

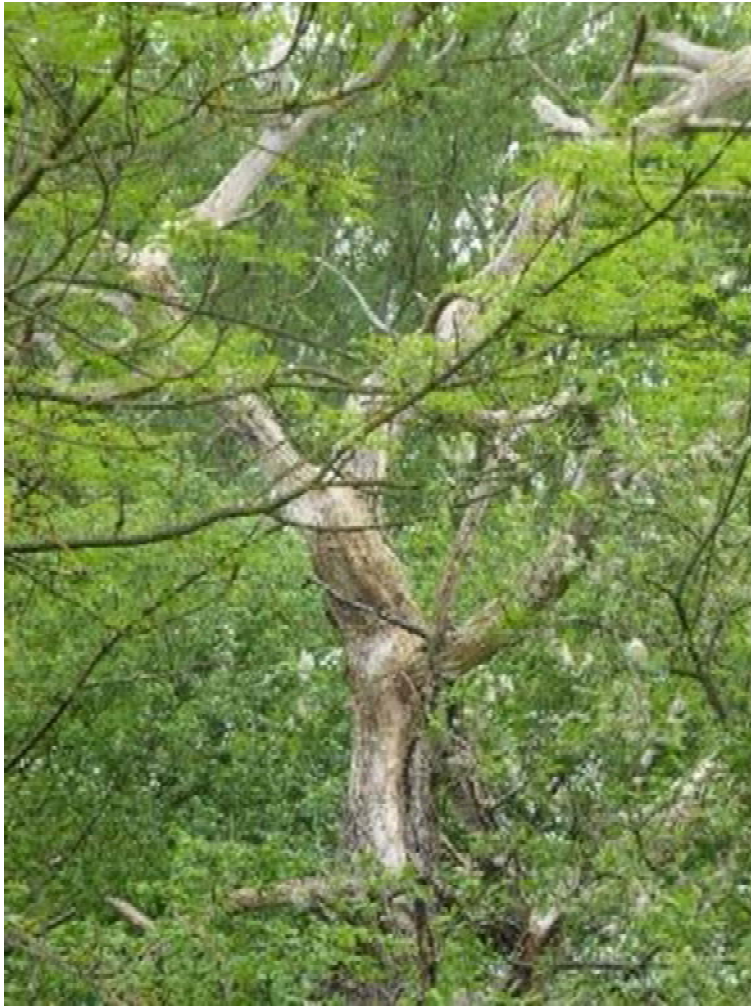


T13 Willow – mature single stem



T13 Dead wood with multiple woodpecker holes 8m up on east side. **High potential** but >20m from development.





T14 Large dead tree Only visible from a distance – features likely due to size and significant deadwood. **Moderate potential**

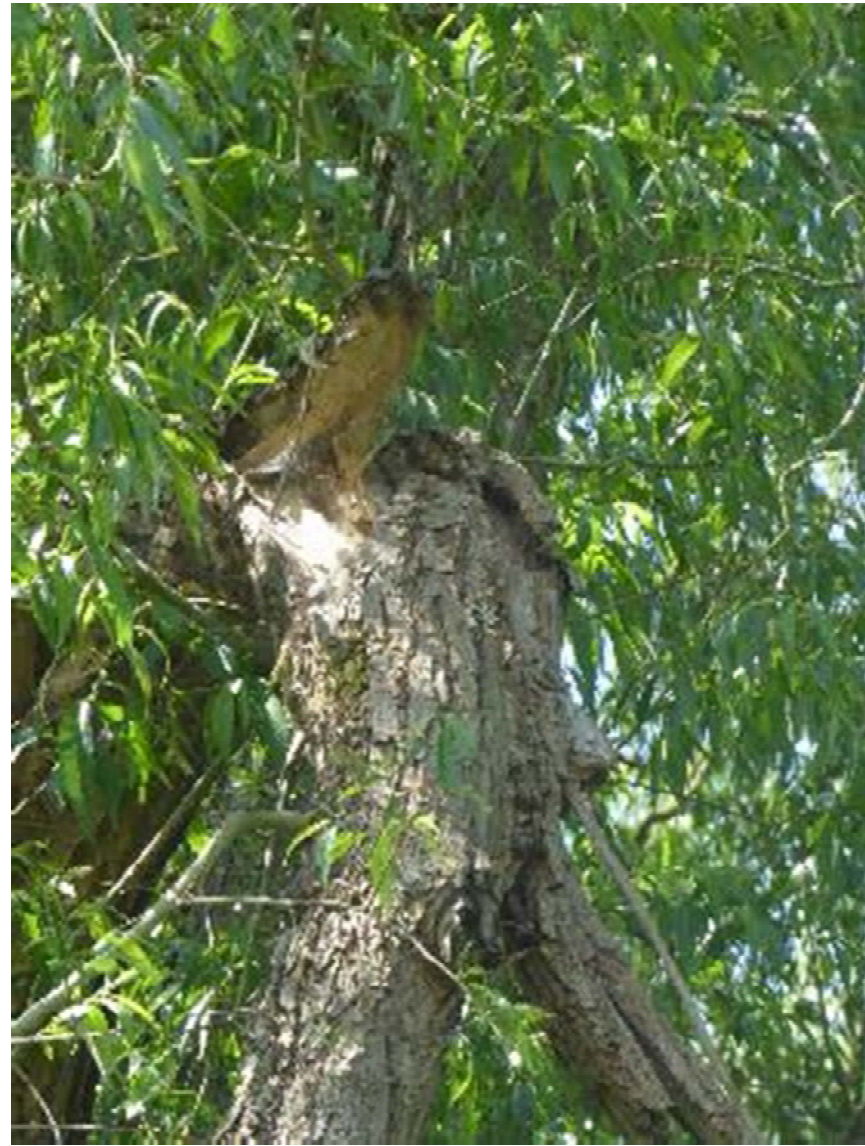


T15 Willow sp - mature Main stem cracked at c.8m (leaning east). Splits and potential cavities present around cracked section. **Moderate potential**





T16 Willow sp - mature



T16 Cracked branch with relatively small cavities possible. **Low potential**





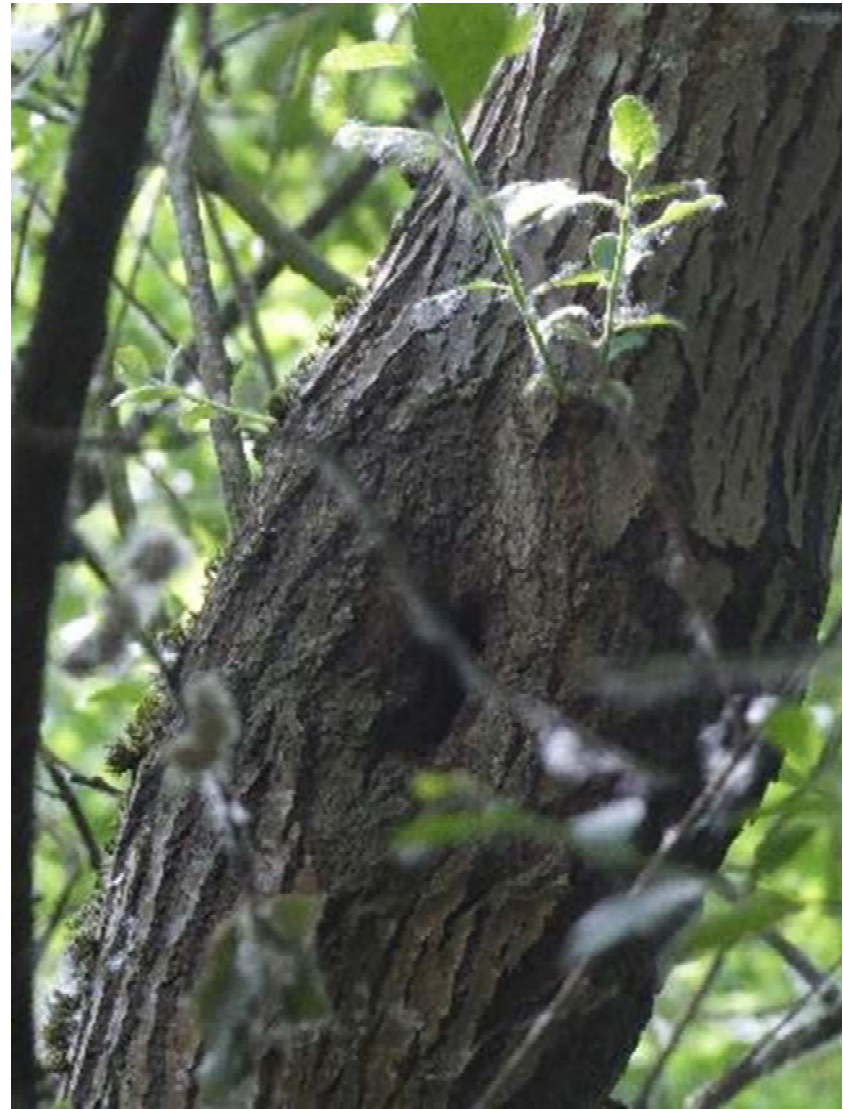
T17 Willow sp – mature, multi-stemmed - set between fisherman storage shed and workshop



T17 Multiple stem cracks including hazard beams between 0.5 and 2m, east facing. **Moderate potential.**



T18 Alder – semi-mature, multi-stemmed



T18 Knothole at 4m north-east - **low potential.**





T19 Willow sp – semi-mature  
Long split in main trunk from ground level to c.5m, north facing. **Moderate potential** but >20m from proposed development.



T20 Willow sp - mature Main trunk cracked with significant split present from near ground level, visible northern aspect. **Moderate potential** but >20m from proposed development.





T21 Black poplar adjacent to right of canal bridge - ivy covered trunk and branches., **Moderate potential.** (found to be a confirmed roost through subsequent surveys)

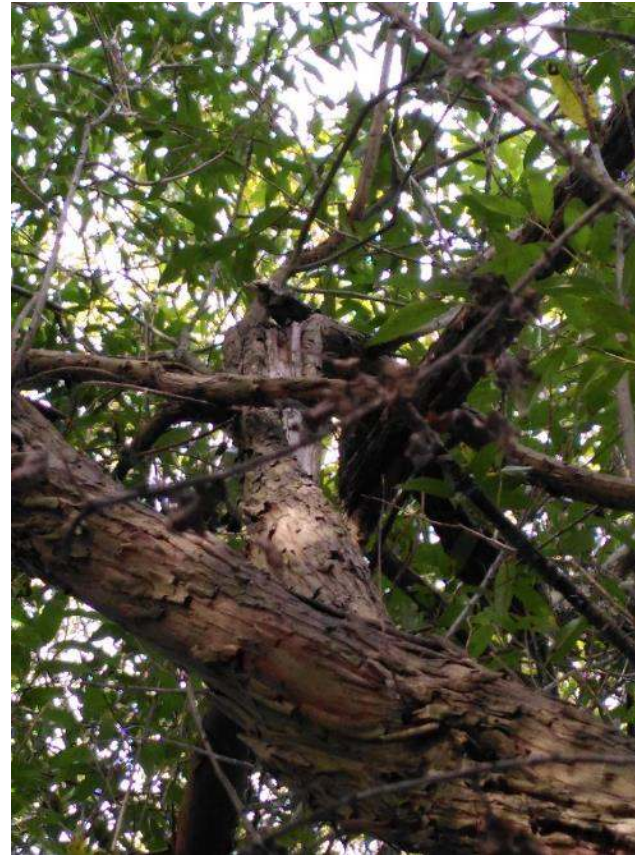


T22 Willow sp - mature multi-stem - eastern stem - knothole @ 3.5m facing north. **Low potential.**



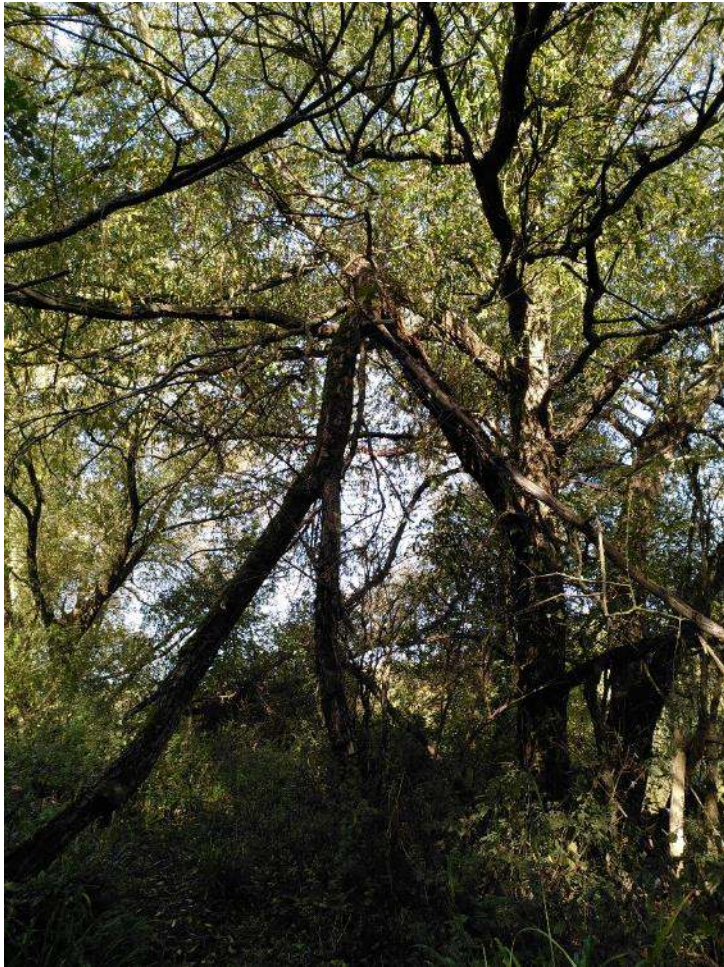


T23 - largely dead tree - two intertwined stems. **Low potential.**



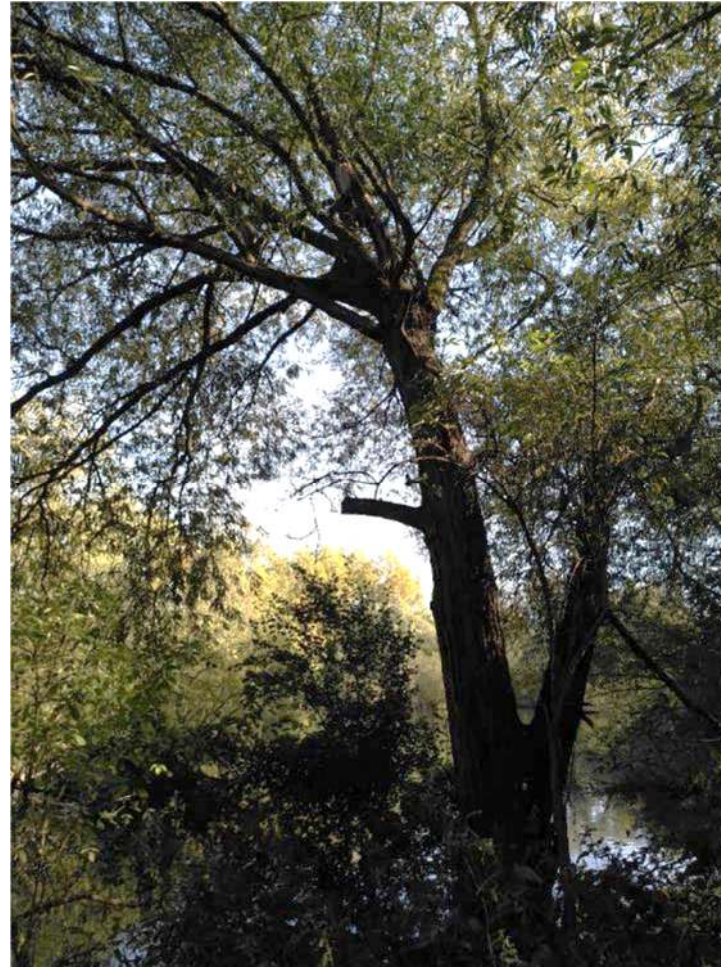
T23 - lifted bark at 6m - cavity 6cm length 2cm width, open / draughty.  
**Low potential.**





T24 Willow sp - semi-mature Bark flap at 6m on broken branch with **low potential**.

Many other broken hung-up branches but all have splits at the top and open to water ingress - negligible potential.



T25 Willow sp - mature Broken branch open to top with lifted bark to sides at 7-8m height; lifted bark on adjacent stem. **Low potential**.

Many other broken hung-up branches but all have splits at the top and open to water ingress - negligible potential.





T26 Dead willow stem 0.28m DBH



T26 - hollow cavity in centre of stem, empty one way and cobwebbed the other, very open and draughty, no signs of bats and bats absent. **Low potential.**





T27 - willow sp. - fallen main stem. **Low potential.**

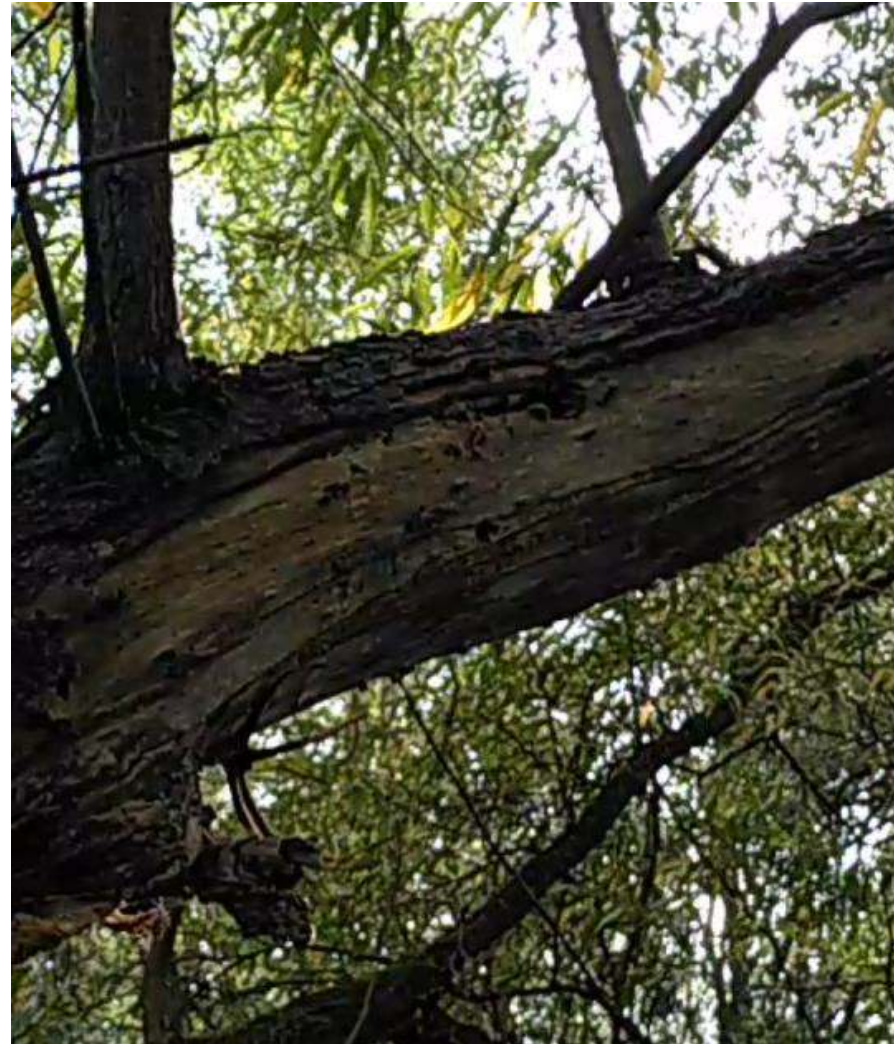


T27 - fallen stem - main split very open - multiple fractures extending less than 5cm depth and thin. **Low potential.**





T28 - willow sp. - Large fallen split branch, multiple fractures which are thin and shallow, space for only one bat per split, but very draughty. **Low potential.**



T29 - Willow sp - semi-mature 0.4m DBH- Insect hole on dead limb 2m above ground facing north, wood frass spilling out, very dusty / dirty with no signs of bat use. **Low potential.**





Trees 27 - 29 - view facing east (scrub obscuring adjacent lake behind) - likely location of HS2 Roost E due to open clearing and presence of multiple features although all are individually low potential, as detailed above.



## APPENDIX D PRF INSPECTION RESULTS

Table D.1 Combined results of ground level tree inspections (GLTA) and subsequent endoscopic PRF inspections.

Tree No.	Description	Features identified during GLTA	GLTA Potential	Reassessment after PRF Inspection / Potential roost types / No. bats feature could support	Further surveys required / Justification
T1	Willow sp – semi-mature multi-stemmed	Small hazard beam 1m south	Low	Low Transitional / day / night 1-2	No
T2	Willow sp – semi-mature multi-stemmed	Small hazard beam 2.5m west	Low	Low Transitional / day / night 2-4	No
T3	Willow – mature with 3 main stems	Deadwood leading into potential cavities x2 at 6m west. Knothole x2 at 5m west	Moderate	Moderate 4 features: 3 moderate, 1 low Hibernation / transitional / day / night 5-10 All PRFs with cluttered drop zone - lots of enclosing vegetation.	Yes
T4	Willow – mature, collapsed at base	Cavity into large collapsed stem. Split in additional twisted, collapsed stem – both at ground level south-west facing	Moderate	Negligible – all features very damp	No
T5	Willow sp – mature multi-stem, collapsed	Cavity at base (newly collapsed tree) with loose bark on limbs.	Low	Low – basal cavity damp, full of slugs; loose bark low potential. Bats absent - endoscoped on 5/7/23 and 11/8/23.	No



Tree No.	Description	Features identified during GLTA	GLTA Potential	Reassessment after PRF Inspection / Potential roost types / No. bats feature could support	Further surveys required / Justification
T6	Ash - mature	Bird box attached to tree	Moderate	Not inspected – no access to property	No – to be retained and protected from impacts
T7	Horse chestnut - mature	Bird box attached to tree	Moderate	Low – bird nest present, no eggs Day / night 2-4	No
T8	Silver birch – semi-mature	Bird box attached to tree	Moderate	Negligible Nests present no eggs	No
T9	Willow sp – mature, multi-stemmed by lake shore	Knothole 4m west, woodpecker hole 5m west	Moderate	Low Woodpecker hole - Negligible Knot hole – low Transitional / day / night 1-2	No
T10	Alder – young or stem part of larger mature tree	Trunk cavity in dead heartwood 2m south	Moderate	Low Callus roll upper section – Low Day / night 1-2	No
T11	Willow sp – mature tree leaning over water	Small hazard beam 2m south-west	Negligible	Negligible No space for a bat	No



Tree No.	Description	Features identified during GLTA	GLTA Potential	Reassessment after PRF Inspection / Potential roost types / No. bats feature could support	Further surveys required / Justification
T12	Willow sp – mature with two main stems	Dead heartwood with potential cavity 6m west	Moderate	Not assessed. >20m from development within area to be protected from impacts – excluded from scope.	No
T13	Willow – mature single stem	Area of dead wood with multiple woodpecker holes. Branches and vegetation cluttering drop zone.	High	Unsafe to climb. Within area to be protected from impacts and with buffering vegetation present– excluded from scope.	No
T14	Large dead tree	Only visible from a distance – features likely due to size and significant deadwood	Moderate	Unsafe to climb. Within boggy / sinking sand area. Visibility through vegetation poor. Approximately 15m from development. Within area to be protected from impacts	Yes
T15	Willow sp - mature	Main stem cracked at c.8m (leaning east). Splits and potential cavities present around cracked section.	Moderate	Not assessed. >20m from development within area to be protected from impacts – excluded from scope.	No
T16	Willow sp - mature	Cracked branch with relatively small cavities possible	Low	Low – not surveyed.	No
T17	Willow sp – mature, multi-stemmed	Multiple stem cracks including hazard beams between 0.5 and 2m, east facing	Moderate	3 features Torn limb – Moderate Hazard beam – Moderate Hazard beam – Moderate Hibernation / transitional / day / night Each feature 1-2 bats	Yes



Tree No.	Description	Features identified during GLTA	GLTA Potential	Reassessment after PRF Inspection / Potential roost types / No. bats feature could support	Further surveys required / Justification
T18	Alder – semi-mature, multi-stemmed	Knothole at 4m north-east	Low	Negligible. Knothole 4m high – exposed, wet and full of slugs	No
T19	Willow sp – semi-mature	Long split in main trunk from ground level to c.5m, north facing	Moderate	Not assessed. >20m from development within area to be protected from impacts – excluded from scope.	No
T20	Willow sp - mature	Main trunk cracked with significant split present from near ground level, visible northern aspect	Moderate	Not assessed. >20m from development within area to be protected from impacts – excluded from scope.	No
T21	Black poplar	Large ivy covered tree – ivy is a feature (thick. Braided) and features may be hidden beneath ivy	Moderate	Unsafe to climb.	Yes
T22	Willow sp - mature	Multi stem willow, knot hole 3.5m up north	Low	Low – not surveyed.	No
T23	Dead tree	Two intertwined stems, at top (6m) a feature with 6cm length 1cm width space for 1 bat	Low	Low – not surveyed.	No
T24	Willow sp - semi-mature	Bark flap at 6m on broken branch	Low	Low – not surveyed.	No



Tree No.	Description	Features identified during GLTA	GLTA Potential	Reassessment after PRF Inspection / Potential roost types / No. bats feature could support	Further surveys required / Justification
T25	Willow sp - mature	Broken branch open to top with lifted bark to sides at 7-8m height; lifted bark on adjacent stem	Low	Low – not surveyed.	No
T26	Dead willow stem 0.28m DBH	Hollow cavity in centre of stem, empty one way and cobwebbed the other, very open and draughty, no signs of bats and bats absent.	Low	Low – not surveyed.	No
T27	Willow sp - mature	Fallen main stem, split at top open and exposed, multiple fractures extending less than 5cm depth and thin.	Low	Low – not surveyed.	No
T28	Willow sp - mature	Large failed split branch, multiple fractures which are thin and shallow.	Low	Low – not surveyed.	No
T29	Willow sp - semi-mature 0.4m DBH	Insect hole on dead limb 2m above ground facing north, wood frass spilling out, very dusty / dirty with no signs of bat use.	Low	Low – not surveyed.	No



## APPENDIX E EMERGENCE SURVEY RESULTS

Table E.1 Dates of building surveys undertaken with results

Building ID	Potential	Surveys required	Survey 1	Survey 2	Survey 3	Result
Storage shed	Low	1	24/05/2023			Bats absent
Fisherman's hut	Low	1	24/05/2023			Bats absent
Electricity substation	Low	1	24/05/2023			Bats absent
Pumphouse	Low	1	11/08/2023			Bats absent
BSC Club House	Low	1	19/07/2023			Bats absent
Bridge	Moderate	2	05/06/2023	28/07/2023 - roost identified	15/09/23	Confirmed night roost / feeding perch - possible day roost for small numbers of soprano pipistrelles

Table E.2 Tree surveys undertaken and results

Tree ID	Potential	Surveys required	Survey 1	Survey 2	Survey 3	Result
T3	Moderate	2	09/08/23	30/08/23		Bats absent
T14	Moderate	2	09/08/23	15/09/23		Bats absent
T17	Moderate	2	10/08/23	15/09/23		Bats absent
T21 Black poplar	Moderate	2	28/07/2023	29/08/23 - roost identified	15/09/23	Confirmed day roost for 2 soprano and / or common pipistrelles



## APPENDIX F ROOST MAPS



Figure F.1 Roosts identified approximately by HS2 through radio-tracking surveys within a 50m buffer (the area within which these roosts may actually be located)

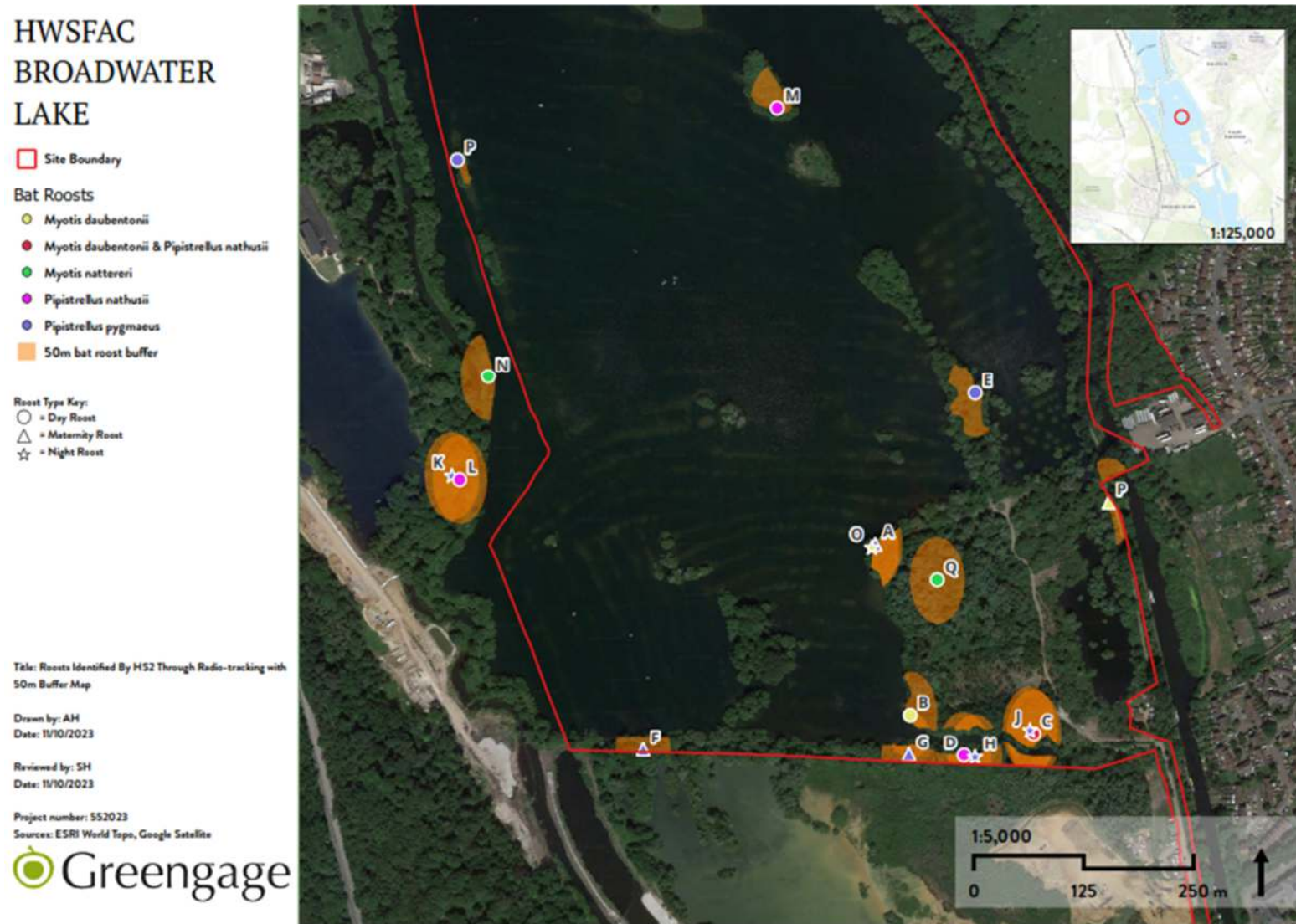


Figure F.2 Confirmed roosts identified through emergence surveys in 2023

# HWSFAC BROADWATER LAKE

Site Boundary

Confirmed Bat Roosts

Pipistrellus pygmaeus

Roost Type Key:

○ = Dry Roost

△ = Mating Roost

Title: Confirmed Bat Roost Map

Drawn by: AH

Date: 11/10/2023

Reviewed by: SH

Date: 11/10/2023

Project number: 552023

Sources: ESRI World Topo, Google Satellite





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## APPENDIX G LEGISLATION AND POLICY

### G.1 LEGISLATION

All UK bats and their roosts are protected by law. Since the first legislation was introduced in 1981, which gave strong legal protection to all bat species and their roosts in England, Scotland and Wales, additional legislation and amendments have been implemented throughout the UK.

Six of the 18 British species of bat have Biodiversity Action Plans (BAPs) assigned to them, which highlights the importance of specific habitats to species, details of the threats they face and proposes measures to aid in the reduction of population declines.

The Wildlife & Countryside Act 1981 (WCA) was the first legislation to provide protection for all bats and their roosts in England, Scotland and Wales (earlier legislation gave protection to horseshoe bats only.)

All eighteen British bat species are listed in Schedule 5 of the Wildlife and Countryside Act, 1981 and under Annexe IV of the Habitats Directive , 1992 as a European protected species. They are therefore fully protected under Section 9 of the 1981 Act and under Regulation 43 of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, which transposes the Habitats Directive into UK law. Consequently, it is an offence to:

- Deliberately capture, injure or kill a bat;
- Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats;
- Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time);
- Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat; and
- Intentionally or recklessly obstruct access to a bat roost.

This legislation applies to all bat life stages.

The implications of the above in relation to the proposals are that where it is necessary during construction to remove trees, buildings or structures in which bats roost, it must first be determined that work is compulsory and if so, appropriate licenses must be obtained from Natural England. Additionally, although habitats that are important for bats are not legally protected, care should be taken when dealing with the modification or development of an area if aspects of it are deemed important to bats such as flight corridors and foraging areas.

### G.2 PLANNING POLICY

#### National Planning Policy Framework (NPPF)

The National Planning Policy Framework (NPPF) 2021<sup>6</sup> sets out the Government's planning policies for England, including how plans and decisions are expected to apply a presumption in favour of sustainable development. Chapter 15 of the NPPF focuses on conservation and enhancement of the

natural environment, stating plans should ‘identify and pursue opportunities for securing measurable net gains for biodiversity’.

It goes on to state: ‘if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused’. Alongside this, it acknowledges that planning should be refused where irreplaceable habitats such as ancient woodland are lost..

## The London Plan<sup>7</sup>

### *Policy G1 Green infrastructure*

1. London’s network of green and open spaces, and green features in the built environment such as green roofs and street trees, should be protected, planned, designed and managed as integrated features of green infrastructure.
2. Boroughs should prepare green infrastructure strategies that integrate objectives relating to open space provision, biodiversity conservation, flood management, health and wellbeing, sport and recreation.
3. Development Plans and Opportunity Area Planning Frameworks should:
  1. identify key green infrastructure assets, their function and their potential function
  2. identify opportunities for addressing environmental and social challenges through strategic green infrastructure interventions.
4. Development proposals should incorporate appropriate elements of green infrastructure that are integrated into London’s wider green infrastructure network.

### *Policy G5 Urban greening*

1. Major development proposals should contribute to the greening of London by including urban greening as a fundamental element of site and building design, and by incorporating measures such as high-quality landscaping (including trees), green roofs, green walls and nature-based sustainable drainage.
2. Boroughs should develop an Urban Greening Factor (UGF) to identify the appropriate amount of urban greening required in new developments. The UGF should be based on the factors set out in Table 8.2, but tailored to local circumstances. In the interim, the Mayor recommends a target score of 0.4 for developments that are predominately residential, and a target score of 0.3 for predominately commercial development. (excluding B2 and B8 uses).
3. Existing green cover retained on site should count towards developments meeting the interim target scores set out in (B) based on the factors set out in Table 8.2.

### *Policy G6 Biodiversity and access to nature*



1. Sites of Importance for Nature Conservation (SINCs) should be protected.
2. Boroughs, in developing Development Plans, should:
  - a. use up-to-date information about the natural environment and the relevant procedures to identify SINCs and ecological corridors to identify coherent ecological networks
  - b. identify areas of deficiency in access to nature (i.e. areas that are more than 1km walking distance from an accessible Metropolitan or Borough SINC) and seek opportunities to address them
  - c. support the protection and conservation of priority species and habitats that sit outside the SINC network, and promote opportunities for enhancing them using Biodiversity Action Plans
  - d. seek opportunities to create other habitats, or features such as artificial nest sites, that are of particular relevance and benefit in an urban context
  - e. ensure designated sites of European or national nature conservation importance are clearly identified and impacts assessed in accordance with legislative requirements.
3. Where harm to a SINC is unavoidable, and where the benefits of the development proposal clearly outweigh the impacts on biodiversity, the following mitigation hierarchy should be applied to minimise development impacts:
  - a. avoid damaging the significant ecological features of the site
  - b. minimise the overall spatial impact and mitigate it by improving the quality or management of the rest of the site
  - c. deliver off-site compensation of better biodiversity value.
4. Development proposals should manage impacts on biodiversity and aim to secure net biodiversity gain. This should be informed by the best available ecological information and addressed from the start of the development process.
5. Proposals which reduce deficiencies in access to nature should be considered positively.

### *Policy G7 Trees and woodlands*

1. London's urban forest and woodlands should be protected and maintained, and new trees and woodlands should be planted in appropriate locations in order to increase the extent of London's urban forest – the area of London under the canopy of trees.
2. In their Development Plans, boroughs should:
  - a. Protect 'veteran' trees and ancient woodland where these are not already part of a protected site
  - b. Identify opportunities for tree planting in strategic locations
3. Development proposals should ensure that, wherever possible, existing trees of quality are retained [Category A and B]. If planning permission is granted that necessitates the removal of trees, there

should be adequate replacement based on the existing value of the benefits of the trees removed, determined by, for example, i-tree or CAVAT or another appropriate valuation system. The planting of additional trees should generally be included in new developments – particularly large-canopied species which provide a wider range of benefits because of the larger surface area of their canopy.

### London Environment Strategy 2018<sup>8</sup>

The Mayor's Environment Strategy was published in May 2018. This document sets out the strategic vision for the environment throughout London. Although not primarily a planning guidance document, it does set strategic objectives, policies and proposals that are of relevance to the delivery of new development in a planning context, including:

#### *Objective 5.1 Make more than half of London green by 2050*

Policy 5.1.1 Protect, enhance and increase green areas in the city, to provide green infrastructure services and benefits that London needs now.

This policy states:

“New development proposals should avoid reducing the overall amount of green cover and, where possible, seek to enhance the wider green infrastructure network to increase the benefits this provides. [...] New developments should aim to avoid fragmentation of existing green space, reduce storm water run-off rates by using sustainable drainage, and include new tree planting, wildlife-friendly landscaping, or features such as green roofs to mitigate any unavoidable loss”.

This supports the ‘environmental net gain’ approach promoted by government in the 25 Year Environment Plan.

Proposal 5.1.1.d The London Plan includes policies to green streets and buildings, including increasing the extent of green roofs, green walls and sustainable drainage.

#### *Objective 5.2 conserving and enhancement wildlife and natural habitats*

Policy 5.2.1 Protect a core network of nature conservation sites and ensure a net gain in biodiversity

This policy requires new development to include new wildlife habitat, nesting and roosting sites, and ecologically appropriate landscaping will provide more resources for wildlife and help to strengthen ecological corridors. It states:

“Opportunities should be sought to create or restore priority habitats (previously known as UK Biodiversity Action Plan habitats) that have been identified as conservation priorities in London [and] all land managers and landowners should take BAP priority species into account”.



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## REFERENCES

- <sup>1</sup> Collins, J. (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines*. Bat Conservation Trust 3 edn
- <sup>2</sup> MAGIC (2019); *Interactive Map*. (Partnership project involving six government organisations: Defra (Department for Environment, Food and Rural Affairs); English Heritage; Natural England; Environment Agency; Forestry Commission; Department for Communities and Local Government). Available at: [www.magic.gov.uk](http://www.magic.gov.uk).
- <sup>3</sup> CIEEM (2023). *UK Bat Mitigation Guidelines*. Available: <https://cieem.net/resource/uk-bat-mitigation-guidelines-2023/>
- <sup>4</sup> Bat Conservation Trust (BCT) & Institute of Lighting Professionals (ILP) (2023). *GN08/23 Bats and artificial lighting*. Available: [Guidance Note 8 Bats and Artificial Lighting | Institution of Lighting Professionals \(theilp.org.uk\)](https://www.theilp.org.uk/guidance-note-8-bats-and-artificial-lighting)
- <sup>5</sup> 2F Schwegler Bat Box [2F Schwegler Bat Box \(General Purpose\) | NHBS Practical Conservation Equipment](#) (Greengage does not specifically endorse this product)
- <sup>6</sup> GOV.UK. (2021). *National Planning Policy Framework*. [online] Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework>
- <sup>7</sup> Greater London Authority (2021) *The London Plan: The Spatial Development Strategy for Greater London (GLA)*
- <sup>8</sup> Greater London Authority (2018). *London Environment Strategy 2018*. London: Greater London Authority.