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BAT GROUND LEVEL TREE ASSESSMENT

At

Plot 3A

Wrexham Industrial Estate
Wrexham
Wrexham County Borough
L22 3XS

NGR: SJ 39272 50416

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A handwritten signature in black ink, appearing to read 'Toby Hart', is positioned below the 'Approved by:' line.

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EXECUTIVE SUMMARY

This report is written by Robert Mooney MSc, Graduate Ecologist at United Environmental Services Ltd (UES). It provides an assessment of the potential impacts on bats as a result of the tree works associated with a proposed development at Plot 3A, Wrexham Industrial Estate, Wrexham. The development proposals include the construction of large industrial units with associated parking and infrastructure. No detailed tree removal plan has been provided to UES at the time of writing, but the works are likely to involve the removal of a large number of mature and semi-mature trees in order to facilitate the development. However, it is likely that the trees along the northern site boundary that form a strip of woodland will be retained as part of the proposals.

All trees on site were subjected to a ground-level assessment of potential to support roosting bats between 15th February and 4th April 2022. All potential roosting features (PRFs) which could be accessed from ground level were closely inspected for bat presence and features associated with bat activity, as detailed in Bat Conservation Trust (BCT) guidance (Collins, 2016).

The site provides mostly moderate-quality habitat for foraging and commuting bats. The presence of the ponds and areas of woodland, scrub and rough grassland provide foraging and commuting opportunities, whilst roosting opportunities are also potentially available within mature trees. The ponds and woodland provide pockets of high-quality foraging and commuting habitat, while the areas of hardstanding provide low-quality habitat.

No evidence of roosting bats was observed within any of the trees on site, however PRFs were noted in 46 individual trees or groups of trees. Of these, 3 were found to be unsuitable for bats on closer inspection, and require no further survey work or mitigation measures, along with the trees on site which contain no PRFs.

The majority of the trees on site do not contain any PRFs and were assessed as having negligible potential to support roosting bats. This includes T2, T16 and T18 which were assessed as having negligible potential to support roosting bats following a close inspection with an endoscope. These trees may be felled without restriction with regard to bats.

22 trees along the northern site boundary are noted as containing PRFs of at least low roosting potential for bats. It is expected that these trees will be retained under the current proposals and as such, no further survey work or mitigation measures are required. However, if the impact on these trees are to change as a result of future changes to the site plans, further surveys and mitigation measures will be required, as detailed in section 4.2.1 of this report.

The remaining 21 trees or groups of trees which are considered to contain low, moderate or high potential to support roosting bats may be removed to facilitate the development proposals. Further mitigation measures and/ or aerial tree inspections or bat presence / absence surveys should be undertaken of these trees, as detailed in section 4.2.1 of this report.

In order to compensate for the loss of potential roosting habitats on site, a selection of bat boxes should also be incorporated into the retained trees. Additional bat boxes should be provided to ensure there is an enhancement in the roosting opportunities available on site.

The report should be read in conjunction with appendices 1 to 5.



1 INTRODUCTION

1.1 Author, surveyors and qualifications

This report is compiled and written by Robert Mooney MSc, UES Graduate Ecologist. Robert is trained in tree climbing and aerial rescue to CS38 level.

Other surveyors include:

- Mark Halliwell MBIol, UES Ecologist. Mark is licensed by Natural England to survey all species of bats by observation using an artificial light under licence number 2020-45183-CLS-CLS (level 1). Mark is also trained in tree climbing and aerial rescue to CS38 level.
- Alasdair Grubb BSc, UES Ecologist. Alasdair is licensed by Natural England to survey all species of bats by observation using an artificial light under licence number 2020-45183-CLS-CLS (level 1). Alasdair is also trained in tree climbing and aerial rescue to CS38 level.
- Daniel Smith BSc MScRes, UES Ecologist
- Noah Fulton BSc, UES Graduate Ecologist.

All surveyors have the knowledge, skills and experience identified within CIEEM's "Competencies for Species Survey: Bats" (2013).

1.2 Survey objectives

UES was commissioned in September 2021 to conduct site surveys which include the following activities:

- Assess the suitability and potential of the trees for use by roosting bats
- Conduct aerial tree inspections of all trees identified as having potential to support roosting bats in order to look for bats or field signs of bats
- Recommend further surveys, mitigation and compensation, where appropriate

1.3 Proposed development

The development proposals include the construction of large industrial units with associated parking and infrastructure. No detailed tree removal plan has been provided to UES at the time of writing, but the works are likely to involve the removal of a large number of mature and semi-mature trees in order to facilitate the development. However, it is likely that the trees along the northern site boundary that form a strip of woodland will be retained as part of the proposals.

1.4 Structure of the report



This report sets out the methodology, results, and recommendations in relation to a specific bat survey. Recommendations are in line with statutory legislation and planning policy objectives.

The report should be read in conjunction with appendices 1 to 5.

2 METHODOLOGY

2.1 General

All surveys were carried out to recognised guidelines, timings and weather conditions, with particular reference to Natural England and BCT publications (see references for further information).

The habitats on site and in the surrounding area were also assessed during a walkover survey and through studying aerial photographs in order to gauge their suitability to support roosting, foraging and commuting bats.

2.2 Ground-level tree assessment

A ground-level assessment was carried out of all trees on site between the 15th February and 4th April 2022, using binoculars and a high-powered torch. Trees were inspected on all aspects and assessed for their potential to contain roosting bats, based on the number and quality of suitable roosting features present, as detailed in BS8596:2015 Surveying for Bats in Trees and Woodland and BCT guidelines (Collins, 2016).

Potential roosting features, as described in Bat Roosts in Trees (Bat Tree Habitat Key, 2018) are listed in Table 1 below.

Table 1 – Types of PRFs found in trees

DISEASE & DECAY FEATURES	DAMAGE FEATURES	ASSOCIATION FEATURES	OTHER FEATURES
Woodpecker holes	Lightning strikes	Fluting	Bat boxes
Squirrel holes	Hazard beams	Ivy	Bird boxes
Knot holes	Subsidence cracks		
Pruning cuts	Shearing cracks		
Tear-outs	Transverse snaps		
Wounds	Welds		
Cankers	Lifting bark		
Compression forks	Desiccation fissures		
Butt rots	Frost cracks		

Based on the quality of features present, trees were given a rating of negligible, low, moderate or high suitability for roosting bats.

Where accessible, PRFs at ground level were inspected with an endoscope by the licensed ecologist, in order to identify any roosting bats or field signs of bats and to inspect the internal conditions of the PRF. Field signs of bats include:

- Scratches, staining or droppings around entry points or within a cavity
- Presence of bat-fly cases
- Odour
- Smoothing of surfaces around cavity
- Audible chattering / squeaking at dusk or in warm weather (during the active season)



2.3 Survey limitations

The trees were surveyed relatively early in the year when bats are spending large amounts of time in torpor. However, this type of survey can be carried out at any time of year, and bats use different types of tree roosts at different times of year. Moreover, due to a lack of vegetation cover a more detailed ground-level assessment was possible than if the surveys were conducted in the summer months. Therefore, this is not considered to be a significant limitation to the survey.



3 RESULTS

3.1 Habitat assessment

Plot 3A is found at the north-eastern edge of Wrexham Industrial Estate east of the city of Wrexham. Habitats within the development boundary include semi-improved grassland, continuous scrub, broadleaved semi-natural woodland, scattered scrub and trees, tall ruderal vegetation, amenity grassland and five ponds of varying size. Rough semi-improved grassland and continuous scrub comprise the majority of the site area. There are two large areas of hardstanding, one towards the north-west corner of the site and another in the south-eastern corner.

The local area consists of agricultural land to the north, east and south-east of the site, with the rest of Wrexham Industrial Estate to the south-west. Tree lines and hedgerows divide the fields in the nearby agricultural land, providing potential bat foraging and commuting habitat. A large number of ponds are present both in the industrial estate and agricultural land surrounding the site.

In the wider surrounding area, two golf courses are found to the immediate north-west of Wrexham Industrial Estate, featuring large numbers of trees. The town of Wrexham is found further to the west of the industrial estate, while agricultural land dominates the landscape in all other directions. Some small patches of woodland are found nearby, particularly to the south near the River Clywedog which joins the Dee to the south-east of the industrial estate.

In summary, Plot 3A provides largely moderate quality habitat for foraging and commuting bats, with smaller areas of high-quality habitat in the form of the woodland and ponds, and low-quality habitat in the form of hardstanding and amenity grassland. The presence of the many ponds and areas of rough grassland, scrub, woodland, and scattered mature trees both within the site and in the local area provide foraging and commuting opportunities, whilst roosting opportunities area also potentially available from nearby residential and agricultural buildings and mature trees.

3.2 Tree assessments

All trees on site were assessed for any PRFs which could support roosting bats. Trees which are considered to have low, moderate or high potential for bat roosting due to the presence of PRFs were recorded and are listed below, in addition to those which contained features which initially appeared suitable but were discounted upon close inspection. A total of 49 such trees were surveyed:

T1 is a dead tree of unknown species which lies at the south-west corner of the site, surrounded by dense scrub. It is approximately 3m in height with a diameter at breast height (DBH) of 0.7m. The tree features fissures in the stem and knot holes, and is considered to have moderate roosting potential.

T2 is a mature ash *Fraxinus excelsior* located found on the western boundary of the site, just beyond the scrub which runs along a watercourse. It is approximately 14m in height with a DBH of 0.6m. The tree features a knot hole at 3m on its southern aspect. This feature could be fully inspected and was found to be shallow, superficial and unsuitable for roosting bats. This tree is considered to have negligible potential to support roosting bats.

T3 is a mature pedunculate oak *Quercus robur* found on the western boundary of the site, just beyond the scrub which runs along a watercourse. It is approximately 14m in height with a



DBH of 0.5m. The tree features a basal stem cavity reaching 1.5m from the ground on its western aspect, and a tear out at around 8m on its eastern aspect. The basal stem cavity could not be fully inspected as it extends beyond endoscope reach up the stem. This tree is considered to have moderate roosting potential.

T4 is a mature oak located in the scrub along the eastern boundary of the lorry park. It is approximately 8m in height with a DBH of 0.8m. The tree features sparse ivy cover on the stem and crown which may provide PRFs. The tree is considered to have low roosting potential.

T5 is a large Lombardy poplar *Populus nigra* "*Italica*" found just beyond the north-west corner of the site. It is approximately 25m in height with a DBH of 1.2m. The tree features a hollow stem from ground level upwards. This tree is considered to have moderate potential to support roosting bats.

T6 is the northernmost of a line of mature pedunculate oaks found in the continuous scrub which separates two areas of rough grassland in the north-west of the site. It is approximately 9m in height with a DBH of 0.8m. The tree features two tear outs on its western aspect at ~2.5m and 4m, large areas of flaking bark, and several hollow limbs. This tree is considered to have high potential to support roosting bats.

T7 is a mature pedunculate oak found just to the south of T6, in the same line of scrub. It is approximately 9m in height with a DBH of 1.0m. This tree features a large callus roll from ground level on its south-eastern aspect, and an area of lifted bark at around 2m on its southern aspect. This tree is considered to have high potential to support roosting bats.

T8 is the next mature pedunculate oak in the line of scrub, heading south. It is approximately 12m in height and has a DBH of 1.0m. The tree features a broken branch at around 5m on its eastern aspect, and deadwood at 3m on its north-western aspect. This tree is considered to have moderate potential to support roosting bats.

T9 is the next mature pedunculate oak in the line of scrub, heading south. It is approximately 7m in height and has a DBH of 0.5m. The tree features a hollow branch cavity on its western aspect at a height of 3m. The eastern aspect of the tree could not be inspected from ground level. This tree is considered to have moderate potential to support roosting bats.

T10 is the next mature pedunculate oak in the line of scrub, heading south. It is approximately 15m in height with a DBH of 1.0m. The tree features loose bark around some deadwood at 7m on its western aspect, a tear out at 6m on its northern aspect, a callus roll at ground level and another at 4m on its southern aspect, and a knot hole at 12m on its southern aspect. This tree is considered to have high potential to support roosting bats.

T11 is the next mature pedunculate oak in the line of scrub, heading south. It is approximately 13m in height with a DBH of 0.8m. PRFs include a callus roll 5m from ground level on an upward-facing branch on the tree's south-western aspect and a crack in deadwood at 5m on the eastern aspect. This tree is considered to have moderate roosting potential.

T12 is the southernmost pedunculate oak in the line of scrub. It is approximately 13m tall with a DBH of 0.8m. The tree features a knot hole on a branch elbow at a height of 4m on the tree's north-eastern aspect. This tree is considered to have moderate potential to support roosting bats.

T13 is a mature pedunculate oak in the dense scrub on the eastern side of the lorry park. It is approximately 13m in height with a DBH of around 1.0m. The tree features low density ivy cover which may provide small roosting features. This tree is considered to have low potential to support roosting bats.



T14 is a mature pedunculate oak in the dense scrub on the eastern side of the lorry park. It is approximately 15m in height with a DBH of 0.8m. The tree features a tear out at 3.5m on its western aspect, an adjacent callus roll, and a stem cavity at 8m on the tree's northern aspect. This tree is considered to have moderate potential to support roosting bats.

T15 is a mature pedunculate oak in the dense scrub on the eastern side of the lorry park. It is approximately 17m in height with a DBH of 0.8m. The tree features exposed heartwood on the northern aspect of its trunk at a height of 7m, and the trunk and crown feature light ivy cover. This tree is considered to have moderate roosting potential.

T16 is a semi-mature crack willow *Salix fragilis* found on the western bank of a large pond towards the south-east of the site, among scrub. It features a branch cavity showing exposed heartwood at 1.8m on its southern aspect. This feature was inspected and found to be superficial and unsuitable to support roosting bats as there is no sheltered cavity. This tree is considered to have negligible potential to support roosting bats.

T17 is a mature hawthorn *Crataegus monogyna* in the broadleaved woodland which stretches along the northern boundary of the site. It is approximately 7m in height with a DBH of 0.25m and features sparse ivy cover, which may provide some small PRFs. This tree is considered to have low potential to support roosting bats.

T18 is a mature hawthorn in the broadleaved woodland which stretches along the northern boundary of the site. It is approximately 7m in height, and its DBH could not be assessed due to the high density of the vegetation around the tree. This tree features ivy cover which may provide some roosting features, however the dense vegetation found around this tree provides too much clutter for any features to be suitable. This tree is therefore considered to have negligible potential to support roosting bats.

T19 is a mature hawthorn in the broadleaved woodland which stretches along the northern boundary of the site. It is approximately 7m in height with a DBH of 0.2m and features sparse ivy cover, which may provide some small PRFs. This tree is considered to have low potential to support roosting bats.

T20 is a mature ash in the broadleaved woodland which stretches along the northern boundary of the site. It is approximately 14m in height with a DBH of 0.7m. The tree features two large knot holes on its southern aspect at a height of 4m. The south aspect also features cavities created by flaking bark at 2-3m, and a smaller knot hole at 3m. This tree is considered to have high roosting potential.

T21 is a dead tree stump of unknown species around 1.5m in height with a DBH of 0.5m. It features fissures in the top of the stump and along its whole height on its south-western and south-eastern aspects. This tree is considered to have low potential to support roosting bats.

T22 is a mature pedunculate oak in the broadleaved woodland which stretches along the northern boundary of the site. It is approximately 12m in height with a DBH of 0.5m. A small basal cavity is found on the south aspect of the tree. This tree is considered to have low potential to support roosting bats.

T23 is a mature pedunculate oak in the broadleaved woodland which stretches along the northern boundary of the site. It is approximately 13m in height with a DBH of 0.5m. The tree's southern aspect features a tear out at 3m on its southern aspect and a cavity at 2.5m. This tree is considered to have moderate potential to support roosting bats.



T24 is a mature crack willow in the broadleaved woodland which stretches along the northern boundary of the site. It is approximately 16m in height with a DBH of 0.7m. The tree features a trunk cavity at 6m on its southern aspect and a branch cavity on a south-leaning limb at 7m. This tree is considered to have moderate potential to support roosting bats.

T25 is a mature pedunculate oak in the broadleaved woodland which stretches along the northern boundary of the site. It is approximately 13m in height with a DBH of 0.7m. The southern aspect of the tree features ivy cover from the ground level upwards which creates PRFs where the ivy meets the trunk. This tree is considered to have moderate potential to support roosting bats.

T26 is a mature crack willow in the broadleaved woodland which stretches along the northern boundary of the site. It is approximately 16m in height with a DBH of 1.0m. The tree features a hollow northward-facing branch and several woodpecker holes on its southern aspect up to a height of 10m. The tree is considered to have high potential to support roosting bats.

T27 is a mature pedunculate oak in the broadleaved woodland which stretches along the northern boundary of the site. It is approximately 16m in height with a DBH of 1.0m. The tree features a cavity on a southward-facing branch at a height of 4m, a stem cavity at 3m on its western aspect, and a branch weld at 4m on its southern aspect. This tree is considered to have high roosting potential.

T28 is a mature pedunculate oak in the broadleaved woodland which stretches along the northern boundary of the site. It is approximately 16m in height with a DBH of 1.0m. The tree features two stem cavities on a south-east leaning limb at a height of 3m, and PRFs created where ivy meets the tree trunk. This tree is considered to have moderate roosting potential.

T29 is a mature pedunculate oak in the broadleaved woodland which stretches along the northern boundary of the site. It is approximately 8m in height with a DBH of 0.3m. The tree features a stem cavity at 1.5m on its southern aspect which extends around 0.3m up and 0.4m down from the entrance. This tree is considered to have moderate potential to support roosting bats.

T30 is a mature hawthorn in the broadleaved woodland which stretches along the northern boundary of the site. It is approximately 10m in height with a DBH of 0.25m, and features a stem cavity at 1.5m on its southern aspect. This tree is considered to have low roosting potential.

T31 is a mature pedunculate oak in the broadleaved woodland which stretches along the northern boundary of the site. It is approximately 10m in height with a DBH of 1.5m. This tree features stem cavities on its western aspect from ground level to 5m with two associated basal cavities, and a v-join cavity on its southern aspect at 2.5m. This tree is considered to have high potential to support roosting bats.

T32 is a mature pedunculate oak in the broadleaved woodland which stretches along the northern boundary of the site. It is approximately 14m in height with a DBH of 2m. The tree features a v-split stem cavity on its western aspect at a height of 2m, and its eastern aspect features deadwood at 7m as well as PRFs created by flaking bark. This tree is considered to have high roosting potential.

T33 is a mature hawthorn with a twin stem in the broadleaved woodland which stretches along the northern boundary of the site. It is approximately 6m in height with a DBH of 0.2m. The southern stem has stem cavities on its southern and western aspects at 1.5 and 0.3m respectively, while the northern stem has a basal cavity on its western aspect. This tree is considered to have moderate roosting potential.



T34 is a mature pedunculate oak found in the broadleaved woodland which stretches around a large pond in the south-east of the site. It is approximately 20m in height with a DBH of 1.0m. This tree features deadwood at 3m on its northern aspect and at 7m on both its northern and southern aspects. This tree is considered to have moderate roosting potential.

T35 is a mature pedunculate oak found in the broadleaved woodland which stretches around a large pond in the south-east of the site. It is approximately 20m in height with a DBH of 1.0m. It has a stem cavity at 3.5m on its southern aspect, a knothole and deadwood on a western branch at 10m, and deadwood on the trunk at 4, 7 and 8m on its western, eastern, and southern aspects respectively. This tree is considered to have moderate potential to support roosting bats.

T36 is a mature goat willow *Salix caprea* found in the broadleaved woodland which stretches around a large pond in the south-east of the site. It is approximately 8m in height with a DBH of 0.2m. It features a stem cavity on its northern aspect at 1m height. It is considered to have low roosting potential.

T37 is a mature silver birch *Betula pendula* among scattered scrub near the eastern boundary of the site. It is approximately 12m in height with a DBH of 0.3m. This tree has a number of fissures in its bark from ground level up to 1.0m on all aspects, creating many small PRFs. This tree is considered to have low potential to support roosting bats.

T38 is a mature silver birch found in the broadleaved woodland which stretches around a large pond in the south-east of the site. It is approximately 12m in height with a DBH of 0.4m. This tree has a number of fissures in its bark from ground level up to 1.5m on all aspects, creating many small PRFs. This tree is considered to have low potential to support roosting bats.

T39 is a mature goat willow found in the broadleaved woodland which stretches around a large pond in the south-east of the site. It is approximately 5m in height with a DBH of 0.2m. It features stem cavities on all aspects from ground level up to a height of 1.0m, a branch cavity at 0.5m on its northern aspect, and welds at 1.0m on its southern aspect. It is considered to have low potential to support roosting bats.

T40 is a mature pedunculate oak found in the dense scrub which runs along the watercourse in the north-west corner of the site. It is approximately 13m in height with a DBH of 1.5m. It features a stem cavity at a height of 3m on its western aspect and extensive ivy cover on its trunk on aspects. This tree is considered to have moderate potential to support roosting bats.

T41 is a mature crack willow found in the dense scrub which runs along the watercourse in the north-west corner of the site. It is approximately 8m in height with a DBH of 0.3m. It features ivy cover on all aspects. This tree is considered to have low potential to support roosting bats.

T42 is a mature pedunculate oak found in the dense scrub which runs along the watercourse in the north-west corner of the site. It is approximately 12m in height with a DBH of 0.7m. The tree features dense ivy cover on all aspects and is considered to have moderate potential to support roosting bats.

T43 is a mature pedunculate oak found in the dense scrub which runs along the watercourse in the north-west corner of the site. It is approximately 12m in height with a DBH of 0.7m. The tree features dense ivy cover on all aspects and is considered to have moderate potential to support roosting bats.



T44 is a mature pedunculate oak found in the dense scrub which runs along the watercourse in the north-west corner of the site. It is approximately 10m in height with a DBH of 0.5m. It features a knot-hole on its western aspect at a height of 3m and a weld at a height of around 4m on its southern aspect. This tree is considered to have moderate potential to support roosting bats.

T45 is a mature crack willow found on an island in a pond in the south of the site. It is approximately 16m in height with a DBH of ~1m. This tree cannot be fully inspected due to its position, although missing bark can be observed on its eastern aspect at a height of around 10m, possibly indicating a cavity underneath. As a precaution, this tree is considered to have moderate potential to support roosting bats.

G1 is a line of four trees (**G1A**, **G1B**, **G1C** and **G1D**) consisting of goat willow/grey willow *Salix cinerea* oriented north/south, found in the centre of a pond in the south-east of the site. They are 6-7m in height with DBHs of 0.2-0.4m. There are a low number of welds on all aspects of these trees from ground level to around 5m. These trees are considered to have low potential to support roosting bats.

See also Appendix 2 – Survey results and Appendix 3 – Photographs.

4 EVALUATION AND RECOMMENDATIONS

4.1 Evaluation of results

The site provides largely moderate suitability habitat for foraging and commuting bats, with smaller areas of high quality and low-quality habitat. The presence of the many ponds, woodland and dense scrub provide foraging and commuting opportunities, whilst roosting opportunities are also potentially available within nearby residential and agricultural buildings and mature trees.

See Table 1 below for a summary of the potential of the trees on site to support roosting bats.

PRFs were identified in T2, T16, and T18, although after a closer inspection with an endoscope from ground-level, these features were deemed to be superficial and so the trees were assessed as having negligible potential to support roosting bats.

A total of 12 trees and 1 group of trees on the site are considered to have low potential to support roosting bats. 22 trees are considered to have moderate potential, and 8 to have high potential (see Table 2).

All other trees were assessed on site and no further PRFs or roosting suitability were found.

Table 2 – Summary of bat roosting potential of trees on site

Negligible	Low	Moderate	High
T2, T16, T18	T4, T13, T17, T19, T21, T22, T30, T36, T37, T38, T39, T41, G1 (G1A-D)	T1, T3, T5, T8, T9, T11, T12, T14, T15, T23, T24, T25, T28, T29, T33, T34, T35, T40, T42, T43, T44, T45	T6, T7, T10, T20, T26, T27, T31, T32

4.2 Mitigation and compensation measures

4.2.1 Mitigation

No detailed proposals are available to UES at the time of writing, but many of the mature and semi-mature trees on site will be removed as part of the works. It is considered that those along the northern boundary forming a strip of woodland will be retained, although this has not been confirmed by a detailed arboricultural plan. See Table 3 below for summary of further required action for the recorded trees.

Trees T2, T16, and T18 are assessed as having negligible roosting suitability after a close inspection, and as such the felling of these trees will have no direct impact on bats or bat roosts. All other trees on site not included within this report were assessed as having negligible potential to support roosting bats too. They can be felled without restriction, with regards to bats.

Trees T5, T17, T19-T33 and T40-T44 contain PRFs of at least low roosting suitability for bats. These trees are likely to be retained as part of the development proposals. If this changes and any of these trees are to be removed, soft-felling techniques are to be used for those trees considered to have low potential to support roosting bats, whilst those trees which are

considered to have moderate or high potential to support roosting bats will require further surveying before felling, likewise using soft-felling techniques. Soft-felling techniques involve cutting the trees in sections and lowering any section containing PRFs to the ground. Once lowered to the ground, the PRFs should be left facing upwards overnight, before being removed from the site or chipped at a minimum of 24 hours later. Alternatively, the features associated with these trees could also be inspected by a suitably experienced and licenced ecologist immediately prior to the felling of the tree to confirm that no roosting bats are present.

Trees that are to be felled or subject to arboricultural works, and are considered to contain moderate or high potential features to support roosting bats, should be subject to aerial tree assessments to fully inspect the noted PRFs. These surveys will be carried out using ropes and harnesses by trained professionals. This may result in the reclassification of these trees' bat roosting potential..

Those trees to be felled which are considered to contain low potential to support roosting bats, and which are able to be fully inspected from ground level, should be removed using soft-felling techniques as described above.

T45 is a large crack willow on an island in a large pond could not be accessed during the ground-level tree assessment and is unlikely to be accessible for aerial tree assessments. Therefore, two bat presence/absence surveys will be required, with a potential third roost characterisation survey if necessary. These surveys should be undertaken by an appropriately licenced ecologist during the bat survey season, May to September inclusive.

Table 3 – Summary of further action required for recorded trees

To be retained (no further action required)	To be felled			
	Fell without restriction	Soft-felling	Aerial tree assessments	Presence / absence survey
T5, T17, T18, T19, T20, T21, T22, T23, T24, T25, T26, T27, T28, T29, T30, T31 T32, T33, T40, T41, T42, T43, T44	T2, T16	T36, T37, T38, T39, G1 (G1A- D)	T1, T3, T4, T6, T7, T8, T9, T10, T11, T12, T13, T14, T15, T34, T35	T45

4.2.2 Compensation and enhancement

Bat boxes should be provided as part of the development, to compensate for the loss of roosting habitat within the trees to be removed and to further enhance the roosting habitats on site. This can be achieved through the provision of bat boxes on the trees to be retained on site, to be detailed in a future Landscape and Ecological Management Plan.

The bat boxes should be fitted at a height of 5-6 metres (slightly higher than usual to reduce potential for vandalism or theft), on a southerly aspect, with no clutter around the entrance by surrounding branches. External lighting must be directed away from installed bat boxes, as well as tree lines and the pond, so that nocturnal wildlife is not deterred from using the site. For more information, see Appendix 4 – External lighting guidance.



4.2.3 Nesting birds

A detailed nesting bird check was not conducted, although it is almost a certainty that nesting birds will be using the large areas of dense scrub on site in addition to the mature trees and woodland. As such, it is recommended that the initial site clearance (including vegetation removal) works take place outside of the breeding bird season and should not be undertaken from March to August inclusive. If this is not possible, a breeding bird nest survey should be undertaken prior to the commencement of works by a suitably experienced ecologist and an ecological clerk of works appointed if considered necessary.



5 CONCLUSION

The site provides mostly moderate quality habitat for foraging and commuting bats in the form of scrub and rough grassland, with smaller areas of high-quality habitat (the woodland and ponds) and low-quality habitat (the hardstanding and amenity grassland).

No detailed arboricultural proposals are available to UES at the time of writing, although many of the mature and semi-mature trees along the northern site boundary are likely to be retained as part of the development. However, a number of trees will be removed to facilitate the proposals.

The majority of trees on site contain negligible roosting potential for bats.

A total of 3 trees were assessed as having negligible potential to support roosting bats after a closer inspection of suspected PRFs. A further 42 trees and 1 group of trees on site have been assessed as having at least low potential to support roosting bats. 12 trees and 1 group of trees have been assessed as having low potential to support roosting bats, 22 as having moderate potential, and a further 8 as having high potential.

Of these 43 trees/ groups of trees, 22 are likely to be retained as they form the northern site boundary and a woodland buffer.

Further survey work and mitigation measures are therefore required for the 21 trees containing low, moderate and high potential roosting features which are likely to be felled, as detailed in section 4.2 of this report.



6 REFERENCES

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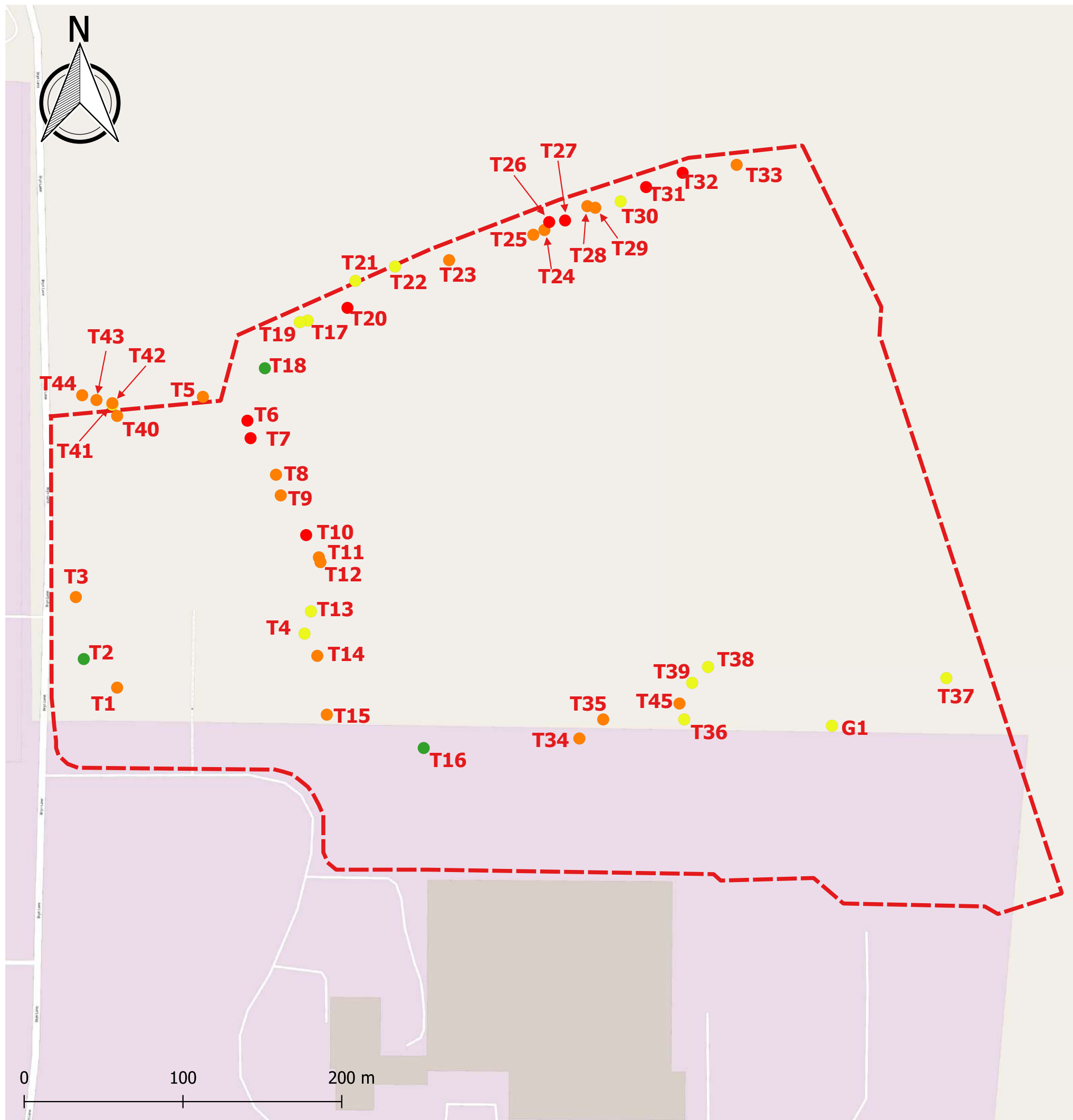
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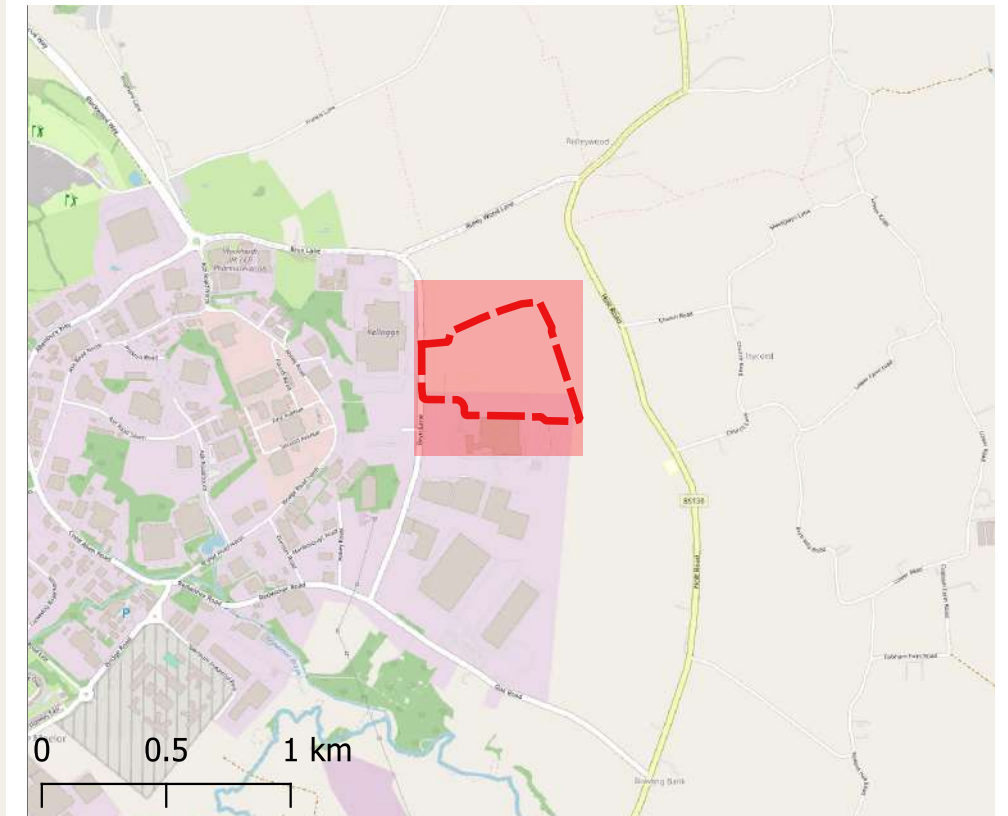
APPENDICES

Appendix 1 – Site plan



Ground Level Tree Assessment

Site: Plot 3A, Wrexham
NGR: SJ 39272 50416
Author: Robert Mooney
Date: 12/08/2022



KEY:

Bat Roosting Potential

- High
- Moderate
- Low
- Negligible

THIS PLAN IS BASED UPON OpenStreetMap® AND IS OPEN DATA, LICENSED UNDER THE OPEN DATA COMMONS OPEN DATABASE LICENCE (ODbL) BY THE OpenStreetMap FOUNDATION.

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Appendix 2 – Survey results

Appendix 1 - Survey results

Site: Plot 3A, Wrexham

Job no: UES03448/06

Date: 12/04/2022

Surveyors: Mark Halliwell, Alasdair Grubb, Daniel Smith, Robert Mooney, Noah Fulton

Table 1 – Summary of trees surveyed

Tree number / GPS	Species	Age class	Height (m) / DBH	Description of PRF(s) & position in tree	BCT Cat. (N/L/M/H)	Surrounding habitat context	All aspects of tree seen? Y/N	Climbable (only if qualified)	Notes from inspection of PRF(s)
T1	N/A	Dead	3/0.7	Fissures running up whole height of stem and potential knot holes	M	Tree located dense bramble scrub. Very cluttered, but good connectivity to other woodland and standing water habitats nearby.	N	N	
T2	Ash <i>Fraxinus excelsior</i>	Mature	14/0.6	Knot hole on main stem at height of 3m on southern aspect.	N	One of a line of trees near the site's western boundary between a road and dense scrub along a watercourse.	Y	Y	Knot hole found on southern aspect at 3m. This was found to be superficial upon inspection
T3 / SJ38986 50366	Pedunculate oak <i>Quercus robur</i>	Mature	14/0.5	Basal stem cavity on western aspect. Tear-out at 8m on eastern aspect.	M	One of a line of trees near the site's western boundary between a road and dense scrub along a watercourse.	Y	Y	Unable to fully inspect the stem cavity as it extends beyond the reach of endoscope.
T4 / SJ39117 50343	Pedunculate oak <i>Quercus robur</i>	Mature	8/0.8	Sparse ivy cover on main stem on all aspects.	L	Among scrub along the eastern boundary of an area of hardstanding.	N	Y	
T5 / SJ39066 50492	Lombardy poplar <i>Populus nigra</i> var. <i>Italica</i>	Mature	25/1.2	Stem cavity from ground upward to 3m.	M	Within dense scrub by watercourse near the north-west corner of the site.	N	Y	Among dense scrub by a watercourse.

T6 / SJ39094 50477	Peduncul ate oak <i>Quercus robur</i>	Mature	9 / 0.8	Tear outs at ~2.5m and ~4m on western aspect. Flaking bark on main stem.	H	One of a line of oaks within an area of dense scrub running between two areas of semi-improved grassland.	Y	Y	
T7 / SJ39096 50466	Peduncul ate oak <i>Quercus robur</i>	Mature	9 / 1	Large callus roll on south-eastern aspect from ground level. Lifted bark on southern aspect at ~2m.	H	One of a line of oaks within an area of dense scrub running between two areas of semi-improved grassland.	Y	Y	
T8 / SJ39112 50443	Peduncul ate oak <i>Quercus robur</i>	Mature	12 / 1	Broken branch at ~5m on eastern aspect. Deadwood at 3m on north- western aspect	M	One of a line of oaks within an area of dense scrub running between two areas of semi-improved grassland.	Y	Y	
T9 / SJ39115 50430	Peduncul ate oak <i>Quercus robur</i>	Mature	7 / 0.5	Branch cavity at ~3m on western aspect	M	One of a line of oaks within an area of dense scrub running between two areas of semi-improved grassland.	Y	Y	
T10 / SJ39131 50405	Peduncul ate oak <i>Quercus robur</i>	Mature	15 / 1	Loose bark around deadwood at ~7m on western aspect. Tear outs at ~6m on northern aspect and at ~4m on southern aspect respectively. Knot hole at 12m on southern aspect. Callus roll at ground level on southern aspect.	H	One of a line of oaks within an area of dense scrub running between two areas of semi-improved grassland.	Y	Y	

T11 / SJ 39139 50391	Peduncul ate oak <i>Quercus robur</i>	Mature	13 / 0/8	Callus roll at ~5m on south-western aspect. Crack by deadwood at ~5m on eastern aspect	M	One of a line of oaks within an area of dense scrub running between two areas of semi-improved grassland.	N	Y	
T12 / SJ39240 50388	Peduncul ate oak <i>Quercus robur</i>	Mature	13 / 0.8	Knot hole on a branch elbow at ~4m on north- eastern aspect	M	One of a line of oaks within an area of dense scrub running between two areas of semi-improved grassland.	Y	Y	
T13 / SJ39134 50357	Peduncul ate oak <i>Quercus robur</i>	Mature	13 / 1	Low density ivy cover on main stem.	L	Within dense scrub between hardstanding and pond.	N	Y	
T14 / SJ39144 50292	Peduncul ate oak <i>Quercus robur</i>	Mature	15 / 0.8	Tear out at ~3.5m on western aspect with adjacent callus roll. Stem cavity at 8m on northern aspect. Deadwood at centre of crown at 5m on southern aspect.	M	Within dense scrub between hardstanding and pond. Cluttered.	Y	Y	

T15 / SJ30144 50292	Peduncul ate oak <i>Quercus robur</i>	Mature	17 / 0.8	Light ivy cover on stem, Exposed heartwood at ~7m on northern aspect	M	Within blackthorn thicket in dense scrub between hardstanding and pond.	Y	Y	
T16 / SJ39205 50271	Crack willow <i>Salix x fragilis</i>	Mature	8 / 0.3	Branch cavity by exposed heartwood at ~1.8m on southern aspect.	N	Within dense scrub by pond.	Y	N	Cavity fully inspected. No evidence of bat activity.
T17 / SJ39132 50540	Hawthorn <i>Crataegu s monogyn a</i>	Mature	7 / 0.25	Features created where ivy meets bark, mostly on eastern aspect,	L	In the strip of broadleaved woodland along the site's northern boundary.	Y	N	Features fully inspected. No evidence of bat activity found.
T18 / SJ39105 50510	Hawthorn <i>Crataegu s monogyn a</i>	Mature	7 / 0.2		N	In the strip of broadleaved woodland along the site's northern boundary.	N	N	Too cluttered to provide suitable roosting habitat.
T19 / SJ39127 50539	Hawthorn <i>Crataegu s monogyn a</i>	Mature	7 / 0.2		L	In the strip of broadleaved woodland along the site's northern boundary.	Y	N	Relatively uncluttered drop zone available.

				Features created where ivy meets bark					
T20 / SJ39157 50548	Ash <i>Fraxinus excelsior</i>	Mature	14 / 0.7	Two large knot holes on southern aspect at ~4m and a smaller one at ~3m. Cavities under flaking bark at ~2-3m on southern aspect.	H	In the strip of broadleaved woodland along the site's northern boundary.	N	Y	
T21 / SJ39162 50565	N/A (stump)	Dead	1.5 / 0.5	Fissures on top of stump. Fissures up whole height on south-western and south-eastern aspects of stem.	L	In the strip of broadleaved woodland along the site's northern boundary.	Y	N/A	
T22 / SJ39187 50574	Pedunculate oak <i>Quercus robur</i>	Mature	12 / 0.5	Small basal cavity on southern aspect	L	In the strip of broadleaved woodland along the site's northern boundary.	N	Y	The feature was fully inspected with endoscope, no evidence of bat roosting was found.

T23 / SJ39221 50578	Peduncul ate oak <i>Quercus robur</i>	Mature	13 / 0.5	Tear out at ~3m and cavity at ~2.5m on southern aspect.	M	In the strip of broadleaved woodland along the site's northern boundary.	N	Y	
T24 / SJ39281 50597	Crack willow <i>Salix</i> × <i>fragilis</i>	Mature	16 / 0.7	Trunk cavity at ~6m on southern aspect. Branch cavity on southern-leaning limb at ~7m.	M	In the strip of broadleaved woodland along the site's northern boundary.	N	Y	
T25 / SJ39274 50594	Peduncul ate oak <i>Quercus robur</i>	Mature	13 / 0.7	Features created where ivy meets trunk from ground level upwards on southern aspect.	M	In the strip of broadleaved woodland along the site's northern boundary.	N	Y	
T26 / SJ39284 50602	Crack willow <i>Salix</i> × <i>fragilis</i>	Mature	16 / 1	Hollow north- leaning branch. Woodpecker holes on southern aspect at various heights up to ~10m.	H	In the strip of broadleaved woodland along the site's northern boundary.	N	N	As climbing is not possible, a presence/absence survey will be required if this tree is to be affected.

T27 / SJ39294 50603	Crack willow <i>Salix</i> × <i>fragilis</i>	Mature	16 / 1	Branch cavity on a southward-leaning limb at ~4m and nearby weld. Stem cavity at ~3m on western aspect.	H	In the strip of broadleaved woodland along the site's northern boundary.	N	Y	
T28 / SJ39308 50612	Peduncul ate oak <i>Quercus</i> <i>robur</i>	Mature	16 / 1	Two stem cavities on south-eastern fork of the trunk at ~3m. Features created where ivy meets trunk on all aspects	M	In the strip of broadleaved woodland along the site's northern boundary.	N	Y	
T29 / SJ39313 50611	Peduncul ate oak <i>Quercus</i> <i>robur</i>	Mature	8 / 0.3	Stem cavity at ~1.5m on southern aspect, which extends ~0.3m downwards and ~0.4m upwards.	M	In the strip of broadleaved woodland along the site's northern boundary. Quite cluttered.	N	N	The feature was fully inspected and no evidence of bat roosting was found

T30 / SJ39329 50615	Hawthorn <i>Crataegus monogyna</i>	Mature	10 / 0.3	Stem cavity at ~1.5m on southern aspect.	L	In the strip of broadleaved woodland along the site's northern boundary.	Y	N	The feature was fully inspected and no evidence of bat roosting was found
T31	Pedunculate oak <i>Quercus robur</i>	Mature	10 / 1.5	Multiple stem cavities on southern aspect from ground level up to ~5m, with two associated basal stem cavities. Cavity at v-join on southern aspect at 2.5m.	H	In the strip of broadleaved woodland along the site's northern boundary.	Y	Y	Cavities cannot be fully inspected due to their internal complexity. Presence/absence survey required if this tree is to be affected.
T32	Pedunculate oak <i>Quercus robur</i>	Mature	14 / 2	V-join stem cavity at ~2m on western aspect. Deadwood at ~7m on eastern aspect. Flaking bark on eastern aspect.	H	In the strip of broadleaved woodland along the site's northern boundary.	Y	Y	
T33	Hawthorn <i>Crataegus monogyna</i>	Mature	6 / 0.2	Stem cavities on the southern and western aspects at ~1.5m and ~0.3m	M	In the strip of broadleaved woodland along the site's northern boundary.	Y	N	

				respectively. The interior of the southern cavity extends 0.15m downwards and 0.3m upwards. The interior of the western cavity extends 20cm upwards.					
T34 / SJ39303 50277	Pedunculate <i>Quercus robur</i>	Mature	20 / 1	Deadwood at 3m on northern aspect, and at ~7m on both the northern and southern aspects.	M	Within broadleaved woodland surrounding large pond.	N	Y	
T35 / SJ39303 50277	Pedunculate oak <i>Quercus robur</i>	Mature	20 / 1	Stem cavity at ~3.5 on southern aspect. Deadwood at ~8m on the southern aspects and at ~4m on the western aspect. Knot hole on a western-leaning limb at ~10m.	M	Within broadleaved woodland surrounding large pond.	N	Y	

T36 / SJ39369 50289	Goat willow <i>Salix caprea</i>	Mature	20 / 1	Stem cavity on the northern aspect at ~1m.	L	Within broadleaved woodland surrounding large pond.	N	N	
T37 / SJ39534 50315	Silver birch <i>Betula pendula</i>	Mature	12 / 0.3	Fissures in bark from ground level up to ~1m on all aspects	L	Between dense scrub and hardstanding.	Y	N	
T38 / SJ39384 50322	Silver birch <i>Betula pendula</i>	Mature	12 / 0.4	Fissures in bark from ground level up to ~1.5m on all aspects	L	Within broadleaved woodland surrounding large pond.	Y	N	
T39 / SJ39374 50312	Goat willow <i>Salix caprea</i>	Mature	5 / 0.2	Multiple basal stem cavities extending up to ~1m on all aspects. Branch cavity on northern- leaning limb at ~0.5m. Welds at ~1m on southern aspect	L	Within broadleaved woodland surrounding large pond.	N	N	

T40 / SJ 39012 50480	Peduncul ate oak <i>Quercus robur</i>	Mature	13 / 1.5	Stem cavity at ~3m on western aspect.	M	Within dense scrub by watercourse near the north-west corner of the site.	Y	Y	
T41 / SJ 390095 50487	Crack willow <i>Salix x fragilis</i>	Mature	8 / 0.3	Ivy cover on all aspects. Several welds from 0-3m on all aspects.	L	Within dense scrub by watercourse near the north-west corner of the site.	N	N	
T42 / SJ 39009 50488	Peduncul ate oak <i>Quercus robur</i>	Mature	12 / 0.7	Ivy cover on all aspects from 0-8m.	M	Within dense scrub by watercourse near the north-west corner of the site.	N	N	
T43 / SJ 38999 50490	Peduncul ate oak <i>Quercus robur</i>	Mature	12 / 0.1	Ivy cover on all aspects from 0-7m.	M	Within dense scrub by watercourse near the north-west corner of the site.	N	N	

T44 / SJ 38990 50493	Peduncul ate oak <i>Quercus robur</i>	Mature	10 / 0.5	Knot-hole at 3m on western aspect. Weld at 4m on southern aspect.	M	Within dense scrub by watercourse near the north-west corner of the site.	N	N	
T45 / SJ 39366 50299	Crack willow <i>Salix</i> × <i>fragilis</i>	Mature	16 / 1	Missing bark at 10m on eastern aspect.	M	On an island in a large pond surrounded by broadleaved woodland.	N	N	Tree unable to be fully inspected due to inaccessibility. Bat presence/absence survey required.
G1 / SJ 38990 50493	Goat willow <i>Salix caprea</i> / Grey willow <i>Salix cinerea</i>	Mature	6-7 / 0.2-0.4	Knot-hole at 3m on western aspect. Weld at 4m on southern aspect.	L	Growing from the centre of a pond surrounded by dense scrub.	N	N	Some features unable to be fully inspected. Soft-felling techniques to be used

Table 2– Summary of PRFs found

Tree ID	PRF number	PRF type	Aspect	Height (m)	Distance from main stem (m)	Clutter	Entrance orientation	Size of entrance (cm)	Evidence	Roost potential (N/L/M/H)	Photo no.	Comments
T1	T1.1	Fissure	W	0-2.5	0	Bramble scrub up to ~1.5m	Horizontal	5	None	M	1	
T1	T1.2	Knot Hole	W	~2.8	0	None	Horizontal	10x10	None	M	1	
T1	T1.3	Knot hole	W	~2.9	0	None	Upwards-diagonal	10x10	None	M	1	
T3	T3.1	Basal stem cavity	W	0~1.5	0	None	Vertical, pointing downwards		None	M	3	
T3	T3.2	Tear-out	E	~8	0	None	N/A	N/A	None	M	4	
T4	T4.1	Ivy cover	All	N/A	0	Dense scrub from 0~4m	N/A	N/A	None	L	5	
T5	T5.1	Stem cavity	S	0~4	0	None	N/A	20	None	M	6	
T6	T6.1	Tear-out	W	~2.5	0.5	None	Upwards-diagonal	N/A	None	H	8	
T6	T6.2	Tear-out	W	4	1	None	Vertical, pointing upwards	N/A	None	H	9	
T6	T6.3	Flaking bark	N/A	N/A	0	Scrub up to ~2m	N/A	N/A	None	H	N/A	
T7	T7.1	Callus-roll	S-E	0~4	0	Branches, ivy	Horizontal	10	None	H	10	
T7	T7.2	Lifted bark	S	2	0	Branches, ivy	N/A	N/A	None	H	N/A	
T8	T8.1	Branch cavity	W	5	1	None	Horizontal	10x10	None	M	12	



T8	T8.2	Deadwood	N-W	3	0	None	N/A	N/A	None	M	N/A	
T9	T9.1	Branch cavity	W	3	2	None	Horizontal	10x100	None	M	14	
T10	T10.1	Branch cavity/loose bark	W	6	2	None	N/A	N/A	None	H	15	
T10	T10.2	Knot-hole	S	12	4	None	Horizontal	10x10	None	H	17	
T10	T10.3	Tear-out	N	6	3	Branches	Horizontal	N/A	None	H	16	
T10	T10.4	Callus-roll	S	0	0	Scrub	N/A	N/A	None	H	N/A	
T10	T10.5	Tear-out	S	4	2	None	N/A	N/A	None	H	N/A	
T11	T11.1	Callus-roll	S-W	5	2	None	All	150x15	None	M	19	
T11	T11.2	Branch cavity	E	5	1	None	N/A	N/A	None	M	N/A	
T12	T12.1	Knot-hole	N-E	4	3	None	Horizontal	15x20	None	M	21	
T13	T13.1	Ivy cover	All	0-11	0	Scrub up to ~2m	N/A	N/A	None	L	22	
T14	T14.1	Tear-out	W	3.5	0	Ivy	N/A	N/A	None	M	25	
T14	T14.2	Stem cavity	N	8	0	Bramble scrub	N/A	N/A	None	M	24	
T14	T14.3	Deadwood	S	5	0-1	None	N/A	N/A	None	M	23	
T15	T15.1	Ivy cover	All	0-12	0	Branches, scrub from 0-~2m	N/A	N/A	None	M	26	



T15	T15.2	Exposed heartwood	N	8	0	Ivy, branches	N/A	N/A	None	M	27	
T17	T17.1	Ivy cover	All	0-7	0	None	N/A	N/A	None	L	29	
T19	T19.1	Ivy cover	All	0-7	0	Bramble scrub 0-1.5m	N/A	N/A	None	L	31	
T20	T20.1	Knot-hole	S	4	0	None	Horizontal	10x10	None	H	32	
T20	T20.2	Knot Hole	S	4	1	None	Horizontal	15x30	None	H	33	
T20	T20.3	Flaking bark	S	3.5	0	None	N/A	N/A	None	H	32	
T20	T20.4	Knot-hole	S	3	0.3	None	Upward-diagonal	N/A	None	H	32	
T21	T21.1	Stem cavity	SW	0-1.5	0	None	Horizontal	150x10	None	L	34	
T21	T21.2	Stem cavity	S-E	0-1.5	0	Ivy over top 0.5m	Horizontal	150x10	None	L	34	
T21	T21.3	Stem cavity	On top	1.5	0	None	Vertical, pointing upwards	N/A	None	L	N/A	
T22	T22.1	Basal stem cavity	S	0-0.5	0	Branches	Vertical, pointing downwards	N/A	None	L	35	
T23	T23.1	Tear-out	S	3	0	None	N/A	N/A	None	M	36	
T23	T23.2	Pruning-cut cavity	S	3.5	0	None	Horizontal	5x20	None	M	36	
T24	T24.1	Stem cavity	S	6	0	None	N/A	N/A	None	M	39	
T24	T24.2	Branch cavity	S	7	0	None	N/A	N/A	None	M	N/A	



T25	T25.1	Ivy cover	S	0-5	0	None	N/A	N/A	None	M	40	
T26	T26.1	Woodpecker hole	S	6	0	Ivy, branches	N/A	N/A	None	H	42	
T26	T26.2	Woodpecker hole	S-E	7	0	Branches	N/A	N/A	None	H	43	
T26	T26.3	Hollow branch	N	8	1	Branches	N/A	N/A	None	H	43	
T27	T27.1	Branch cavity	S	4	1	None	Horizontal	10x40	None	H	45	
T27	T27.2	Weld	S	4	2	Branches	N/A	N/A	None	H	46	
T27	T27.3	Stem cavity	W	3	0	Branches	N/A	N/A	None	H	N/A	
T28	T28.1	Stem cavity	S-E	3	0	Branches	N/A	N/A	None	M	N/A	
T28	T28.2	Stem cavity	S-E	3	0	Branches	N/A	N/A	None	M	N/A	
T28	T28.3	Ivy cover	All	0-12	0	Branches, ivy	N/A	N/A	None	M	48	
T29	T29.1	Stem cavity	S	1.5	0	Iv	Vertical, upwards and downwards	20x2	None	M	50	
T30	T30.1	Stem cavity	S	1.5	0	None	Horizontal	15x5	None	L	51	
T31	T31.1	Stem cavities on exposed heartwood	W	0-5	0	None	N/A	N/A	None	H	54	
T31	T31.2	V-split stem cavity	S	2.5	0	Ivy	Horizontal	15x30	None	H	N/A	



T31	T31.3	Basal stem cavity	W	0	0	None	N/A	N/A	None	H	N/A	
T31	T31.4	Basal stem cavity	W	0	0	None	N/A	N/A	None	H	N/A	
T32	T32.1	V-split stem cavity	W	2	0	Branches	N/A	N/A	None	H	56	
T32	T32.2	Deadwood branch cavity	E	7	0	None	N/A	N/A	None	H	57	
T32	T32.3	Flaking bark	E	4	0	Branches	N/A	N/A	None	H	N/A	
T33	T33.1	Stem cavity	W	0.3	0	Scrub	Vertical, pointing upwards	N/A	None	M	N/A	
T33	T33.2	Stem cavity	S	1.5	0	Scrub	Vertical, pointing upwards and downwards	20x5	None	M	59	
T33	T33.3	Basal stem cavity	W	0	0	Scrub	N/A	N/A	None	M	N/A	
T34	T34.1	Deadwood	N	7	0-1.5	Scrub	N/A	N/A	None	M	61	
T34	T34.2	Deadwood	S	7	0-1.5	None	N/A	N/A	None	M	62	
T34	T34.3	Deadwood	N	3	0-1	None	N/A	N/A	None	M	63	
T35	T35.1	Stem cavity	S	3.5	0	Ivy	N/A	N/A	None	M	65	
T35	T35.2	Deadwood	8	S	0-0.5	None	N/A	N/A	None	M	66	
T35	T35.3	Deadwood	7	E	0-1	None	N/A	N/A	None	M	67	
T35	T35.4	Deadwood	4	W	0-1	Ivy	N/A	N/A	None	M	68	



T35	T35.5	Deadwood	10	W	2-2.5	None	N/A	N/A	None	M	69	
T35	T35.5	Knot-hole	10	W	2	None	N/A	N/A	None	M	69	
T36	T36.1	Stem cavity	1	N	0	None	Diagonal, pointing downwards	10x5	None	L	71	
T37	T37.1	Fissures in bark	0-1	All	0	None	N/A	N/A	None	L	73	
T38	T38.1	Fissures in bark	0-1.5	All	0	None	N/A	N/A	None	L	75	
T39	T39.1	Stem cavities	0-1	All	0	None	N/A	N/A	None	L	77	
T39	T39.2	Branch cavity	0.5	N	0.3	None	Horizontal	30x10	None	L	78	
T39	T39.3	Weld	1	S	1	None	N/A	N/A	None	L	79	
T40	T40.1	Stem cavity	3	W	0	None	Vertical, pointing upwards	10x10	None	L	81	
T40	T40.2	Ivy cover	0-10	All	0	Branches, scrub	N/A	N/A	None	M	80	
T41	T41.1	Ivy cover	0-4	All	0	Branches, scrub	N/A	N/A	None	L	82	
T41	T41.2	Welds	0-3	All	N/A	Branches, scrub	N/A	N/A	None	L	N/A	
T42	T42.1	Ivy cover	0-8	All	0	Branches	N/A	N/A	None	M	83	
T43	T43.1	Ivy cover	0-7	All	0	Branches, scrub	N/A	N/A	None	M	84	
T44	T44.4	Knot-hole	3	W	0	Ivy	N/A	N/A	None	M	86	



T44	T44.2	Weld	4	S	2	None	N/A	N/A	None	M	87	
T45	T45.1	Missing bark (possible stem cavity)	10	E	0	None	N/A	N/A	None	M	89	
G1	G1.1	Low number of welds	0-5	All	N/A	None	N/A	N/A	None	L	N/A	



Appendix 3 – Photographs



Photograph 1 – T1



Photograph 2 – T2 showing superficial knot hole.



Photograph 3 – T3 showing basal stem cavity.



Photograph 4 – T3 showing tear-out at base of crown.



Photograph 5 – T4 showing ivy cover.



Photograph 6 – T5 showing hollow stem.



Photograph 7 – The crown of T6



Photograph 8 – T6 showing tear-out.



Photograph 9 – T6 showing tear-out.



Photograph 10 – T7 showing callus roll and ivy cover.



Photograph 11 – T8.



Photograph 12 – T8 showing cavity created by broken branch.



Photograph 13 – The crown of T9.



Photograph 14 – T9 showing lateral branch cavity.



Photograph 15 – T10 showing vertical branch cavity.



Photograph 16 – T10 showing tear-out on horizontal branch.



Photograph 17 – T10 showing knot-hole on horizontal branch.



Photograph 18 – T11.



Photograph 19 – T11 showing vertical callus-roll.



Photograph 20 – T12.



Photograph 21 – T12 showing knot-hole on branch elbow.



Photograph 22 – The crown of T13.



Photograph 23 – T14.



Photograph 24 – T14 showing stem cavity.



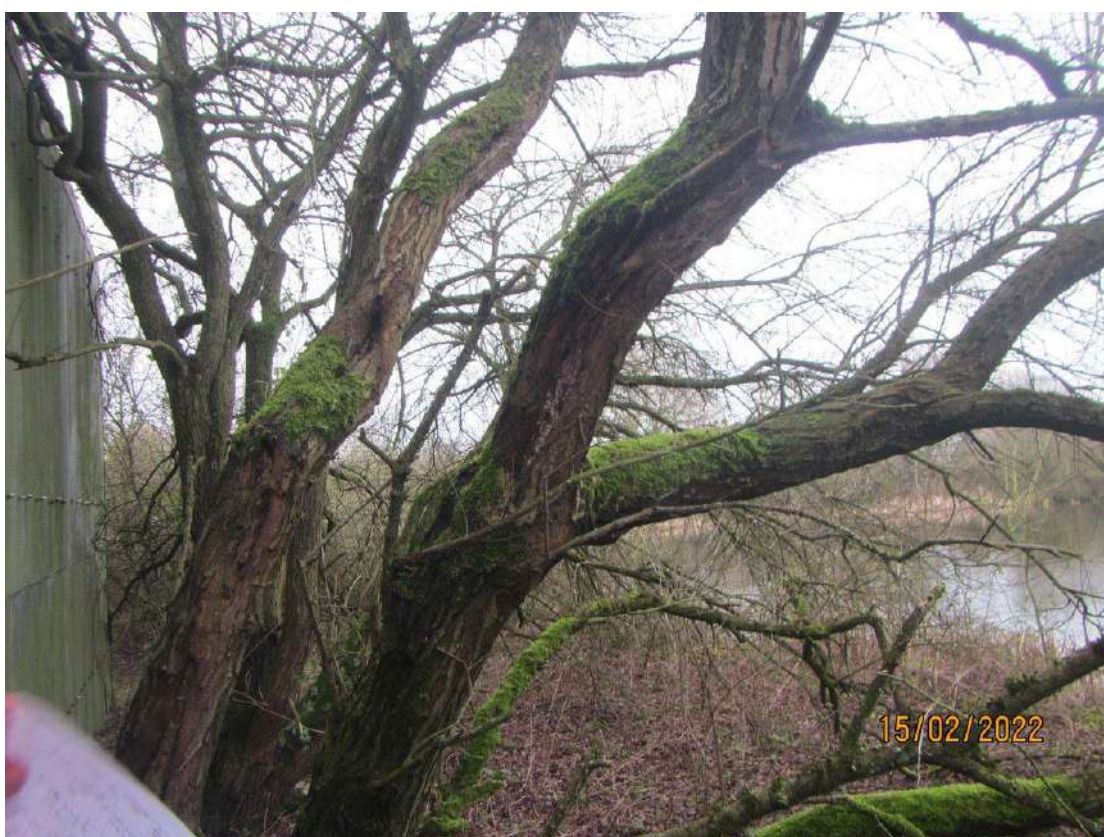
Photograph 25 – T14 showing cluttered vertical tear-out.



Photograph 26 – T15 showing ivy cover on trunk and some limbs.



Photograph 27 – T15 showing exposed heartwood.



Photograph 28 – T16 showing superficial branch cavity.



Photograph 29 – T17 showing ivy cover.



Photograph 30 – T18.



Photograph 31 – T19 showing crevice created where ivy meets bark.



Photograph 32 – T20 showing knot-hole and flaking bark.



Photograph 33 – T20 showing large knot-hole on horizontal branch elbow.



Photograph 34 – T21.



Photograph 35 – T22 showing basal stem cavity.



Photograph 36 – T23 showing tear-out from trunk (above pruning-cut).



Photograph 37 – T23 showing cavity in pruning-cut.



Photograph 38 – T24 (right).



Photograph 39 – T24 showing diagonal trunk cavity.



Photograph 40 – T25 showing ivy cover.



Photograph 41 – T26.



Photograph 42 – T26 showing woodpecker hole.



Photograph 43 – T26 showing woodpecker hole (upper right) and hollow branch (lower centre).



Photograph 44 – T27.



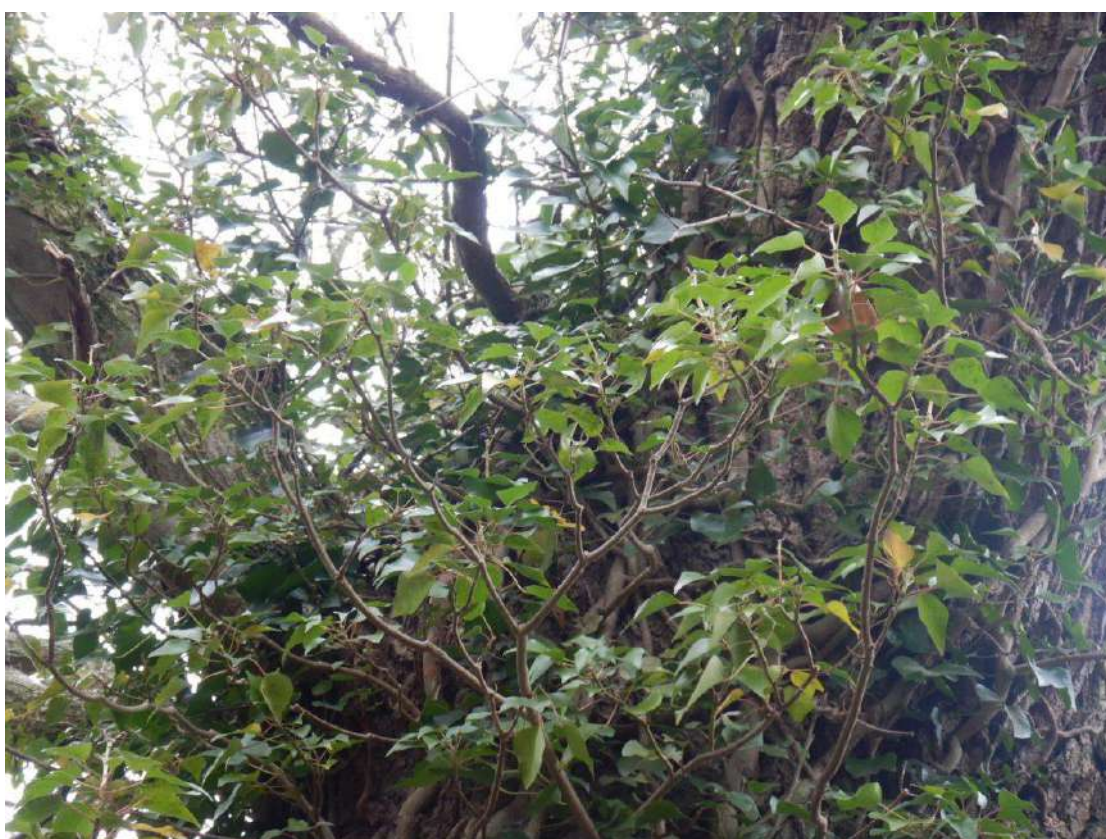
Photograph 45 – T27 showing horizontal branch cavity.



Photograph 46 – T27 showing branch weld.



Photograph 47 – Crown of T28.



Photograph 48 – T28 showing dense ivy cover at trunk fork.



Photograph 49 – T29 showing clutter by surrounding scrub.



Photograph 50 – T29 showing stem cavity.



Photograph 51 – T30 (left, rear).



Photograph 52 – Crown of T31.



Photograph 53 – T31 showing basal stem cavity.



Photograph 54 – T31 showing multiple stem cavities in exposed heartwood.



Photograph 55 – T32 showing trunk v-split.



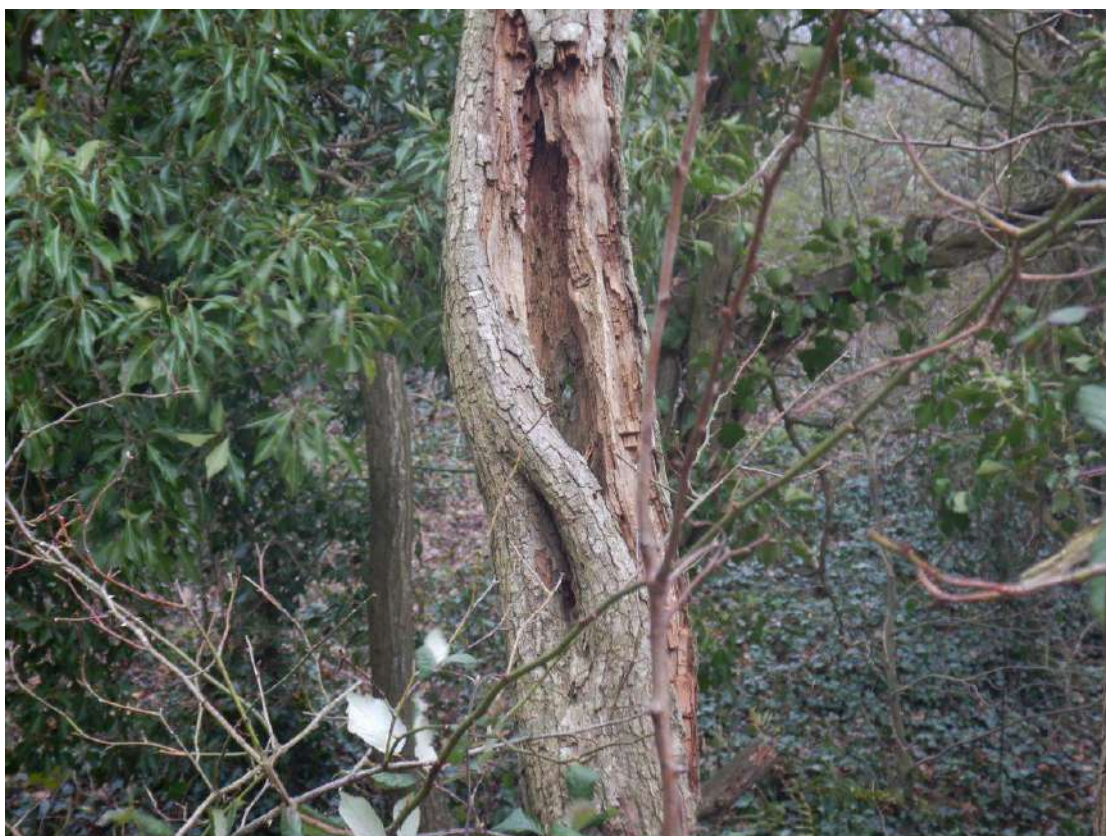
Photograph 56 – T32 showing v-split lateral stem cavity.



Photograph 57 – T32 showing split deadwood branch (centre, rear).



Photograph 58 – T33.



Photograph 59 – T33 showing vertical stem cavity.



Photograph 60 – T34.



Photograph 61 – T34 showing deadwood on northern aspect.



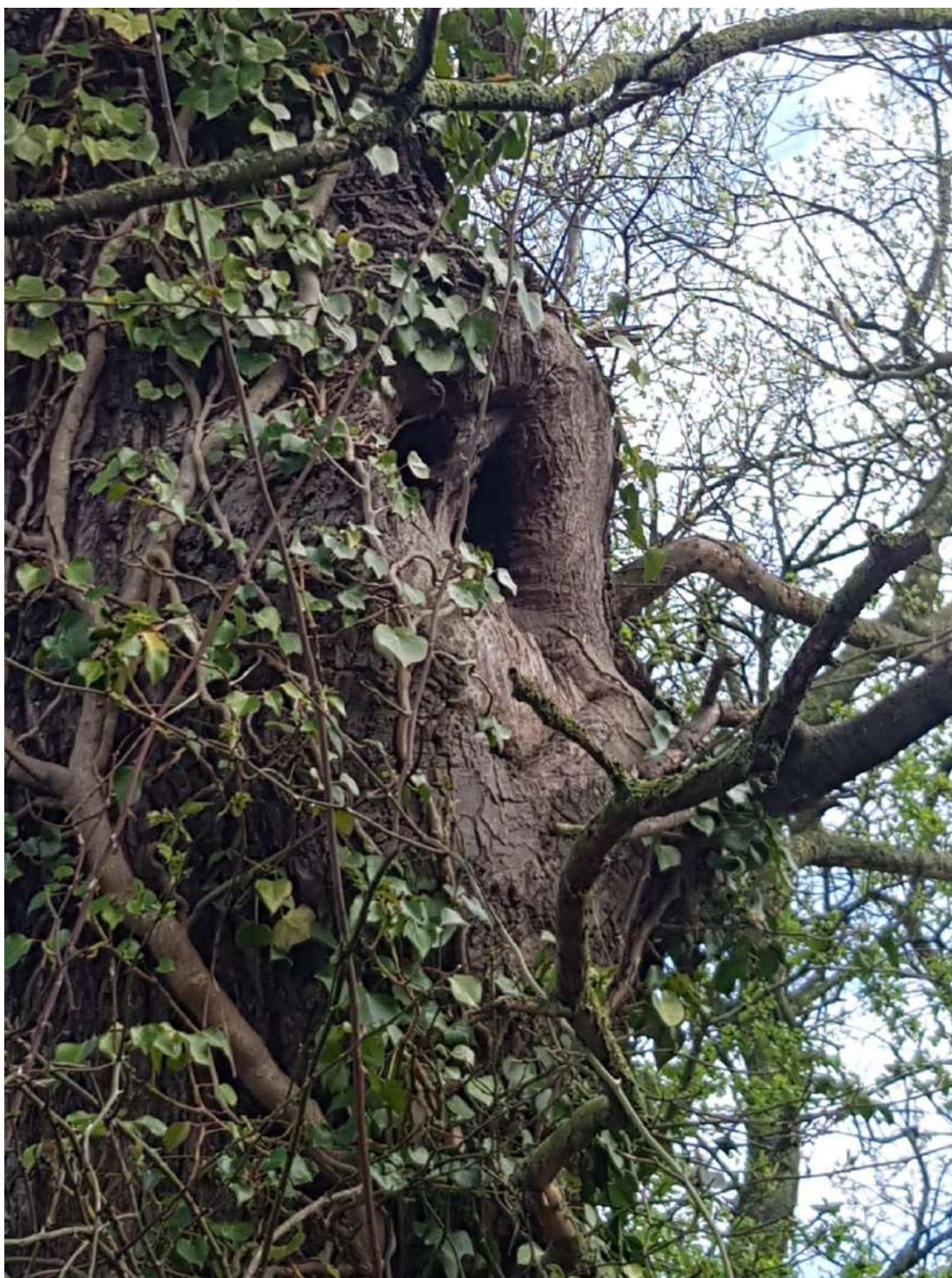
Photograph 62 – T34 showing deadwood on southern aspect.



Photograph 63 – T34 showing deadwood on northern aspect.



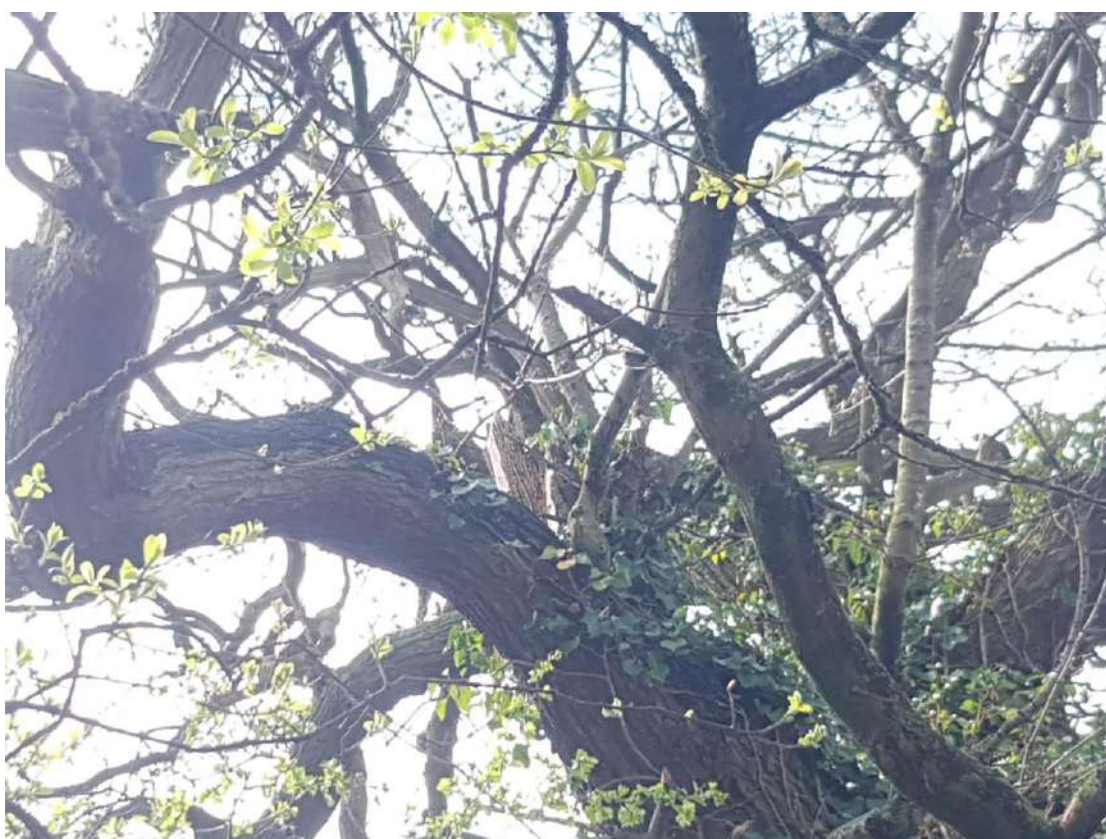
Photograph 64 – T35.



Photograph 65 – T35 showing stem cavity.



Photograph 66 – T35 showing deadwood on southern aspect.



Photograph 67 – T35 showing deadwood on eastern aspect.



Photograph 68 – T35 showing deadwood on western aspect.



Photograph 69 – T35 showing deadwood and knot hole on western aspect.



Photograph 70 – T36.



Photograph 71 – T36 showing stem cavity.



Photograph 72 – T37.



Photograph 73 – T37 showing fissures in stem.



Photograph 74 – T38.



Photograph 75 – T38 showing fissures in stem.



Photograph 76 – T39.



Photograph 77 – T39 showing basal stem cavity.



Photograph 78 – T39 showing branch cavity.



Photograph 79 – T39 showing weld.



Photograph 80 – T40 showing ivy cover.



Photograph 81 – T40 showing stem cavity.



Photograph 82 – T41.



Photograph 83 – T42 showing ivy cover.



Photograph 84 – T43 showing ivy cover.



Photograph 85 – T44.



Photograph 86 – T44 showing knot-hole beneath ivy cover.



Photograph 87 – T44 showing welds.



Photograph 88 – T45.



Photograph 89 – T45 showing missing bark.



Appendix 4 – External lighting guidance

Lighting scheme in relation to bats

The two most important features of street and security lighting with respect to bats are:

1. The UV component. Low or zero UV installations are preferred to reduce attraction of insects to lighting and therefore to reduce the attraction of foraging bats to these areas.
2. Restriction of the area illuminated. Lighting must be shielded to maintain dark areas, particularly above lighting installations, and in many cases, land adjacent to the areas illuminated. The aim is to maintain dark commuting corridors for foraging and commuting bats. Bats avoid well lit areas, and these create barriers for flying bats between roosting and feeding areas.

UV characteristics:

Low

- Low pressure Sodium Lamps (SOX) emit a minimal UV component.
- High pressure Sodium Lamps (SON) emit a small UV component.
- White SON, though low in UV, emit more than regular SON.

High

- Metal Halide lamps emit more UV than SON lamps, but less than Mercury lamps
- Mercury lamps (MBF) emit a high UV component.
- Tungsten Halogen, if unfiltered, emit a high UV component
- Compact Fluorescent (CFL), if unfiltered, emit a high UV component.
- Variable
- Light Emitting Diodes (LEDs) have a range of UV outputs. Variants are available with low or minimal UV output.
- Glass glazing and UV filtering lenses are recommended to reduce UV output.

Street lighting

- Low-pressure sodium or high-pressure sodium must be used instead of mercury or metal halide lamps. LEDs must be specified as low UV. Tungsten halogen and CFL sources must have appropriate UV filtering to reduce UV to low levels.
- Lighting must be directed to where it is needed and light spillage avoided. Hoods must be used on each lamp to direct light and contain spillage. Light leakage into hedgerows and trees must be avoided.
- If possible, the times during which the lighting is on overnight must be limited to provide some dark periods. If the light is fitted with a timer this must be adjusted to reduce the amount of 'lit time' and provide dark periods.

Security and domestic external lighting

The above recommendations concerning UV output and direction apply. In addition:

- Lighting should illuminate only ground floor areas. Light should not leak upwards to illuminate first floor and higher levels.
- Lamps of greater than 2000 lumens (150 W) must not be used.
- Movement or similar sensors must be used. They must be carefully installed and aimed, to reduce the amount of time a light is on each night.
- Light must illuminate only the immediate area required, by using as sharp a downward angle as possible. Light must not be directed at or close to bat roost access points or flight paths from the roost. A shield or hood can be used to control or restrict the area to be lit.
- Wide angle illumination must be avoided as this will be more disturbing to foraging and commuting bats as well as people and other wildlife.
- Lighting must not illuminate any bat bricks and boxes placed on buildings, trees or other nearby locations.



Appendix 5 – Statutory and planning context

STATUTORY AND PLANNING CONTEXT

Ecological assessments

Ecological assessments play an important part within the planning context; they include an initial assessment which highlights any specific interests of a site. From the initial site assessment, the surveyor assesses the suitability of habitats within the site to support protected species and makes recommendations for further survey works if required. The following paragraphs provide a brief interpretation of the legislative protection that is relevant to the findings of this report.

Habitats

Section 7 of the Environment Act (Wales) places a duty on Welsh Ministers to publish, review and revise lists of types of habitats and species in Wales which they consider are of key significance to sustain and improve biodiversity. The Welsh Ministers must also take all reasonable steps to maintain and enhance the habitats published in these lists, and encourage others to take such steps.

Bats

In the United Kingdom, all species of bat and their roosts are afforded full protection under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 (known as the “Habitats Regulations”). The Wildlife and Countryside Act is the domestic implementation of the Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) and was amended by the Countryside and Rights of Way Act 2000. This makes it an offence to:

- Deliberately, intentionally or recklessly kill, injure or capture a bat
- Deliberately, intentionally or recklessly disturb a bat while it is occupying a structure or place that it uses for shelter or protection
- Deliberately, intentionally or recklessly damage, destroy or obstruct access to any place that a bat uses for shelter or protection (even if the bat is not present at the time)
- Keep, transport, sell or exchange, or offer for sale or exchange any live or dead bat, any part of a bat or anything derived from a bat

Under UK law, a bat roost is *any structure or place which any wild [bat] ... uses for shelter or protection*. As bats often reuse the same roosts, legal opinion is that a roost is protected whether or not the bats are present at the time of the activity taking place.

Penalties for offences include unlimited fines (formerly up to £5000), plus up to six months imprisonment, for each offence committed.

If an activity is likely to result in any of the above offences, a licence can be applied for to derogate from the protection afforded. These licences must provide appropriate mitigation and are issued by NRW.

The Environment (Wales) Act 2016 also lists the following bat species as species of principle importance under Section 7:

- Barbastelle *Barbastella barbastellus*
- Bechstein's bat *Myotis bechsteinii*
- Noctule *Nyctalus noctula*
- Common pipistrelle *Pipistrellus pipistrellus*
- Soprano pipistrelle *Pipistrellus pygmaeus*
- Brown long-eared bat *Plecotus auritus*
- Greater horseshoe *Rhinolophus ferrumequinum*
- Lesser horseshoe *Rhinolophus hipposideros*

Birds

All wild birds, their nests and young are protected throughout England and Wales by the Wildlife & Countryside Act 1981 (as amended). It is illegal to kill, injure or take any wild bird, or damage or destroy the nest or eggs of breeding birds. The legislation applies to all bird species, common and rare.

In addition to the protection afforded to all wild birds, more vulnerable species listed on Schedule 1 of the Act receive enhanced protection when breeding. Schedule 1 species, including their dependent young, are protected from intentional or reckless disturbance whilst at or near the nest, in addition to the protection afforded the more common species.

The Environment (Wales) Act 2016 offers further protection to the nests of some species that regularly re-use their nests, even when the nests are not in use.

The leading governmental and non-governmental conservation organisations in the UK have reviewed the population status of 244 UK bird species. "Birds of Conservation Concern 4: the Red List for Birds" is the most recent publication summarising their findings. Three lists, Red, Amber and Green, have been produced based on the most up-to-date evidence available and criteria include conservation status at global and European levels and, within the UK: historical decline, trends in population and range, rarity, localised distribution and international importance. These lists are a valuable resource when considering conservation priorities.

Planning Policy

National planning guidance is issued in the form of Planning Policy Wales (PPW - 2018). The most relevant sections are included in Chapter 6: Distinctive and Natural Places. This chapter details the policies on issues such as the protection of trees, woodlands, species, and designated sites. The document is free and available to view online