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BAT AERIAL TREE ASSESSMENT AND PRESENCE / ABSENCE SURVEYS

At

The Oaks
Wrexham Industrial Estate
Wrexham
LL13 9RG

NGR: SJ 38806 49238

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Tom Kenwright

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EXECUTIVE SUMMARY

This report is written by Noah Fulton BSc, 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 The Oaks, Wrexham Industrial Estate, Wrexham.

At the time of the survey, no detailed proposals had been submitted to UES and the potential development area had not been determined. As such, the survey boundary for the survey included all areas with the potential to be impacted by the proposed development.

The site is dominated by dense scrub and provides mostly moderate-quality habitat for foraging and commuting. Pockets of higher quality habitat are present throughout and include numerous ponds (most of which are ephemeral), areas of woodland and watercourses at the southern and western site boundaries. These habitats will provide an abundance of foraging opportunities, and the site is well connected to the wider landscape to the south and east via watercourses, tree lines and hedgerows, providing high-quality commuting routes. Alternative roosting opportunities are available within the buildings on site and within trees and buildings within the wider industrial estate and surrounding landscape.

A ground-level tree assessment (GLTA) was undertaken by UES between the 19th and 27th April 2023. An additional area was also surveyed on the 25th June 2024. The GLTA covered all trees with the potential to be impacted by the proposed development and assessed 37 trees and the 4 groups of trees as having low potential to support roosting bats and 28 trees as having moderate potential.

Following the GLTA, all 28 trees assessed as having moderate potential to support roosting bats were subject to further aerial tree inspections where accessible. This aerial inspection was conducted using harnesses and ropes, by trained and licensed ecologists. All potential roosting features (PRFs) were closely inspected for bat presence and features associated with bat activity, as detailed in Bat Conservation Trust (BCT) guidance (Collins, 2016).

The close assessment of PRFs during the aerial inspection allowed for an updated roosting assessment and trees were recategorized as follows:

Table 1 – Summary of bat roosting potential of trees following aerial tree inspections

Negligible	Low	Moderate
T7, T9 & T14	T4, T5, T10, T35, T44, T49, T50, T51, T55 & T61	T13, T17, T21, T24, T26, T28, T32, T37, T42, T43, T45, T46, T47, T53 & T54

During the ground-level and aerial tree inspections, five trees (T10, T21, T26, T32, and T54) were found to contain features that could not be fully inspected via endoscope (e.g. due to the shape or depth of the cavity) or were considered unsafe to climb. As such, these trees were subject to further bat presence / absence surveys.

No evidence of roosting bats was found in any of the trees subject to ground level and aerial tree assessments, and no roosting bats were recorded during the bat presence / absence surveys. As such, no further survey effort is considered necessary with regards to bats in trees. However, soft felling techniques or a pre-commencement

inspection (where possible) by a licensed ecologist should be undertaken if any of the trees assessed as having low or moderate potential to support roosting bats are to be impacted by the works, as detailed in section 4.2.1 of this report.

Trees assessed as having negligible potential to support roosting bats may be felled or subject to arboricultural works without restriction with regards to bats.

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

All trees and areas of vegetation on site have the potential to support breeding birds. As such, any arboricultural work, tree felling, or vegetation clearance should be undertaken outside of the nesting bird season, and should not be undertaken from March to August inclusive. If this is not possible and works need to commence during the period, a breeding bird nest check can be undertaken immediately prior to the commencement of works by a suitably qualified ecologist and an ecological clerk of works appointed to oversee the works if considered necessary.

The report should be read in conjunction with appendices 1 to 6 and the ground level tree assessment report that has previously been prepared for the site by UES (see report reference UES03918/20).

1 INTRODUCTION

1.1 Author, surveyors and qualifications

This report is compiled and written by Noah Fulton BSc, UES Graduate Ecologist. Noah is trained in tree climbing and aerial rescue to CS38 level.

Other surveyors include:

- Toby Hart BSc MCIEEM PIEMA, UES Managing Director. Toby is licensed by Natural Resources Wales to disturb, take and handle all species other than greater or lesser horseshoe under licence number S092789/1. Toby is trained in tree climbing and aerial rescue to CS38 level.

- Mark Halliwell MBiol, UES Senior Ecologist. Mark is licensed by Natural Resources Wales to disturb, take and handle all species other than greater or lesser horseshoe under licence number S094856/1. Mark is trained in tree climbing and aerial rescue to CS38 level.

- Daniel Smith BSc MScRes, UES Ecologist. Daniel is listed as an accredited agent on the bat survey licence of Toby Hart. As such, he has been deemed competent to undertake licensable activities such as using a torch and endoscope to survey for bats. Daniel is trained in tree climbing and aerial rescue to CS38 level.

- Alasdair Grubb BSc ACIEEM, UES Sub-contractor. Alasdair is licensed by Natural Resources Wales to disturb, take and handle all species of bat other than greater or lesser horseshoe under licence number S091891/01. Alasdair is trained in tree climbing and aerial rescue to CS38 level.

- Bethan Beeston, UES trainee ecologist. Bethan is trained in tree climbing and aerial rescue to CS38 level.

- Paul Cassidy ACIEEM, UES Sub-contractor. Paul is licensed by Natural Resources Wales to disturb, take and handle all species of bats under licence number S088256/1.

- Jenny Gibbs, UES administrator.

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

This report has been reviewed and approved by Tom Kenwright BSc MSc ACIEEM, UES Senior Ecologist. Tom is licensed by Natural Resources Wales to disturb, take and handle all species other than greater or lesser horseshoe under licence number S094176/1.

1.2 Survey objectives and previous survey information

All trees on site were subjected to a ground-level assessment of their potential to support roosting bats by UES between the 19th and 27th April 2023. An additional area was surveyed on the 25th June 2024 (see report reference UES03918/20). Following the ground level assessment, UES was commissioned to conduct further aerial tree assessments and / or bat presence / absence survey of any trees with bat roosting potential that could be adversely

impacted by the proposed development. The aims of the surveys were to further assess the suitability of trees and determine the presence or absence of bats within these trees. In addition to recommending mitigation and compensation measures where appropriate.

1.3 Proposed development

No detailed proposals or tree removal plans have been provided to UES at the time of writing.

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.

This report should be read in conjunction with appendices 1 to 6, and the GLTA report that has previously been prepared for the site by UES(see report reference UES03918/20).

2 METHODOLOGY

2.1 General

All surveys were carried out to recognised guidelines, timings and weather conditions, with particular reference to Natural Resources Wales 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 Aerial tree assessment

A ground-level assessment was carried out of all trees within the survey area between the 19th and 27th April 2023. An additional area was surveyed on the 25th June 2024 (see UES report reference UES03918/20).

Following the ground-level assessment, all 28 trees assessed as having moderate potential to support roosting bats were subject to an aerial assessment between the 8th and 30th August 2023. As part of the aerial inspection, trees were climbed using ropes and harnesses by trained ecologists in order to inspect the potential roosting features more closely using an endoscope. 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 2 below.

Table 2 – 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		

In addition to assessing the suitability of potential roosting features, the PRFs were inspected in order to identify any roosting bats or field signs of bats and to assess the internal conditions. Field signs of bats can 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)

Based on the availability of new information from the close inspection of features during the aerial inspection, trees were either kept as the having the same roosting suitability as assessed during the ground level assessment, or were re-classified as negligible, low, moderate or high suitability based on the updated information available.

Trees still considered to have moderate potential to support roosting bats following the initial aerial inspection, and which contained features which could confidently be fully inspected with an endoscope, were subject to an additional aerial inspection between the 11th and 14th September 2023.

As such, all trees that could be fully inspected with an endoscope were subject to two aerial tree inspections, with one of the inspections in August during the peak bat survey season, and the second in September, as per BCT guidelines. Aerial tree inspections were undertaken at least two weeks apart for each tree.

2.3 Emergence and re-entry surveys / endoscope inspection

During the ground-level and aerial tree inspections, five trees (T10, T21, T26, T32, and T54) were found to contain features that could not be fully inspected via endoscope (e.g. due to the shape or depth of the cavity) or were considered unsafe to climb. As such, these trees were subject to further bat presence / absence surveys. With the exception of T10, these trees were subject to two further bat presence / absence surveys, with one of the surveys in August during the peak bat survey season, and the second in September, as per BCT guidelines. Bat presence / absence surveys were undertaken at least two weeks apart for each tree.

Tree 10 was not subject to a second bat presence / absence survey as the use of an endoscope with an articulated head allowed for a comprehensive aerial tree inspection to be undertaken as the second survey in September. Though the use of the articulated endoscope, all PRFs within the tree could be thoroughly inspected.

During these presence / absence surveys, all potential roosting features within these trees were covered by a surveyor or infrared camera during the dusk emergence or dawn re-entry periods.

Bat echolocation, flight and habitat characteristics were recorded where possible, in order to determine the species. The level and type of bat activity was also recorded to establish how bats are using the site.

2.3.1 Equipment

BATLOGGER M bat detectors and recorders were used during the bat presence / absence surveys. This device records bat echolocation calls across the full spectrum, with a sensitivity range of 10 – 150 kHz. The integrated heterodyne live monitoring also allows the observer to hear the echolocation calls in real time, with automatic tuning. The recordings are individually time/date, GPS and temperature stamped, and are of high enough quality to produce time expansion quality sonograms.

Anabat Walkabout bat detectors were also used during the bat presence / absence surveys. This allowed the observer to hear bat echolocation calls and see the sonograms in real time, aiding identification. All registrations were automatically recorded onto a memory card and time/ date stamped. The device can record and display both zero crossing and full spectrum bat echolocation calls and has a built-in GPS and mapping system.

Anabat Scout bat detectors were also used during the bat presence / absence surveys. This allowed the observer to hear bat echolocation calls in real time, with automatic tuning. All registrations were automatically recorded onto a memory card and time/ date stamped. The device can record and display both zero crossing and full spectrum bat echolocation calls and has a built-in GPS and mapping system.

Canon XA11 Professional Video Cameras were used in conjunction with infra-red LED illuminators to monitor PRFs within trees during the presence / absence surveys. Footage from the survey was recorded and reviewed post-survey. This enabled a more thorough assessment of the use of the trees throughout the entirety of the survey and ensured that any bats using the trees were identified, even when ambient light levels may have prohibited surveyors from observing bats.

2.3.2 Weather conditions

Table 3 - Weather conditions and survey timings

DATE	SURVEY TYPE	TIMINGS	SUNSET / SUNRISE	TEMP.	WIND	RAIN	CLOUD COVER
10/08/23	Emergence (T10 & T54)	20:35 – 22:20	20:50	23°C	Still	None	50%
18/08/23	Emergence (T21, T26)	20:18 – 22:03	20:33	18°C	Light breeze	Moderate rain throughout	100%
20/08/23	Emergence (T32)	20:14 – 21:59	20:29	18°C	Still	None	0%
11/09/23	Re-entry (T21, T26, T32, T54)	05:08 – 06:53	06:38	16°C	Light breeze	None	70%

2.4 Survey limitations

Moderate rain was recorded during the emergence survey conducted on the 18th August 2023. Despite this, bats were still recorded as active throughout the survey, with moderate levels of activity consistent with the previous survey, As such, this is not considered to be a significant limitation.

3 RESULTS

3.1 Habitat assessment

The Oaks is located within Wrexham Industrial Estate, south-east of the city of Wrexham. The proposed development site is dominated by dense scrub with scattered trees, ponds and derelict buildings. Small stands of more mature scrub and broadleaved woodland are present within the southern section of the site. Small areas of disturbed ground and semi-improved grassland are also present across the site. Redwither Brook flows along part of the western site boundary and the Clywedog River demarcates the southern site boundary.

The surrounding area consists of commercial, office and warehouse buildings with well-lit roads which may cause noise and light pollution for commuting bats. However, there is an extensive area of arable land with hedge-lined fields and tree lines to the south of the proposed development site. These habitats provide low-moderate quality foraging and commuting opportunities for bats.

The wider surrounding areas consists of further industrial estate buildings to the north and arable fields bordered by hedgerows and tree lines to the south of the site. There are additional woodland habitats within the surrounding areas which may provide commuting, foraging and roosting opportunities for bats, all of which are connected to the site by hedgerows and tree lines.

3.2 Tree assessments

Full details of the aerial tree inspections, including details of all PRFs are provided at Appendix 2. Photographs are provided in Appendix 4.

No evidence of bat activity was observed during the aerial tree assessments.

3.3 Emergence and re-entry surveys

Table 4 – Presence / absence survey results

DATE	SURVEY TYPE	SPECIES	NUMBER OF INDIVIDUALS	ROOST LOCATION	ACCESS POINT	TIMINGS
10/08/23	Emergence (T10, T54)	N/A – No roosting bats were observed				
18/08/23	Emergence (T21, T26)	N/A – No roosting bats were observed				
20/08/23	Emergence (T32)	N/A – No roosting bats were observed				
11/09/23	Re-entry (T21, T26, T32, T54)	N/A – No roosting bats were observed				

3.4 Activity summary

Table 5 – Bat activity summary

DATE	SURVEY TYPE	SPECIES	NOTES
10/08/23	Emergence (T10, T54)	Common and soprano pipistrelles	Common pipistrelles and soprano pipistrelles (to a lesser extent) were recorded commuting and socialising in proximity to the trees. Bats were identified occasionally foraging within the area of open canopy to the north of T54. No activity was observed beneath the tree canopy of T10. Only distant calls were recorded.
		Noctule	A low number of noctules were observed commuting across the site.
18/08/23	Emergence (T21, T26)	Common and soprano pipistrelles	Common pipistrelles and soprano pipistrelles were recorded foraging and commuting across the site.
		Noctule	A low number of noctules were observed commuting across the site.
20/08/23	Emergence (T32)	Common and soprano pipistrelles	Common pipistrelles and soprano pipistrelles were recorded foraging and commuting across the site
		Myotis sp.	A single M*yotis* bat pass was recorded.
		Noctule	Two noctule passes were recorded.
11/09/23	Re-entry (T21, T26, T32, T54)	Common and soprano pipistrelles	Common pipistrelles and soprano pipistrelles were recorded most frequently commuting across the site, with occasional foraging.
		Noctule	A low number of noctule bats observed commuting across the site.
		Myotis	A low number of myotis bats were recorded passing briefly.

4 EVALUATION AND RECOMMENDATIONS

4.1 Evaluation of results

The site is dominated by dense scrub and provides mostly moderate-quality habitat for foraging and commuting bats. Pockets of higher quality habitat are present throughout and include numerous ponds (most of which are ephemeral), areas of woodland and watercourses. These habitats will provide an abundance of foraging opportunities and the site is connected to the wider landscape to the south and east via watercourses, tree lines and hedgerows, providing high-quality commuting routes.

Trees were assessed as having the following bat roosting potential during the aerial tree assessments:

Table 6 – Summary of bat roosting potential of trees on site

Negligible	Low	Moderate
T7, T9, T14	T4, T5, T10, T35, T44, T49, T50, T51, T55, T61	T13, T17, T21, T24, T26, T28, T32, T37, T42, T43, T45, T46, T47, T53, T54

All other trees within the survey area were previously assessed as having negligible potential to support roosting bats following a ground level tree assessment (see report reference UES03918/20).

A minimum of four species of bat were recorded during the bat presence / absence surveys: common pipistrelle, soprano pipistrelle, noctule and at least one *Myotis* species. Moderate levels of activity were recorded and pipistrelle accounted for the majority of bat activity.

No roosting bats nor any evidence of roosting bats were recorded in any of the trees on site during the ground level tree inspections, aerial tree inspections or presence / absence surveys.

4.2 Mitigation and compensation measures

4.2.1 Mitigation

In accordance with BCT guidelines, no further survey work is required for trees that have been assessed as having low potential (or negligible potential) to support roosting bats. However, as a precautionary measure, it is recommended that if any trees assessed as having low potential are to be felled or subject to arboricultural works, soft felling techniques or a pre-commencement inspection should be implemented.

Soft felling techniques involve cutting the tree 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 at a minimum of 24 hours later. Alternatively, the features associated with these trees could also be inspected with an endoscope to confirm bat absence immediately prior to the felling of the tree or pruning of the branch containing the feature. In the unlikely event that a roosting bat is observed, works must stop immediately until a licence can be secured from Natural Resources Wales to allow the removal of the bat roost.

Although no bats were found to be roosting within the trees assessed as having moderate roosting potential, bats use tree roosts in a very transient way and their remains some, albeit low potential for bats to use the trees in the future and at the time of the felling and arboricultural works. As such, any trees assessed as having moderate potential to support roosting bats should also be subject to soft-felling techniques or a pre-commencement inspection by a licenced and suitably qualified ecologist (where possible) as detailed above.

A summary of further mitigation measures required are provided below for all trees within the survey boundary, including trees that were discounted following the ground level assessment:

Table 7 – Summary of bat roosting potential of trees on site

Bat roosting potential	Tree number	Mitigation measures required
Negligible	T7, T9, T14 and all other unnumbered trees within the survey area.	Fell without restriction.
Low	T1, T2, T3, T4, T5, T6, T8, T10, T11, T12, T15, T16, T18, T19, T20, T22, T23, T25, T27, T29, T30, T31, T33, T34, T35, T36, T38, T39, T40, T41 T44, T48, T49, T50, T51, T52, T55, T56, T57, T58, T59, T60, T61, T62, T63, T64, T65, G1, G2, G3, G4	Soft felling techniques or pre-commencement inspection.
Moderate	T13, T17, T24, T28, T37, T42, T43, T45, T46, T47, T53	Soft felling techniques or pre-commencement inspection.
Moderate	T21, T26, T32, T54	Soft-felling techniques only. Trees are not suitable for pre-commencement inspection as the PRFs cannot be fully inspected with an endoscope or the trees are unsafe to climb.

4.2.2 Compensation and enhancement

Where possible, trees should be retained and protected on site, so that they can continue to provide ecosystem services to local wildlife, which may use them for foraging, commuting, roosting or nesting purposes.

To compensate for the loss of roosting habitat, at least one bat box should be provided on site for each of the trees with bat roost potential that are removed. Additional bat boxes should be provided to enhance the ecological value of the site.

Bat boxes should include a variety of models and could include:

- Schwegler 2F bat box

- Schwegler 1FF bat box
- Schwegler 2FN bat box
- Schwegler 1FS bat box
- Schwegler 2FR bat tube (incorporated into newly constructed buildings)

All bat boxes should be fitted at a height of 5-6 metres (slightly higher than usual to reduce the 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 to increase the likelihood of occupancy. For more information, see Appendix 5 – External lighting guidance.

4.2.3 Nesting birds

All trees and areas of vegetation on site have the potential to support breeding birds. As such, any arboricultural work, tree felling, or vegetation clearance should be undertaken outside of the nesting bird season, and should not be undertaken from March to August inclusive. If this is not possible and works need to commence during the period, a breeding bird nest check can be undertaken immediately prior to the commencement of works by a suitably qualified ecologist and an ecological clerk of works appointed to oversee the works if considered necessary.

5 CONCLUSION

The site is dominated by dense scrub and provides mostly moderate-quality habitat for foraging and commuting. Pockets of higher quality habitat are present throughout and include numerous ponds (most of which are ephemeral), areas of woodland and watercourses. These habitats will provide an abundance of foraging opportunities, and the site is connected to the wider landscape to the south and east via watercourses, tree lines and hedgerows, providing high-quality commuting routes.

No bat roosts of evidence of bat roosts, such as droppings, were found during the ground level or aerial tree inspections. Furthermore, no bats were recorded roosting in any of the trees during the bat presence / absence surveys.

Soft felling techniques or a pre-commencement inspection by a licensed ecologist (where possible) should be undertaken of any trees assessed as having low or moderate potential to support roosting bats, as detailed in section 4.2.1 of this report. Compensation for the loss of roosting opportunities can be provided through the provision of bat boxes as detailed in section 4.2.2.

Due to the potential presence of nesting birds on site, it is recommended that the vegetation clearance, building demolition, tree felling and arboricultural works, take place outside of the breeding bird season and should not be undertaken from March to August inclusive. If this is not possible and works need to take place during this period, 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 to oversee the works if considered necessary.

6 REFERENCES

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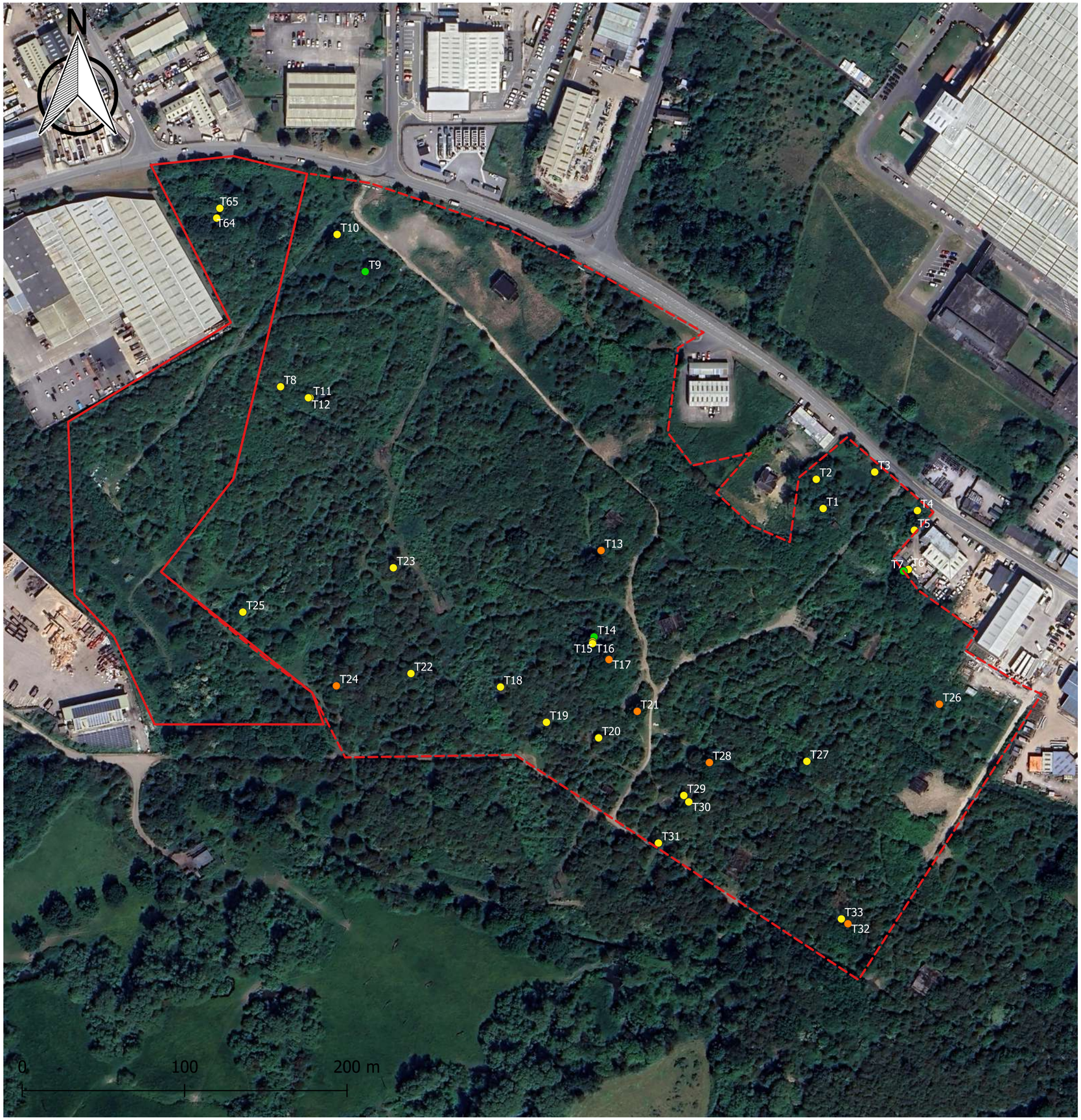
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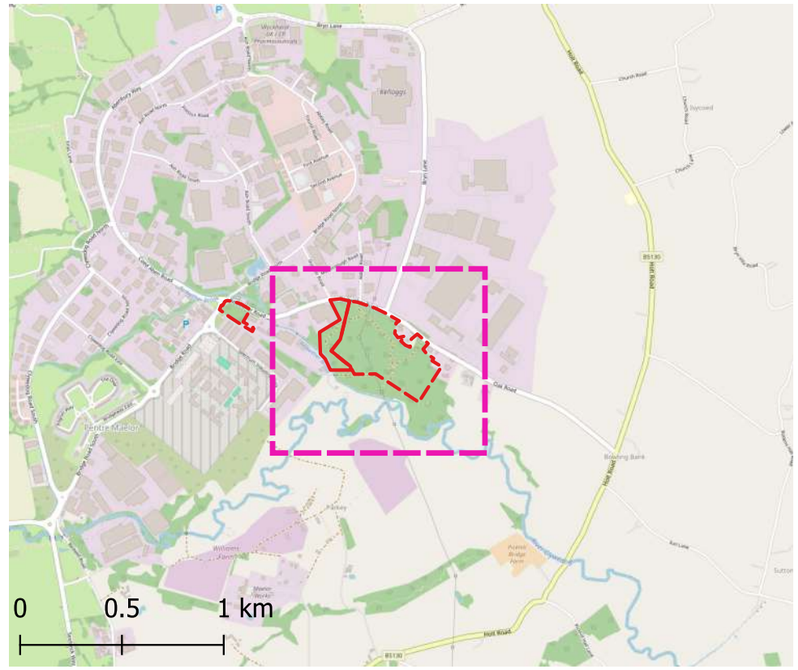
APPENDICES

Appendix 1 – Tree plan

Aerial Tree Assessment

Site: The Oaks, Wrexham
NGR: SJ 38699 49320
Author: Tom Kenwright
Date: 02/04/2025





KEY:

- 2023 survey boundary
- 2024 survey boundary
- Trees with negligible bat roosting potential
- Tress with low bat roosting potential
- Trees with moderate bat roosting potential

Map data © 2025 Google, Imagery © 2025 Google

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Aerial Tree Assessment

Site: The Oaks, Wrexham
NGR: SJ 38699 49320
Author: Tom Kenwright
Date: 02/04/2025





KEY:

- 2023 survey boundary
- 2024 survey boundary
- Trees with negligible bat roosting potential
- Tress with low bat roosting potential
- Trees with moderate bat roosting potential

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Appendix 2 – Aerial tree inspection results

Appendix 2 - Survey results

Site: The Oaks, Wrexham Industrial Estate

Job no: UES03918/20

Date: 10/11/2023

Surveyors: Noah Fulton, Daniel Smith, Toby Hart, Mark Halliwell, Alasdair Grubb & Bethan Beeston

Table 8 - Summary of trees subject to aerial inspection

Tree number / grid reference	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)	Photo no.	Notes from inspection of PRF(s)
T4 / SJ90918 72946	Pedunculate oak *Quercus robur*	Mature	12 / 1	T4.1 Dense ivy cover on the main stem.	L	Along the northern boundary of the site. Surrounded by dense scrub.	Y	Y	1	Downgraded to low potential following close-up inspection.
T5 / SJ38962 49285	Pedunculate oak	Mature	5 / 1	Two features including: T5.1 A stem cavity at 1.5m. T5.2 Dense ivy cover on the main stem.	L	Located along the northern site boundary to the south-east of T4. Surrounded by dense scrub.	Y	Y	2 - 3	Downgraded to low potential following close-up inspection.
T7 / SJ38955 49261	Pedunculate oak	Mature	12 / 1.1	T7.1 Callus roll on the eastern aspect of the main stem.	N	Located along the northern site boundary. Surrounded by dense hawthorn scrub.	Y	Y	4	Downgraded to negligible potential following close-up inspection.
T9 / SJ38626 49449	Pedunculate oak	Mature	11 / 0.93	Seven features including: T9.1 rot hole at 2m on the south -western aspect with protruding deadwood. T9.2 Deadwood branch cavity at 4m between a branch and the western limb.	N	Located within an area of dense scrub.	Y	Y	5 - 11	Downgraded to negligible potential following close-up inspection.

				T 9.3 A pruned branch at 4m on the southern aspect. T9.4 Flaking bark surrounding a deadwood limb at 2m on the southern aspect. T9.5 Deadwood at 4m off the east facing limb. T9.6 Pruned branch with surrounding rot at 4m on the north-west facing limb. T9.7 Deadwood branch on the main stem at 5m.						
T10 / SJ38609 49472	Pedunculate oak	Mature	12 / 0.7	Two features: T10.1 Stem cavity with an upward chamber (multi-chambered). T10.2 Callus roll at 3m on a south facing limb.	L	Located in the north-western corner of the site. Surrounded by dense scrub to the north, east and south, with a hardstanding pathway to the adjacent west	Y	N	N/A	Downgraded to low potential following close-up inspection.
T13 / SJ38769 49276	Pedunculate oak	Mature	14 / 1.05	Four features: T13.1 Callus roll at 3m on an eastern protruding limb (upward facing). T13.2 Callus roll at 3m on the northern aspect following the length of the branch. T13.3 Knot hole at 3m on the western aspect.	M	Located within an area of dense scrub.	Y	Y	12 -15	Confirmed as moderate potential. Requires two aerial tree assessment inspections.

				T13.4 Callus roll at 3.5m on the western limb						
T14 / SJ38764 49222	Pedunculate oak	Mature	16 / 1	Four features: T14.1 Branch rot at 6m on the southern aspect. x2 identifiable holes. T14.2 Callus roll at 7m on a north-west facing limb. T14.3 Knot hole with rotten branch at 4m on the south-western aspect (downward facing). T14.4 Knot hole with inward rot at 8m on the western aspect of the main stem.	N	Located within an area of dense scrub and semi-improved neutral grassland.	Y	Y	16 - 19	Downgraded to low potential following close-up inspection.
T17 / SJ38773 49209	Pedunculate oak	Mature	13 / 0.4	Two features: T17.1 Callus roll at 4m on the eastern aspect. T17.2 Deadwood at 3m on the western aspect.	M	Located within an area of dense scrub.	Y	Y	20	Confirmed as moderate potential. Requires two aerial tree assessment inspections.
T21 / SJ38790 49177	Pedunculate oak	Mature	12 / 0.6	Seven features: T21.1 Stem cavity at 2m on the north-western aspect (bees nest) T21.2 Callus roll at 2.5m on the western aspect with a protruding branch.	M	Located within a small pocket of semi improved neutral grassland.	Y	N	N/A	Confirmed as moderate potential. Requires two bat presence / absence surveys as tree cannot be safely climbed due to presence of bees nest within a cavity.

				T21.3 Deadwood branch with inward rot where it meets the stem at 5m on the northern aspect. T21.4 Branch cavity at 8m on eastern branch. T21.5 Knot hole at 8.5m on the south-western aspect. T21.6 Knot hole with protruding deadwood (next to T21.5). T21.7 Broken branch with flaking bark and a tear out at 4m on a southern limb.						
T24 / SJ8605 49195	Crack willow *Salix fragilis*	Mature	3 / 0.2	T24.1 Branch cavity at 0.5m on W aspect (M).	M	Located outside of the development boundary to the south of section Q2.	Y	Y	See GLTA	
T26 / SJ38980 49174	Pedunculate oak	Mature	9 / 0.5	Four features: T26.1 Stem cavity at 5m on northern aspect. T26.2 Numerous cracks in the bark of main stem. T26.3 Broken branch with inward rot a 9m on a southern protruding limb. T26.4 Woodpecker hole at 8.5m (below T26.3) on the northern aspect of a southern protruding limb.	M	Located within an area of dense scrub.	Y	N	N/A	Confirmed as moderate potential. Requires two bat presence / absence surveys as PRFs cannot be fully inspected with an endoscope.

T28 / SJ38833 49145	Pedunculate oak	Mature	11 / 0.6	Three features: T28.1 Wound within the rooting bark / broken branch at 3m on the north-eastern aspect. T28.2 Deadwood branch with inward rot at 4m on western aspect. T28.3 Broken branch would at 4m on north-eastern aspect.	M	Located within an area of dense scrub.	Y	Y	21 - 23	Confirmed as moderate potential. Requires two aerial tree assessment inspections.
T32 / SJ38918 49044	Pedunculate oak	Mature	8 / 0.6	T32.1 Dense ivy cover on the main stem. T32.2 Split branch at 3m on the south-eastern aspect.	M	Located within an area of dense scrub.	Y	Y	24 - 25	Confirmed as moderate potential. Requires two bat presence / absence surveys as PRFs cannot be fully inspected with an endoscope.
T35 / SJ37991 49507	Pedunculate oak	Mature	10 / 0.7	Seven features: T35.1 Callus roll at 6m on the northern aspect. T35.2 Deadwood at 5.75m on a northern branch. T35.3 Flaking bark at 5m on the western aspect. T35.4 Upward facing cavity at 6m on the south-eastern aspect. T35.5 Snapped branch and callus roll at 5m on the eastern aspect.	L	Located within an area of dense scrub.	Y	Y	26 - 32	Downgraded to low potential following close-up inspection.

				T35.6 Callus roll at 7m on the western aspect. T35.7 Deadwood branch at 1.5m on the south-western aspect.						
T37 / SJ37977 49472	Multi-stemmed hawthorn *Crataegus monogyna*	Mature	9 / 0.4	Four features: T37.1 Deadwood limb with numerous cavities on the north-eastern aspect. T37.2 Deadwood at 2.5m on the south-western facing limb. T37.3 Stem cavity at 0.5m on the southernmost limb (hollow stem). T37.4 Broken stem at 4.5m on the easternmost limb. T37.5 Stem split on the southern aspect.	M	Located within an area of dense scrub.	Y	Y	33 - 37	Confirmed as moderate potential. Requires two aerial tree assessment inspections.
T42 / SJ38029 49448	Goat willow *Salix caprea*	Mature	12 / 0.4	T42.1 Rot hole protruding upward 20cm on the western aspect.	M	Located within an area of dense scrub.	Y	Y	38	Confirmed as moderate potential. Requires two aerial tree assessment inspections.
T43 / SJ37994 49456	Willow *Salix sp.*	Mature	7 / 0.5	Eleven features: T43.1 Tear out at 1.5m on a south-western limb. T43.2 Knot hole main limb at 2m on the south-western aspect.	M	Located within an area of dense scrub.	Y	Y	39 - 49	Confirmed as moderate potential. Requires two aerial tree assessment inspections.

				T43.3 Knot hole at 2.2m on the main stem. T43.4 Knot hole above T43.3 at 3m on a south-western limb facing north-west. T43.5 Tear out at 2.5m on a western protruding limb. T43.6 Callus roll with inward rot at 4m on a north-western limb. T43.7 Rot hole with a deadwood limb at 2.5m on the north-western aspect. T43.8 Knot hole at 0.75m on a south facing stem. T43.9 x2 Callus rolls on the north-western limb at 4m. T43.10 Knot hole at 0.75m on the south facing aspect. T43.11 Knot hole at 0.25m on the south aspect.						
T44 / SJ38031 49459	Goat willow	Mature	12 / 0.6	Four features: T44.1 Rot hole at 2m on the north-western aspect beside a pruned branch.	L	Located within an area of dense scrub.	Y	Y	50 - 53	Downgraded to low potential following close-up inspection.

				T44.2 x2 woodpecker holes at 5m on a northern limb. T44.3 Knot hole at 5m on the southern aspect. T44.4 Basal cavity at 0.75m on the south-western aspect.						
T45 / SJ38034 49456	Goat willow	Mature	13 / 0.3	Four features: T45.1 Knot hole at 11m on a western limb. T45.2 Broken branch at 7m on the north-western aspect. T45.3 Rot hole at 4m on the eastern aspect of the main stem. T45.4 Tear out at 7m on the eastern aspect.	M	Located within an area of dense scrub.	Y	Y	54 - 57	Confirmed as moderate potential. Requires two aerial tree assessment inspections.
T46 / SJ38034 49456	Goat willow	Mature	12 / 0.5	Five features: T46.1 Callus roll at 4.5m on the northern aspect. T46.2 Rot hole at 1m on eastern aspect. T46.3 Broken branch at 4.5m on north-western aspect. T43.4 Upward facing callus roll at 4m on north-eastern limb. T46.5 Callus roll with inward rot at 4m on southern limb.	M	Located within an area of dense scrub.	Y	Y	58 - 62	Confirmed as moderate potential. Requires two aerial tree assessment inspections.

T47 / SJ38039 49453	Goat willow	Mature	8 / 0.2	T47.1 Large stem cavity at 0.5m on the south-eastern aspect extending upward 1m.	M	Located within an area of dense scrub.	Y	Y	63	Confirmed as moderate potential. Requires two aerial tree assessment inspections.
T49 / SJ38042 49450	Pedunculate oak	Mature	9 / 0.3	Three features: T49.1 Rot hole at 2.5m on the north-western aspect. T49.2 Rot hole at 5m on the north-eastern aspect (downward facing. T49.3 Hazard beam at 7m on the northern aspect.	L	Located within an area of dense scrub.	Y	Y	64 - 66	Downgraded to low potential following close-up inspection.
T50 / SJ38052 49453	Multi-stemmed goat willow	Mature	11 / 50	Six features: T50.1 Rot hole at 1.5m on main stem (west facing). T50.2 Callus roll with inward rot at 2m on southern stem. T50.3 Rot hole on broken branch at 1.5m on eastern limb. T50.4 Broken branch at 1.9m (same limb at T50.3). T50.5 Callus roll with inward rot at 1.9m on south-eastern branch. T50.6 Callus roll at 1.7 to 3m on the central stem.	L	Located within an area of dense scrub.	Y	Y	67 - 72	Downgraded to low potential following close-up inspection.

T51 / SJ38045 49444	Goat willow	Mature	10 / 0.3	T51.1 Woodpecker hole at 3m on north-western aspect.	L	Located within an area of dense scrub.	Y	Y		Downgraded to low potential following close-up inspection.
T53 / SJ38064 49443	Goat willow	Mature	10 / 0.2	T53.1 Tear out with inward rot at 3m on the north-eastern aspect of the main stem.	M	Located within an area of dense scrub.	Y	Y		Confirmed as moderate potential. Requires two aerial tree assessment inspections.
T54 / SJ38056 49442	Goat willow	Mature	11 / 0.3	Two features: T54.1 Stem cavity at 1.5m on the eastern aspect. T54.2 Larger cavity below T54.1 at 1m (1m in length)	M	Located within an area of dense scrub.	Y	N		Confirmed as moderate potential. Requires two bat presence / absence surveys as PRFs cannot be fully inspected with an endoscope.
T55 / SJ38056 49441	Goat willow	Mature	10 / 0.3	T55.1 Callus roll on main stem on the N facing aspect measuring 5cm x 5m.	L	Located within an area of dense scrub.	Y	Y		Downgraded to low potential following close-up inspection.
T61 / SJ38084 49468	Goat willow	Mature	10 / 0.3	Two features: T61.1 Woodpecker hole at 5m on the eastern aspect. T61.2 Woodpecker hole at 5m on the north-eastern aspect of the main stem.	L	Located within an area of dense scrub.	Y	Y		Downgraded to low potential following close-up inspection.

Table 9 - Summary of PRFs subject to aerial inspection

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
T4	T4.1	Ivy cover	All aspects	Up to 6	0-3	Dense ivy clutter	N/A	100 to 10	None	L	1	
	T4.2	Deadwood	E	6	2	Ivy clutter	Upward	4 x 6	None	L	1	Deadwood and pruning wound. Decay and a gap is evident.
T5	T5.1	Stem cavity	NW	2.5	On stem	Surrounding vegetation	NW	75	None	L	2	Endoscope and downgraded from moderate to low potential.
	T5.2	Ivy cover	All aspects	N/A	On stem	Ivy clutter	N/A	N/A	None	L	3	Light ingress within numerous cavities.
T7	T7.1	Callus roll	E	0 - 2	On stem	Surrounding vegetation	E	200 x 25	None	N	4	
T9	T9.1	Rot hole	SW	2	1.75	None	Horizontal	10 x 15	None	N	5	Damp inside containing slugs and woodlice. Extends back 4cm.
	T9.2	Deadwood branch cavity	W	4	1.75	Leaf clutter and elder saplings	None	None	None	N	6	No cavity is present
	T9.3	Pruned branch	S	5	On stem	Leaf clutter	None	None	None	N	7	Superficial cavities
	T9.4	Flaking bark around deadwood	S	2	0.5	Leaf and branch clutter	None	None	None	N	8	No cavities
	T9.5	Deadwood meeting an eastern facing limb	E	4	On stem (E limb)	None	None	None	None	N	9	No cavity

	T9.6	Pruned branch with surrounding rot	NW	4	0.75	Branches and new shoots	None	None	None	N	10	No cavities
	T9.7	Deadwood branch on main stem	NW	5	On stem	None	None	None	None	N	11	No cavities
T10	T10.1	Stem cavity	SE	0.5	On stem	Surrounding scrub	Vertical	100 x 20 x 70 (upward)	None	L	N/A	Subject to a single presence / absence survey before being inspected again using endoscope with articulated head and downgraded to low potential
	T10.2	Callus roll	N	3	1	Surrounding branches and scrub	Horizontal and upward facing	50 x 10	None	L	N/A	
T13	T13.1	Callus roll	S	3	0.1	None	Upward facing	3.5 x 0.3	None	N	12	Open top – No feature present
	T13.2	Callus roll	W	3.5	On stem	Surrounding branches	Upward facing	3 x 0.3	None	N	13	Open top – no feature present
	T13.3	Knot hole	NW	3.5	4	None	Horizontal	10 x 10	None	N	14	No cavity present
	T13.4	Callus roll	W	3.5	2	Branches / leaves	Downward facing	2 x 20 x 15	None	M	15	Endoscoped, dry and containing woodlice. Room for 4 – 5 bats.
T14	T14.1	Branch rot	S	6	3	Branches	Horizontal	N/A	None	N	16	Endoscoped and found to be superficial
	T14.2	Callus roll	NW	7	0	Branches	Horizontal	N/A	None	N	17	Endoscoped and found to be superficial
	T14.3	Knot hole	SW	4	2	Branches	Downward facing	N/A	None	N	18	Endoscoped and found to be superficial
	T14.4	Knot hole	SW	8	0	Branches	Horizontal	N/A	None	N	19	Endoscoped and found to be superficial

T17	T17.1	Callus roll	E	4	1	Leaf and branch clutter	Downward facing	5 x 10	None	M	20	30cm deep, cobwebbed, damp and containing slugs.
T21	Tree contained an active bee hive and was not climbed. The tree was subject to two additional presence / absence surveys. No bats were observed to be roosting within any of the features.											
T24	T24.1	Branch cavity	W	0.4	On stem	Surrounding vegetation	Vertical	7.5 x 7.5	None	M		
T26	This tree was considered unsafe to climb and was subject to two presence / absence surveys. No bats were observed to be roosting within any of the features.											
T28	T28.1	Wound In the rotting bark	NE	3	On stem	None	Horizontal and slightly upward	5 x 10 x 10 (deep) x 3 (down)	None	M	21	Cobwebs, slugs and woodlice present
	T28.2	Inward rot on deadwood branch	W	4	Adjacent to stem	None	No feature	N/A	None	N	22	Superficial cavity
	T28.3	Broken branch wound	NE	4	1	None	Horizontal and upward facing	1.5 x 1.5	None	N	23	Does no extend inward (superficial)
T32	T32.1	Dense ivy cover	All aspects	Whole tree	On stem	Ivy clutter	N/A	N/A	None	M	24	Dense cover that is obscuring other PRFs. This tree was subject to two subsequent presence / absence surveys.
	T32.2	Split branch	SE	3	1	Ivy clutter	Downward facing	5 x 2	None	L	25	

T35	T35.1	Callus roll	N	6	1 (on N branch)	None	Vertical	N/A	None	N	26	Sealed cracks in the deadwood
	T35.2	Deadwood	NW	5.75	0.5	None	Horizontal	1 x 0.3	None	N	27	Upward facing fisure is present. Located on a limb.
	T35.3	Flaking bark	W	5	On crown	None	N/A	N/A	None	N	28	
	T35.4	Upward facing cavity	SE	6	1.5	None	Horizontal	7 x 4 x 7	None	L	29	Downward and horizontal containing evidence of birds. Squirrel chewed. Space for a single bat.
	T35.5	Snapped branch with callus roll	E	5	< 1	None	Horizontal	2 x 2 (up 1)	None	L	30	Hole identified at the top. Woodlice are present.
	T35.6	Callus roll	W	7	On stem	None	Vertical extending downward	0.5 x 1	None	N	31	No suitable cavity for a bat. 25cm in length and largely exposed.
	T35.7	Deadwood branch	SW	1.5	On stem	None	Vertical	3 x 3 x 10	None	L	32	
T37	T37.1	Deadwood limb with numerous cavities	NE	0.5 – 1.5	On stem	Ivy and leaf clutter	Both vertical and horizontal	5 (up) for the main crevice and 1 to 5 for the superficial crevices	None	L	33	
	T37.2	Deadwood	SW	2.5	SW limb of the main stem	None	Upward facing	No hole	None	L	34	Flaking bark and cobwebs present.
	T37.3	Stem cavity	NE	0.5	On stem	None	Horizontal	3 x 3 internally and inward 50cm.	None	M	35	Dry and cobwebbed. Light ingress observed toward the south of the cavity.

	T37.4	Broken stem	E	4.5	1	Hawthorn branches	Upward facing	10cm wide	None	N	36	Open at the top with no cavity.
	T37.5	Stem split	S	0.25	On stem	None	Vertical	5xm inward	0.25None	L	37	Shallow with woodlice present.
T42	T42.1	Rot hole	W	1.2	On stem	Surrounding leaf clutter	Vertical	20cm upward	None	M	38	Birds nest observed downward. Dry with frass and an upward facing cavity.
T43	T43.1	Tear out	SE	1.5	2	Bramble scrub	Vertical	8 x 10 (first chamber), 5 x 4 (second chamber) rounded and extending 15 inward.	None	L	39	Cobwebs present
	T43.2	Knot hole	SW	2	On stem	Cobwebs and tree shoots	Vertical and upward	4 x 7 x 20cm upward	None	M	40	Bird nesting material present and blocking entrance to cavity
	T43.3	Knot hole (above T43.2)	SW	2.2	On stem	Tree shoots	Vertical	Downward 15cm and upward 7cm. 3 x 3 (entrance 1) and 6 x 9 (entrance 2)	None	L	41	Two entrances, multichambered and cobwebbed with spiders and woodlice present.
	T43.4	Knot hole (above T43.3)	SW	3	SW limb	Tree shoots	Horizontal and downward	Horizontal 4 x 4 and downward 5 x 5	None	L	42	2 entrances with an internal cavity down the limb with an internal measurement of 5 x 5cm.
	T43.5	Tear out	W	2.5	SW limb	Tree shoots	Downward 15cm	25 x 10	None	L	43	Ants present with a downward cavity measuring 7 x 4cm. Deadwood present.
	T43.6	Callus roll	NW	4	2.5	Leaf clutter	Downward	N/A	None	N	44	Superficial

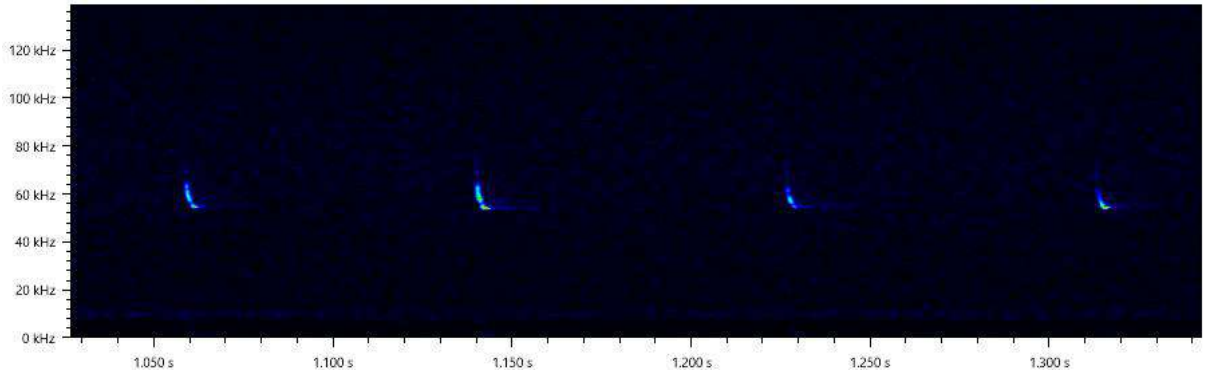
	T43.7	Rot holes	NW	2.5	On stem	None	Downward	N/A	None	L	45	
	T43.8	Knot hole	S	1	0.3	Surrounding branches	Upward	10 x 7	None	M	42	Cobwebbed, contains cashed nuts and evidence of nesting birds.
	T43.9	x5 connected callus rolls	NW	4	Main limb	Leaf clutter	Tubular upward with a top roll	5 x 4 an 40 in / up	None	L	46	New callus roll identified 15cm and upward facing. Middle section is 7cm. All 5 features are connected and follow a 'Y' shaped branch fork Internal dimensions are 4 x 5cm and 1m in total.
	T43.10	x2 knot holes	SE	1.8 – 2.2	Main stem	Surrounding branches / limbs	Vertical	Lower section 1 x 1 and upper section 5 x 5 and 4cm inward.	None	Lower section – N Upper section L	47 & 48	Lower section is too narrow for bats.
	T43.11	Knot hole	S	0.25	Main stem	Branches / limbs	Vertical	3 x 3 x 6 (inside) and back 10	None	L	49	
T44	T44.1	Rot hole	NW	2	One stem	None	Vertical	N/A	None	N	50	
	T44.2	Woodpecker hole	N	5	On stem	None	Vertical downward	10 x 7 and internally 10 x 10	None	L	51	Downgraded from moderate to low. Curved roof straight down onto chamber 5cm.
	T44.3	Knot hole	S	5	On stem	None	Vertical downward	2 x 2 x 7	None	L	52	
	T44.4	Basal cavity	SW	0.75	On stem	None	Vertical	2 x 2 x 1	None	L	53	

T45	T45.1	Knot hole	NE limb facing N	11	On stem	None	N/A	1 x 1 x 1	None	N	54	Knot hole not woodpecker hole.
	T45.2	Broken branch	NW	7	1	None	Vertical extending upward	5 x 2	None	L	55	Cavity below snapped branch. Cavity 3cm in diameter. x2 chambers with room for a single bat.
	T45.3	Rot hole	W	4	On stem	None	Vertical	10 x 2 and extending 60 upward. Internal cavity is 5 x 5	None	M	56	X4 old lady moths *Mormo maura* inside. Tapers to a point at the peak. Fully inspected with an endoscope.
	T45.4	Tear out	W	7	On stem	None	Vertical	5 x 10 and upward 6	None	L	57	Deadwood present with internal rot
T46	T46.1	Callus roll	NW	4.5	On stem	Leaf clutter	Vertical	30 long and 40 up	None	M	58	Moths present. A bat could fit in 20cm of the crevice.
	T46.2	Rot hole	W	1	On stem	Surrounding branches	Vertical	4 x 4 and 20 upward	None	L	59	Slugs inside
	T46.3	Broken branch	NW	4	1 on N limb	None	Vertical and horizontal	Downward 10	None	N	60	The snap itself is broadly unsuitable as it is wet and exposed.
	T46.4	Upward facing callus roll	NW	4	2	Leaf clutter	Upward facing	25 x 7 and up 20cm	None	L	61	Cobwebbed, damp, slugs present with and internal diameter of 5 x 4cm that tapers to a point.
	T46.5	Callus roll with inward rot	SW	4	On central stem	Leaf and branch clutter	Vertical	6 x 25 and upward 15	None	L	62	Tubular cavity, 4cm in diameter, dry with woodlice present.
T47	T47.1	Stem cavity	SE	0.5	On stem	Surrounding branches	Vertical	10 x 10 and upward 75	None	M	63	Contains spiders and woodlice.
T49	T49.1	Rot hole	NW	1.5	On stem	None	Vertical	20 x 2 and upward 20	None	L	64	Narrow cavity at 2 x 2cm. Internally dry with slugs.

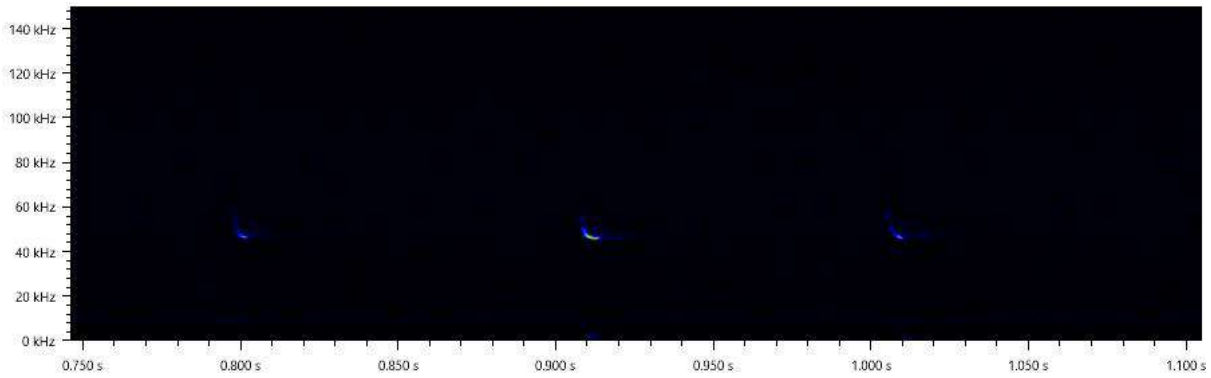
	T49.2	Knot hole	N	7	0.5	None	Vertical	N/A	None	N	65	No cavity present.
	T49.3	Hazard beam	N	7	2	None	Vertical	3 x 3 and upward 15	None	L	66	Extends upward and downward with room for a single bat.
T50	T50.1	Rot hole	W	1.5	On stem	None	Vertical upward	2 x 100 externally, internally 5 x 5 and 15 upward	None	L	67	Very narrow with space for one bat.
	T50.2	Callus roll	S	2	On stem	None	Vertical upward	7 x 10	None	L	68	Southern stem
	T50.3	Rot hole	E	1.5	On eastern branch adjacent to the main stem.	None	Upward	5 x 1 and narrow upward (approximately 6cm). 5 x 20 downward	None	L	69	Very cobwebbed and thin upward.
	T50.4	Broken branch	E	1.5	1	None	Vertical	N/A	N/A	N	70	
	T50.5	Callus roll	E	1.9	On stem	None	Upward extending at 3cm	1m tubular cavity	None	L	71	Damp with earth inside. No suitable gap.
	T50.6	Callus roll	Central stem	1.7 to 3	On stem	None	Vertical extending upward 20.	2 x 2 diameter.	None	L	72	
T51	T51.1	Woodpecker inspection hole	NW	3	On stem	None	Inward 3m	7.5 x 7.5	None	N	73	
T53	T53.1	Rot hole	NE	3.5	On stem	Branches / tree shoots	Vertical	10 x 5 extending upward 40cm	None	M	74	Hollow stem connecting to NW facing woodpecker hole. A large open chamber that extends horizontally at the bottom.

T54	This tree was subject to two presence / absence surveys. No bats were observed to be roosting within either of the features present.											
T55	T55.1	Stem cavity	N	3	On stem	None	Horizontal and inward 5cm	5 x 5	None	L	**76**	
T61	T61.1	Inspection woodpecker hole	E	5	On stem	None	Horizontal inward 3cm	10 x 5	None	N	77	
	T61.2	Inspection woodpecker hole	NE	5	On Stem	None	Horizontal inward 3cm	10 x 5	None	N	78	

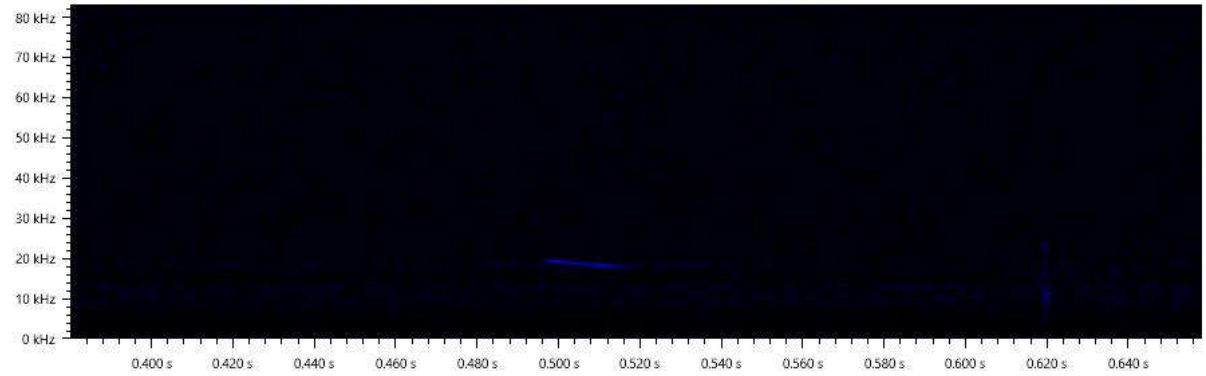
Appendix 3 – Presence / absence survey results



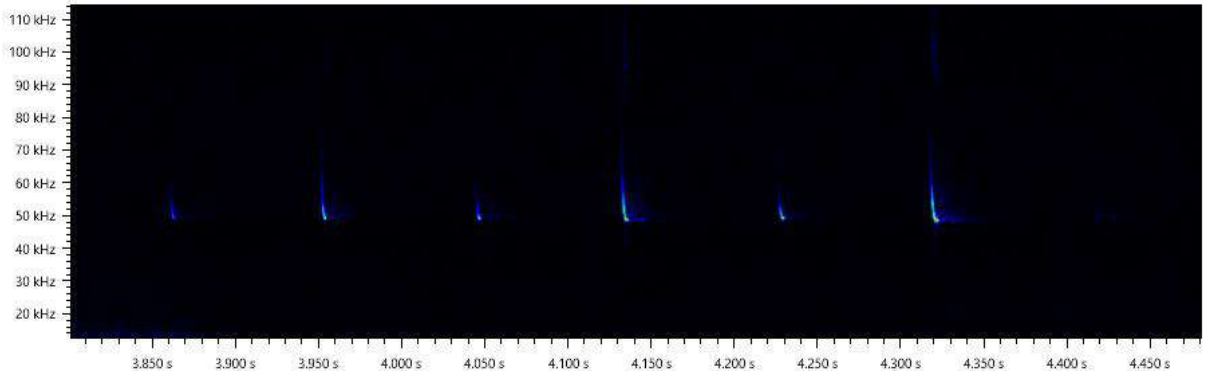
Sonogram 1 – Soprano pipistrelle commuting over site at 21:05 on 10th August 2023.



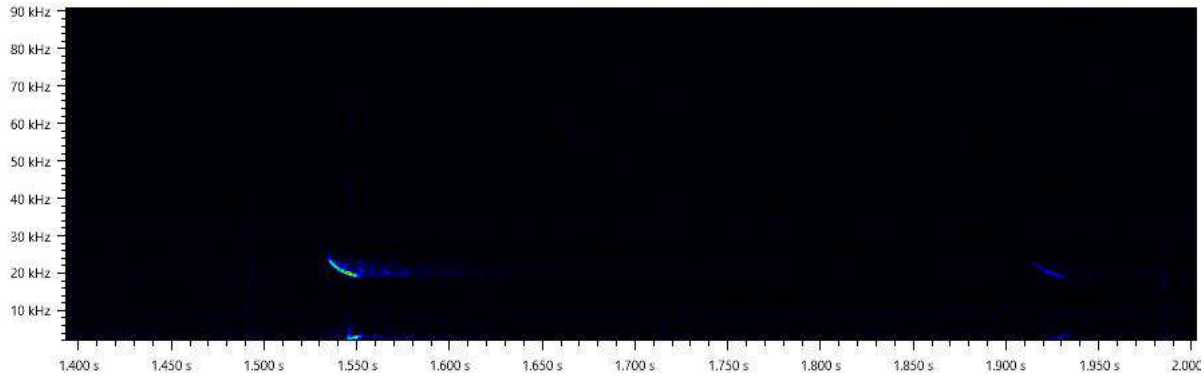
Sonogram 2 – Common pipistrelle commuting in proximity to T54 on 10th August 2023.



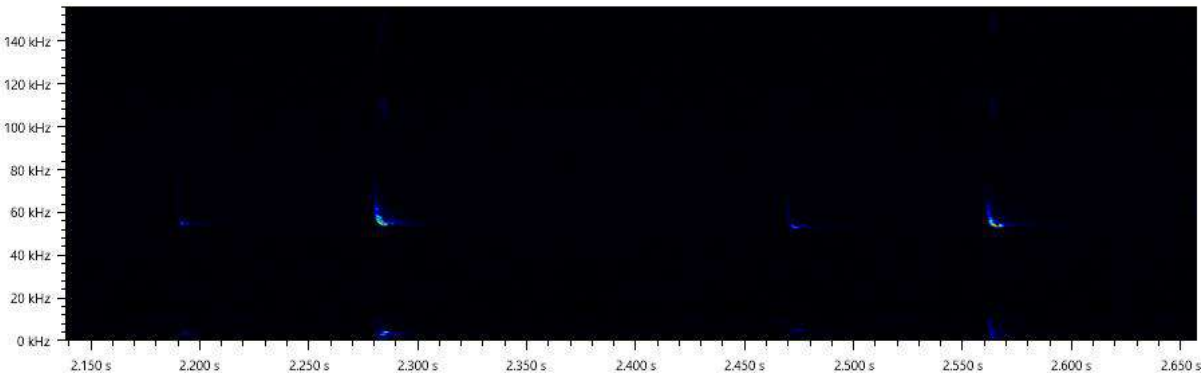
Sonogram 3 – Noctule commuting in proximity to T54 on 10th August 2023.



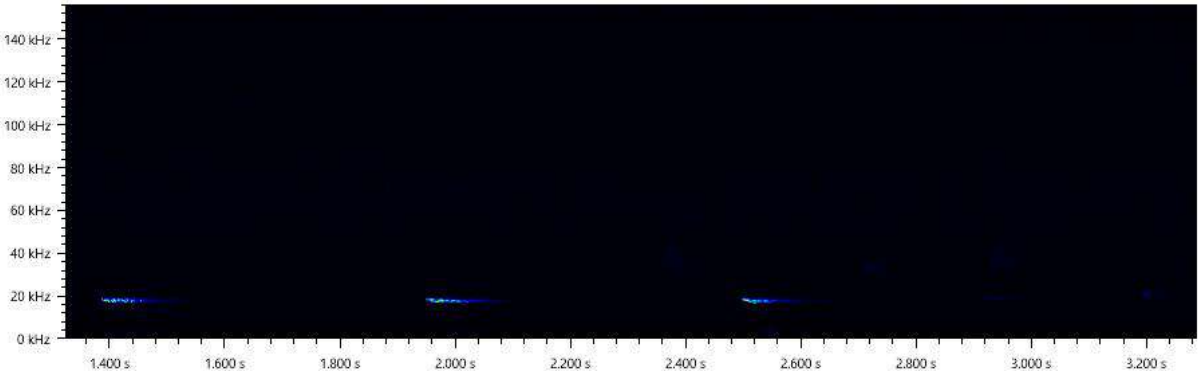
Sonogram 4 – Common pipistrelle commuting in proximity to T21 at 21:48 on 18th August 2023.



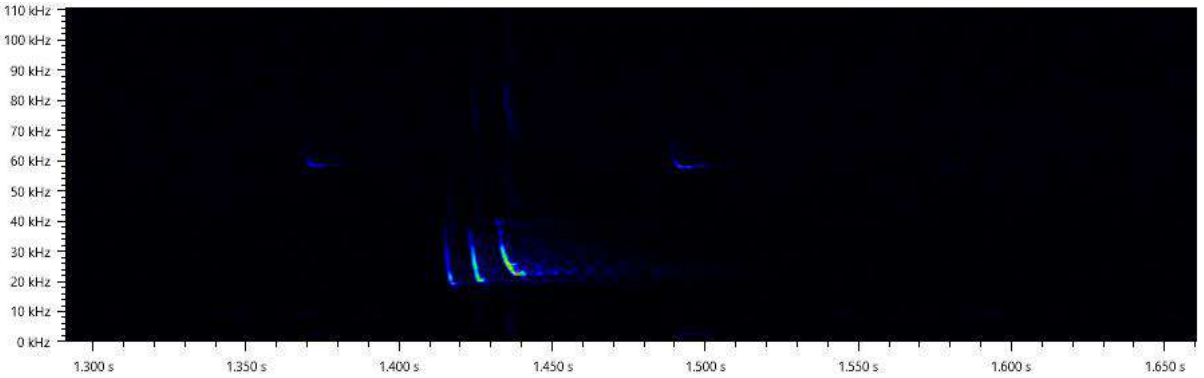
Sonogram 5 – Noctule commuting in proximity to T21 at 21:52 on 18th August 2023.



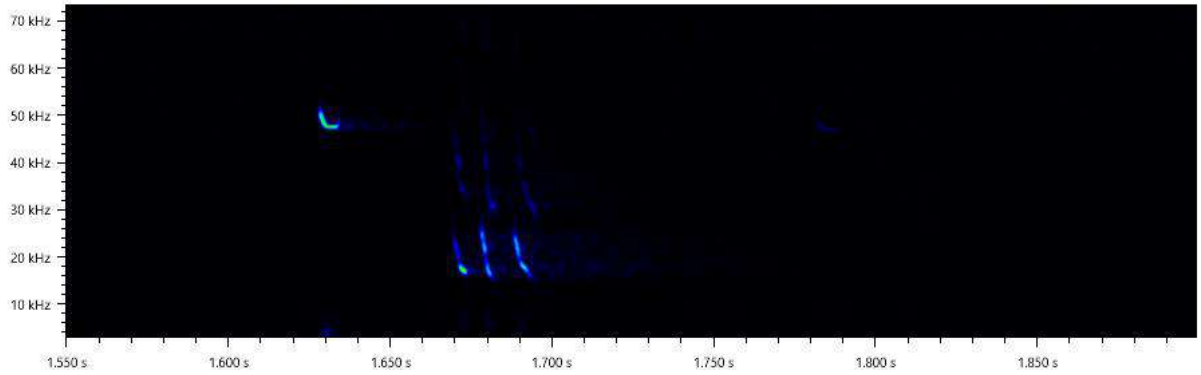
Sonogram 6 – Soprano pipistrelle commuting in proximity to T21 at 21:59 on 18th August 2023.



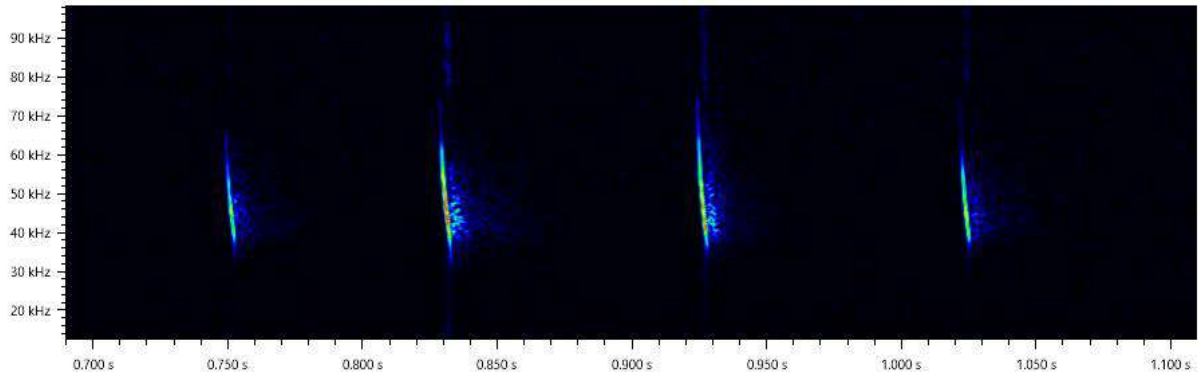
Sonogram 7 – Noctule commuting in proximity to T32 at 21:14 on 20th August 2023.



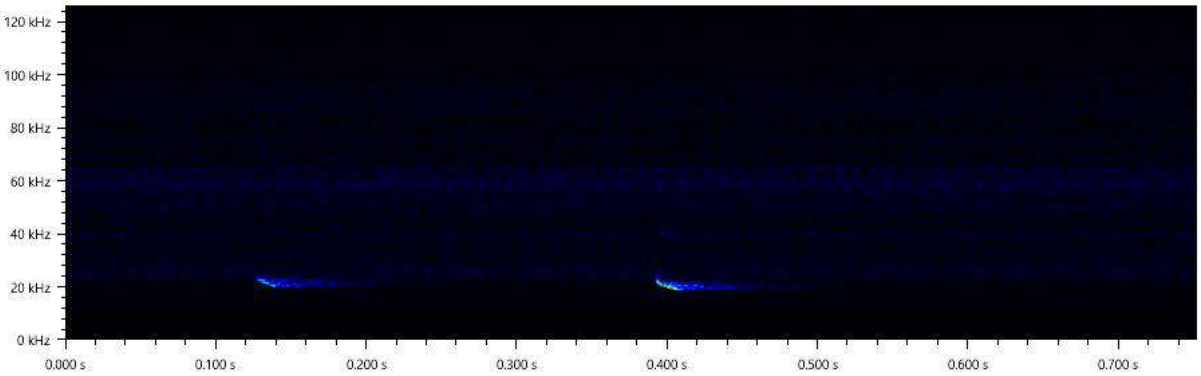
Sonogram 8 – Soprano pipistrelle commuting and socialising in proximity to T21 at 04:59 on 11th September 2023.



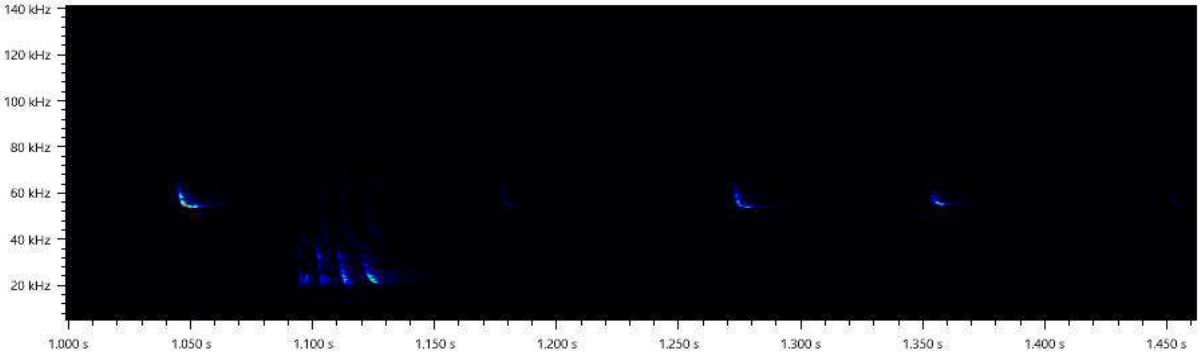
Sonogram 9 – Common pipistrelle commuting and socialising in proximity to T21 at 05:01 on 11th September 2023.



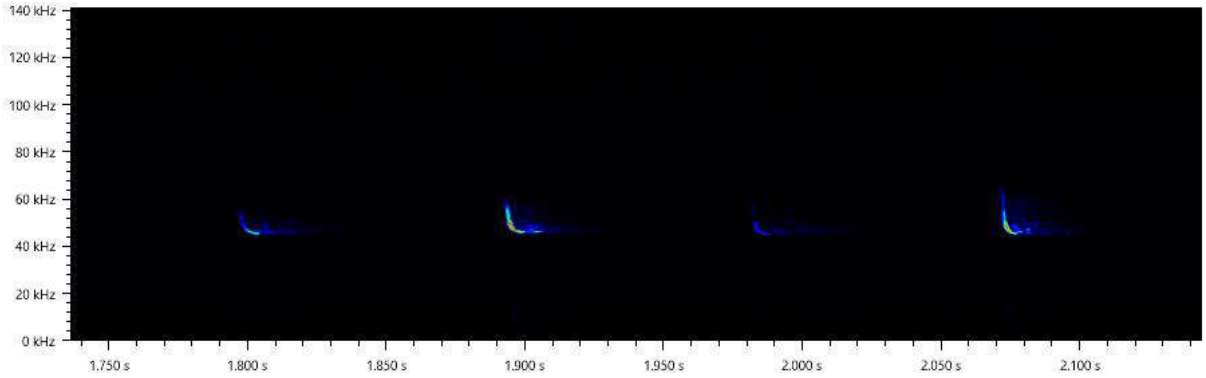
Sonogram 10 – *Myotis* sp. bat commuting in proximity to T21 at 05:16 on 11th September 2023.



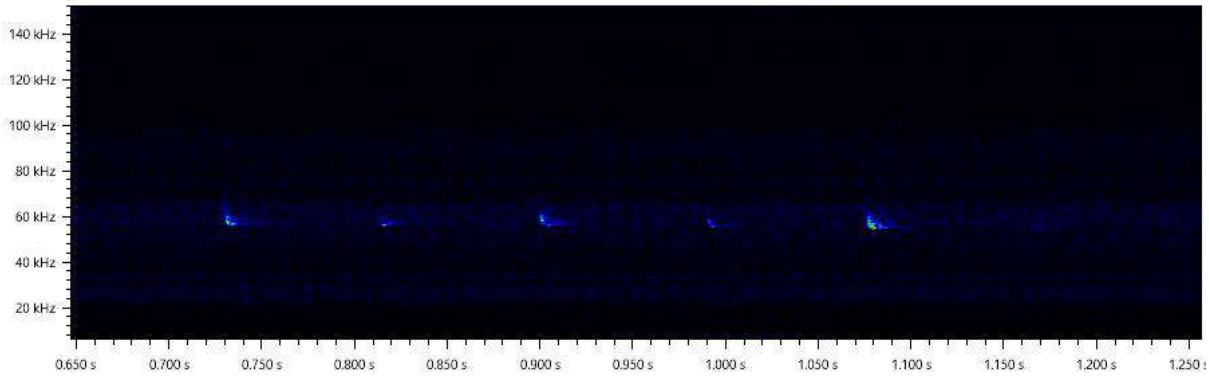
Sonogram 11 – Noctule bat commuting in proximity to T32 at 05:19 on 11th September 2023.



Sonogram 12 – Soprano pipistrelle commuting and socialising in proximity to T26 at 05:31 on 11th September 2023.



Sonogram 13 - Common pipistrelle commuting in proximity to T26 at 05:52 on 11th September 2023.



Sonogram 14 – Soprano pipistrelle commuting in proximity to T32 at 05:54 on 11th September 2023.

Appendix 4 – Photographs



Photograph 1 – T4.1 dense ivy cover and T4.2 flaking bark.



Photograph 2 – T5.1 Stem cavity.



Photograph 3 – T5.2 Dense ivy cover.



Photograph 4 – T7.1 callus roll.



Photograph 5 – T9.1 rot hole.



Photograph 6 – T9.2 deadwood branch cavity.



Photograph 7 – T9.3 pruned branch.



Photograph 8 – T9.4 flaking bark around deadwood.



Photograph 9 – T9.5 deadwood meeting limb.



Photograph 10 – T9.6 pruned branch with surrounding rot.



Photograph 11 – T9.7 deadwood branch on main stem.



Photograph 12 – T13.1 callus roll.



Photograph 13 – T13.2 callus roll.



Photograph 14 – T13.3 knot hole.



Photograph 15 – T13.4 callus roll



Photograph 16 – T14.1 branch rot.



Photograph 17 – T14.2 callus roll.



Photograph 18 – T14.3 knot hole.



Photograph 19 – T14.4 knot hole.



Photograph 20 – T17.1 callus roll.



Photograph 21 – T28.1 wound in rotting bark.



Photograph 22 – T28.2 Inward rot on deadwood branch.



Photograph 23 - T28.3 broken branch wound.



Photograph 24 – T32.1 dense ivy cover.



Photograph 25 – T32.2 split branch.



Photograph 26 – T35.1 callus roll.



Photograph 27 – T35.2 deadwood.



Photograph 28 – T35.3 superficial flaking bark.



Photograph 29 – T35.4 upward facing cavity.



Photograph 30 – T35.5 snapped branch callus roll.



Photograph 31 – T35.6 callus roll.



Photograph 32 – T35.7 deadwood branch.



Photograph 33 – T37.1 deadwood limb with numerous cavities.



Photograph 34 – T37.2 deadwood.



Photograph 35 – T37.3 stem cavity



Photograph 36 – T37.4 broken stem.



Photograph 37 – T37.5 stem split.



Photograph 38 – T42.1 rot hole.



Photograph 39 – T43.1 tear out.



Photograph 40 – T43.2 knot hole.



Photograph 41 – T43.3 knot hole.



Photograph 42 – T43.4 knot hole.



Photograph 43 – T43.5 tear out.



Photograph 44 – T43.6 callus roll.



Photograph 45 – T43.7 knot hole.



Photograph 46 – T43.9 x5 callus rolls.



Photograph 47 – T43.10 upper section of the knot holes.



Photograph 48 – T43.10 lower section of the knot holes.



Photograph 49 – T43.11 lower section of the knot holes.



Photograph 50 – T44.1 rot hole.



Photograph 51 – T44.2 woodpecker hole.



Photograph 52 – T44.3 knot hole.



Photograph 53 – T44.4 basal cavity.



Photograph 54 – T45.1 woodpecker hole.



Photograph 55 – T45.2 broken branch.



Photograph 56 – T45.3 rot hole.



Photograph 57 – T45.4 tear out.



Photograph 58 – T46.1 callus roll.



Photograph 59 – T46.2 rot hole.



Photograph 60 – T46.3 broken branch.



Photograph 61 – T46.4 upward facing callus roll.



Photograph 62 – T46.5 callus roll with inward rot.



Photograph 63 – T47.1 stem cavity.



Photograph 64 – T49.1 rot hole.



Photograph 65 – T49.2 knot hole,



Photograph 66 – T49.3 hazard beam.



Photograph 67 – T50.1 rot hole.



Photograph 68 – T50.2 callus roll.



Photograph 69 – T50.3 rot hole.



Photograph 70 – T50.4 broken branch.



Photograph 71 – T50.5 callus roll.



Photograph 72 – T50.6 callus roll.



Photograph 73 – T51.1 Woodpecker hole.



Photograph 74 - T55.1 stem cavity.



Photograph 75 – T61.1 Woodpecker hole.



Photograph 76 – T61.2 woodpecker hole.

Appendix 5 - 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.

Taken from the Bat Conservation Trust

Appendix 6 – 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 - 2024). 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.