



Wokingham Borough Council

SOUTH WOKINGHAM DISTRIBUTOR ROAD

Preliminary Bat Roost Assessment Report





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EXECUTIVE SUMMARY

Wokingham Borough Council (WBC) has instructed WSP UK Ltd to conduct ecological surveys to support the detailed design and discharge of planning conditions for the South Wokingham Distributor Road (SWDR) Scheme. The SWDR is located between Easthampstead Road and Finchampstead Road, south of Wokingham. The main objective of the SWDR is to facilitate access for strategic housing allocations and reduce the impact of increased traffic on local roads.

The SWDR Scheme received planning permission (planning ref. 192928) in 2021. However, due to the time which has elapsed since, an ecological gap analysis (WSP, 2024) was undertaken by WSP on behalf of WBC in order to identify the requirements for any further ecological surveys required, in line with any relevant planning conditions, or otherwise to appropriately inform pre-construction mitigation measures.

Following the findings of the most recent ecological gap analysis (WSP, 2024), WSP UK Ltd was commissioned by WBC to complete a Preliminary Bat Roost Assessment (PBRA) of all trees within the SWDR Scheme footprint plus an additional 10m buffer to update and inform on their current suitability to support roosting bats. A visual inspection of the exterior of all trees was completed from ground level, with the assistance of binoculars and torches where necessary, to search for features which may provide potential roosting opportunities for bats.

During the visual inspection, ninety-three trees were inspected during the PBRA with eighty-three identified as having suitability to support roosting bats. Trees have been classified as having negligible suitability (NONE), roosts suitable for individual bats (PRF-I), roosts suitable for multiple bats (PRF-M), needing further assessment required (FAR) for trees which could not be fully assessed during the PBRA and trees which were not accessed/assessed due to access restrictions. The results of the tree suitability are summarised below:

Suitability	Tree Count	Tree Number
NONE	6	T01, T06, T28, T30, T38, T52
FAR	1	T32
PRF-I	16	N06, N08, N11, N13, N15, N16, N17, N33, T20, T25, T35, T39, T40, T41, T45, T49
PRF-M	66	N01, N02, N03, N04, N05, N07, N09, N10, N14, N19, N20, N21, N22, N23, N24, N25, N26, N27, N28, N29, N30, N31, N32, N34, N35, N36, N37, N38, N39, T02, T03, T04, T05, T07, T08, T09, T10, T11, T12, T13, T14, T15, T16, T17, T18, T19, T22, T23, T24, T26, T27, T29, T33, T34, T36, T37, T42, T43, T44, T46, T46a, T47, T48, T50, T51, T53
Not assessed/ accessed	4	N12, N18, T21, T31

Bats and their roosts are protected under a range of national legislation and planning policy. Retention of vegetation including woodland, tree lines and hedgerow should be considered in the first instance. Where clearance cannot be avoided, it should be kept to a minimum to ensure continued habitat suitability for bats.

Recommendations have been made for further survey to determine the presence or likely absence of roosting bats in trees classified as PRF-M that will be affected by the Scheme. For trees which could not be completely inspected during PBRA, at height/climbing and endoscope inspections would be required, or dusk emergence surveys for those features which cannot be suitably surveyed at height due to access or health and safety issues. Trees classified as PRF-I that will be impacted do not require further survey but would be subject to soft-felling under supervision of a qualified ecologist.

Mitigation and ecological enhancement measures based on the current ecological data from the PBRA have been recommended in this report to update and support the detailed design and discharge of planning conditions for the SWDR Scheme.

1 INTRODUCTION

1.1 PROJECT BACKGROUND

- 1.1.1. Wokingham Borough Council (WBC) secured planning permission in 2021 (planning ref. 192928) to construct the South Wokingham Distributor Road (SWDR) between Easthampstead Road and Finchampstead Road, hereafter the 'Site'. The SWDR aims to facilitate access to strategic housing allocations and to reduce the impact of increased traffic on local roads. The SWDR is hereafter referred to as the 'Scheme'.
- 1.1.2. The Scheme is currently progressing through detailed design and discharge of planning conditions. Given the time elapsed since the previous survey efforts, it is recommended that an updated suite of ecological surveys is to be completed where there is a reasonable likelihood of change in presence/absence or where previous information was not obtained.

1.2 ECOLOGICAL BACKGROUND

- 1.2.1. WSP completed ecological surveys of the Site and a buffer area between 2017 and 2021 to support the planning application. In addition, ecological survey work for areas targeting the South Wokingham Strategic Development Location (SDL), an associated major phased development which includes the Scheme, were carried out by ECOSA and The Ecology Partnership between 2013 and 2022.
- 1.2.2. The SDL is defined as the following:
'...an urban extension of Wokingham town, Montague Park and south of the railway between the boundary with Bracknell Forest and Finchampstead Road. It will include new homes, new primary schools, local shopping and community facilities in two new neighbourhood centres, open spaces and roads including a South Wokingham Distributor Road.'
- 1.2.3. Previously conducted bat surveys comprised Preliminary Bat Roost Assessment (PBRA) of trees, emergence and/or re-entry surveys of suitable trees and bat activity surveys (automated/static) of the Site. During these surveys, one active common pipistrelle *Pipistrellus pipistrellus* roost has been confirmed in tree T42. The complete results, implications and recommendations made in previous assessments may be found in the WSP (2019) – SWDR Spine Road & Western Gateway – Bat Survey Report.
- 1.2.4. As a significant period of time has passed since the previous surveys, the data from previous surveys has now exceeded its period of validity. Bats may switch roosts or colonise different trees as new roosting features develop over time. Therefore, updated survey and assessments are required to inform mitigation and/or licencing requirements.
- 1.2.5. An Ecology Gap Analysis (WSP, 2024) was completed by WSP for the Scheme in January 2024, consisting of a detailed, desk-based review of existing survey information, planning conditions and associated documents to determine further survey and pre-construction requirements. The Ecology Gap Analysis identified that an updated PBRA of trees within the Site was required.

1.3 BRIEF AND OBJECTIVES

- 1.3.1. WBC commissioned WSP UK Ltd to complete PBRA surveys across the Site. The brief was to:

- establish the suitability of potential bat roosts by completing a PBRA of trees within the Scheme footprint;
- recommend further survey of trees with features identified as suitable to support roosting bats, where found;
- make recommendations to account for roosting bats with respect to legislation and planning and biodiversity policy.

1.3.2. The results of the PBRA surveys, and subsequent recommendations, are included within this report.

2 METHODS

2.1 PRELIMINARY BAT ROOST ASSESSMENT SURVEY

- 2.1.1. All trees present within the Site and a 10m buffer, hereafter referred to as the 'Survey Area' (Figure 2a), were subject to a PBRA during daylight hours to identify the potential for trees and groups of trees, or woodlands, to support roosting bats.
- 2.1.2. The PBRA involved an exterior ground level tree assessment (GLTA) search for Potential Roost Features (PRFs) and detailed descriptions of such features. Descriptions of PRFs should be sufficient to inform an assessment, in terms of the overall availability of roosting resources in the Survey Area, and requirements of further survey and/or mitigation measures.
- 2.1.3. The suitability of trees to support PRFs were assessed and categorised during a ground level tree assessment as set out in Table 2-1 below.

Table 2-1 - Guidelines for assessing the suitability of trees in the Survey Area (Collins, J (ed.), 2023)

Suitability	Description
NONE	Either no PRFs in the tree or highly unlikely to be any.
FAR	Further Assessment Required to establish if PRFs are present in the tree
PRF	A tree with at least one PRF present.

- 2.1.4. Trees with PRFs are further categorised to provide information on the nature of their suitability for roosting bats, as set out in Table 2-2 below.

Table 2-2 - Guidelines for categorising the potential suitability of PRFs for bats (Collins, J (ed.), 2023)

Suitability	Description
PRF-I	PRF is only suitable for individual bats or very small numbers of bats either due to the size or the lack of suitable surrounding habitats.
PRF-M	PRF is suitable for multiple bats and therefore may be used by a maternity colony.

2.2 DATES OF SURVEY AND PERSONNEL

- 2.2.1. The PBRA surveys were carried out on 25 and 26 March 2024, during the period when leaves are absent from trees and therefore visibility of PRFs is good. The surveys were conducted between 10.00am and 4.00pm when trees and PRFs are visible without the use of artificial lighting (though a torch was used to further light up the inside of PRFs). The weather conditions during the surveys were dry with intermittent clouds on both days.

- 2.2.2. The surveys were conducted in accordance with Bat Conservation Trust guidelines (Collins, J (ed.), 2023). The PBRA was led and completed by an experienced surveyor with over seven years of experience in bat surveys, including GLTA).

2.3 NOTES AND LIMITATIONS

- 2.3.1. Several trees could not be safely surveyed during the GLTA due to access limitations comprising proximity to roads, proximity to watercourses and waterbodies, dense vegetation and private parcels with fencing and restricted access. As the suitability of these trees could not be fully assessed, further surveys to confirm bat roost presence are recommended as outlined in section 5.2 to overcome this limitation.
- 2.3.2. Tree locations in Figures 2 and 3 are indicative based on mapping and GPS signal in the field. As such, some locations may appear outside of the Scheme boundary or 10m buffer but are thought to lie within it.
- 2.3.3. Ecological survey data is typically valid for up to 18 months unless otherwise specified, for example if conditions are likely to change more quickly due to ecological processes or anticipated changes in management (CIEEM, 2019).

3 RESULTS

3.1 PRELIMINARY BAT ROOST ASSESSMENT

- 3.1.1. Within the Survey Area, 93 trees were inspected during the GLTA for their potential to support roosting bats (Figure 2a-e) with 83 trees identified as having suitability to support roosting bats. The summary of results and classification of roosting suitability of all assessed trees can be found in Table 3-1 below.

Table 3-1 – Summary of Preliminary Roost Suitability Assessment

Suitability	Tree Count	Tree Number
NONE	6	T01, T06, T28, T30, T38, T52
FAR	1	T32*
PRF-I	16	N06, N08, N11, N13*, N15, N16, N17, N33, T20, T25, T35, T39, T40, T41, T45*, T49
PRF-M	66	N01, N02, N03, N04, N05, N07, N09, N10, N14, N19, N20, N21, N22, N23, N24, N25, N26*, N27, N28, N29, N30, N31*, N32, N34, N35, N36, N37, N38, N39, T02, T03*, T04, T05*, T07*, T08*, T09*, T10, T11*, T12*, T13, T14, T15, T16, T17, T18, T19*, T22, T23*, T24, T26, T27, T29, T33, T34, T36, T37, T42, T43, T44, T46, T46a, T47*, T48, T50, T51, T53
Not assessed/ accessed	4	N12, N18, T21, T31

*Trees with limited access which were not surveyed from all aspects during the GLTA.

- 3.1.2. It is understood that not all trees will be impacted by the Scheme works. Based on the Scheme's tree removal plan (WSP, 2018), there are 48 out of the 93 surveyed trees which will be impacted by the development of the Scheme. Trees which will be impacted by the Scheme are outlined in Table 3-2 below.
- 3.1.3. Trees which will be impacted by the development of the Scheme and have been identified as FAR or PRF-M will require further surveys. The trees which require further survey effort are summarised in Table 3-2 below. Further survey requirements specific to each tree can be found in section 5 of this report.
- 3.1.4. Tree T42, which is the only tree with a known confirmed bat roost from previous PBRA (WSP, 2019), has been classified as a PRF-M during the GLTA. No further survey is currently required for T42, as the tree is to be retained based to the tree removal plan (WSP, 2018), unless there are changes to the tree removal plan design. Nonetheless, as the updated PBRA has not ruled out the presence of an active roost, T42 is hereafter referred to and treated as a 'Confirmed Roost' (Figure 2d).

Table 3-2 – Summary of trees impacted by the Scheme development which require further survey

Tree category	Tree Count	Tree number
Trees impacted by the Scheme development	48	N01, N02, N03, N04, N11, N13, N19, N20, N21, N22, N23, N24, N25, N26, N27, N30, N31, N39, T01, T02, T03, T04, T05, T06, T07, T08, T09, T10, T11, T12, T17, T18, T19, T22, T23, T24, T25, T32, T36, T37, T44, T45, T47, T48, T49, T50, T51, T52
Trees that require further survey	40	N01, N02, N03, N04, N19, N20, N21, N22, N23, N24, N25, N26, N27, N30, N31, N39, T02, T03, T04, T05, T07, T08, T09, T10, T11, T12, T17, T18, T19, T22, T23, T24, T32, T36, T37, T44, T47, T48, T50, T51

- 3.1.5. The complete results of the GLTA for each tree with further survey requirements can be found in Table A-1 in Appendix A.
- 3.1.6. Tree photography of the 83 surveyed trees may be found in Appendix B.

4 IMPLICATIONS FOR DEVELOPMENT

4.1 OVERVIEW

- 4.1.1. In the absence of further survey and mitigation, the Scheme has the potential to cause direct effects on potential bat tree roosts in the Survey Area through removal of potential roost features and degradation of the habitat used by roosting bats. It is understood that the current tree removal plan includes retention of a previously confirmed roost in tree T42, ensuring legal compliance in protecting bat roosts within the Site. Legislation and planning policy relevant to bats and their roosts is set out below. Recommendations on how to comply with the relevant legislation and policy are set out in Section 5.

4.2 LEGAL COMPLIANCE

- 4.2.1. Bats and their roosts are afforded a high level of protection under the Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitat Regulations'). The legislation means that it is an offence to:
- Deliberately capture, injure or kill a wild bat;
 - Deliberately disturb wild bats; 'disturbance of animals includes in particular any disturbance which is likely:
 - (a) to impair their ability —
 - (i) to survive, to breed or reproduce, or to rear or nurture their young; or
 - (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
 - (b) to affect significantly the local distribution or abundance of the species to which they belong.'
 - Damage or destroy a breeding site or resting place used by this species.
- 4.2.2. Protection is also afforded under the Wildlife and Countryside Act 1981 (as amended) with respect to disturbance of animals when using places of shelter and obstruction of access to places of shelter.
- 4.2.3. Due to the high level of protection afforded to bats and their habitat, mitigation for this species is governed by a strict licensing procedure administered by Natural England. Licencing is subject to three tests, as defined under the Habitats Regulations. These must also be applied by the planning authority before granting permission for activities affecting bats
- 4.2.4. Certain species of bats including noctule *Nyctalus noctula*, brown long-eared *Plecotus auritus*, barbastelle *Barbastella barbastellus* and soprano pipistrelle *Pipistrellus pygmaeus* are also listed as a Species of Principal Importance (SPI) for the Conservation of Biodiversity in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Under Section 40 of the NERC Act (2006) public bodies (including local planning authorities) have a duty to have regard for the conservation of SPI when carrying out their functions, including determining planning applications.
- 4.2.5. In addition, barbastelle is listed under Annexe II of the Habitats Directive, which places a requirement on member states to designate Special Areas of Conservation (SACs) for such species, in order to contribute to a European-wide ecological network of protected sites. No SACs with barbastelle listed as a qualifying feature for designation are present within 30km of the Survey Area.

4.3 PLANNING POLICY COMPLIANCE

- 4.3.1. At the national level, the National Planning Policy Framework (NPPF) (2023) forms the basis for planning system decisions with respect to conserving and enhancing the natural environment, including bats. The Office of the Deputy Prime Minister (ODPM) circular 06/2005 (HMSO, 2005) also provides supplementary guidance, including confirmation that ‘the presence of a protected species is a material consideration when a planning authority is considering a development proposal’.
- 4.3.2. The NPPF sets out, amongst other points, how at an overview level ‘planning policies and decisions should contribute to and enhance the natural and local environment by:
- *...recognising the wider benefits from natural capital and ecosystem services; and*
 - *minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures...*
- 4.3.3. A list of principles which local planning authorities should follow when determining planning applications is included in the NPPF, and includes the following:
- *‘- if significant harm to biodiversity resulting from a development cannot be avoided...adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*
 - *- ...opportunities to incorporate biodiversity in and around developments should be encouraged;*
 - *- development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused planning permission should be refused unless there are wholly exceptional reasons and a suitable compensation strategy exists...’*
- 4.3.4. At a local level, Core Policy CP7 of the Wokingham Borough Core Strategy (2010) states that ‘development which may harm habitats or, species of principal importance in England for nature conservation...will only be permitted if it has been clearly demonstrated that:
- *the need for the proposal outweighs the need to safeguard the nature conservation importance;*
 - *No alternative site that would result in less or no harm is available which will meet the need; and*
 - *Mitigation measures can be put in place to prevent damaging impacts or appropriate compensation measures to offset the scale and kind of losses are provided.’*
- 4.3.5. Without appropriate measures, it is considered that the Scheme will contravene the legislation and planning policy through the loss of trees with roost suitability and the loss of commuting and foraging habitat for bats. It is understood that the confirmed roost in tree T42 will be retained as suggested by the tree removal plan (WSP, 2018). Mitigation, compensation, and enhancement measures are recommended in Section 5 to enable the Scheme to be compliant with the above legislation and planning policy.

5 RECOMMENDATIONS

5.1 AVOIDANCE AND MITIGATION MEASURES

- 5.1.1. Where possible, trees with bat roost suitability should be retained and protected from impacts of the Scheme. Where it is not possible to retain them, trees that have been assessed as having PRF-M and FAR suitability with features to support multiple bats, will require further survey to identify the presence or likely absence of bats. PRF-M trees are presented in Table 5-2 below.
- 5.1.2. The confirmed roost in tree T42 is understood to be retained by the current Scheme design. If the tree removal plan receives changes to its design requiring the removal of T42, then further survey to confirm or rule out the presence of an active bat roost will be required. If an active bat roost is discovered by the further survey, a licence from Natural England would then be required to permit the works to proceed, with the licence application being subject to a detailed method statement.
- 5.1.3. In accordance with good practice guidelines (Collins, J (ed.), 2023), further survey is not required for trees that have been assessed as having features with suitability for individual bats (PRF-I). However, where felling of these trees is unavoidable, this should be carried out under the supervision of a bat licenced ecologist, using soft-felling techniques. In this case, an at-height inspection by a bat licenced ecologist, or an arborist under the direct supervision of the licenced ecologist, will be undertaken to enable a thorough assessment of the PRFs for the presence of roosting bats.
- 5.1.4. If roosting bats are absent, then the PRF-I trees can be soft felled by a suitably experienced person. If the presence of a bat roost is highlighted at this stage, then the roost will be left *in-situ* and works affecting the associated tree stopped immediately. A licence would then be sought from Natural England to permit the works to proceed, with the licence application being subject to a detailed method statement. PRF-I trees which are understood to be impacted by the Scheme development (WSP, 2018) are summarised in Table 5-1 below.

Table 5-1 – Summary of PRF-I trees that will be impacted by the Scheme development

Tree number	Tree count	Impacted by the Scheme works
N11, N13, T25, T45, T49	5	Yes – Soft-felling mitigation required
N06, N08, N15, N16, N17, N33, T20, T35, T39, T40, T41	11	No – Tree to be retained based on the tree removal plan (WSP, 2018)

- 5.1.5. It is understood that the Scheme development plan includes the provision compensatory roost creation through the provision of bat roost boxes within the Site to enhance the roosting opportunities available as part of the Scheme development. Where possible, the bat roost boxes should be implemented prior to commencement of the Scheme works to mitigate effects of the loss of the PRF-I trees within the Site.

5.2 FURTHER SURVEY

- 5.2.1. Further surveys are required for trees with PRF-M and FAR suitability classification to confirm the presence or likely absence of roosting bats. Trees recommended for further survey, along with the

survey type or access limitations, are summarised in Table 5-2 and Figures 3a-e. More detailed descriptions of the nature of the further surveys recommended and recommendations regarding trees with limited access is described below.

Table 5-2 - Summary of PRF-M and FAR trees that require further survey

Trees that require further survey	Tree count	Further survey technique required
N01, N02, N03, N04, N24, N25, N26, N27, N30, T02, T03, T04, T07, T08, T09, T10, T12, T17, T18, T19, T24, T32, T36, T37, T47, T48, T50, T51	28	At-height inspection
N24, N30, T05, T12, T17, T19, T23	7	Ground level endoscope inspection
N19, N20, N21, N22, N23, N31, N39, T11, T22, T44	10	Dusk emergence surveys

AT-HEIGHT INSPECTION

- 5.2.2. For trees which require further survey but have a limited view from ground level due to restrictions such as canopy cover or health and safety concerns, an at-height climbing survey is recommended in the first instance. Further details on individual trees are described in Table 5-2.
- 5.2.3. PRF-M and FAR trees are to be checked at-height using rope climbing techniques by a specialist ecologist during the active season (March to October) for bats, with potential roost features inspected with the use of a high-powered torch and an endoscope. Trees which have been classified with PRF-M or FAR suitability will require further three visits spaced at least three weeks apart during period from May to September, with at least two visits taking place between May and August. Where suitable features are noted, their location and a brief description of their character should be recorded. Each feature should then be closely inspected for evidence indicating use by roosting bats such as droppings, urine staining and scratch marks / characteristic staining (from fur oils), or the presence of bats. If maternity roost is discovered during at-height survey, the survey effort will switch to a less invasive and more appropriate dusk emergence survey to complete the assessment of the tree's PRFs.
- 5.2.4. In some cases, depending on further survey requirements of each tree, a ladder survey may be possible instead of rope climbing to be undertaken by a specialist ecologist during the bat active season. Survey frequency and methods remain the same as stated above for the rope climbing surveys. Information on which trees require a ladder inspection only is included in Table A-1 in Appendix A.
- 5.2.5. Based on the results of the at-height inspections, the roosting potential of trees can be either confirmed, upgraded or downgraded accordingly to provide the most accurate representation of suitability. Further survey may be required depending on the results of the at-height tree inspection surveys.
- 5.2.6. The close inspections completed during at-height inspections can also be used to determine the suitability of potential roosting features to support winter hibernation roosts (and any subsequent hibernation survey requirements as appropriate).

- 5.2.7. Where climbing or aerial inspections have been recommended, this is on the assumption that it will be safe to undertake these inspections at the time of survey. In the event that this survey method is not deemed suitable (for example, due to unsafe conditions), dusk emergence surveys will be required (see Section 5.2.8).

DUSK EMERGENCE SURVEYS

- 5.2.8. Trees which were located next to the road, water course, water body or are covered in dense ivy coverage and/or are dead and require further survey are not suitable for at-height inspections for health and safety reasons. For these surveys, surveyors would observe the PRFs from ground level during a dusk survey (dawn surveys are now considered to risk missing capturing bats which return to roost early (BCT, 2022)), utilising infrared imaging cameras to identify any emerging bats.
- 5.2.9. Dusk emergence surveys should be completed during the bat active season (May to September inclusive). Three survey visits should be undertaken where further surveys are required. These should be completed a minimum of three weeks apart during a period from May to September, with at least two visits taking place between May and August, inclusive.

TREES WITH LIMITED ACCESS

- 5.2.10. Several trees could not be safely inspected during the GLTA from all aspects. The main access limitations comprise proximity to roads, proximity to watercourses and waterbodies, dense vegetation and private parcels with fencing and restricted access. Trees with limited access are flagged in Table 3-1.
- 5.2.11. As views of all aspects of all trees within the Scheme was not possible, the interpretation of results could be impacted. Considering this, it has been recommended that trees which have been flagged by the GLTA as 'with limited access' (see Table 3-1) are retained in the first instance. Where felling is required, a pre-felling inspection by an ecologist under safe conditions (e.g. utilising traffic management, permissions from landowners, specialist equipment for felling trees near water, vegetation clearance) would be required. If the presence of a bat roost is highlighted at this stage, then the roost will be left in-situ and works affecting the associated tree stopped immediately. A licence would then be sought from Natural England to permit the works to proceed, with the licence application being subject to a detailed method statement.

5.3 SENSITIVE LIGHTING

- 5.3.1. Lighting both during the construction phase and operational phase of the Scheme could have a negative effect upon bat activity, by deterring bats from using regular commuting corridors or foraging sites.
- 5.3.2. It is recommended that the lighting strategy for the Scheme seeks to:
- Maintain dark corridors along retained areas of retained woodland and hedgerows along Survey Area boundaries, to ensure continued connectivity within and across the Survey Area for bats.
 - Use the minimum light levels necessary for the relevant task / function, this may equate to reducing light intensity and/or using the minimum number of light sources or minimum column height.
 - Use hoods, louvres or other luminaire design features to avoid light spill onto retained and newly created areas of vegetation likely to be used by foraging and commuting bats. In particular, light

spill from the construction or operational phase lighting onto and all other trees with bat roosting potential should be avoided to minimise the risk of disturbance.

- Use narrow spectrum light sources where possible to lower the range of species affected by lighting, specifically avoiding shorter wavelength blue light, using instead warm/neutral colour temperature 2,700 (ideally) kelvin lighting (BCT, 2023).
- Use light sources that emit minimal ultra-violet light to avoid attracting night-flying invertebrate species which in turn may attract bats to the light.

- 5.3.3. Where possible, consideration should also be given to varying the lighting levels in particularly ecologically valuable areas. For example, it may be possible to reduce lighting levels or perhaps even switch installations off after certain times e.g. between 00:00 and sunrise in the vicinity of tree lines of proposed landscaping. This use of “adaptive lighting” can tailor the installation to suit human health and safety as well as wildlife needs (BCT, 2014).

5.4 ECOLOGICAL ENHANCEMENT MEASURES

- 5.4.1. Planning policy promotes the inclusion of ecological enhancement. It is understood that the following ecological enhancement measures have been implemented into the Scheme development plan (WSP, 2021):

- Compensatory tree planting strategy for verge landscaping and other green infrastructure which includes species of known benefit to bats i.e. plants which attract night-flying insects in order to enhance foraging opportunities.
- Compensatory habitat creation at an offsite location within the scope of the wider SDL, which may include the provision of additional bat boxes on retained and new trees and the provision of standing waterbodies to provide additional foraging resources.

- 5.4.2. No further ecological enhancement measures are currently required.

6 CONCLUSIONS

- 6.1.1. A PBRA undertaken in March 2024 surveyed 93 trees within the Survey Area to assess their suitability to support roosting bats. There were 83 tree which were identified as being potentially suitable for roosting bats. The breakdown their suitability was:
- 66 trees classified as PRF-M;
 - 16 trees classified as PRF-I;
 - 1 tree classified as FAR; and
 - 6 trees classified as NONE.
- 6.1.2. Four trees were not assessed due to access restrictions or because these trees were no longer present within the Survey Area during the GLTA.
- 6.1.3. In the absence of further survey and/or mitigation measures, the Scheme has the potential to adversely affect roosting bats and associated habitats.
- 6.1.4. Mitigation measures have been recommended in this report to inform avoidance strategy in the Scheme plan against the adverse impacts of the Scheme development on roosting bats within the Site. Trees classified as PRF-I do not require further surveys. However, mitigation measures summarised in section 5 apply, including soft-felling and provision of compensatory bat roost boxes within the Site.
- 6.1.5. Further survey has been recommended for any impacted trees classified as PRF-M and FAR in order to establish the presence or likely absence of bat roosts. In total, 40 trees will require a further survey. This includes the one tree classified as FAR and 39 trees classified as PRF-M which are being impacted by the Scheme development (WSP, 2018). Further surveys include at height inspection (climbing/ladder) and endoscope surveys, with dusk emergence surveys recommended where at height inspections or endoscope surveys are not possible. The other 27 trees which were classified as PRF-M are understood to be retained and protected by the Scheme works and, therefore, are not considered to require any further survey requirements. Should any of these trees become subject of a future updated Scheme tree removal plan, further surveys and mitigation effort will be required.
- 6.1.6. Lighting both during the construction phase and operational phase of the Scheme could have a negative effect upon bat activity on Site. As a result, it is recommended that a sensitive lighting strategy is developed in line with best guidance from the Institute of Lighting Professionals (BCT, 2023) summarised in section 5.3 of this report.
- 6.1.7. Updated mitigation and ecological enhancement measures that reflect the current ecological baseline have been recommended in this report to inform relevant planning conditions and ensure compliance of the Scheme with legislation, planning and biodiversity policies.

7 REFERENCES

7.1 PROJECT REFERENCES

- WSP (2018) SWDR Spine Road & Western Gateway – Detailed Arboricultural Report
- WSP (2019) SWDR Spine Road & Western Gateway – Bat Survey Report
- WSP (2021) South Wokingham Distributor Road – Central section - Vol. 1 Environmental Statement Addendum - Main Text
- WSP (2024) South Wokingham Distributor Road – Ecological Gap Analysis

7.2 TECHNICAL REFERENCES

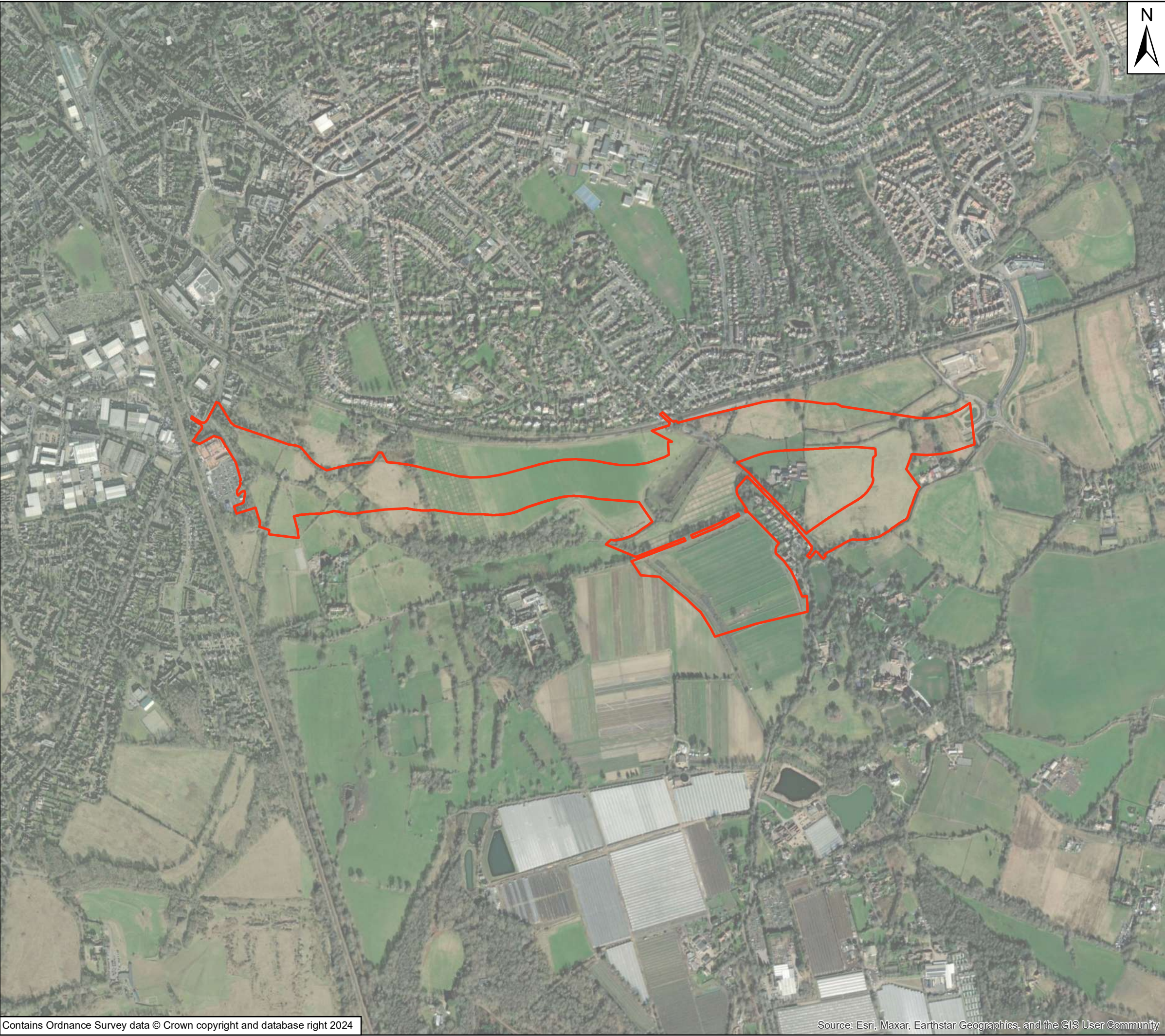
- Bat Conservation Trust (BCT) (2014). Artificial Lighting and Wildlife – Interim Guidance: Recommendations to help minimise the impact of artificial lighting. Bat Conservation Trust, London.
- BCT (2022). Interim Guidance Note: Use of night vision aids for bat emergence surveys and further comment on dawn surveys. Bat Conservation Trust, London.
- BCT (2023). Guidance Note 08/23: Bats and artificial lighting at night. Bat Conservation Trust, London.
- Collins, J (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition), The Bat Conservation Trust, London.
- CIEEM (2019) Advice note on the lifespan of ecological reports and surveys.
- Her Majesty's Stationary Office (HMSO) (1981). Wildlife and Countryside Act (as amended by the Environment Act 2021).
- HMSO (2005) Biodiversity and Geological Conservation – Statutory Obligations and Their Impact Within the Planning System. Office of the Deputy Prime Minister (ODPM) Circular 06/2005
- HMSO (2006). Natural Environment and Rural Communities Act.
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- Ministry of Housing, Communities & Local Government (2023). National Planning Policy Framework. Department for Communities and Local Government, London.
- National Highways (2020) Design Manual for Roads and Bridges, Sustainability and Environment LD 118 Biodiversity design, Part 3 HA 80/99 Nature Conservation Advice in Relation to Bats.
- Wokingham Borough Council (2010). Wokingham Borough Core Strategy Local Plan.
- Wokingham Borough Council (2014). Wokingham Borough Development Plan, Adopted Managing Development Delivery Local Plan.

FIGURES

Figure 1 - Site Location Plan

Figure 2a-e - PBRA Results – Tree Suitability

Figure 3a-e - Trees with further survey requirements



N

Key

Scheme Boundary

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0.25

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Kilometers

wsp

Client:

Wokingham Borough Council (WBC)

Project:

South Wokingham Distributor Road (SWDR)

Title:

Site Location Plan

Drawing No:

Figure 1

Date:

August 2024

Scale:

10,000 @ A3

Drawn:

DB

Checked:

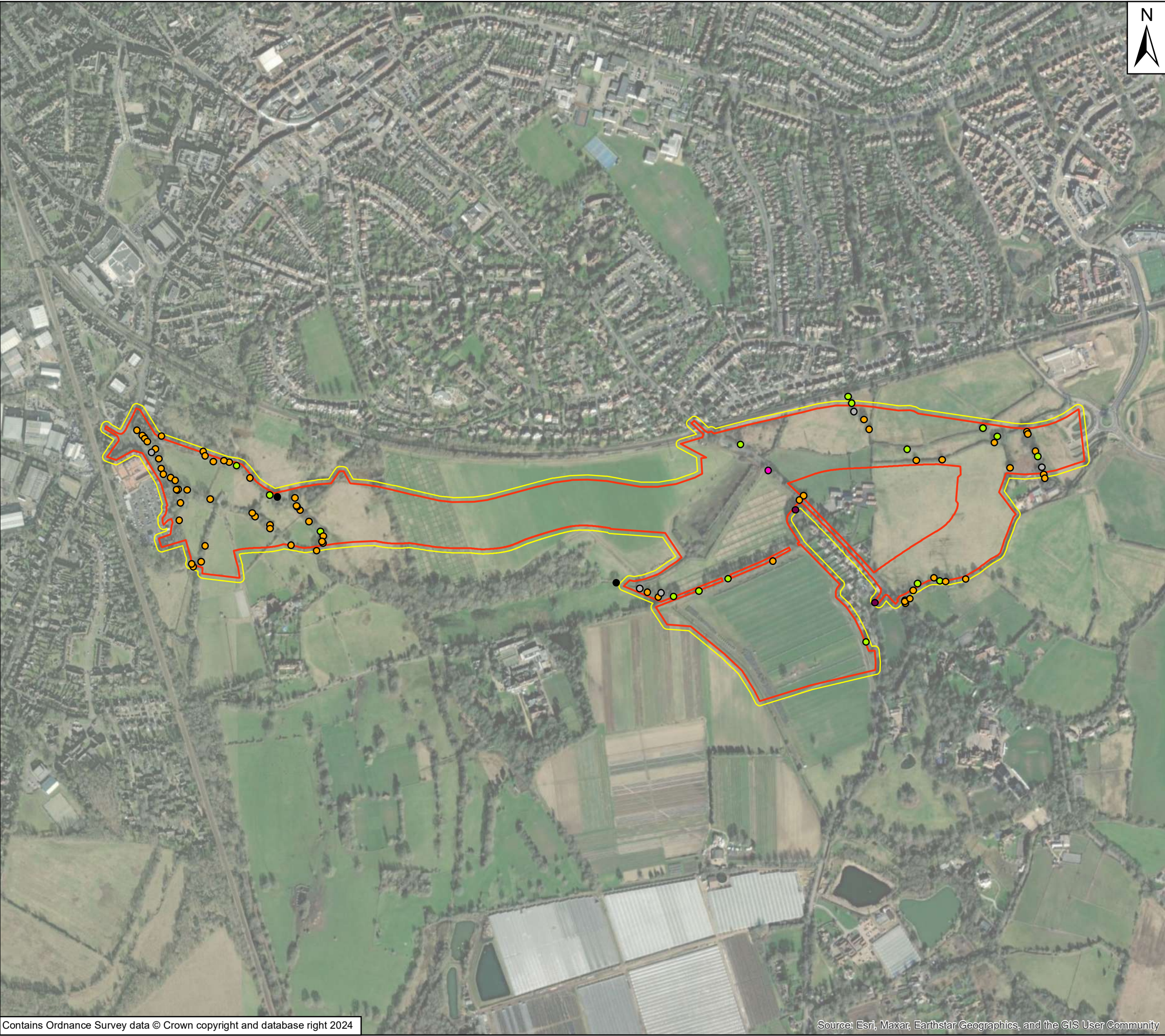
KT

Approved:

CH

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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

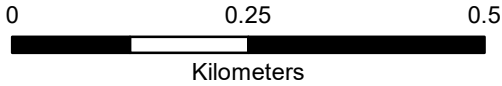


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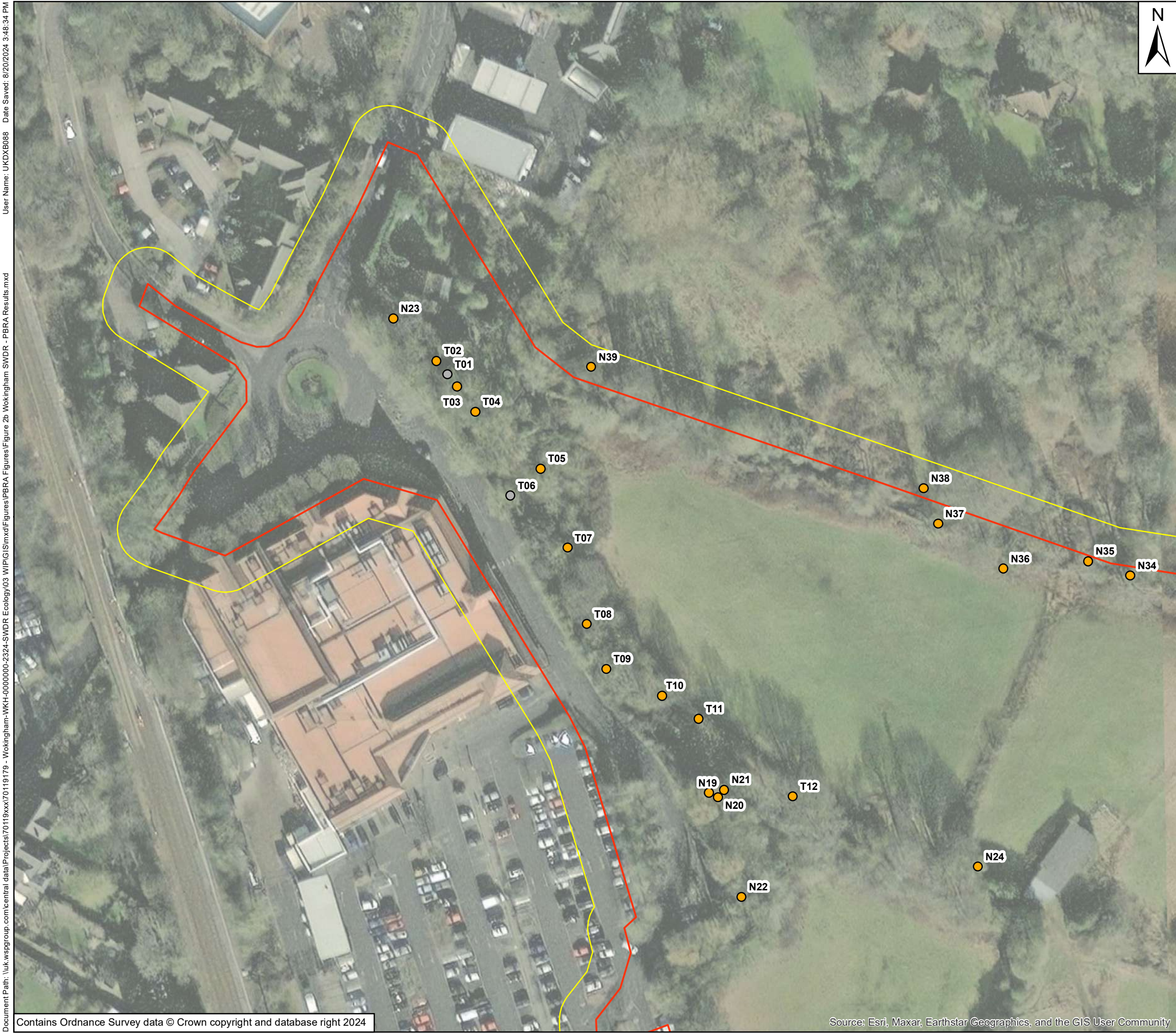
- Scheme Boundary
- Survey Area

Tree Suitability

- FAR
- PRF-M
- PRF-I
- NONE
- Tree not accessed
- Tree not present

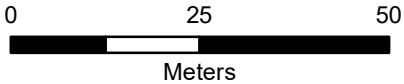


Client:	Wokingham Borough Council (WBC)		
Project:	South Wokingham Distributor Road (SWDR)		
Title:	PBRA Results - Tree Suitability - Overview		
Drawing No:	Figure 2a	Drawn:	DB
Date:	August 2024	Checked:	CH
Scale:	8,000 @ A3	Approved:	KT

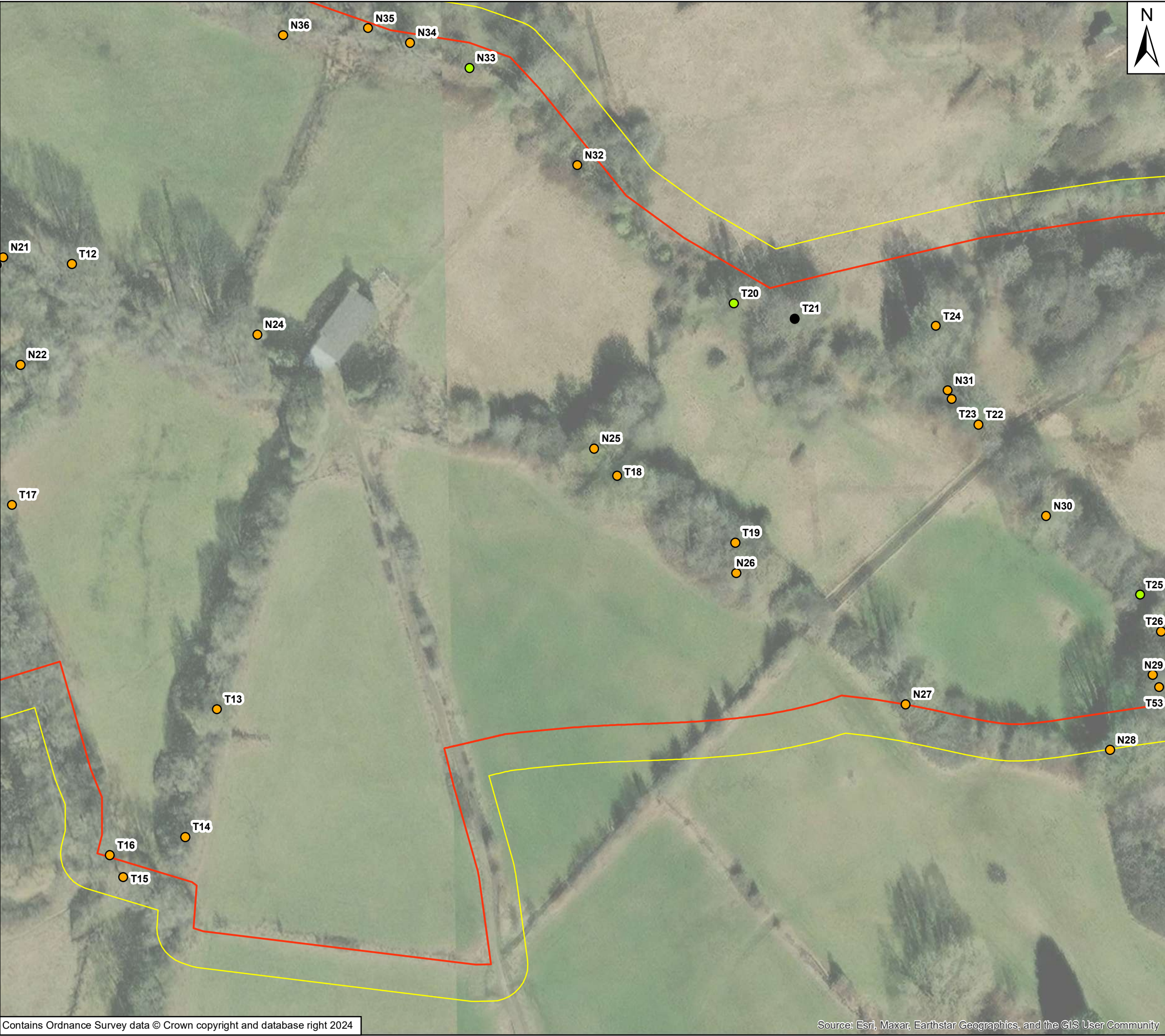


Key

- Scheme Boundary
- Survey Area
- Tree Suitability**
- PRF-M
- NONE



Client:	Wokingham Borough Council (WBC)		
Project:	South Wokingham Distributor Road (SWDR)		
Title:	PBRA Results - Tree Suitability		
Drawing No:	Figure 2b	Drawn:	DB
Date:	August 2024	Checked:	KT
Scale:	1,000 @ A3	Approved:	CH



N

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Meters

Key

Scheme Boundary

Survey Area

Tree Suitability

PRF-M

PRF-I

Tree not present

wsp

Client:

Wokingham Borough Council (WBC)

Project:

South Wokingham Distributor Road (SWDR)

Title:

PBRA Results - Tree Suitability

Drawing No:

Figure 2c

Date:

August 2024

Scale:

1,000 @ A3

Drawn:

DB

Checked:

KT

Approved:

CH

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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

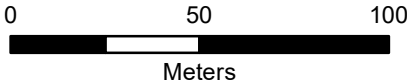


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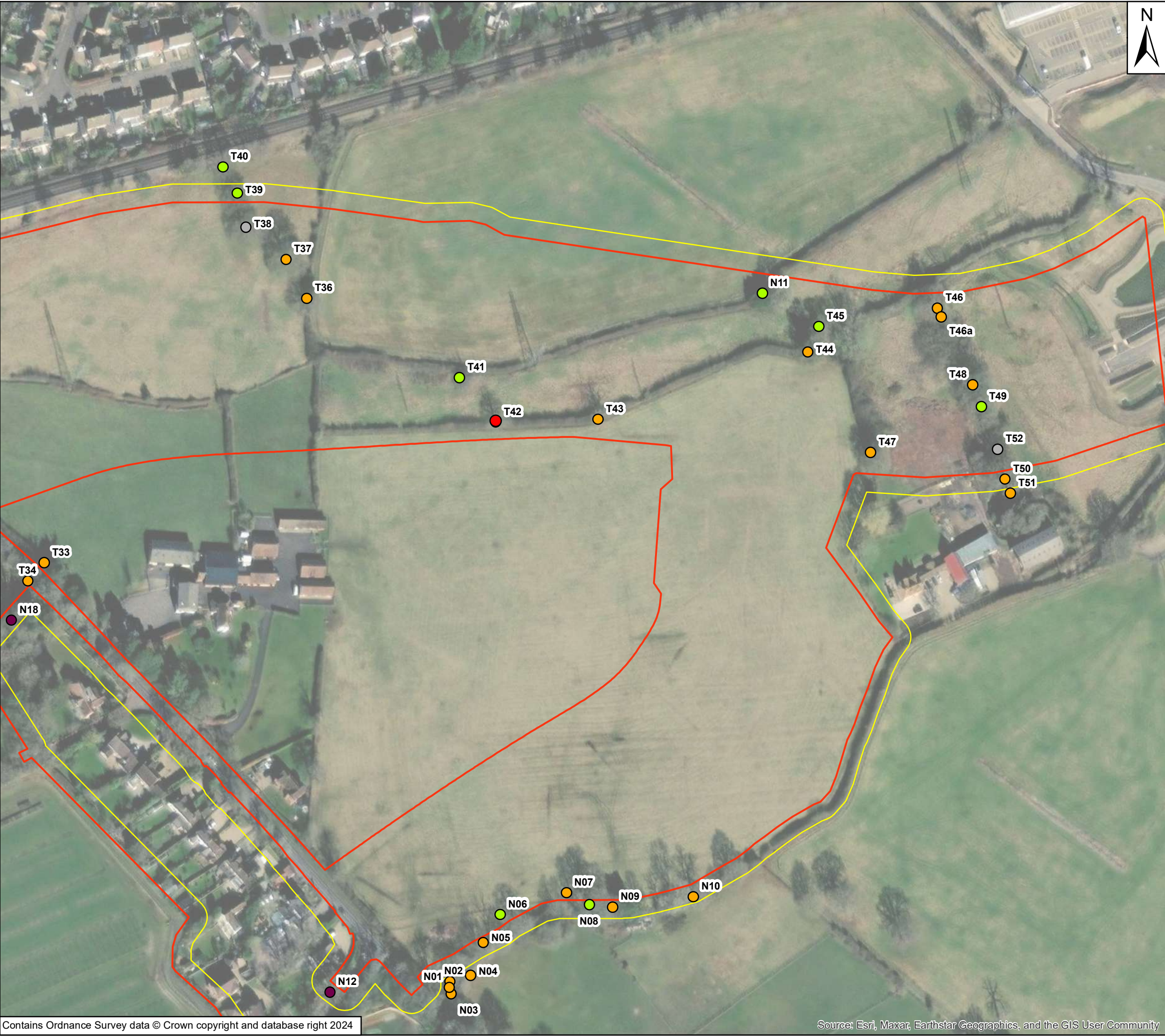
- Scheme Boundary
- Survey Area

Tree Suitability

- FAR
- PRF-M
- PRF-I
- NONE
- Tree not accessed
- Tree not present



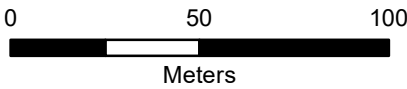
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Project:	South Wokingham Distributor Road (SWDR)		
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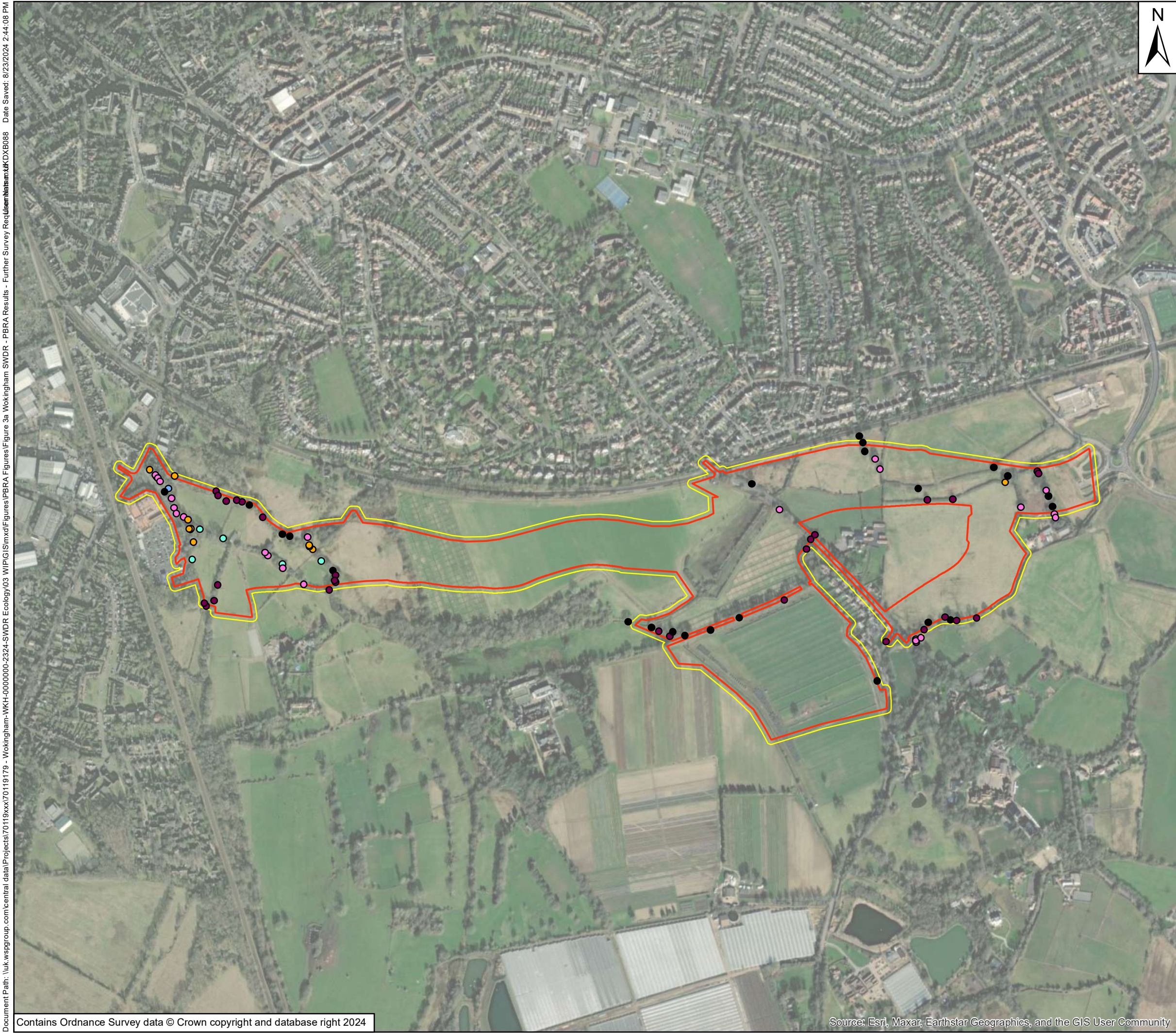
Key

- Scheme Boundary
- Survey Area
- PRF-M
- PRF-I
- NONE
- Tree not accessed
- Confirmed Roost

Tree Suitability



Client:	Wokingham Borough Council (WBC)		
Project:	South Wokingham Distributor Road (SWDR)		
Title:	PBRA Results - Tree Suitability		
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Date:	August 2024	Checked:	KT
Scale:	2,000 @ A3	Approved:	CH

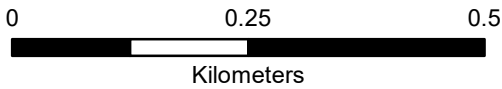


Key

- Scheme Boundary
- Survey Area

Further Survey Requirements

- Yes – At-height inspection
- Yes – Dusk emergence surveys
- Yes – Ground level endoscope inspection
- Yes – Ground level endoscope and at-height inspection (climbing)
- No – Not impacted
- No – Soft-felling under ecological supervision required



Client:	Wokingham Borough Council (WBC)		
Project:	South Wokingham Distributor Road (SWDR)		
Title:	Further Survey Requirements - Overview		
Drawing No:	Figure 3a	Drawn:	DB
Date:	August 2024	Checked:	KT
Scale:	8,000 @ A3	Approved:	CH

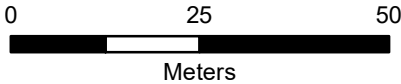


Key

- Scheme Boundary
- Survey Area

Further Survey Requirements

- Yes – At-height
- Yes – Dusk emergence surveys
- Yes – Ground level endoscope inspection
- Yes – Ground level endoscope and at-height inspection (climbing)
- No – Not impacted
- No – Soft-felling under ecological supervision required



Client:	Wokingham Borough Council (WBC)		
Project:	South Wokingham Distributor Road (SWDR)		
Title:	Further Survey Requirements		
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Date:	August 2024	Checked:	KT
Scale:	1,000 @ A3	Approved:	CH

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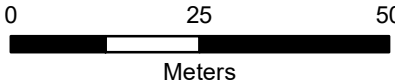


Key

- Scheme Boundary
- Survey

Further Survey Requirements

- Yes – At-height
- Yes – Dusk emergence surveys
- Yes – Ground level endoscope inspection
- Yes – Ground level endoscope and at-height inspection (climbing)
- No – Not impacted
- No – Soft-felling under ecological supervision required



Client:	Wokingham Borough Council (WBC)		
Project:	South Wokingham Distributor Road (SWDR)		
Title	Further Survey Requirements		
Drawing No:	Figure 3c	Drawn:	DB
Date:	August 2024	Checked:	KT
Scale:	1,000 @ A3	Approved:	CH



Key

- Scheme Boundary
- Survey Area

Further Survey Requirements

- Yes – At-height inspection
- No – Not impacted
- No – Soft-felling under ecological supervision required

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Meters

Client:
Wokingham Borough Council (WBC)

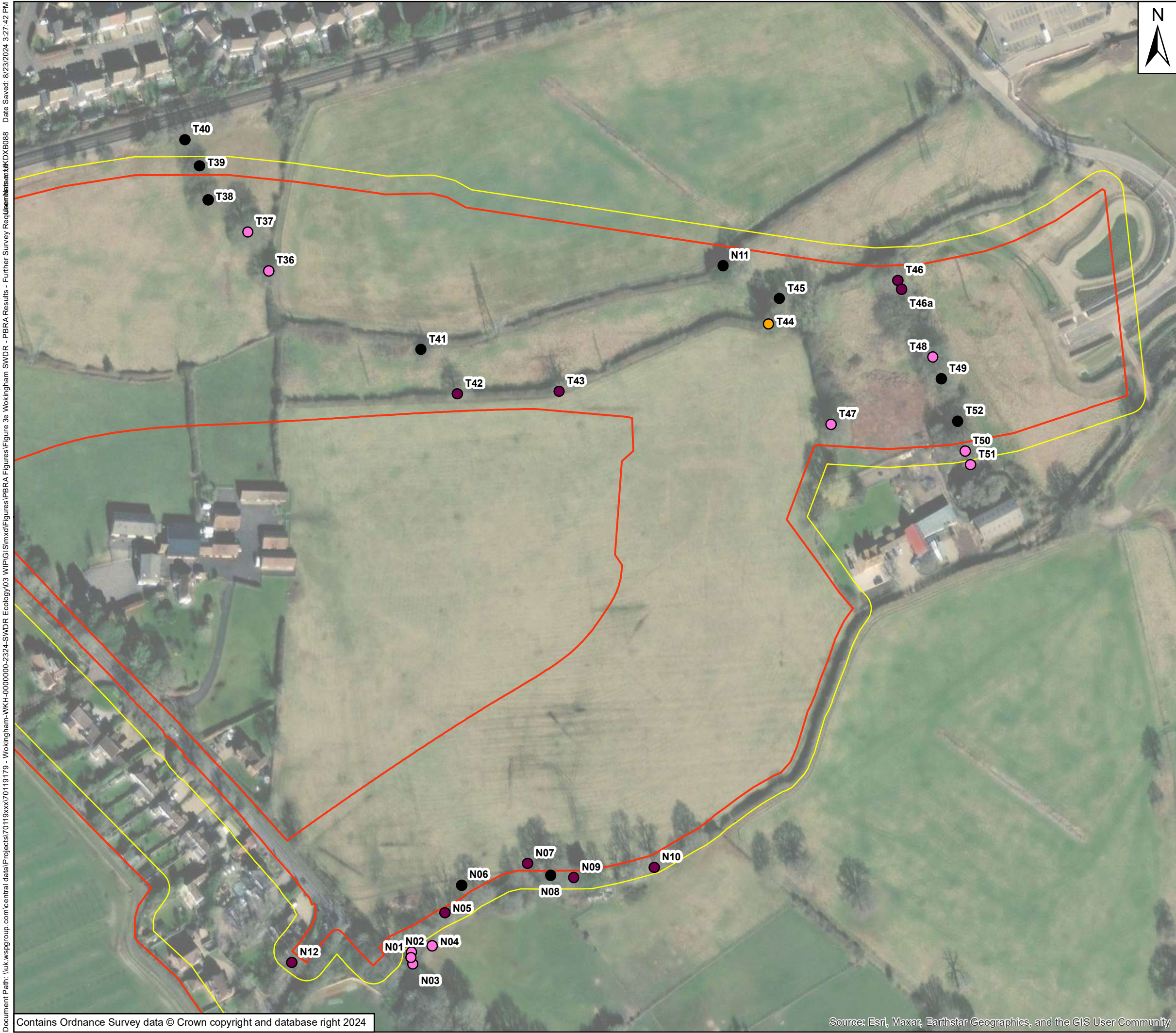
Project:
South Wokingham Distributor Road (SWDR)

Title:
Further Survey Requirements

Drawing No:	Figure 3d	Drawn:	DB
Date:	August 2024	Checked:	KT
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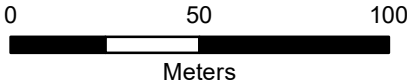


Key

- Scheme Boundary
- Survey Area

Further Survey Requirements

- Yes – At-height inspection
- Yes – Dusk emergence surveys
- No – Not impacted
- No – Soft-felling under ecological supervision required



Client:	Wokingham Borough Council (WBC)		
Project:	South Wokingham Distributor Road (SWDR)		
Title:	Further Survey Requirements		
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Scale:	2,000 @ A3	Approved:	CH

Appendix A

PBRA RESULTS

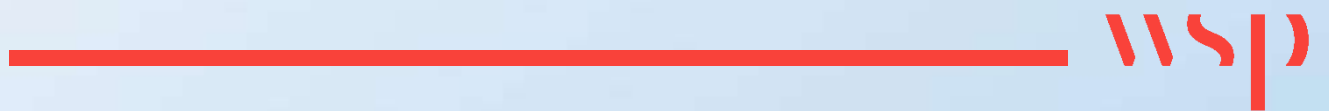


Table A-1 – PBRA Results and Further survey requirements

Tree No.	Arboriculture Survey Reference No.	Description	Features with Suitability to Support Roosting Bats	Overall Assessment	Further Survey Requirements
N01	0	Sweet chestnut (<i>Castanea sativa</i>), DBH approx. 80cm	PRF1 – multiple woodpecker holes throughout the trunk between 3-8m high on all aspects, PRF-M. PRF2 – dead limbs present approx. 8-9m above ground level, potential ramshorn feature on the southern and eastern aspects, PRF-M.	PRF-M	Yes – At-height inspection (climbing)
N02	0	Dead tree (species ID limited due to level of wood degradation), DBH approx. 30cm	PRF1 – dead wood and completely hollow trunk from 1m to the top at 4m above ground level, multiple holes and large cracks throughout the trunk, PRF-M.	PRF-M	Yes – At-height inspection (climbing)
N03	0	Dead tree, Oak (<i>Quercus sp.</i>), DBH 35cm	PRF1 – a large stress fracture from ground to trunk top at 5m high with vertical cracks and dead wood, PRF-M.	PRF-M	Yes – At-height inspection (climbing)
N04	0	Oak (<i>Quercus sp.</i>), DBH approx. 50cm	PRF1 – multiple dead branches from 4m to the top at 12m with lifted bark observed, PRF-M.	PRF-M	Yes – At-height inspection (climbing)
N05	0	Oak (<i>Quercus sp.</i>), mature, DBH over 100cm	PRF1 – six limbs with a potential access to an internal cavity facing southern and southwestern aspects, PRF-M. PRF2 – potential additional features present, could not be assessed during the GLTA, PRF-M.	PRF-M	No – Not impacted
N06	0	Oak (<i>Quercus sp.</i>), mature, DBH approx. 60cm	PRF1 – dead wood feature on branches which were broken off, PRF-I.	PRF-I	No – Soft-felling under ecological supervision required

Tree No.	Arboriculture Survey Reference No.	Description	Features with Suitability to Support Roosting Bats	Overall Assessment	Further Survey Requirements
			PRF2 – 3 PRFs identified from the ground, however, the height of 10m or more meters above the ground level limited GLTA observation, PRF-I. PRF3 – a branch at 7m height overhanging into the field with two dead features present, PRF-I.		
N07	0	Ash (<i>Fraxinus excelsior</i>), mature, DBH over 100cm	PRF1 – the central trunk void at 3.5m above ground level, potential access to an internal cavity facing western aspect, PRF-M.	PRF-M	No – Not impacted
N08	0	Oak (<i>Quercus sp.</i>), mature, DBH approx. 70cm	PRF1 – the first branch from the ground on the field side had lifted bark, PRF-I.	PRF-I	No – Soft-felling under ecological supervision required
N09	0	Oak (<i>Quercus sp.</i>), mature, DBH approx. 50cm	PRF-1 – a knothole at 10m above the ground level off the main trunk, potentially entrance to an internal cavity, PRF-M.	PRF-M	No – Not impacted
N10	0	Oak (<i>Quercus sp.</i>), mature, DBH approx. 125cm	PRF1 – several dead branches to extremities, tree is of sufficient age and size, PRF-I. PRF2 – a large limb overhanging the field to the southern aspect has a large fracture, cracks and is possibly hollow, PRF-M.	PRF-M	No – Not impacted
N11	92	Oak (<i>Quercus sp.</i>), mature, DBH dual trunk - over 100cm combined	PRF1 – some ivy coverage on the left trunk (when observing from the southern aspect), tree seemingly in good condition with no PRFs observed from the ground, however, tree is of sufficient size and age, GLTA not possible from the northern aspect, PRF-I.	PRF-I	No – Soft-felling under ecological supervision required
N12	0	Oak (<i>Quercus sp.</i>)	Not surveyed due to access restrictions. Tree is located within Survey Area with potential for PRFs. However, the tree is in	-	No – Not impacted

Tree No.	Arboriculture Survey Reference No.	Description	Features with Suitability to Support Roosting Bats	Overall Assessment	Further Survey Requirements
			an area that is to be retained and does not currently require further survey.		
N13	0	Oak (<i>Quercus sp.</i>), DBH 70cm Note: Tree is in a private land parcel. Complete inspection was not possible during GLTA due to access limitations.	PRF1 – dense ivy coverage on a tree of suitable size and maturity, PRF-I.	PRF-I	No – Soft-felling under ecological supervision required
N14	250	Oak (<i>Quercus sp.</i>), mature, DBH over 100cm	PRF1 – a mature oak with complex canopy including many dead branches, PRF-I. PRF2 – a stress fracture on a branch with a gap, PRF-M. PRF3 – a broken branch with a large void cavity in the branch split with a knothole below it, PRF-M.	PRF-M	No – Not impacted
N15 (Tag #0729)	0	Oak (<i>Quercus sp.</i>), mature, DBH over 100cm	PRF1 – dense ivy coverage obscured observation from ground level. However, the tree was in a good condition, PRF-I.	PRF-I	No – Soft-felling under ecological supervision required
N16	52	Oak (<i>Quercus sp.</i>), semi-mature	PRF1 – dense ivy coverage but otherwise the tree was in a good condition, PRF-I.	PRF-I	No – Soft-felling under ecological supervision required
N17	N/A	Oak (<i>Quercus sp.</i>), semi-mature	PRF1 – dense ivy coverage obscured observation from ground level. However, the tree was in a good condition, PRF-I.	PRF-I	No – Soft-felling under ecological

Tree No.	Arboriculture Survey Reference No.	Description	Features with Suitability to Support Roosting Bats	Overall Assessment	Further Survey Requirements
					supervision required
N18	0	Oak (<i>Quercus sp.</i>)	Not surveyed due to access restrictions. Tree is located within Survey Area with potential for PRFs. However, the tree is in an area that is to be retained and does not currently require further survey (WSP, 2018).	-	No – Not impacted
N19	0	Poplar (<i>Populus sp.</i>), mature, DBH over 100cm	PRF1 – an extensive dense ivy coverage with significant stem diameter, potential features could not be completely inspected during GLTA due to significant ivy cover, PRF-M	PRF-M	Yes – Dusk emergence surveys
N20	0	Poplar (<i>Populus sp.</i>), mature, DBH over 100cm	PRF1 – an extensive dense ivy coverage with significant stem diameter, potential features could not be completely inspected during GLTA due to significant ivy cover, PRF-M	PRF-M	Yes – Dusk emergence surveys
N21	0	Poplar (<i>Populus sp.</i>), mature, DBH over 100cm	PRF1 – an extensive dense ivy coverage with significant stem diameter, potential features could not be completely inspected during GLTA due to significant ivy cover, PRF-M	PRF-M	Yes – Dusk emergence surveys
N22	0	Ash (<i>Fraxinus excelsior</i>)	PRF1 – a major dieback with a large crevice in a seemingly hollow trunk from 2-6m above the ground level, PRF-M. PRF2 – a large stress fracture with a crack which may continue into a potentially hollow stem, PRF-M.	PRF-M	Yes – Dusk emergence surveys
N23	0	Leyland cypress (<i>Cupressus × leylandii</i>), mature, DBH over 100cm	PRF1 – significant ivy coverage across the trunk which may potentially promote cavity formation, complete GLTA not possible due to ivy cover, significant survey effort needed, PRF-M.	PRF-M	Yes – Dusk emergence surveys
N24	0	Ash (<i>Fraxinus excelsior</i>), Semi-mature, DBH approx. 40cm	PRF1 – a small cavity at approx. 0.5m above the ground level on the northern aspect, PRF-M.	PRF-M	Yes – Ground level endoscope and at-height inspection (climbing)

Tree No.	Arboriculture Survey Reference No.	Description	Features with Suitability to Support Roosting Bats	Overall Assessment	Further Survey Requirements
N25	0	Field maple (<i>Acer campestre</i>)	PRF1 – a trunk cavity present at 1.5m above the ground level on the northeastern aspect, PRF-M. PRF2 – a trunk cavity on the southeastern aspect at approx. 1.5m above the ground level facing the northeastern aspect, PRF-M.	PRF-M	Yes – At-height inspection (ladder)
N26	0	Oak (<i>Quercus sp.</i>), mature, multi-stemmed, DHB approx. 100cm, located on the water course bank	PRF1 – a basal cavity on northwestern stem approx. 0.5m above the ground level, PRF-M. PRF2 – a limb wound at approx. 5m in the fork facing northeastern aspect, PRF-M. PRF3 – four ramshorn features and basal cavities present in multiple trunks, PRF-M.	PRF-M	Yes – At-height inspection (climbing)
N27	26	Ash (<i>Fraxinus excelsior</i>), twin trunk,	PRF1 – a dual trunk with large fissure in the right hand trunk at the ground level, upwards facing with potential cavity, PRF-M. PRF2 – a hole on left hand trunk, smaller but with potential for cavity as bumblebee seen flying into the hole, PRF-M. PRF3 - a knothole above PRF1, could be continuous and connected internally with PRF1, PRF-M.	PRF-M	Yes – At-height inspection (ladder)
N28	30	Ash (<i>Fraxinus excelsior</i>), mature, DBH over 100cm	PRF1 - significant dense ivy coverage potentially covering roost features, GLTA not possible due to ivy coverage, PRF-M.	PRF-M	No – Not impacted
N29	0	Alder (<i>Alnus glutinosa</i>)	PRF1 – a large basal cavity at the ground level, PRF-M. PRF2 – two knotholes approx. at 3-5 m above ground level, PRF-M.	PRF-M	No – Not impacted

Tree No.	Arboriculture Survey Reference No.	Description	Features with Suitability to Support Roosting Bats	Overall Assessment	Further Survey Requirements
N30	0	Oak (<i>Quercus sp.</i>), mature	PRF1 – a large basal cavity at ground level, potentially leading into a larger internal cavity, PRF-M.	PRF-M	Yes – Ground level endoscope and at-height inspection (climbing)
N31	0	Alder (<i>Alnus glutinosa</i>), multiple stems	PRF1 – the southeastern aspect trunk has trunk rot present up majority of the length at 2-4m facing northeastern aspect, with the feature over watercourse, PRF-M.	PRF-M	Yes – Dusk emergence surveys
N32	0	Alder (<i>Alnus glutinosa</i>)	PRF1 – a woodpecker or knotholes observed about 4m above the ground level on the water course side, potentially leading into a cavity in small diameter trunk, PRF-M.	PRF-M	No – Not impacted
N33	0	Alder (<i>Alnus glutinosa</i>)	PRF1 – a peeling bark all around the trunk from the base to the top, PRF-I.	PRF-I	No – Soft-felling under ecological supervision required
N34	0	Alder (<i>Alnus glutinosa</i>)	PRF1 – a multiple stemmed trunk with knotholes (at least 3 seen from ground) that may indicate larger cavity PRF-M.	PRF-M	No – Not impacted
N35	0	Alder (<i>Alnus glutinosa</i>)	PRF1 - a dead trunk with a potential internal cavity, PRF-M.	PRF-M	No – Not impacted
N36	0	Alder (<i>Alnus glutinosa</i>)	PRF1 – six knotholes on all aspects of tree at 3-5m above the ground level, PRF-M.	PRF-M	No – Not impacted
N37	0	Alder (<i>Alnus glutinosa</i>), mature, multi-stemmed	PRF1 – a knothole at 3.5m above ground level on the southern aspect, significantly obscured by ivy, PRF-M. PRF2 – a knothole at approx. 3m above the ground level on the southern aspect, PRF-M.	PRF-M	No – Not impacted
N38	0	Alder (<i>Alnus glutinosa</i>), multi-stemmed.	PRF1 – multiple knotholes from head height to approx. 10m on both trunks, 4 knot holes counted, 2 for each stem, potential cavity present, PRF-M.	PRF-M	No – Not impacted

Tree No.	Arboriculture Survey Reference No.	Description	Features with Suitability to Support Roosting Bats	Overall Assessment	Further Survey Requirements
N39	0	Alder (<i>Alnus glutinosa</i>)	PRF1 – a large woodpecker hole likely leading into a cavity as the adjacent branch has snapped off, PRF-M.	PRF-M	Yes – Dusk emergence survey
T01	2	Oak (<i>Quercus sp.</i>)	No features recorded, NONE.	NONE	No – Soft-felling under ecological supervision required
T02	1	Oak (<i>Quercus sp.</i>)	PRF1 – a large opening on the front of the tree at about 2m height, potentially into a void, PRF-M. PRF2 – a woodpecker hole where branch has been removed, overhanging path at about 5m high, PRF-M.	PRF-M	Yes – At-height inspection (climbing)
T03	3	Ash (<i>Fraxinus excelsior</i>) Note: access limitation, tree is within residential property.	PRF1 – a mature ash with large pruning cut, PRF-M. Otherwise in good condition, PRF-M.	PRF-M	Yes – At-height inspection (climbing)
T04	4	Ash (<i>Fraxinus excelsior</i>), twin stem, DBH over 100cm combined	PRF1 – a woodpecker hole, approx. 3m high on the westerly aspect of the trunk, PRF-M. PRF2 – a knothole slightly obscured by ivy approx. 4m high on the westly aspect, PRF-M. PRF3 – significant ivy coverage with large diameter stems potentially obscuring other features, PRF-M.	PRF-M	Yes – At-height inspection (climbing)
T05	0	Willow (<i>Salix sp.</i>) Note: access limitation,	PRF1 – dense ivy coverage and suitably mature, potential PRF-I. PRF2 – a hazard beam at ground level, PRF-M.	PRF-M	Yes – Ground level endoscope inspection

Tree No.	Arboriculture Survey Reference No.	Description	Features with Suitability to Support Roosting Bats	Overall Assessment	Further Survey Requirements
		adjacent to water course			
T06	0	Willow (<i>Salix sp.</i>)	No features recorded, NONE.	NONE	No
T07	0	Oak (<i>Quercus sp.</i>) Note: access limitation, next to a ditch	PRF1 – a knothole with a potential void cavity at about 3m above ground level facing the footpath, PRF-M. PRF2 – lifted bark about 2m from ground level with large space formed, PRF-M.	PRF-M	Yes – At-height inspection (climbing and ladder)
T08	5	Oak (<i>Quercus sp.</i>)	PRF1 – multiple large woodpecker holes seen from ground at 5m (x2) on right hand branch as you view the tree from the path. Additionally, off main central trunk branch has another woodpecker hole with knothole next to it at about 10m height, PRF-M.	PRF-M	Yes – At-height inspection (climbing)
T09	7	Oak (<i>Quercus sp.</i>), mature, DBH over 100cm	PRF1 – a managed limb partially healing and potentially providing roost space, PRF-M. PRF2 – dense ivy coverage with wide diameter stems, PRF-M.	PRF-M	Yes – At-height inspection (climbing)
T10	8	Oak (<i>Quercus sp.</i>)	PRF1 – a knothole present, facing path about 3m above ground level, PRF-M. Otherwise good condition, semi-mature tree, with light ivy coverage.	PRF-M	Yes – At-height inspection (ladder)
T11	0	Willow (<i>Salix sp.</i>)	PRF1 – very dense ivy coverage obscuring most of the tree, PRF-M.	PRF-M	Yes – Dusk emergence surveys
T12	0	Willow (<i>Salix sp.</i>)	PRF1 – tear/wound from ground level up to 2m, providing access to a potential void cavity, PRF-M.	PRF-M	Yes – Ground level endoscope and at-

Tree No.	Arboriculture Survey Reference No.	Description	Features with Suitability to Support Roosting Bats	Overall Assessment	Further Survey Requirements
					height survey (climbing)
T13	0	Field maple (<i>Acer campestre</i>)	No specific PRF identified, however, full GLTA not possible due to dense hawthorn scrub acting as an access barrier. Further dense ivy coverage present on the tree potentially obscuring PRFs, PRF-M.	PRF-M	No – Not impacted
T14	0	Field maple (<i>Acer campestre</i>),	PRF1 – large cracks up the whole length of the trunk, PRF-M.	PRF-M	No – Not impacted
T15	0	Willow (<i>Salix sp.</i>), overmature, DBH over 100cm	PRF1 – a large void cavity in the trunk approx. 2m above the ground level facing western aspect, PRF-M. PRF2 – a large void cavity in the trunk approx. 2m above the ground level facing northern aspect, PRF-M. PRF3 – extensive crevice features throughout the tree with opportunity for roosting bats, PRF-M.	PRF-M	No – Not impacted
T16	0	Oak (<i>Quercus sp.</i>), semi-mature, dual-stem	PRF1 – a dual trunk with dense ivy coverage on one trunk, some dead wood present. Otherwise, the tree is in good condition and semi mature, PRF-M.	PRF-M	No – Not impacted
T17	0	Ash (<i>Fraxinus excelsior</i>)	PRF1 – light ivy cover with large stems. Furthermore, the main trunk is open and in good condition, PRF-M.	PRF-M	Yes – Ground level endoscope and at-height survey (climbing)
T18	0	Willow (<i>Salix sp.</i>)	PRF1 – trunk densely covered with ivy, dead limbs found on the fallen tree, PRF-M.	PRF-M	Yes – At-height survey (ladder)

Tree No.	Arboriculture Survey Reference No.	Description	Features with Suitability to Support Roosting Bats	Overall Assessment	Further Survey Requirements
T19	0	Willow (<i>Salix sp.</i>)	PRF1 – significant damage within the base, multiple stems approx. 0.5m above ground level, PRF-M.	PRF-M	Yes – Ground level endoscope and at-height survey (climbing)
T20	0	Alder (<i>Alnus glutinosa</i>)	PRF1 – ivy coverage with large diameter stems, PRF-I.	PRF-I	No – Soft-felling under ecological supervision required
T21	0	Oak (<i>Quercus sp.</i>)	Tree was already felled prior to the GLTA, NONE.	-	No – Soft-felling under ecological supervision required
T22	29	Oak (<i>Quercus sp.</i>)	PRF1 – dense ivy and holly coverage. Ivy with large diameter stems, obscuring most of the tree, which is suitably large and mature, PRF-M.	PRF-M	Yes – Dusk emergence surveys
T23	0	Alder (<i>Alnus glutinosa</i>), DBH approx. 50cm	PRF1 – a basal cavity providing access to internal structures approx. 1m above ground level on the easterly aspect, PRF-M.	PRF-M	Yes – Ground level endoscope inspection
T24	28	Oak (<i>Quercus sp.</i>)	PRF1 – a large fissure up high with a likely large cavity, approx. 10m+, PRF-M. PRF2 – lots of dead wood and ivy coverage obscuring ground level assessment, further PRFs may be present PRF-M.	PRF-M	Yes – At-height inspection (climbing)
T25	0	Alder (<i>Alnus glutinosa</i>)	PRF1 – dead wood present, PRF-I.	PRF-I	No – Soft-felling under ecological supervision required

Tree No.	Arboriculture Survey Reference No.	Description	Features with Suitability to Support Roosting Bats	Overall Assessment	Further Survey Requirements
T26	0	Ash (<i>Fraxinus excelsior</i>)	PRF1 – a basal cavity between 0.5m to 2.5m above ground level facing northwest, PRF-M. PRF2 – two woodpecker holes facing northeast approx. 5m above ground, PRF-M.	PRF-M	No – Not impacted
T27	0	Alder (<i>Alnus glutinosa</i>), multi-stemmed, DBH over 50cm combined	PRF1 – a multi-trunk with 20-30cm trunk diameter each, dead wood and lifted bark present, PRF-M. PRF2 – a knothole into a potential void cavity in a branch, PRF-M.	PRF-M	No – Not impacted
T28	0	Willow (<i>Salix sp.</i>)	No features found, NONE.	NONE	No – Soft-felling under ecological supervision required
T29	0	Alder (<i>Alnus glutinosa</i>), multi-stemmed	PRF1 – dead wood present in a multi-trunk tree with large knothole potentially leading into a void cavity, PRF-M.	PRF-M	No – Not impacted
T30	0	Alder (<i>Alnus glutinosa</i>)	No features found, NONE.	NONE	No – Soft-felling under ecological supervision required
T31	0	Willow (<i>Salix sp.</i>)	The tree was no longer present in the Survey Area during the GLTA.	-	No – Soft-felling under ecological supervision required

Tree No.	Arboriculture Survey Reference No.	Description	Features with Suitability to Support Roosting Bats	Overall Assessment	Further Survey Requirements
T32	0	Ash (<i>Fraxinus excelsior</i>)	PRF1 – dense ivy coverage. GLTA not possible from all elevations due to access limitations, further PRFs may be present, FAR.	FAR	Yes – At-height inspection (Climbing)
T33	0	Oak (<i>Quercus sp.</i>)	PRF1 – large cracks along dead branch over-hanging field, PRF-M. PRF2 – very dense ivy coverage and many dead branches and dead wood present, PRF-M.	PRF-M	No – Not impacted
T34	0	Oak (<i>Quercus sp.</i>)	PRF1 – dense ivy coverage with stems of significantly large diameter, PRF-M.	PRF-M	No – Not impacted
T35	0	Oak (<i>Quercus sp.</i>)	PRF1 – complex canopy with dense ivy cover, suitably mature and large, PRF-I.	PRF-I	No – Soft-felling under ecological supervision required
T36	76	Oak (<i>Quercus sp.</i>), mature, DBH over 100cm	PRF1 – knothole approx. 5m above ground, facing southwestern aspect, PRF-M. PRF2 – eastern aspect not fully assessed during GLTA and will require a further PRF check, PRF-M.	PRF-M	Yes – At-height inspection (climbing)
T37	74	Oak (<i>Quercus sp.</i>)	PRF1 – some broken branches with lifted bark, PRF-I. PRF2 – huge extensive crown makes the tree hard to survey. The tree is of sufficient size and maturity, PRF-M.	PRF-M	Yes – At-height inspection (climbing)
T38	73	Oak (<i>Quercus sp.</i>), mature, DBH over 100cm	No features found, NONE.	NONE	No – Soft-felling under ecological supervision required

Tree No.	Arboriculture Survey Reference No.	Description	Features with Suitability to Support Roosting Bats	Overall Assessment	Further Survey Requirements
T39	72	Oak (<i>Quercus sp.</i>), mature, DBH over 100cm	PRF1 – some dead branches but otherwise the tree is in good condition. Huge canopy makes tree difficult to fully assess, PRF-I.	PRF-I	No – Soft-felling under ecological supervision required
T40	71	Oak (<i>Quercus sp.</i>), mature, DBH approx. 70cm	PRF1 – some dead branches but small in diameter with evidence of management. The tree is of suitable size and maturity, PRF-I.	PRF-I	No – Soft-felling under ecological supervision required
T41	82	Oak (<i>Quercus sp.</i>), mature, DBH approx. 50cm	PRF1 – a highly managed tree with dead wood in the centre towards the top of the tree. GLTA difficult due to surrounding canopy, PRF-I. PRF2 – tree of sufficient size and maturity, PRF-I.	PRF-I	No – Soft-felling under ecological supervision required
T42	84	Oak (<i>Quercus sp.</i>)	PRF1 – multiple broken branches with cracks, PRF-I. PRF2 – a deep knothole on the down facing branch, PRF-M. PRF3 – a fissure in trunk from base up to 3m above the ground level, providing access under bark, PRF-M. PRF4 – a long southern aspect fissure along trunk from ground level up to 4m above the ground level, which opens into larger void cavity beneath bark, PRF-M.	PRF-M	Confirmed Roost from previous assessments
T43	88	Oak (<i>Quercus sp.</i>), mature, DBH over 100cm	PRF1 – peeling bark and dead wood present throughout crown providing low level of suitability for bats, 4 distinct features seen from ground. PRF2 – a limb dropped/poorly felled with potential to provide access to internal structures at 4m above the ground level facing the southern aspect, PRF-M.	PRF-M	No – Not impacted

Tree No.	Arboriculture Survey Reference No.	Description	Features with Suitability to Support Roosting Bats	Overall Assessment	Further Survey Requirements
			PRF3 – an upward facing limb (probably a wound in the dead branch) at 5m above the ground level facing southeastern aspect, PRF-M. PRF4 – significant peeling bark on the trunk at base approx. 1-1.5m facing southern aspect, PRF-M.		
T44	93	Oak (<i>Quercus sp.</i>), mature, DBH over 100cm	PRF1 – significant ivy coverage with stems over 20cm thick potentially providing/obscuring a feature, PRF-I. PRF2 – a woodpecker hole on a broken branch (upwards facing), potentially providing access to internal structures approx. 10m above the ground level on the western aspect, PRF-M, PRF3 – dead wood present throughout canopy with no significant features present, PRF-I. PRF4 – a large tree of size and maturity where full assessment could not be made during GLTA, PRF-M.	PRF-M	Yes – Dusk emergence surveys
T45	0	Oak (<i>Quercus sp.</i>), mature, DBH approx. 100cm	PRF1 – a mature tree with some dead branches and dead ivy cover with large diameter on trunk. No PRFs observed during GLTA. However, the tree is of sufficient size and maturity. Furthermore, GLTA was not completed from all aspects due to access restrictions, PRF-I.	PRF-I	No – Soft-felling under ecological supervision required
T46	100	Ash (<i>Fraxinus excelsior</i>)	PRF1 – multiple knotholes and woodpecker holes from approx. 5m above ground to the top of the tree, PRF-M. PRF2 – dead, broken and cracked trunk with large tear near the top of the tree at approx. 12m above the ground level, PRF-M.	PRF-M	No – Not impacted

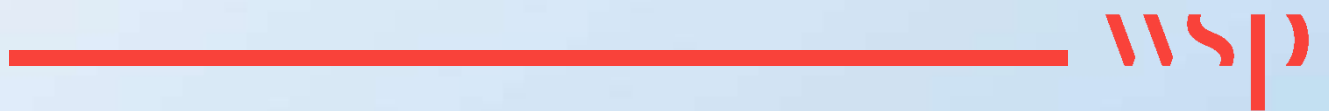
Tree No.	Arboriculture Survey Reference No.	Description	Features with Suitability to Support Roosting Bats	Overall Assessment	Further Survey Requirements
T46a	100	Oak (<i>Quercus sp.</i>)	PRF1 – a hazard beam feature facing down on limbs growing in the western aspect direction approx. 5m high. A complete GLTA not possible due to access limitations, PRF-M.	PRF-M	No – Not impacted
T47	95	Oak (<i>Quercus sp.</i>)	PRF1 – the tree has multiple dead limbs and lifted bark with ivy obscuring parts of the trunk. GLTA unable to access the eastern elevation. The tree is of sufficient size and maturity, PRF-M.	PRF-M	Yes – At-height inspection (climbing)
T48	101	Oak (<i>Quercus sp.</i>), mature	PRF1 – dead and broken branches with lifted bark and cracks. The tree is of sufficient size (over 10m) and maturity, PRF-M. PRF2 – a knothole observed on lower branch facing into the field in the southern aspect direction, PRF-I.	PRF-M	Yes – At-height inspection (climbing)
T49	103	Oak (<i>Quercus sp.</i>), mature, DBH 70cm	PRF1 – multiple dead branches and the tree is of sufficient size and maturity, PRF-I.	PRF-I	No – Soft-felling under ecological supervision required
T50	107	Oak (<i>Quercus sp.</i>)	PRF1 – a dead branch encased throughout its whole length by peeling bark with potential void cavity present throughout the limb approx. 5m above the ground level growing in the western aspect direction. PRF-M. PRF2 – fragments of dead wood present, PRF-M.	PRF-M	Yes – At-height inspection (climbing)
T51	N/A	Oak (<i>Quercus sp.</i>)	PRF1 – a large knot hole/woodpecker hole about 6m above the ground level on a branch leaning over a pond, potentially provides a suitable void cavity, PRF-M. PRF2 – dead wood and multiple broken branches, PRF-I.	PRF-M	Yes – At-height inspection (climbing)



Tree No.	Arboriculture Survey Reference No.	Description	Features with Suitability to Support Roosting Bats	Overall Assessment	Further Survey Requirements
T52	105	Oak (<i>Quercus sp.</i>)	No features found, NONE.	NONE	No – Soft-felling under ecological supervision required
T53	N/A	Alder (<i>Alnus glutinosa</i>)	PRF1 – two knotholes with a large woodpecker hole in between with access into a potential void cavity, PRF-M.	PRF-M	No – Not impacted

Appendix B

TREE PHOTOGRAPHY



Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.



N01



N02



N03



N04

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.



N05



N06



N07



N08

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.



N09



N10



N11



N12

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.



N13



N14



N15



N16

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.



No photography available

N17

N18



N19

N20

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.



N21



N22



N23



N24

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.



N25



N26



N27



N28

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.



N29



N30



N31



N32

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.



N33



N34



N35



N36

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.



N37



N38



N39



T01

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.



T02



T03



T04



T05

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.

No photography available



T06

T07



T08

T09

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.



T10



T11



T12



T13

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.



T14

No photography available

T15



T16



T17

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.



T18



T19

No photography available

No photography available

T20

T21



T22



T23

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.



No photography available

T24

T25



T26

T27

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.



T28



T29



T30

No photography available

T31

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.



T32



T33

No photography available

T34



T35

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.

No photography available



T36

T37

No photography available



T38

T39

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.

No photography available



T40

T41



T42

T43

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.

No photography available



T44

T45



No photography available

T46

T46a

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.



T47



T48



T49



T50

Photography of the trees that were surveyed during the PBRA with respective tree number below each photography.



T51



T52



T53



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