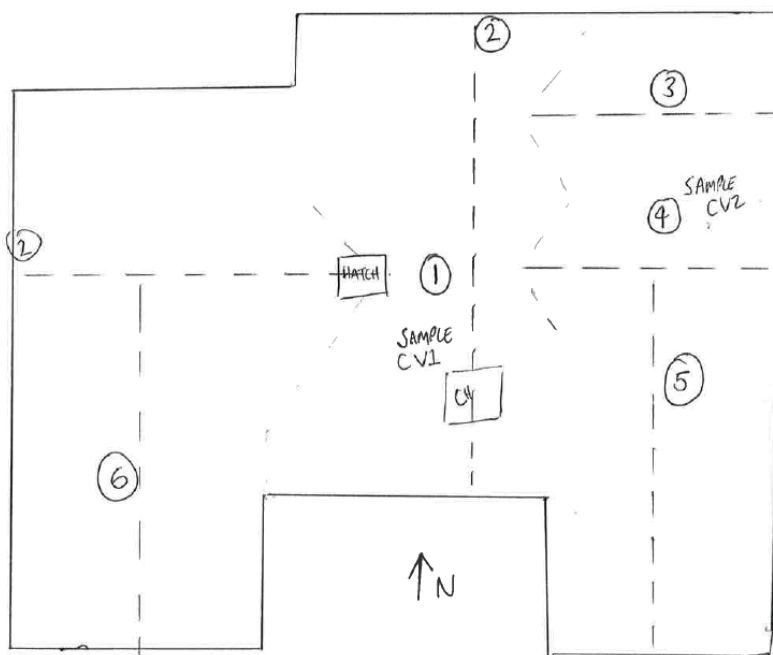
TN5 Ripped sarking cloth and fallen mortar may allow access to the roof void from the outside but very small gaps only and cluttered.

TN6 Some small gaps under roof tiles but generally tight.

The building is bounded to the north by the A5 road, beyond which are arable fields. Arable fields, mostly horse paddocks, are present to the west, east and south of the property. Tall tree line in close proximity to two elevations. Heavily shaded.

**Potential to support roosting bats: MODERATE**

**Drawing:**





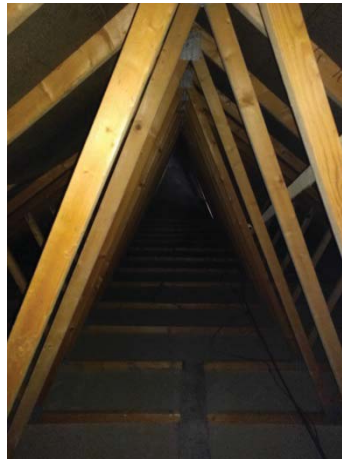
**North elevation and garage**



**South west elevation**



**Outbuilding**



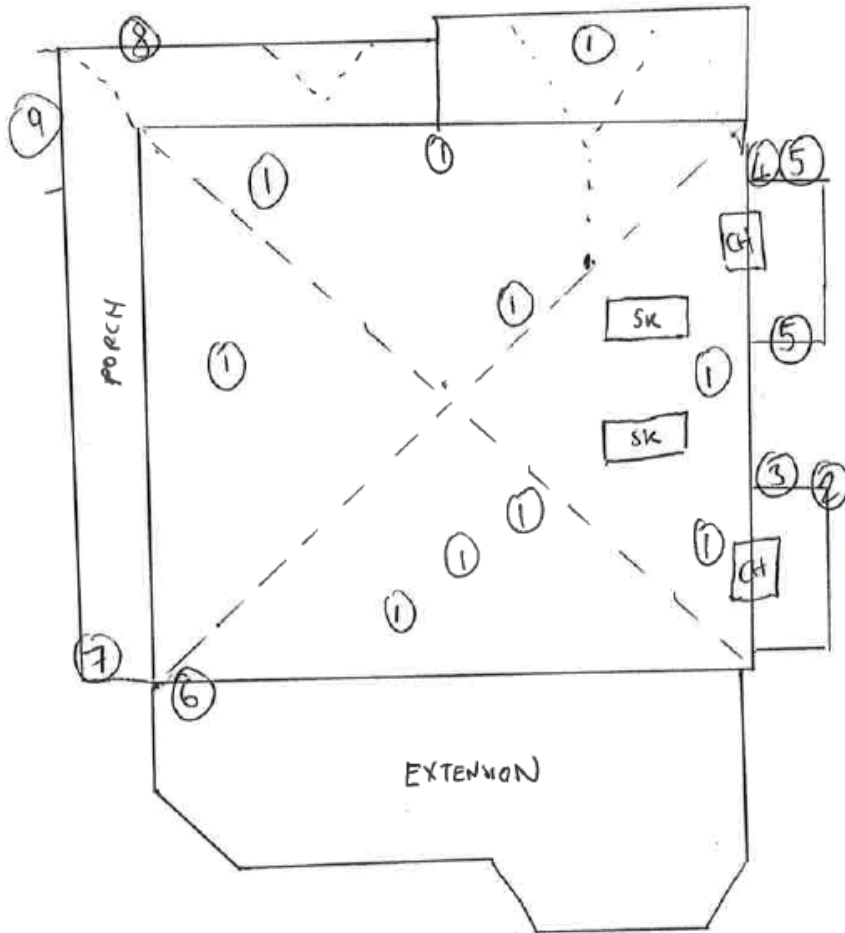
**Outbuilding roof space**

## **ANNEX 10.1.6 K BAT ROOST ASSESSMENT FOR STRUCTURES**

<b>Structure Reference:</b>	Ash House
<b>Structure Location</b>	SJ 92533 08840 – Straight Mile
<b>Approximate Structure Age:</b>	1980s
<b>Current Structure Use:</b>	Residential property – children’s home.
<b>Construction materials:</b>	
<p>1980s construction of brick with a concrete/clay tile roof. Two storeys with a one storey extension to the rear (north). Generally in good condition to the roof. Brick chimney present. Timber soffits and fascias around the building. There is a front porch built onto the front of the building (south). It is of brick construction with several windows and concrete/clay roof tiles.</p> <p>The rear extension is constructed of brick with a concrete tile roof and areas of lead flashing to the main house.</p> <p>There are two rendered brick extensions adjoining the main building to the west. Both have pitched concrete tile roofs and timber panel fascias.</p> <p>There was no bat roost potential in the trees around the properties.</p>	
<b>Potential access points and assessment of roost suitability:</b>	
<ol style="list-style-type: none"> <li>1) Slipped/ damaged/ lifted tiles.</li> <li>2) Gap in corner of fascia by gutter.</li> <li>3) Gap in mortar bed to tiled roof.</li> <li>4) Slated fascia board missing.</li> <li>5) Gaps between fascia and tiled roof. No concrete bed.</li> <li>6) Gaps around soil pipe. House sparrow coming and going.</li> <li>7) Four slipped raised tiles.</li> <li>8) Hole in soffit box.</li> <li>9) Void over wall. Access possible.</li> </ol> <p>Internal access was achieved. No eaves were available to check in the main house and the loft appeared to have been converted into an unused room to the roof. A loft hatch was observed in the single storey extension on the east side of the house but it was screwed shut and no access was possible.</p> <p>The building is next to an arable field to the east and a horse paddock to the south (both within 10m).</p>	

**Potential to support roosting bats: MODERATE**

Drawing:



**Front south elevation**



**Rear north elevation**



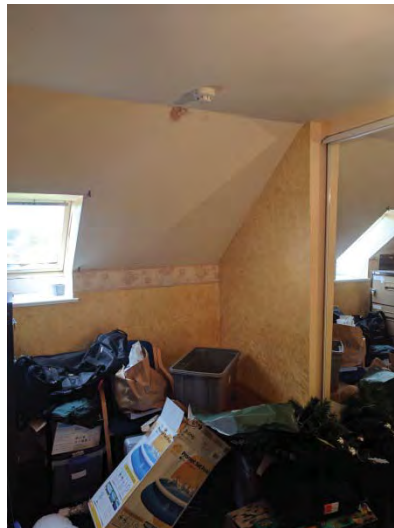
**Degraded soffit board and gaps to roof tiles.**



**Gaps above fascia board under tiles**



**Gap around soil pipe**



**Roof void converted into living space (currently unoccupied)**

**ANNEX 10.1.6 L BAT ROOST ASSESSMENT FOR STRUCTURES**

<b>Structure Reference:</b>	Stoney Brook Annex
<b>Structure Location</b>	SJ 92438 08881 – Vicarage Road
<b>Approximate Structure Age:</b>	1980s
<b>Current Structure Use:</b>	Annex to Stoney Brook Cottage
<b>Construction materials:</b>	
<p>Small annex to the north of Stoney Brook Cottage. The general construction is the same as the cottage, being of rendered brick with timber soffits boxes and fascias and concrete interlocking tiles on the roof. There are dormer windows in the roof, installed seven years ago as it was converted from a garage. There were no accessible roof voids inside the building.</p>	
<b>Potential access points and assessment of roost suitability:</b>	
<ol style="list-style-type: none"> <li>1) Gap between overhanging fascia and undercloaking.</li> <li>2) Gaps to cement base.</li> <li>3) Timber fascia.</li> </ol> <p>The building is adjacent to a small arable field to the east and is situated in a generally rural wider landscape.</p>	
<b>Potential to support roosting bats: MODERATE</b>	
<b>Drawing:</b>	
<p>The drawing shows a hand-drawn floor plan of a rectangular building. A dashed line on the left side indicates an extension or a specific area of interest. Three numbered circles are placed to identify key features: (1) is at the bottom-left corner, (2) is at the top-left corner, and (3) is on the right wall. A north arrow is located on the right side of the drawing, pointing upwards.</p>	



**West elevation - Gap between overhanging fascia and undercloak**



**West elevation**



**North elevation**



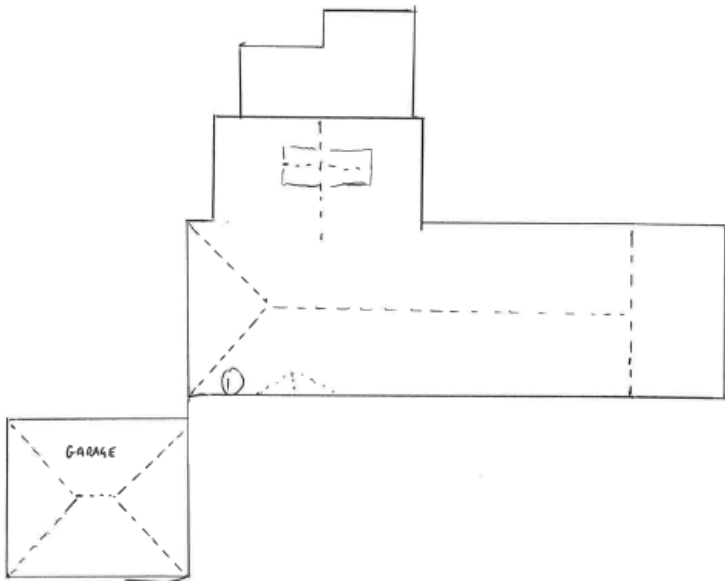
**East elevation**

## **ANNEX 10.1.6 M BAT ROOST ASSESSMENT FOR STRUCTURES**

<b>Structure Reference:</b>	Stoney Brook Cottage
<b>Structure Location</b>	SJ 92439 08844 – Straight Mile
<b>Approximate Structure Age:</b>	1800s (main body of the house) with multiple renovations and additions since
<b>Current Structure Use:</b>	Residential property
<b>Construction materials:</b>	
<p>The general construction was of rendered brick with timber soffits and fascias around the building. The roof was made of concrete interlocking tiles across the building. There were several roof pitches across the property and a conservatory has been added to the north. There is a garage building at the south west corner of the main house building and constructed in largely the same style.</p> <p>The access to the loft space was somewhat restricted due to belongings and the majority of the accessible loft space being low in height. The main roof void was approximately 1.5m in height, getting lower towards the edges of the roof spaces. The inside of the roof was of timber frame construction over bituminous sarking felt. MMMF insulation was present in the loft space and several voids into various roof pitches were observed.</p> <p>The building was in generally sound condition.</p>	
<b>Potential access points and assessment of roost suitability:</b>	
<p>1) There is potential access for bats in the small gaps under the interlocking concrete tiles, however the building was generally found to offer low/moderate bat roost potential.</p> <p>Mouse droppings were identified in the roof void.</p> <p>The building is adjacent to a small arable field to the east and is situated in a generally rural wider landscape.</p>	
<b>Potential to support roosting bats: LOW/MODERATE</b>	



**Drawing:**



**Front (south) elevation**



**Rear (north) elevation**



**Rear (north east) elevation**



**Rear (north west) elevation**

**ANNEX 10.1.6 N BAT ROOST ASSESSMENT FOR STRUCTURES**

<b>Structure Reference:</b>	Croft House
<b>Structure Location</b>	SJ 91676 10124 – Croft Lane
<b>Approximate Structure Age:</b>	1928-1928 with various add-ons and renovations since
<b>Current Structure Use:</b>	Residential property
<b>Construction materials:</b>	
<p>Large two storey house with rendered walls and a double pitched roof covered in clay tiles. PVC soffits and fascias are installed on the property and the house was re-roofed approximately 15 years according to the current tenant. The fascias and soffits are generally flush to the building walls. The property has one brick chimney surrounded by lead flashing to the roof tiles. There is an open porch around the front and side of the property, facing approximately west and north. The porch is supported by a timber frame and has a clay tile roof.</p> <p>An area of the property towards the north east has a two storey extension built with a flat bitumen covered roof. Some of the bitumen felt is lifted in places. It is constructed of rendered brick with timber fascias, flush to the building walls.</p> <p>There is also a conservatory built onto the south elevation of the house, built with a block base, glazed walls and plastic roof. There is lead flashing to the rendered wall of the house.</p> <p>Internal access was gained to two loft spaces, though access was very restricted in both cases due to the size of the loft hatch and access being restricted by the chimney structure. Both loft spaces ran approximately east to west in the two roof pitches.</p> <p>Void space one was on the northern side of the house and was a long thin area with timber beams over bituminous sarking felt. It was approximately 1.75m in height. No obvious daylight showed through the roof.</p> <p>Void space two ran adjacent to void space one and was approximately 4m wide, running from the front to the back of the building. The access hatch opened hard against the chimney structure and the centre of the space was approximately 1.75m in height. As void one, the construction was of timber beams over bituminous sarking felt. There was no clear access between the two void spaces apart from an approximate 6 inch gap in places along the floor of the void. A sample of suspected bat droppings were taken from</p>	

around the access hatch.

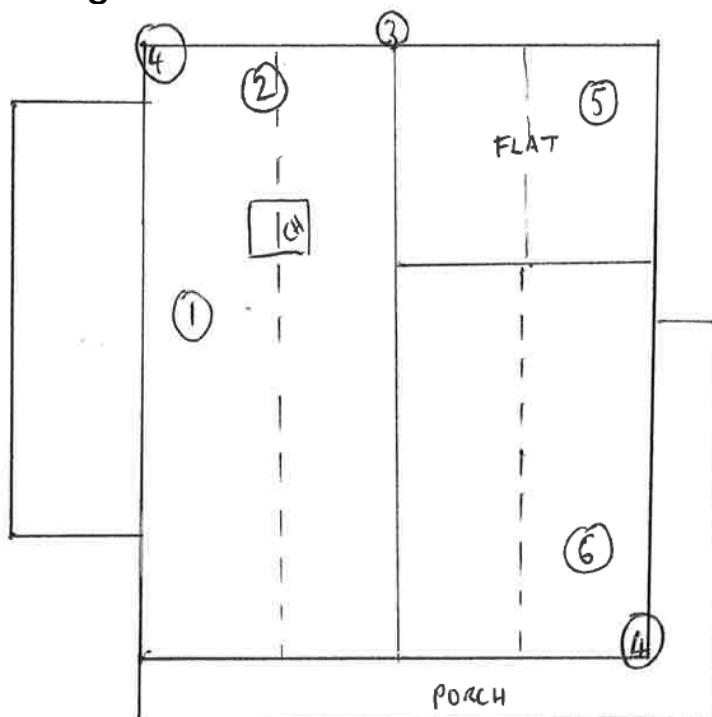
**Potential access points and assessment of roost suitability:**

- 1) Slipped tiles above gutterwork, providing potential access into the roof void.
- 2) Interlocking concrete ridge tiles. Some gaps noted between or underneath the tiles.
- 3) UPVC fascia to gable end. 2cm gap between fascia and rendered wall. Original timber present behind UPVC.
- 4) Undercloaking and mortar to the roof is degraded allowing potential access.
- 5) Single storey extension, shallow grade bitumen felt roof. Rendered walls. Some lifted felt attached to timber frame.
- 6) Two semi-slipped tiles allowing potential access.

The building is surrounded by arable fields to the north, west and south and has an LPG fuel facility to the west.

**Potential to support roosting bats: MODERATE**

**Drawing:**





**Front (north east elevation)**



**Front (south east elevation)**



**Side (south elevation).**



**Gaps in ridge tile, slipped tiles by gutter – south elevation.**



**Gaps in ridge tile – south elevation.**



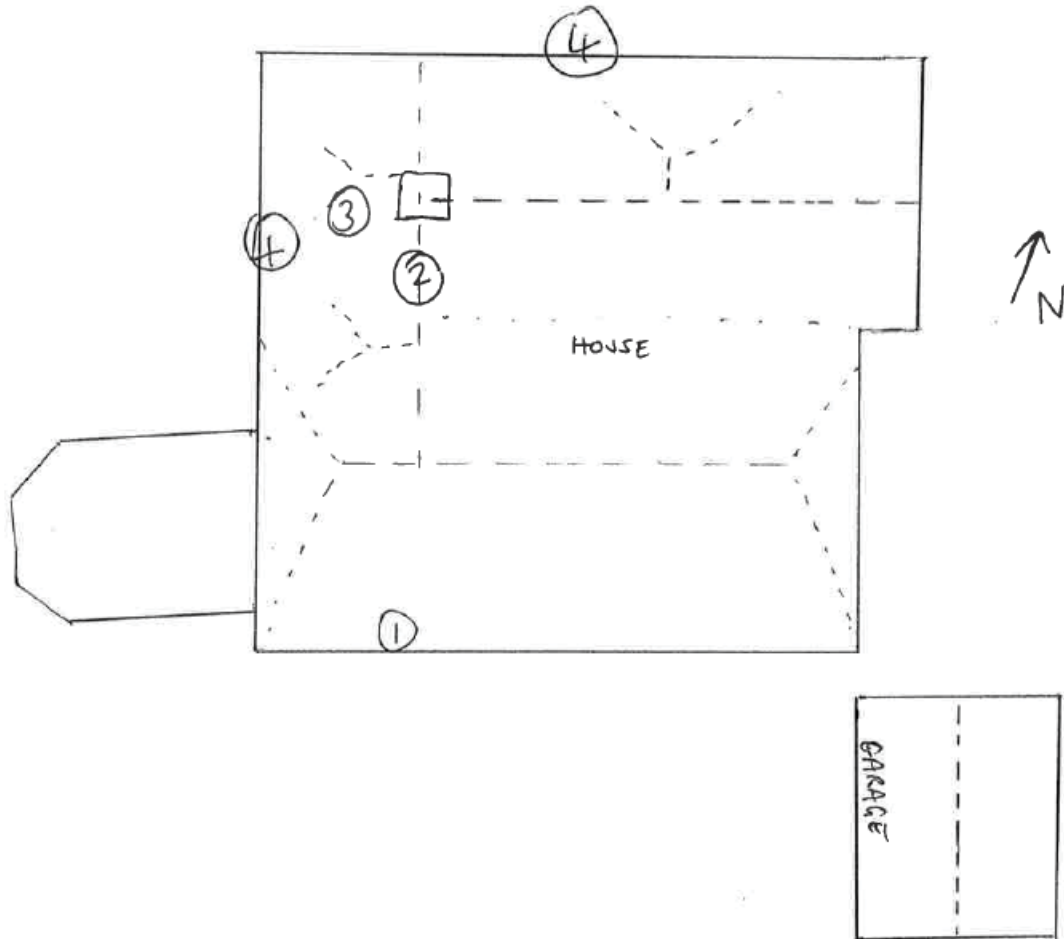
**Gaps between roof tile and soffit / fascia. North east and south west elevations.**

**ANNEX 10.1.6 O BAT ROOST ASSESSMENT FOR STRUCTURES**

<b>Structure Reference:</b>	Mile End Cottage
<b>Structure Location</b>	SJ 92403 08843 – Straight Mile
<b>Approximate Structure Age:</b>	1800s with multiple additions and renovations since
<b>Current Structure Use:</b>	Residential property
<b>Construction materials:</b>	
<p>The building is constructed from rendered brick. A portion of the building to the north is covered with hung tiles over brick. There are multiple pitched roofs covered with concrete tiles. PVC fascias and soffits are in evidence throughout the property and are tight and well-fitted. There is a modern porch built onto the front of the property with rendered brick and clay tile roof. Lead flashing is coming away from one area of the building.</p> <p>There is also a conservatory built on to the western elevation of the building. It has a rendered brick base and the walls are roof are glazed.</p> <p>A garage, now converted into a games room is present to the south east of the main building. It is constructed of rendered brick with a concrete tile roof and PVC fascias. Some gaps to the ridge tile were observed. A roof void was present but not accessible.</p>	
<b>Potential access points and assessment of roost suitability:</b>	
<ol style="list-style-type: none"> <li>1) 5/6 slipped tiles and some ridge tiles with missing mortar.</li> <li>2) Missing mortar to ridge tile.</li> <li>3) Handful of slipped or raised tiles</li> <li>4) Hung tiles, some slipped. One area of lead flashing beneath is sagging.</li> </ol> <p>Internal access to two separate roof voids within the main building was achieved:</p> <p>Internal void 1 (to south): Approximately 1.75 m in height. Insulation present. Inside of roof constructed of sarking felt secured by timber batons. Water tank limited access. Droppings were found on top of insulation installed in 2012.</p> <p>Internal void 2 (to north): Approximately 0.5 m in height. Looked inside but no physical access was possible. Plaster ceiling in evidence – likely to be a roof void above this but no access was possible. Droppings were noted in this area. Samples were taken.</p>	

**Potential to support roosting bats on the basis of inspection:  
MODERATE**

**Drawing:**



**Southern elevation**



**West elevation – tile hung**



**North and west elevations – tile hung**



**Converted garage – games room**



**Northern roof void**



**Southern roof void**



**Southern roof void**

**Annex 10.1.7**

Bat Roost Assessment for Trees



**Annex 10.1.1.7 – Tree Survey for Bat Roost Potential Results – 14/02/2017 – 17/02/2017 – Sunny, Clear, 2-5°C \*AGL – Above Ground Level**

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
<b>G23</b>	<ul style="list-style-type: none"> <li>• Rot hole – 3m AGL, north side</li> <li>• Flaky bark – crevice up to 2m north side</li> </ul>	<ul style="list-style-type: none"> <li>• Multi-stem oak</li> <li>• West of scrub area</li> </ul>	<b>LOW</b>	-	-
<b>T13</b>	<ul style="list-style-type: none"> <li>• Ivy – perhaps &lt;50mm diameter</li> </ul>	<ul style="list-style-type: none"> <li>• No access due to hedges fencing – seen from hedge or fence</li> <li>• 20m lighting column adjacent</li> </ul>	<b>LOW</b>	-	-
<b>G21</b>	<ul style="list-style-type: none"> <li>• Ivy - 50mm &gt; diameter</li> </ul>	<ul style="list-style-type: none"> <li>• Group may have been modified by works</li> </ul>	<b>LOW</b>	-	-
<b>G5</b>	<ul style="list-style-type: none"> <li>• Split – less than 1.5m, north side and south side with rot</li> <li>• Flaky bark – 2.5m east side</li> </ul>	<ul style="list-style-type: none"> <li>• Northern most willow</li> <li>• Poached at base</li> <li>• Signs of horse scratching</li> <li>• Split with cobwebs, no droppings</li> </ul>	<b>LOW</b>	-	-
<b>H3/G13</b>	<ul style="list-style-type: none"> <li>• 3 woodpecker holes – 8m, south side</li> <li>• Multi-stem ash with basal cavity near eastern protrusion of trees</li> <li>• Hazard beam – dead branch with cracks, 7m AGL east side</li> <li>• Knot hole – with dead stem, 6m AGL south side</li> </ul>	<ul style="list-style-type: none"> <li>• Dead tree with flaky bark, likely to come off</li> <li>• Oak 10m near north of group</li> </ul>	<b>MODERATE</b>	-	-

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
W1(G)	<ul style="list-style-type: none"> <li>• Rot hole – 4m AGL south west side, fallen/cut limb</li> <li>• Flaky bark – all over branches</li> </ul>	<ul style="list-style-type: none"> <li>• 18m wide crown oak, north east of multi-stem sycamore</li> </ul>	LOW	-	-
W1(H)	<ul style="list-style-type: none"> <li>• Rot holes – small holes, all over</li> <li>• Flaky bark</li> <li>• Knot holes/rot</li> </ul>	<ul style="list-style-type: none"> <li>• Exposed</li> </ul>	LOW	-	-
W1(I)	<ul style="list-style-type: none"> <li>• Rot holes – small holes, all over</li> <li>• Flaky bark</li> <li>• Knot holes/rot</li> </ul>	<ul style="list-style-type: none"> <li>• Exposed</li> </ul>	LOW	-	-
G19 (OAK)	<ul style="list-style-type: none"> <li>• Flaky bark – 4m AGL east</li> <li>• Knot hole – 3m AGL east, dead limb</li> </ul>	<ul style="list-style-type: none"> <li>• Exposed</li> </ul>	LOW	-	-
T16	<ul style="list-style-type: none"> <li>• Flaky bark – 3.5m AGL south west, cut limb</li> <li>• Knot hole – 2m AGL south west, approx. 2x 2cm</li> </ul>	N/A	LOW	-	-

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
W1(C)	<ul style="list-style-type: none"> <li>Woodpecker hole – 6m AGL south west, 2x 1.5cm</li> <li>Flaky bark – branch, 3m AGL north east</li> </ul>	<ul style="list-style-type: none"> <li>17m oak, east of deadwood stump</li> </ul>	LOW	-	-
W1(D)	<ul style="list-style-type: none"> <li>Woodpecker holes – three holes, 12m AGL north</li> <li>Cracks – 4m AGL east and 11m AGL east</li> <li>Knot hole – 4m AGL north</li> </ul>	<ul style="list-style-type: none"> <li>17m oak (leaning), south of W1(C)(above)</li> </ul>	MODERATE	Tear out on Main stem on S side at 12.5m AGL. No evidence of bats or use by bats.	LOW
W1(E)	<ul style="list-style-type: none"> <li>Woodpecker holes – 6m AGL south</li> </ul>	<ul style="list-style-type: none"> <li>17 m oak, south of leaning tree (WD(1))</li> </ul>	LOW	-	-
W1(F)	<ul style="list-style-type: none"> <li>Woodpecker holes – 6m AGL north, &lt;15cm deep</li> <li>Flaky bark – approx. 6m AGL</li> </ul>	<ul style="list-style-type: none"> <li>15m sycamore, in east of wood amongst conifers</li> </ul>	LOW	-	-
G15(ASH)	<ul style="list-style-type: none"> <li>Knot holes – 2x 3m AGL and 4m AGL north</li> </ul>	<ul style="list-style-type: none"> <li>Western most ash</li> </ul>	LOW	-	-

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
<b>G15 POPLAR</b>	<ul style="list-style-type: none"> <li>• Rot hole – at base, south west</li> <li>• Flaky bark – large, up to 3m AGL south</li> <li>• Knot hole – shallow</li> <li>• Cankers – &lt;2cm</li> </ul>	<ul style="list-style-type: none"> <li>• Diamond lenticels</li> <li>• Features all shallow/small</li> </ul>	<b>LOW</b>	-	-
<b>G15(ASH)</b>	<ul style="list-style-type: none"> <li>• Rot hole – at base, large cavity</li> <li>• Flaky bark – over 2m AGL</li> <li>• Knot holes/Scar – 2x &lt;2m AGL north</li> </ul>	<ul style="list-style-type: none"> <li>• Western most ash</li> </ul>	<b>MODERATE</b>	Yes, downgrade. No evidence of bats or use by bats.	<b>LOW</b>
<b>G14(EASTERN ASH)</b>	<ul style="list-style-type: none"> <li>• Rot hole – at base, droppings</li> </ul>	<ul style="list-style-type: none"> <li>• Collected droppings – tubes 1, 6, 10, 14</li> </ul>	<b>MODERATE</b>	-	-
<b>G26</b>	<ul style="list-style-type: none"> <li>• Flaky bark – 3.5m AGL south</li> <li>• Knot holes – 5.2m AGL</li> </ul>	<ul style="list-style-type: none"> <li>• Second oak south of bridge</li> <li>• Rail land</li> </ul>	<b>LOW</b>	-	-
<b>G26</b>	<ul style="list-style-type: none"> <li>• Knot holes – three knot holes at 1.5-2m AGL east</li> </ul>	<ul style="list-style-type: none"> <li>• Multi-stem oak by second gantry</li> <li>• Rail land</li> </ul>	<b>LOW</b>	-	-

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
<b>G26</b>	<ul style="list-style-type: none"> <li>Cracks – split branch, 3m AGL east</li> </ul>	<ul style="list-style-type: none"> <li>South of other G26 bat trees (above)</li> <li>north of tag 9623</li> <li>Rail land</li> </ul>	<b>LOW</b>	-	-
<b>G27</b>	<ul style="list-style-type: none"> <li>Cracks – 10m+ AGL split of main stem, likely to get wet</li> <li>Knot holes – two, 3m AGL east and north</li> </ul>	<ul style="list-style-type: none"> <li>20m oak</li> <li>Next to largest of three gantries</li> <li>Rail land</li> </ul>	<b>LOW</b>	-	-
<b>G29</b>	<ul style="list-style-type: none"> <li>Overlapping stem/branch – two at 2m AGL east</li> <li>Exposed</li> </ul>	<ul style="list-style-type: none"> <li>Large multi-stem oak</li> <li>Near south of group</li> <li>Rail land</li> </ul>	<b>LOW</b>	-	-
<b>W1</b>	<ul style="list-style-type: none"> <li>Rot holes – 4m AGL south on main stem and 6m AGL east branch</li> </ul>	<ul style="list-style-type: none"> <li>15m oak</li> <li>North east of wood</li> <li>Two large bird nests in scrub elder</li> </ul>	<b>LOW</b>	-	-
<b>W1</b>	<ul style="list-style-type: none"> <li>Rot holes – ground level</li> <li>Knot holes – 2.5m east, large. 2x cavities with bird droppings, 3.5m west</li> </ul>	<ul style="list-style-type: none"> <li>12m oak</li> <li>Closest to T15</li> </ul>	<b>MODERATE</b>	Scar South side, 2m AGL, and space for 1 bat. No evidence of bats or use by bats.	<b>NEGLIGIBLE /LOW</b>

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
<b>T18(OAK)</b>	<ul style="list-style-type: none"> <li>Cracks – 4.5m AGL north</li> </ul>	<ul style="list-style-type: none"> <li>Generally sound</li> <li>Damaged/split limb</li> </ul>	<b>NEGLIGIBLE /LOW</b>	-	-
<b>T131(V)</b>	<ul style="list-style-type: none"> <li>Rot holes – 1.5m AGL south</li> <li>Flaky bark – throughout</li> </ul>	<ul style="list-style-type: none"> <li>Standing dead</li> </ul>	<b>HIGH</b>	Yes, downgrade. No evidence of bats or use by bats.	<b>MODERATE</b>
<b>G60(B)</b>	<ul style="list-style-type: none"> <li>Overlapping stem/branch – 3-4m dual</li> </ul>	<ul style="list-style-type: none"> <li>Voids created large by overlapping stems</li> </ul>	<b>LOW</b>	-	-
<b>T83</b>	<ul style="list-style-type: none"> <li>Flaky bark – 2m AGL north, at wound</li> </ul>	<ul style="list-style-type: none"> <li>Limited potential</li> <li>Exposed</li> </ul>	<b>NEGLIGIBLE /LOW</b>	-	-
<b>T80</b>	<ul style="list-style-type: none"> <li>4m AGL north, one small hole</li> </ul>	<ul style="list-style-type: none"> <li>Generally sound</li> <li>Limited potential</li> </ul>	<b>NEGLIGIBLE /LOW</b>	-	-
<b>G48</b>	<ul style="list-style-type: none"> <li>Knot holes – alder</li> </ul>	<ul style="list-style-type: none"> <li>Bees in dead tree</li> <li>Freshly broken off limbs in nearest road</li> </ul>	<b>MODERATE</b>	Negligible potential.	<b>NEGLIGIBLE</b>

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
T16	<ul style="list-style-type: none"> <li>Hazard beam – 3.5m AGL east</li> <li>Cracks</li> </ul>	<ul style="list-style-type: none"> <li>Bark wound</li> <li>Hazard beam does not appear to go anywhere</li> </ul>	LOW	-	-
G26(B)	N/A	<ul style="list-style-type: none"> <li>Recorded as retained</li> <li>By road</li> </ul>	NEGLIGIBLE /LOW	-	-
G26(B) (OAK)	<ul style="list-style-type: none"> <li>Hazard beam</li> <li>Flaky bark</li> <li>Knot holes</li> </ul>	<ul style="list-style-type: none"> <li>Centre of hedge</li> <li>Field centre position to be lost</li> <li>Dead limb with bark</li> </ul>	MODERATE	No obvious features upon climbing.	NEGLIGIBLE
T20	<ul style="list-style-type: none"> <li>Rot holes</li> <li>Cracks – From ground to 6m AGL</li> <li>Flaky bark in places</li> </ul>	<ul style="list-style-type: none"> <li>Lightning strike</li> <li>Features throughout to all aspects</li> </ul>	HIGH	Lightning strike Long split; narrow on S side at 4.5m AGL. No evidence of bats or use by bats.	LOW
T27 (HORNBEA M)	<ul style="list-style-type: none"> <li>Rot holes – 4m AGL south</li> <li>Hazard beams – 3m AGL south</li> </ul>	<ul style="list-style-type: none"> <li>Features either too exposed or insufficiently developed</li> </ul>	LOW	-	-
T28 (ASH)	<ul style="list-style-type: none"> <li>Woodpecker holes – 4m+, multiple holes</li> <li>Rot holes – cavity, north facing limb/stem</li> <li>Cracks</li> <li>Knot holes</li> </ul>	<ul style="list-style-type: none"> <li>Multiple features</li> <li>Developed limb scars/cavities</li> </ul>	HIGH	Inspected knot holes on main stem at 5m AGL on south west side and woodpecker holes in limb on south west side at	HIGH

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
T32(OAK)	<ul style="list-style-type: none"> <li>• Rot/woodpecker holes</li> <li>• Flaky bark – on deadwood</li> </ul>	<ul style="list-style-type: none"> <li>• Deadwood</li> <li>• Declining condition</li> </ul>	<b>MODERATE</b>	Woodpecker hole identified on large limb, S of the main stem, 5m AGL facing down 10. No evidence of bats or use by bats.	<b>LOW</b>
T25(OAK)	<ul style="list-style-type: none"> <li>• Hard wood split</li> <li>• Flaky bark – around split limbs</li> </ul>	<ul style="list-style-type: none"> <li>• Major deadwood</li> <li>• Split limbs</li> </ul>	<b>MODERATE</b>	Broken branch split wood, S facing, 7m AGL and scar on main stem on S side, 6m AGL. No evidence of bats or use by bats.	<b>NEGLECTIBLE</b>
T32(U)	<ul style="list-style-type: none"> <li>• Cracks</li> <li>• Flaky bark – 3m AGL north</li> </ul>	<ul style="list-style-type: none"> <li>• Dead oak</li> <li>• Deadwood splits but to small limbs only</li> </ul>	<b>LOW</b>	-	-
T198(OAK)	<ul style="list-style-type: none"> <li>• Cracks – most to south around 4m AGL</li> <li>• Flaky bark – on dead limbs</li> <li>• Knot holes</li> </ul>	<ul style="list-style-type: none"> <li>• Inspection limited to north side due to quarrying activities and standing water</li> <li>• Dead limbs</li> </ul>	<b>LOW</b>	-	-



Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
<b>T140(ALDER)</b>	<ul style="list-style-type: none"> <li>• Rot at knot holes</li> <li>• Flaky bark</li> <li>• Knot holes – 2.5m AGL east</li> </ul>	<ul style="list-style-type: none"> <li>• Upper stem snapped</li> <li>• Deadwood</li> <li>• Poor condition</li> </ul>	<b>HIGH</b>	-	-
<b>T139(ALDER)</b>	N/A	<ul style="list-style-type: none"> <li>• Upper stem failed but exposed</li> </ul>	<b>MODERATE</b>	-	-
<b>T134</b>	<ul style="list-style-type: none"> <li>• Flaky bark – up to 2.5m AGL east</li> </ul>	N/A	<b>MODERATE</b>	-	-
<b>G80(A) (ASPEN)</b>	<ul style="list-style-type: none"> <li>• Woodpecker holes – approx. 5m AGL south, in limb scar</li> </ul>	N/A	<b>LOW</b>	-	-
<b>G80(DEAD STEM)</b>	<ul style="list-style-type: none"> <li>• Woodpecker holes – throughout</li> <li>• Flaky bark – throughout</li> </ul>	<ul style="list-style-type: none"> <li>• 3.5m AGL woodpecker holes with potential</li> <li>• Full of cavities but exposed limbs</li> </ul>	<b>MODERATE</b>	-	-
<b>T203</b>	<ul style="list-style-type: none"> <li>• Rot holes – 2.5m south</li> <li>• Cracks – 3-4m south</li> </ul>	<ul style="list-style-type: none"> <li>• Deadwood, generally minor limbs</li> </ul>	<b>MODERATE</b>	-	-

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
T207	<ul style="list-style-type: none"> <li>Cracks – flail damage, 1m east and cut limb, 3m south</li> </ul>	<ul style="list-style-type: none"> <li>Cut limb</li> </ul>	LOW	-	-
T12	<ul style="list-style-type: none"> <li>Hazard beam – cut</li> <li>Flaky bark – peeled off</li> </ul>	<ul style="list-style-type: none"> <li>Ivy seems to have been removed at some stage</li> </ul>	NEGLIGIBLE /LOW	-	-
T147	<ul style="list-style-type: none"> <li>Rot holes – many at ends of broken branches</li> <li>Flaky bark</li> <li>Knot holes – more than 5</li> </ul>	N/A	HIGH	-	-
T194	<ul style="list-style-type: none"> <li>Cracks – exposed holes in branch, 4m AGL west</li> <li>Knot holes – 4m AGL south</li> </ul>	<ul style="list-style-type: none"> <li>A little exposed which may limit potential</li> </ul>	MODERATE	-	-
T321	<ul style="list-style-type: none"> <li>Rot holes – deadwood branch</li> <li>Hazard beam – 4m AGL west</li> </ul>	N/A	MODERATE	-	-
T19(C)	<ul style="list-style-type: none"> <li>Flaky bark</li> </ul>	<ul style="list-style-type: none"> <li>Deadwood with encasing bark</li> </ul>	LOW	-	-

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
<b>G99(D)</b>	<ul style="list-style-type: none"> <li>• Rot holes</li> <li>• Knot holes – three at 2m AGL north, 4m AGL north east</li> </ul>	<ul style="list-style-type: none"> <li>• Deadwood with rot hole</li> </ul>	<b>MODERATE</b>	-	-
<b>G99(E)</b>	<ul style="list-style-type: none"> <li>• Limb scar– at 3m AGL South, Cavity</li> </ul>	N/A	<b>MODERATE</b>	-	-
<b>T163(OAK)</b>	<ul style="list-style-type: none"> <li>• Flaky bark – to deadwood</li> <li>• Knot holes – 6m AGL south</li> </ul>	<ul style="list-style-type: none"> <li>• Some deadwood</li> <li>• Features exposed</li> </ul>	<b>LOW</b>	-	-
<b>T153</b>	<ul style="list-style-type: none"> <li>• Rot holes – 1-2m AGL east, exposed deadwood</li> <li>• Flaky bark – east, around base to stump, exposed</li> </ul>	<ul style="list-style-type: none"> <li>• Veteran regrowth from old stump</li> <li>• Open heartwood is very exposed</li> <li>• Exposure of limbs limits potential</li> </ul>	<b>MODERATE</b>	No obvious features upon climbing.	<b>NEGLECTIBLE</b>
<b>T156(CHERRY)</b>	<ul style="list-style-type: none"> <li>• Flaky bark – to damage at base</li> </ul>	<ul style="list-style-type: none"> <li>• Damage at base</li> </ul>	<b>LOW</b>	-	-
<b>T102(H.BLACK POPLAR)</b>	<ul style="list-style-type: none"> <li>• Flaky bark – to deadwood</li> <li>• Knot holes – approx. 6m AGL west</li> <li>• Ivy – 250mm diameter</li> </ul>	<ul style="list-style-type: none"> <li>• Deadwood</li> <li>• Impact marks by access road</li> <li>• In rapid decline</li> <li>• Features not very well developed but likely to deteriorate and become more suitable</li> </ul>	<b>HIGH</b>	Not safe to climb.	<b>MODERATE/HIGH</b>

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
T119	<ul style="list-style-type: none"> <li>Rot holes – at broken end of hazard beam, 4m AGL east, one rot hole</li> <li>Hazard beam – road side, access limited inspection, possible cavity</li> <li>Knot holes – 3.5m AGL south</li> </ul>	<ul style="list-style-type: none"> <li>Some deadwood</li> </ul>	<b>MODERATE</b>	Cavity at the end of snapped limb, NE at 4m AGL. No evidence of bats or use by bats.	<b>MODERATE</b>
T301 (ASH)	<ul style="list-style-type: none"> <li>Woodpecker holes – 8m AGL south east</li> <li>Rot holes – several</li> </ul>	<ul style="list-style-type: none"> <li>No obvious defects</li> <li>Inspected from site only</li> </ul>	<b>HIGH</b>	Knot hole main stem on S side at 4m AGL. No obvious features upon climbing.	<b>NEGLIGIBLE</b>
T302 (ASH)	<ul style="list-style-type: none"> <li>Rot holes – 4m AGL west</li> <li>Knot holes – 4m AGL west</li> </ul>	N/A	<b>LOW</b>	-	-
T159	<ul style="list-style-type: none"> <li>Rot holes – several, 3m AGL south east</li> <li>Flaky bark – up main stem</li> </ul>	<ul style="list-style-type: none"> <li>Deadwood</li> <li>By access road</li> </ul>	<b>HIGH</b>	Flaking bark on main stem on N side at 6m AGL and split stem all around at approx. 7m AGL. No evidence of bats or use by bats.	<b>MODERATE</b>

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
T150(ASH)	<ul style="list-style-type: none"> <li>Cracks – 0.5m AGL west</li> </ul>	<ul style="list-style-type: none"> <li>Multi-stem</li> <li>One stem split at 0.5m</li> <li>Next to access road</li> <li>Inspected – no bats present</li> </ul>	<b>MODERATE</b>	Split in the hard wood of multiple stem ash on N and S at 0.5m AGL - negligible potential.	<b>NEGLIGIBLE</b>
T151(OAK)	<ul style="list-style-type: none"> <li>Flaky bark – minor, no void</li> <li>Overlapping stem/branch – but no void</li> </ul>	<ul style="list-style-type: none"> <li>Deadwood</li> <li>Collision damage</li> <li>Poor suitability</li> <li>Next to haul road</li> </ul>	<b>NEGLIGIBLE</b>	-	-
T178	<ul style="list-style-type: none"> <li>Cracks – split at 3-10m AGL north</li> </ul>	N/A	<b>HIGH</b>	-	-
T177	<ul style="list-style-type: none"> <li>Cracks – 10m AGL and 2m AGL south</li> </ul>	<ul style="list-style-type: none"> <li>Limited inspection due to quarry</li> </ul>	<b>MODERATE</b>	-	-
T175	<ul style="list-style-type: none"> <li>Rot holes – 5m AGL north</li> <li>Knot holes – 3-8m AGL east</li> </ul>	<ul style="list-style-type: none"> <li>Deadwood</li> <li>Hard to see if features are high potential due to cluttered crown.</li> </ul>	<b>MODERATE</b>	-	-

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
T184	<ul style="list-style-type: none"> <li>• Knot holes – socket, not deep</li> </ul>	N/A	LOW	-	-
T186	<ul style="list-style-type: none"> <li>• Rot holes –deadwood</li> </ul>	<ul style="list-style-type: none"> <li>• Mature</li> <li>• Would benefit from off-ground inspection</li> </ul>	LOW	-	-
T187	<ul style="list-style-type: none"> <li>• Hazard beam –cavity, 8m AGL south east</li> <li>• Cracks – 2-6m AGL south</li> <li>• Knot holes – 2m AGL south</li> </ul>	N/A	HIGH	-	-
T180	N/A	<ul style="list-style-type: none"> <li>• Lots of damage to lower limbs</li> <li>• No inspection from north west</li> </ul>	<b>NEGLIGIBLE</b> /LOW	-	-
T182	<ul style="list-style-type: none"> <li>• Knot holes – two at 8m AGL south and south west and 5m AGL north</li> </ul>	N/A	HIGH	Knot hole Stem on S side 5m AGL. No evidence of bats or use by bats.	<b>MODERATE</b>
T174	<ul style="list-style-type: none"> <li>• Rot holes – three at 3-5m AGL south and 2.5m AGL north</li> </ul>	<ul style="list-style-type: none"> <li>• Deadwood</li> </ul>	HIGH	-	-

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
T171	<ul style="list-style-type: none"> <li>Rot holes – two in north west branch</li> </ul>	<ul style="list-style-type: none"> <li>Deadwood</li> <li>Limb damage</li> </ul>	MODERATE	-	-
T170	<ul style="list-style-type: none"> <li>Rot holes – not deep</li> </ul>	<ul style="list-style-type: none"> <li>Mature but no cavities</li> </ul>	LOW	-	-
T188	<ul style="list-style-type: none"> <li>Rot holes – 2m AGL south east in deadwood knot</li> <li>Cracks – cut in split limb, 6m AGL west, also deadwood</li> <li>Knot holes – 5m AGL south west</li> </ul>	<ul style="list-style-type: none"> <li>Large tree</li> <li>Limited inspection from ground</li> </ul>	MODERATE	-	-
T189	<ul style="list-style-type: none"> <li>Rot holes – 3m AGL south</li> <li>Knot holes – 5m AGL north, 3m AGL south, 3m AGL west</li> </ul>	<ul style="list-style-type: none"> <li>Lots of deadwood</li> </ul>	HIGH	-	-
T190	N/A	<ul style="list-style-type: none"> <li>Limb scars but no cavities</li> </ul>	LOW	-	-
T322	<ul style="list-style-type: none"> <li>Woodpecker holes – 5m AGL south west and 5m AGL south east</li> <li>Rot holes – 6m AGL on north east branch</li> <li>Knot holes – 4m AGL east,</li> </ul>	<ul style="list-style-type: none"> <li>South east corner of big woodland</li> </ul>	HIGH	-	-

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
	6m AGL north, 8m AGL east				
<b>G97(C)</b>	<ul style="list-style-type: none"> <li>Hazard beam – cavity</li> </ul>	<ul style="list-style-type: none"> <li>20m oak</li> <li>10m south of haul road on eastern edge</li> </ul>	<b>MODERATE</b>	-	-
<b>G98(A)</b>	<ul style="list-style-type: none"> <li>Rot holes –3m AGL east, may lead to cavity</li> </ul>	<ul style="list-style-type: none"> <li>Western most with damage</li> </ul>	<b>HIGH</b>	-	-
<b>G62(A)</b>	<ul style="list-style-type: none"> <li>Cracks – over water, 3m AGL south</li> </ul>	<ul style="list-style-type: none"> <li>Ivy covered willow</li> </ul>	<b>LOW</b>	-	-
<b>T117</b>	<ul style="list-style-type: none"> <li>Rot holes – 2m AGL east</li> <li>Hazard beam – top branches, 4m AGL east</li> <li>Cankers</li> </ul>	<ul style="list-style-type: none"> <li>Deadwood with living part to south</li> </ul>	<b>HIGH</b>	Canker cavity. Dead stem on E side at 1m AGL. No evidence of bats or use by bats.	<b>MODERATE</b>



Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
T116	<ul style="list-style-type: none"> <li>• Knot holes – 2m AGL south, no claw marks/droppings</li> </ul>	N/A	LOW	-	-
T115	<ul style="list-style-type: none"> <li>• Rot holes – large hole, 4m AGL west on trunk</li> <li>• Hazard beams – 6m AGL west</li> </ul>	<ul style="list-style-type: none"> <li>• Hole does not appear to go anywhere but limited view from ground</li> </ul>	MODERATE	Rot hole + split wood – negligible potential. No evidence of bats or use by bats.	NEGLECTIBLE
T114	<ul style="list-style-type: none"> <li>• Rot holes – various up to 6m</li> <li>• Cracks – various up to 7m AGL</li> <li>• Flaky bark – 1.5m AGL east</li> <li>• Knot holes – around dead branch</li> </ul>	<ul style="list-style-type: none"> <li>• Not safe to climb</li> </ul>	HIGH	-	-
T112	<ul style="list-style-type: none"> <li>• Knot holes – 3m AGL south, hole around dead branch</li> </ul>	<ul style="list-style-type: none"> <li>• Black tarry marking</li> </ul>	LOW	-	-
T111	<ul style="list-style-type: none"> <li>• Rot holes – 2m AGL south, over water</li> <li>• Cracks – 3m AGL west and 3.5m AGL north on west branch</li> <li>• Flaky bark – various up to 5m</li> </ul>	N/A	MODERATE	Rot hole under the bark at the base of the snapped limb on the S side at 1.8m AGL and partially	MODERATE

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
T108	<ul style="list-style-type: none"> <li>Rot holes – 3m AGL north</li> <li>Flaky bark – negligible</li> </ul>	N/A	LOW	- dead branch on NW side at 2m AGL facing down. No evidence of bats or use by bats.	-
T101	<ul style="list-style-type: none"> <li>Rot holes – in long crevice, 6-8m west, middle trunk</li> <li>Cracks – 3m north, bracket fungus</li> <li>Knot holes – 4m, south west, 4m north west</li> </ul>	<ul style="list-style-type: none"> <li>Northern knot hole with black residue</li> </ul>	MODERATE	Rot hole Middle stem on NW side 4m AGL and woodpecker hole above long crevice, NW side 5m AGL. No evidence of bats or use by bats.	MODERATE
T98	<ul style="list-style-type: none"> <li>Cracks – likely to collect water, 8m AGL north west, above dead cut branch, 6m AGL north east</li> </ul>	N/A	LOW	-	-

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
T308	<ul style="list-style-type: none"> <li>Woodpecker holes – 2m AGL south, large cavity</li> </ul>	<ul style="list-style-type: none"> <li>8m oak</li> <li>Deadwood</li> </ul>	MODERATE	Woodpecker hole inspected. No evidence of bats or use by bats.	MODERATE
T309	<ul style="list-style-type: none"> <li>Woodpecker/rot holes – 2m AGL north</li> </ul>	<ul style="list-style-type: none"> <li>Silver birch trunk</li> </ul>	HIGH	Checked with ladder. No evidence of bats or use by bats.	MODERATE
T311	<ul style="list-style-type: none"> <li>Hazard beam – open to rain, 2m AGL</li> <li>Flaky bark – 2m AGL</li> <li>Knot holes – 2m AGL west</li> </ul>	<ul style="list-style-type: none"> <li>20m oak</li> <li>Large deadwood</li> </ul>	MODERATE	Hazard beam + broken beam + knot hole – Negligible potential.	NEGLIGIBLE
T312	<ul style="list-style-type: none"> <li>Cracks – gully on south side</li> </ul>	<ul style="list-style-type: none"> <li>20m silver birch</li> </ul>	LOW	-	-
T313	N/A	<ul style="list-style-type: none"> <li>Dead silver birch</li> <li>Significant rot</li> <li>Exposed so limited potential</li> </ul>	LOW	-	-
T97	<ul style="list-style-type: none"> <li>Rot holes – 3m east, 5m north east</li> <li>Cracks – 15m east</li> <li>Knot holes – 3m south, 4m south, two at 6m south east</li> </ul>	N/A	HIGH	Knot hole main stem on SW side at 3m AGL. Rot hole in snapped limb on S	HIGH

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
T307	<ul style="list-style-type: none"> <li>Woodpecker holes – six woodpecker holes, 9m AGL east and one on north east side of branch at 8.5m AGL</li> </ul>	<ul style="list-style-type: none"> <li>20m oak with wide crown</li> <li>Minor deadwood</li> </ul>	<b>MODERATE</b>	side at 3m AGL. Rot hole limb on E side at 3m AGL – droppings found and sent away for DNA analysis.	<b>LOW</b>
T314	<ul style="list-style-type: none"> <li>Woodpecker holes – 4m north</li> <li>Cracks – two at 4m north</li> </ul>	<ul style="list-style-type: none"> <li>17m oak</li> <li>Deadwood</li> </ul>	<b>MODERATE</b>	Limited opportunity for use by bats. No evidence of bats or use by bats.	<b>LOW</b>
T315	N/A	<ul style="list-style-type: none"> <li>30m oak</li> <li>No features seen but mature with deadwood</li> </ul>	<b>NEGLECTIBLE /LOW</b>	-	-
T316	<ul style="list-style-type: none"> <li>Flaky bark – various</li> <li>Woodpecker hole on stem growing towards field, W side at 7m AGL.</li> <li>Rot holes – Stem growing towards field, W side at 6-8m AGL</li> </ul>	<ul style="list-style-type: none"> <li>10m oak</li> <li>Deadwood on south</li> </ul>	<b>HIGH</b>	Yes, no evidence of bats or use by bats but potential exists.	<b>MODERATE</b>

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
<b>T317</b>	<ul style="list-style-type: none"> <li>Rot holes – 3m east, with cavity</li> </ul>	<ul style="list-style-type: none"> <li>Silver birch</li> </ul>	<b>MODERATE</b>	Rot holes inspected, negligible potential for roosting bats.	<b>NEGLIGIBLE</b>
<b>T318</b>	<ul style="list-style-type: none"> <li>Knot holes – 6m north</li> <li>Scar on large limb on N side, 7m AGL</li> </ul>	<ul style="list-style-type: none"> <li>20m oak</li> </ul>	<b>HIGH</b>	Yes, no evidence of bats or use by bats but high potential exists.	<b>HIGH</b>
<b>T319</b>	<ul style="list-style-type: none"> <li>Cracks – open at top</li> <li>Knot holes – 2m east</li> <li>Rot holes under the snapped limb, N side at 4m AGL</li> </ul>	<ul style="list-style-type: none"> <li>Pollard-like oak</li> </ul>	<b>MODERATE</b>	Limited opportunity for use by bats. No evidence of bats or use by bats.	<b>LOW</b>
<b>T320</b>	<ul style="list-style-type: none"> <li>Woodpecker/ rot holes – 2m and 3m AGL to the east</li> <li>Knot holes – two at 2.5m AGL north</li> </ul>	<ul style="list-style-type: none"> <li>Wide grown oak on north side of ditch</li> </ul>	<b>HIGH</b>	Yes, no evidence of bats or use by bats but high potential exists.	<b>HIGH</b>
<b>T92</b>	<ul style="list-style-type: none"> <li>Knot holes – 1m AGL south, cluttered</li> </ul>	N/A	<b>LOW</b>	-	-
<b>G108 A</b>	<ul style="list-style-type: none"> <li>Woodpecker holes – two in decline</li> </ul>	<ul style="list-style-type: none"> <li>Dead cherry tree</li> <li>Likely to fall</li> <li>Under two oaks</li> </ul>	<b>MODERATE</b>	-	-

Tree ID	Features	Comments	Potential	Climbing Results	Revised Potential
<b>G108 B</b>	<ul style="list-style-type: none"> <li>Large cavity with bird droppings</li> </ul>	<ul style="list-style-type: none"> <li>Large oak</li> </ul>	<b>MODERATE</b>	-	-
<b>G108 C</b>	<ul style="list-style-type: none"> <li>Cavity (cobwebs over cavity)</li> </ul>	<ul style="list-style-type: none"> <li>Along boundary line</li> </ul>	<b>MODERATE</b>	-	-
<b>G108 D</b>	<ul style="list-style-type: none"> <li>Cracked limb</li> <li>Damaged structure</li> </ul>	<ul style="list-style-type: none"> <li>Along boundary line</li> </ul>	<b>MODERATE</b>	-	-
<b>G108 E</b>	<ul style="list-style-type: none"> <li>Rear side from track with old damaged lower trunk</li> <li>Hole at the top of damaged area into trunk</li> </ul>	<ul style="list-style-type: none"> <li>Oak, midway along boundary line</li> </ul>	<b>MODERATE</b>	-	-
<b>G108 G</b>	<ul style="list-style-type: none"> <li>Several dead limbs</li> <li>One fractured limb with multiple splits, voids and cavities</li> </ul>	<ul style="list-style-type: none"> <li>Oak</li> </ul>	<b>MODERATE</b>	-	-

**Annex 10.1.8**

Bat Trapping Details

### Annex 10.1.1.8 – Bat Trapping Details

Date	Trap ref	Time	Species	Sex	Age	Breeding status	Tag ref
27/06/2016	1	23:40	Soprano pipistrelle	Female	Adult	Preg	
	1	23:40	Common pipistrelle	Male	Adult		
	2	23:51	Brown long-eared	Female	Adult	Preg	
	1	23:57	Common pipistrelle	Male	Adult		
	1	00:38	Brandt's	Male	Adult		
	1	00:38	Natterer's	Female	Adult	non breeding	
	2	01:05	Brown long-eared	Male	Adult		
	1	01:50	Daubenton's	Male	Adult		
	1	01:50	Whiskered	Male	Adult		
	5	22:40	Daubenton's	Male	Adult		Bat1
	5	23:40	Common pipistrelle	Female	Adult	non breeding	
	6	23:40	Brown long-eared	Female	Adult	non breeding	Bat2
	6	23:55	Common pipistrelle	Female	Adult	Preg	
	5	00:40	Natterer's	Female	Adult	non breeding	Bat3
4	01:10	Brown long-eared	Male	Adult			
28/06/2016	10	22:42	Soprano pipistrelle	Female	Adult	Preg	
	10	22:42	Soprano pipistrelle	Female	Adult	non breeding	
	10	22:42	Soprano pipistrelle	Female	Adult	non breeding	
	10	01:30	Soprano pipistrelle	Female	Adult	Lact	
30/06/2016			No bat captures				



Date	Trap ref	Time	Species	Sex	Age	Breeding status	Tag ref
22/08/2016	1	21:05	Common pipistrelle	Female	Juv		
	4	22:00	Serotine	Male	Adult		
	1	22:05	Soprano pipistrelle	Male	Adult		
	1	22:26	Common pipistrelle	Male	Juv		
	1	22:26	Whiskered/ Brandt's	Female	Adult	Post Lact	Bat4
	2	22:35	Brown long-eared	Female	Adult	Post Lact	Bat5
	1	23:15	Natterer's	Female	Adult	non breeding	
	1	00:20	Common pipistrelle	Male	Adult		
	1	01:05	Noctule	Male	Adult		
	1	01:10	Soprano pipistrelle	Female	Juv		
	4	21:15	Whiskered	Male	Adult		
	5	21:41	Soprano pipistrelle	Male	Juv		
	5	22:20	Noctule	Female	Juv		
	6	22:22	Noctule	Female	Juv		
23/08/2016	7	23:07	Brown long-eared	Male	Adult		
	7	23:07	Serotine	Male	Adult		
	5	23:26	Whiskered/Brandt's	Female	Juv		
	5	23:26	Whiskered/Brandt's	Female	Adult	Post Lact	
	7	23:20	Brown long-eared	Female	Adult	Post Lact	
	7	00:15	Whiskered/Brandt's	Female	Adult	Post Lact	
	6	00:28	Brown long-eared	Male	Adult		Bat6
	7	01:00	Soprano pipistrelle	Female	Adult		
		00:00	Natterer's	Female	Adult	Lactating	Bat106
		02:42	Brown long-eared	Female	Adult	Heavily pregnant	
	25/06/2017	Woodland strip north bank Staffordshire Worcester canal		No captures			

26/06/2017	Unnamed copse, Calf Heath Small copse on south boundary of Staffordshire Worcester canal Staffordshire Worcester canal (towpath location 1) Staffordshire Worcester canal (towpath location 2) Staffordshire Worcester	22:29	Whiskered	Male	Adult		
		00:15	Whiskered	Male	Adult		
		00:15	Daubenton's	Male	Adult		
		00:15	Brown long-eared	Male	Adult		
		00:36	Soprano pipistrelle	Female	Adult	Lactating	
		01:11	Soprano pipistrelle	Female	Adult	Lactating	
		02:00	Brown long-eared	Male	Adult		Bat406
		02:00	Brown long-eared	Female	Adult	Heavily pregnant	
		02:00	Brown long-eared	Female	Adult	Heavily pregnant	
		02:00	Brown long-eared	Female	Adult	Heavily pregnant	
		02:11	Brown long-eared	Female	Adult	Heavily pregnant	
		23:35	Natterer's	Female	Adult	Lactating	
		23:43	Brown long-eared	Male	Adult	n/a	
		23:55	Daubenton's	Male	Adult	n/a	Bat206
		00:16	Common pipistrelle	Male	Adult	n/a	
00:16	Common pipistrelle	Male	Adult	n/a			
23:30	Whiskered/Brandt's	Female	Adult	Lactating	Bat 306		

	canal (towpath location 3)	23:50	Soprano pipistrelle	Female	Adult	Lactating	
	Small copse on south boundary of Staffordshire Worcester canal	00:05	Daubenton's	Male	Adult	/	
27/08/2017	Woodland strip north bank Staffordshire Worcester canal	01:35	Soprano pipistrelle	Female	Adult	Lactating	Bat208
		22:15	Noctule	Female	Juvenile		
		23:12	Brown long-eared	Female	Adult	Post-lactating	
		23:12	Brown long-eared	Male	Adult		
		23:12	Brown long-eared	Male	Juvenile		
		23:12	Brown long-eared	Female	Juvenile		
		23:42	Noctule	Female	Juvenile		
		00:29	Brown long-eared	Female	Juvenile		
		02:22	Common pipistrelle	Female	Adult	Post-lactating	
		N/A	N/A	N/A	N/A	N/A	
28/08/2017	Small copse on the edge of the field	20:40	Brown long-eared	Female	Juvenile	N/A	Bat 108
		21:06	Noctule	Male	Adult	N/A	
		21:45	Natterer's	Male	Juvenile	N/A	Bat308
		21:34	Brown long-eared	Female	Adult	Post-lactating	
		22:07	Brown long-eared	Female	Adult	Post-lactating	
		22:07	Brown long-eared	Female	Juvenile		
		22:13	Natterer's	Female	Juvenile		
		22:39	Soprano pipistrelle	Male	Juvenile		
		22:44	Soprano pipistrelle	Male	Juvenile		
		23:21	Soprano pipistrelle	Male	Adult		
23:21	Daubenton's	Female	Adult	Non-reproductive	Bat408		



**Annex 10.1.9**

Bat Dropping DNA Analysis Results

17 December 2016

Re: Bat Identification Results for James Fraser, Ramboll Environ

Bat job number 8840, received 05 December 2016

Sample labelled: Ramboll- Woodside- Barn - 02

PCR amplification successful. DNA sequence:

```
ATGACAAACATTTCGAAAGTCCCACCCCCTGATCAAATCATCAATAACTCATTTCATTG
ATCTACCAGCTCCATCAAACATTTTCAGCATGATGAAATTTTGGGTCCCTATTAGGCAT
CTGTTGGACTAC
```

Phylogenetic analysis identification: *Pipistrellus pipistrellus*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

The EcoWarwick Team

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

**Professor Robin Allaby**

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17 December 2016

Re: Bat Identification Results for James Fraser, Ramboll Environ

Bat job number 8841, received 05 December 2016

Sample labelled: Ramboll- Woodside- Barn - 03

PCR amplification successful. DNA sequence:

```
ATGACCAACATTTCGAAAGTCTCACCCCTAATGAAAATTATCAATAACTCCTTTATTGA  
CCTACCCGCTCCATCAAATATCTCTTCCTGATGGAATTTCCGATCTCTTTTAGGAATC  
TGCTGGCATAC
```

Phylogenetic analysis identification: *Myotis nattereri*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

The EcoWarwick Team

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

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17 December 2016

Re: Bat Identification Results for James Fraser, Ramboll Environ

Bat job number 8842, received 05 December 2016

Sample labelled: Ramboll- Woodside- Barn - 04

PCR amplification successful. DNA sequence:

```
ATGACCAACATTTCGAAAGTCTCACCCCCTAATGAAAATTATCAATAACTCCTTTATTGA  
CCTACCCGCTCCATCAAATATCTCTTCCTGATGGAATTTCCGATCTCTTTTAGGAATC  
TGCTGGCA
```

Phylogenetic analysis identification: *Myotis nattereri*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

The EcoWarwick Team

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

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21 December 2016

Re: Bat Identification Results for James Fraser, Ramboll Environ

Bat job number 8839, received 05 December 2016

Sample labelled: Ramboll- Woodside- Barn - 01

PCR amplification successful. DNA sequence:

```
ATGACCAACATTTCGAAAGTCCCACCCTCTCATAAAAATTATCAATGATTCATTCATTGA  
CTTACCTGCTCCCTCAAATATTTTCATCATGGTGAAACTTTGGGTCTCTTCTAGGTATT  
GCCTAGCAC
```

Phylogenetic analysis identification: *Plecotus auritus*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

The EcoWarwicker Team

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

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23 May 2017

Re: Bat Identification Results for James Fraser, Ramboll Environ

Bat job number 9475, received 10 May 2017

Sample labelled: ME1 Ramboll- Mile End Cottage-01

PCR amplification successful. DNA sequence:

ATGACTAACATCCGAAAAACCCACCCATTAATAAAAATCGTTAACAGCTCATTATTG  
ATTACCTGCCCATTC AATATTTTCATCATGATGAAACTTTGGCTCCCTC

Phylogenetic analysis identification: *Sorex minutus*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

Professor Robin Allaby

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

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23 May 2017

Re: Bat Identification Results for James Fraser, Ramboll Environ

Bat job number 9474, received 10 May 2017

Sample labelled: Ramboll- Heath Farm- 01

PCR amplification successful. DNA sequence:

ATGACCAACATTTCGAAAGTCCCACCCTCTCATAAAAATTATCAATGACTCATTTCATTG  
ACTTACCTGCTCCCTCATAATATTTTCATCATGATGAAACTTTGGATCTCATCTAGGC

Phylogenetic analysis identification: *Plecotus auritus*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

Professor Robin Allaby

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

**Professor Robin Allaby**

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Tel: 02476575059  
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18 June 2017

Re: Bat Identification Results for James Fraser, Ramboll Environ

Bat job number 9552, received 23 May 2017

Sample labelled: Ramboll-Croft-House-01. CH1 Four Ashes, Croft House. 18/5/17

PCR amplification successful. DNA sequence:

TCAGCCGTAGTTTACGTCTCGGCAGATTGCGTGACTGATGAGAAGGCAGTTATTGTG  
TCTGATGTGTAG

Phylogenetic analysis identification: *Sorex minutus*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

Professor Robin Allaby

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

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23 May 2017

Re: Bat Identification Results for James Fraser, Ramboll Environ

Bat job number 9477, received 10 May 2017

Sample labelled: CV1 Ramboll- Clovelly- 02

PCR amplification successful. DNA sequence:

TTCTCTACTAGGAATTTGCCTTATAATCCAAATGCTCACAGGCCTATTTCTAGCAATA  
CACTACACATCAGGACACAATAACAG

Phylogenetic analysis identification: *Apodemus sylvaticus*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

Professor Robin Allaby

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

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23 May 2017

Re: Bat Identification Results for James Fraser, Ramboll Environ

Bat job number 9476, received 10 May 2017

Sample labelled: CV1 Ramboll- Clovelly- 01

PCR amplification successful. DNA sequence:

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ATGACCAACATTTCGAAAGTCCCACCCTCTCATAAAAATTATCAATGACTCATTTCATTG
ACTTACCTGCTCCCTCAAATATTTTCATCATGATGAAACTTTGGATCTCTTCTAGGCATT
GCCTAGCACT
```

Phylogenetic analysis identification: *Plecotus auritus*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

Professor Robin Allaby

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

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