



Greater Cambridge Partnership

Cambourne to Cambridge

Appendix TR5.3: Barn Owl Survey Report 2022





Greater Cambridge Partnership

Cambourne to Cambridge

Barn Owl Report

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1 Introduction

1.1 Project Background

- 1.1.1. The Cambourne to Cambridge project (C2C) is a proposed new 13.6km public transport route linking Cambourne and Cambridge. It will include a dedicated busway serving communities in Cambourne and the proposed Bourn Airfield development, as well as in Hardwick, Coton and the West Cambridge campus. A service road, to be used as a path for active travel, particularly by cyclists and pedestrians, will run alongside the busway. A new travel hub will be provided at Scotland Farm.
- 1.1.2. The land within the Proposed Scheme (referred to throughout as the 'Site') comprises arable fields with grassland boundaries, hedgerows, grassland, traditional orchard and urban habitat.
- 1.1.3. Ecological surveys have been undertaken since 2014 with further surveys completed in 2022 to complete baseline to inform the Environmental Statement (ES) in support of the planning application.

1.2 Ecological Background

- 1.2.1. The Proposed Scheme lies within an existing Barn Owl *Tyto Alba* Species Recovery Area (SRA) (Shawyer 2012). Within this area a species recovery programme has been operating for approximately 20 years, which involves collecting nesting data on Barn Owls. Using this data, a desk study report carried out by the Wildlife Conservation Partnership (Shawyer and Cannings, 2020) for the Proposed Scheme in 2020, confirmed Barn Owl to be breeding within 5km of the Proposed Scheme boundary, with one Observed Breeding Site (OBS) found within 1.5 km of the Proposed Scheme boundary.
- 1.2.2. Ecological surveys of the Proposed Scheme carried out by Mott MacDonald in 2019 also recommended that a combined Stage 2 and Stage 3 Barn Owl Survey should be undertaken within 1.5 km of the Proposed Scheme.
- 1.2.3. In addition, gap analysis completed by WSP interrogated results from previous Barn Owl surveys conducted by Cambridge Ecology, along the Scheme in 2018-2019 (Cambridge Ecology, 2019) and updated surveys of Bourn Airfield undertaken by Thomson Environmental Consultants in 2018 (Thomson Ecology, 2018).
- 1.2.4. Ecological data is typically valid for two years, therefore data collected by these surveys are now out of date (WSP, 2021) (CIEEM, 2019). Furthermore, Cambridge Ecology used a 250m survey buffer from the Scheme Boundary, and Thomson Ecological Consultant only surveyed the survey area within Bourn Airfield. As such, the survey buffers used for these surveys is considered insufficient for Barn Owls. Therefore, it was considered that further Barn Owl surveys were required in 2022 in order to obtain robust baseline data to inform the planning application.

- 1.2.5. Following best practice guidelines (Shawyer, 2012) and in line with a desk study report by Colin Shawyer this Barn Owl survey will establish sufficient baseline data to inform impact assessment (Shawyer, 2020).

1.3 Brief and Objectives

- 1.3.1. WSP UK Ltd was commissioned by Greater Cambridge Partnership (GCP) to undertake a Barn Owl survey to support the Proposed Scheme, with the following objectives:
- To determine the presence or absence of breeding and/or roosting Barn Owl within the Scheme boundary;
 - To assess the importance of habitats for this species within the Scheme Boundary and a 1.5km buffer and determine the importance and connectivity of the habitat for foraging Barn Owl;
 - To undertake a desk study to determine if there are records of Barn Owl in the local area; and
 - Present the findings of the surveys in a baseline report.
- 1.3.2. Results will be used to inform the Schemes impact assessment and development of mitigation for Barn Owl across the Scheme. Details of the impact assessment and mitigation will be included within the Biodiversity Chapter of the ES for the Scheme.

2 Legal Compliance

- 2.1.1. Under the Wildlife and Countryside Act 1981 (as amended) it is an offence to intentionally kill, injure or take any wild bird. In addition, it is an offence to intentionally take, damage or destroy the nest of any wild bird while it is in use or being built and eggs of any wild bird are protected from being intentionally taken or destroyed.
- 2.1.2. Additional protection is extended to Barn Owls under Schedule 1 of the Act. This means it is also an offence to disturb these species at or near the nest, or whilst they have dependent young.

3 Methodology

3.1 Desk Study

- 3.1.1. This report followed best practice guidance detailed within the 'Barn Owl *Tyto alba* Survey Methodology and Techniques for use in Ecological Assessment, CIEEM' (Shawyer, 2011). The Desk Study Area comprises the Scheme Boundary and extended up to a 5km buffer, as shown in **Figure 1, Annex A**.
- 3.1.2. A gap analysis was undertaken in October 2021 to review existing baseline information for Barn Owl from previous report desk study results by the Wildlife Conservation Partnership (WCP) (Shawyer and Cannings, 2020) and survey results undertaken by Thomson Ecological Consultants and Cambridge Ecology (WSP, 2021). Barn Owl records and results from these reports (Cambridge Ecology, 2019)(Thomson Ecology, 2018) are still relevant to this desk study as they are less than 10 years old (Shawyer and Cannings, 2020).
- 3.1.3. Cambridgeshire and Peterborough Environmental Records Centre (CPERC) were consulted for Barn Owl records within the Desk Study Area. Records from the last 10 years were included in this report.

3.2 Field Survey

Survey Area

- 3.2.1. The Survey Area consisted of all potentially suitable habitats within the Scheme Boundary and extended to a 1.5km buffer as shown in **Figure 2, Annex A**, where access was granted (see limitations Section 3.5). Bourn Airfield was also excluded from the survey area as updated surveys of this site were completed by Thomson Ecology Ltd in 2022.
- 3.2.2. A detailed desk scoping study carried out in December 2021 identified potentially suitable habitats by examining a combination of aerial photography, Ordnance Survey maps and previous survey effort data were examined to identify suitable Barn Owl foraging habitat (primarily rough unmanaged grassland, but also arable fields with large grass margins, meadows, and habitat corridors), and trees or buildings which could be used for roosting and nesting Barn Owls. Densely wooded areas are not considered suitable foraging or breeding habitats for Barn Owl (Barn Owl Trust, 2012), and therefore woodland within the Field Survey Area was scoped out of this assessment. Only trees on the woodland edge were considered to provide suitable potential roosting and nesting habitats and were scoped in.

Overview Of Approach

3.2.3. Following best practice guidance detailed within Shawyer (2012), the field surveys took the following three-stage approach:

- Stage 1: On site scoping survey - to identify and record habitat features which may support foraging, roosting and/or nesting Barn Owls. This was undertaken in March – August 2022;
- Stage 2: Investigative field survey – an investigation of the features identified during Stage 1 to record potential nest sites (PNS), active roost sites (ARS), temporary rest sites (TRS), and potential foraging or commuting habitat (PFH). This was conducted in July and August 2022; and
- Stage 3: Nest verification survey - a detailed investigation during the Barn Owl breeding season to identify breeding activity. This was conducted in July and August 2022.

Stage 1 – On Site Scoping

- 3.2.4. The Stage 1 survey involved a walkover of potentially suitable habitats identified during the desk study, to record and broadly assess suitability of features of potential value to Barn Owl, such as mature trees and built structures. Stage 1 was undertaken in-between March and August (depending on access available, see Section 3.5) 2022 by WSP ecologists with over 3 years' experience in Barn Owl surveys.
- 3.2.5. Mature trees in open fields, hedgerows and woodland edges, with a trunk diameter of with sufficient girth and with a cavity suitable for Barn Owl, were recorded. A suitable cavity or hole is of a sufficient size to allow access for a Barn Owl (minimum 80 millimetres diameter hole), were identified and recorded. Any other trees with a large hole or cavity from damage or decay from wind or lightning strike and with no access from ground predators were also recorded.
- 3.2.6. Agricultural buildings, bale stacks, Barn Owl boxes and other structures that could support roosting or nesting Barn Owls were recorded and inspected from the ground, with use of binoculars, to note any signs of Barn Owl.
- 3.2.7. Where knowledge was available about mature trees with cavities that could be used by nesting and roosting Barn Owls these were identified and catalogued. Known Barn Owl nest box locations, nest and roost sites and previous sightings of Barn Owl were also identified and recorded.

Stage 2 - Investigative Field Survey

- 3.2.8. Stage 2 was carried out during July and August 2022 by an appropriately licensed ecologist, holding a CL29 class licence.
- 3.2.9. Stage 2 survey involved inspecting features identified during Stage 1 to determine if they were in use by Barn Owl and identify if they had characteristics that could potentially support breeding (PNS) or were instead used for resting/roosting (TRS/ARS). PNS typically include:

- agricultural or old industrial buildings with suitable access and possessing an upper floor, loft, roof void, blocked chimney, wide wall plate, bale-stack, empty water tank, ducting or large nestbox;
- disused or derelict cottages or industrial buildings such as aircraft hangers, which possess an open joist, broken ceiling panel, water tank, disused chimney or large nestbox;
- mature trees, isolated or in clusters in open fields, hedgerow or on the woodland edge, containing a hole >80 mm backed by a large, dark cavity, including those which have rotted-out to ground level but which offer no obvious access to ground predators through an open root structure;
- outdoor nestboxes on poles, trees, buildings or owl towers, which offer a dark chamber;
- outdoor bale-ricks;
- waterway, rail or road bridges containing suitable cavities within their structure; and
- churches, mainly rural, and the chimneys of intermittently used holiday homes (Shawyer, 2012).

3.2.10. The locations of features were mapped and their descriptions recorded. Field signs of Barn Owl, that indicate occupation, or potential occupation, typically include:

- presence of adult birds;
- nests, eggs, or young (during the breeding season);
- pellets;
- white 'splashing' caused by droppings;
- feathers; and
- small mammal remains.

3.2.11. Potential Barn Owl foraging grassland habitat were assessed according to their ability to support populations of small mammals, in particular Field Vole *Microtus agrestis*, the principal food source for Barn Owl. Grassland was either recorded as Type 1, Type 2, or Type 3 Barn Owl habitat (Shawyer, 2012) . Type 1 habitat is ideal foraging habitat and comprises rough grassland characterised by tall tussocky grass with a thick (70-100 millimetres) litter-layer within which small mammals can burrow. Type 2 habitat is suboptimal for foraging but suitable to support feeding Barn Owls and is typically occasionally managed or grazed and supports a smaller litter layer. Type 3 habitat offers very poor habitat for small mammals and as such are of low value to Barn Owls. These habitats are typically improved grasslands characterised by a homogeneous sward, which is often kept short throughout much of the year. No tussock structure is present and these habitats are devoid of any litter layer at their base.

3.2.12. The identification of the Type 1 and Type 2 habitat allowed for the Traffic Accident Blackspots (TAB) to be identified and recorded. These are defined as potential future road/rail traffic accident blackspots for Barn Owl caused by the bisection of prime foraging habitat (Type 1 and 2 Habitats) by a newly proposed major route (Shawyer, 2012).

Stage 3 – Detailed Nest Verification Survey

- 3.2.13. Stage 3 survey was carried out during July and August 2022 by an appropriately licensed ecologist, holding a CL29 class licence.
- 3.2.14. Buildings, trees and nest boxes identified during Stage 2 were revisited during the breeding season (July and August 2022) to carry out the Stage 3 survey and to confirm if the trees or structures were used for breeding (OBS).
- 3.2.15. Structures were first inspected closely from the ground, with use of binoculars to identify and record all evidence of Barn Owl. Elevated internal inspections of structures were then undertaken.
- 3.2.16. Cavities within trees and suitable structures (such as ledges) within buildings/were accessed using a ladder and inspected for evidence of Barn Owls with the aid of a torch, mirror and endoscope. This inspection enabled the surveyor to determine whether the cavity was large enough to accommodate an adult Barn Owl and to search for field signs (as outlined above in Stage 2) indicating current or past use as a nest or roost site. indicated above.

3.3 Dates of Survey and Personnel

Table TR5-3-3-1 – Survey Dates and Surveyors

Survey Stage	Survey Date	Surveyor
Stage 1	March to August 2022	Phoebe Cox, Zoe Phillips and Lauren Blackmore
Stage 2	July to August 2022	Phoebe Cox, Zoe Phillips and Lauren Blackmore
Stage 3	July 2022 and August 2022	Phoebe Cox, Lauren Blackmore and Dan Stewart

3.4 Notes and Limitations

- 3.4.1. The desk study data from CPERC was provided through records at scale of 1km grid squares, not precise locations, and therefore did not provide precise locations of features such as nest sites. Therefore, breeding site records located within the Field Survey Area could not be used to plan further Stage 2 and 3 surveys. However, as the Stage 1, Stage 2 and Stage 3 surveys were comprehensive, the lack of precision from the desk study recorded is not considered to have limited this assessment. In addition, precise locations of individual Barn Owls, OBS and PNS were provided within the Thomson and WPC reports.
- 3.4.2. Several areas could not be accessed during the Stage 2 and Stage 3 surveys due to access restrictions, as shown in **Figure 1, Annex B**. Where access was not permitted, potentially suitable habitat was surveyed with the aid of binoculars from public rights of way or adjacent

land parcels. This method was only suitable where line of sight was possible. Potential Nesting Sites (PNS) which could not be surveyed due to access constraints remained recorded as PNS as presence/absence could not be confirmed. Further considerations, such as if there was suitably habitat connectivity, was given in these instances to reduce this limitation.

- 3.4.3. In addition, access was not granted to all locations prior to surveys commencing and so not all Stages of the survey effort were completed at the same time for each parcel. However, land parcels were surveyed as soon as it was feasibly possible to once access was granted and all data from the accessible survey area was recorded within the recommended survey window and therefore this is not considered to be a constraint.
- 3.4.4. Bourn Airfield was not included within the survey area as updated surveys of this area as updated surveys of this site were completed by Thomson Ecology Ltd in 2022.

4 Results

4.1 Desk Study

- 4.1.1. The desk study reports by WCP and Thomson Ecology confirmed three Observed Breeding Sites (OBS), one natural (tree) site, one within a nest box and one in an unknown structure; and four Potential Nesting Sites (PNS) within nest boxes within 1.5km of the Site. In addition, two PNSs within nest boxes and one Active Roost Site (ARS) were also returned within the Scheme Boundary. CPERC identified 16 records from the last 10 years within 2km of the Scheme Boundary. These records included incidental records of individual Barn Owls and road casualties. The distribution of records show that Barn Owls are present in the local area, with numerous records within and surrounding the Scheme Boundary. The spatial distribution of these records is shown on **Figure 1, Annex C**.
- 4.1.2. The previous report for Bourn Airfield identified no trees within the survey area with potential to support nesting or roosting Barn Owl. A building with a Barn Owl nest box is located within Bourn Airfield.

4.2 Field Survey

Stage 1 - On-site Scoping

- 4.2.1. The Stage 1 assessment identified there to be suitable foraging habitat and potential nest and roost sites within the Survey Area, which were further surveyed during Stage 2 and 3.
- 4.2.2. On-site scoping also identified 182 trees and 258 buildings with potential to support roosting and/or nesting Barn Owl.

Stage 2 – Investigative Field Survey

Foraging Habitat

- 4.2.3. Potential suitable foraging habitat identified within the Site was predominantly managed arable field margins identified as Type 3 habitat. Areas of Type 2 grassland are present in various locations across the Survey Area, with a higher prevalence east of Cambourne and south west of the Scheme. Type 1 grassland was found to be much rarer, however the majority of this habitat was found within Coton Orchard. Other small areas of Type 1 grassland were found to the east and south of the Site.
- 4.2.4. The total area of foraging habitat recorded is outlined in **Table TR5-3-4-1** and is shown as mapped areas in **Figure 2, Annex C**.

Table TR5-3-4-1 - Foraging habitat

Habitat Type	Area within 1.5 km of Scheme alignment	Area within 1km of Scheme alignment	Area within Scheme alignment
Suitable Type 1	40.915 hectares	39.769 hectares	36.449 hectares
Suitable Type 2	53.338 hectares	63.822 hectares	29.178 hectares
Suitable Type 3	184.134 hectares	128.192 hectares	51.454 hectares

Traffic Accident Blackspot

- 4.2.5. A potential TAB spot was identified between the existing A428 and the Site in the east of the site (**Figure 3, Annex C**).

Identification of roosting or nesting sites

- 4.2.6. During the Stage 2 surveys, 89 of the 182 trees and 86 of the 258 buildings identified during the Stage 1 surveys were assessed, as access to the remaining trees and buildings was not granted during the survey period. Of these trees, 16 were found to have roosting potential. One tree (T7) contained bird droppings within the cavity, some of which could be Barn Owl splashing and a white downy feather was also present, however no definitive evidence of Barn Owl was identified. Eight of the 16 trees with roosting potential were also considered to have nesting potential for Barn Owls (PNS), although no evidence of Barn Owl was recorded to suggest these trees were in use or had been in use.
- 4.2.7. Of the buildings assessed during Stage 2 surveys, four buildings were identified as having roosting potential for Barn Owls (PNS), with one located within the Scheme Boundary (B2) and a further 2 buildings identified with roosting and nesting potential for Barn Owl (B1 and B5), although no evidence of Barn Owl was recorded to suggest these buildings were in use or had been in use. One building was also identified as having roosting and nesting potential during the Stage 2 surveys, although could not be fully inspected due to access constraints (B7). A total of 13 Barn Owl nest boxes were identified within the survey and buffer area. No clear or recent evidence of Barn Owls was identified within the Survey Area during Stage 2 work.

Stage 3 – Nest Verification Survey

- 4.2.8. Of the suitable trees and buildings identified during the Stage 2 survey, a Stage 3 survey was carried out for all trees, except T4 and T6, and all buildings except B7, due to access constraints. Of these trees and buildings surveyed, no OBS were confirmed.
- 4.2.9. In addition, 13 Barn Owl nest boxes were identified within the Survey Area, however five of these nest boxes could not be surveyed due to access constraints. Of the remaining eight nest boxes, no evidence of roosting or nesting Barn Owl were observed and the majority of

these nest boxes were occupied by Stock Dove *Columba oenas*. However, the desk study identified one OBS within a nest box, located between 1km and 1.5km south of the Scheme Boundary (Shawyer and Cannings, 2020).

- 4.2.10. The location of all PNS recorded within the Site are detailed below in **Table TR5-3-4-2**. A full description of all trees and buildings with features suitable for Barn Owl and if applicable, reasons for no Stage 2 or Stage 3 survey carried out are detailed below within **Table TR5-3-4-3** and **TR5-1-4-4**. Results are also presented in **Figure 4 and 5** in **Annex C**.
- 4.2.11. Assessing a site for current or historic breeding requires a detailed inspection of field signs within the direct vicinity of the nest. In the case of breeding sites within trees it is common for there to be no evidence of Barn Owl outside or around the base of the tree, and evidence only within the cavity in the location where nesting occurs. Several trees and buildings identified as PNS in Stage 2 could not be confirmed or ruled out as OBS due to lack of safe access to the tree cavity and inspection of the potential nesting area. In these cases where the tree cavity was of a suitable size to enable Barn Owl entry, and tree of a sufficient girth to support a suitable internal cavity these sites remained as PNS.

Table TR5-3-4-2 - Barn Owl Survey Results

Site type	Within Scheme Boundary	Total within Survey Area (500m of Scheme Boundary)	Total within Survey Area (1km of Scheme Boundary)	Total within Survey Area (1.5km of Scheme Boundary)
ARS	0	0	0	0
OBS	0	0	0	0
PNS	1 building (B2), 4 Barn Owl nest boxes	2 Trees (T3 and T12) and 1 Building (B1).	1 Tree (T4), 4 Barn Owl nest boxes and 1 Building (B7).	4 Trees (T1, T6, T7 and T15), 5 Barn Owl nest boxes and 1 Building (B5).
TRS	0	1 Building (B6)	1 Building (B4), 2 Trees (T2 and T10)	6 Trees (T5, T8, T9, T11, T13, T14) and 1 Building (B3)

Table TR5-3-4-3 - Stage 2 and Stage 3 Survey Results

Tree Number	Tree Species	Feature	Feature Description	Barn Owl Evidence	Evidence Description	Surveyed (Reason for no survey)	Suitability
T1	Oak	Large cavity	6m high, large, sheltered cavity/	No	N/A	Y	PNS
T2	Poplar sp.	Two cavities	2 cavities, 1.6m and 1.5m high in ivy. Sheltered but small trunk.	Potential	Small white downy feather at cavity, could be pigeon	Y	PNS
T3	Oak	Cavity	Cavity 3-4m high, looks to be exposed to rain but could have a cavity further in tree that is sheltered.	No	N/A	Y	PNS
T4	-	Cavity	Tree with large cavity 2m high.	N/A	N/A	No access	PNS
T5		Cavity	Cavity 10m up, partially exposed trunk too thin for nesting/	No	N/A	N (no further survey required)	Potential Roost Site but no evidence of Barn Owl
T6	Oak		old mature oak tree. Age and size indicative that it could be contain suitable features.	N/A	N/A	No access	PNS

Tree Number	Tree Species	Feature	Feature Description	Barn Owl Evidence	Evidence Description	Surveyed (Reason for no survey)	Suitability
T7	Oak	Cavity	Cavity 4m high.	Potential	Possible, lots of bird droppings some could be splashing, white downy feather also present. Potential roost site but not an active nest site.	Y	PNS
T8	Ash	Tear out	Tear out 6m high. 20cm x 50cm	No	N/A	Y	Potential Roost Site but no evidence of Barn Owl
T9	Ash	Cavity	3m from ground. Cavity in tree 30cm width x 40cm height.	No	Sheltered. Nest present, most likely pigeon but could be suitable roost for Barn Owl. A white feather (looks like pigeon) is present in scrub below	Y	Potential Roost Site but no evidence of Barn Owl
T10	Beech	Cavity	Cavity at bottom of tear out 15m high. Cavity could go further down into tree but not visible.	No	Nesting not likely as corvid nest is present directly above cavity. Potential roost site only.	Y	Potential Roost Site but no evidence of Barn Owl
T11		Tear out and rot cavity	Cavity 5m high. Not suitable for nesting, exposed cavity and evidence of damp rot in trunk of tree.	No	Downy pigeon feathers present so likely used by pigeon. Most likely potential roost site.	Y	Potential Roost Site but no evidence of Barn Owl

Tree Number	Tree Species	Feature	Feature Description	Barn Owl Evidence	Evidence Description	Surveyed (Reason for no survey)	Suitability
T12	Ash	Tear out cavity		No	Debris stuffed in cavity (likely to be Corvus/pigeon). PNS - no signs of Barn Owl. Juvenile/ female kestrel sitting adjacent to cavity so possibly occupied by kestrels.	Y	PNS
T13		Cavity	Hole on north aspect 5m. Tear out 6m south. Cavity is likely to be exposed. Most likely suitable for tawny owl or potential Barn Owl roost.	No	N/A	Y	Potential Roost Site but no evidence of Barn Owl
T14	Beech	Cavity	Cavity 15m. Has sticks in. Some exposure to rain.	No	Most likely Corvid nesting as some black feathers around base of tree and lots of sticks present. Could be PRS.	Y	Potential Roost Site but no evidence of Barn Owl
T15	Oak	Broken branch leading to potential cavity	Broken branch leading to potential cavity at 6m.	No	Deemed as not in use by Barn Owl most likely pigeon, stock dove or corvid with downy feather present at entrance and lots of corvid pellets and features at base	Y	PNS

Tree Number	Tree Species	Feature	Feature Description	Barn Owl Evidence	Evidence Description	Surveyed (Reason for no survey)	Suitability
					of tree. Potential nest site for Barn Owl.		
T16	Willow	Cavity	Mature willow tree, large cavity 1.5 m up but tree completely hollow within.	No	Likely pigeon nesting in tree as downy feathers present.	Y	Potential Roost Site but no evidence of Barn Owl

Table TR5-3-4-4 - Nest Verification Survey Results

Building ID	Surveyed	Feature	Featured description	Barn Owl Evidence	Suitability
B1	Y	Open barn	Barn with most of the roof missing however, small section at the southern end roof still intact.	No	PNS
B2	Y	Beams	Wooden clad sheep stable and store. Bat box on south side. Open access to north half. Closed off for storage to south. 2x4m. Two little owls within building, likely nesting in closed area.	No	Potential Roost Site but no evidence of Barn Owl
B3	Y	Beams	Small beams on wall for perching. No ledge for nesting. Little owl pellets and old whitewash (likely Little Owl due to other evidence found).	No	Potential Roost Site but no evidence of Barn Owl
B4	Y	Hay bails	Includes hay bails but artificial lighting on during the day, also disturbed. Dark corner could be potential roost site not suitable for nest site.	No	Potential Roost Site but no evidence of Barn Owl



Building ID	Surveyed	Feature	Featured description	Barn Owl Evidence	Suitability
B5	Y	Beams	Farm buildings with potential within old barns.	No	PNS
B6	Y	Beams	No ledges within barn so not suitable for nesting but potential for roosting.	No	Potential Roost Site but no evidence of Barn Owl
B7	No access		Old barn, looks relatively undisturbed	No	PNS

5 Conclusion

- 5.1.1. The desk study from CPERC identified 16 records from the last 10 years within 2km of the Scheme Boundary. Previous survey and desk studies completed by WCP and Thomson Ecology confirmed three Observed Breeding Sites (OBS) and four Potential Nesting Sites (PNS) within nest boxes within 1.5km of the Site. In addition, two PNSs within nest boxes and one Active Roost Site (ARS) were also returned within the Scheme Boundary.
- 5.1.2. The Stage 2 and Stage 3 field surveys undertaken in 2022 identified five PNSs within the Scheme Boundary (one building and four Barn Owl nest boxes). Three PNSs (two trees and one building) and one TRS were identified within 500m of the Scheme Boundary. Six PNSs (one tree, one building and four Barn Owl nest boxes) and three TRSs (one building and two trees) were identified between 500 and 1km of the Scheme Boundary and 10 PNSs (four trees, one building and four Barn Owl nest boxes) and seven TRSs (six trees and one building) were identified between 1km and 1.5km of the Scheme Boundary. Optimal foraging habitat (Type 1) was found to limited within the Scheme Boundary and restricted to Coton Orchard and suboptimal habitat (Type 2) was scattered around the Survey Area with higher prevalence within the east of Cambourne, south west of the Scheme.
- 5.1.3. Despite previous desk study and survey reports recording three Observed Breeding Sites and one Active Roost Site and the 2022 field surveys recording multiple Potential Nest Sites and Temporary Rest Sites within and immediately beyond the Scheme Boundary, the Stage 2 and 3 field surveys recorded no conclusive evidence of Barn Owl, with no breeding sites or active roost sites present within the Scheme Boundary or within a 1.5km radius, where access could be granted.

6 References

6.1 PROJECT REFERENCES

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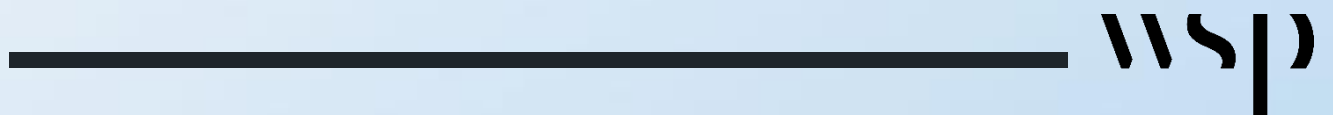
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Annex A

Study & Survey Areas



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THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED AND ONLY WRITTEN DIMENSIONS SHALL BE USED



- Legend
- 2km Buffer
 - 5km Buffer
 - C2C Scheme Boundary (DF4)
 - Previous scheme boundary
 - ESRI Satellite (ArcGIS/World_Imagery)

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Revision Details	By	Date	Suffix

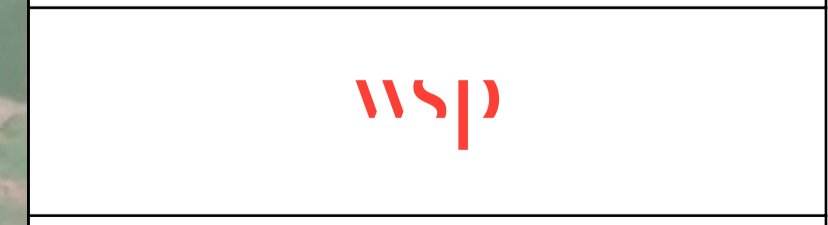
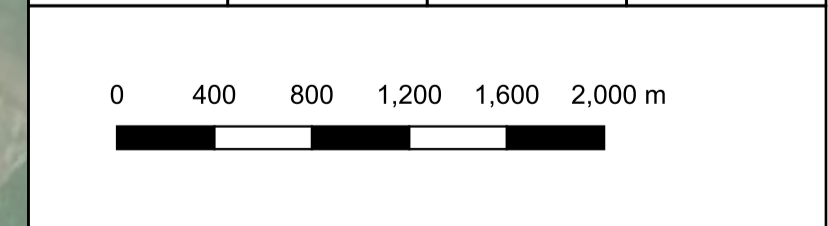
Drawing Status **V1.0**

Job Title
Cambridge to Cambourne

Drawing Title
Figure 1, Annex A - Barn Owl Desk Study Area

Scale at A1 **1:31,036.553865**

Drawn	UKMDP002		
Stage 1 Check	JF	Stage 2 Check	MP
		Originated	ZP
		Date	01/09/2023



Drawing Number **1**



Path: \\uk.wspgroup.com\central_data\Projects\70086xxx\70086660 - C2C TMAO Stage\03 WIP\Ecology\07 GIS & Mapping\GIS\Project\Barn Owl\C2C Barn Owl.ggz



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Legend

- C2C Scheme Boundary (DF4)
- Previous scheme boundary
- 500m_Buffer
- 1km_Buffer
- 1.5km_Buffer
- ESRI Satellite (ArcGIS/World_Imagery)

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Revision Details	By	Date	Suffix
	Check		

Drawing Status: **V1.0**

Job Title: **Cambridge to Cambourne**

Drawing Title: **Figure 2, Annex A - Barn Owl Survey Area**

Scale at A1: **1:20,608.089023**

Drawn: **UKMDP002**

Stage 1 Check	Stage 2 Check	Originated	Date
JF	MP	ZP	01/09/2023

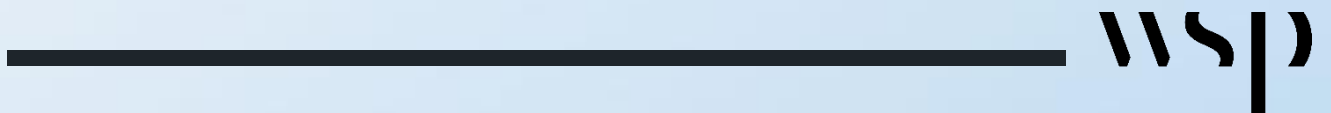
0 300 600 900 1,200 1,500 m

wsp

Drawing Number: **1**

Annex B










Areas not surveyed or not accessed



Path: \\uk.wspgroup.com\central_data\Projects\70086xxx\70086660 - C2C TWA0 Stage\03 WIP\Ecology\07 GIS & Mapping\GIS\Project\Barn Owl\C2C Barn Owl.ggz

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- Legend
-  2km Buffer
 -  5km Buffer
 -  C2C Scheme Boundary (DF4)
 -  Potential_BO_roost_-_Trees_(Points)
 -  BO_foraging_Suitability
 -  No access
 -  Not surveyed
 -  Previous scheme boundary
 -  ESRI Satellite (ArcGIS/World_Imagery)

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Revision Details	By	Date	Suffix

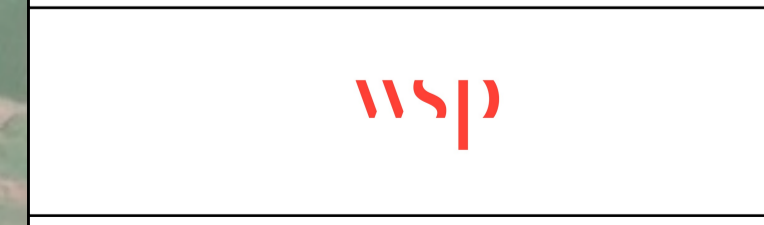
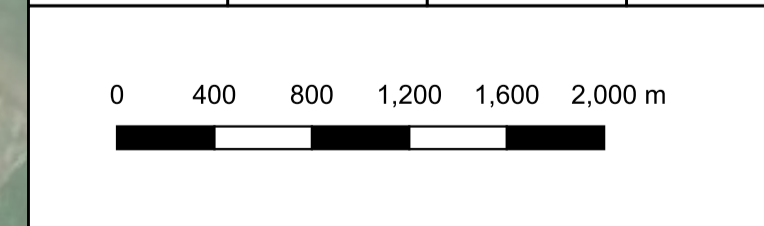
Drawing Status **V1.0**

Job Title
Cambridge to Cambourne

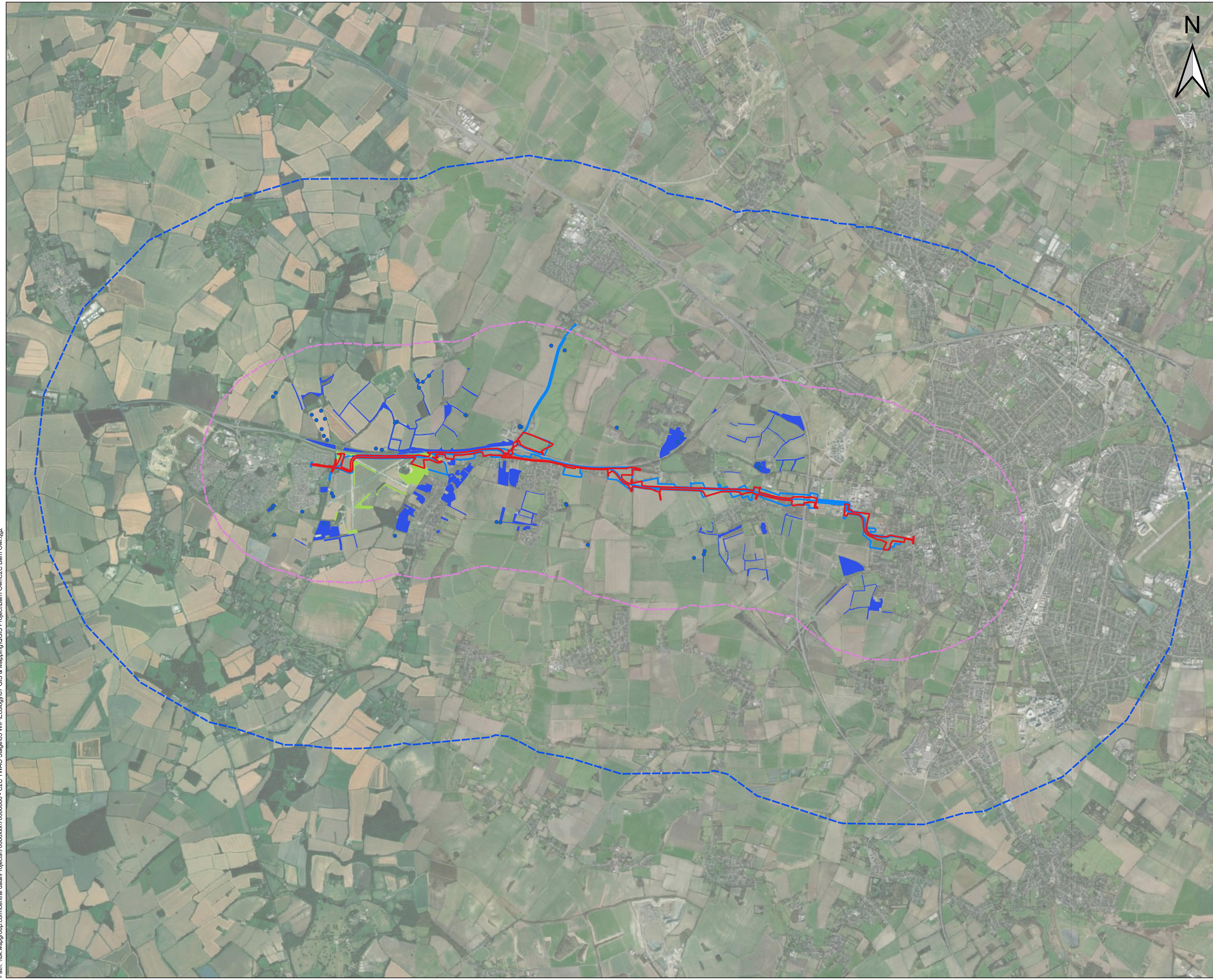
Drawing Title
Figure 1, Annex B - Barn Owl Access and areas unsurveyed

Scale at A1 **1:31,036.553865**

Drawn	UKMDP002
Stage 1 Check	JF
Stage 2 Check	MP
Originated	ZP
Date	01/09/2023

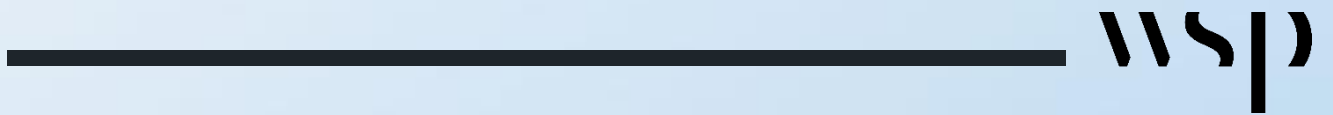


Drawing Number **1**











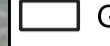
Annex C

Results



Path: \\uk.wspgroup.com\central_data\Projects\70086xxx\70086660 - C2C TWA0 Stage\03 WIP\Ecology\07 GIS & Mapping\GIS\Project\Barn Owl\C2C Barn Owl.ggz

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- Legend
-  2km Buffer
 -  5km Buffer
 -  C2C Scheme Boundary (DF4)
 -  Previous Scheme Boundary
 - Copy of Copy of Barn Owl data report
 -  ARS (nest box)
 -  Individual
 -  OBS (nest box)
 -  PNS (nest box)
 -  Grid reference biological records
 - ESRI Satellite (ArcGIS/World_Imagery)



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Revision Details	By	Date	Suffix

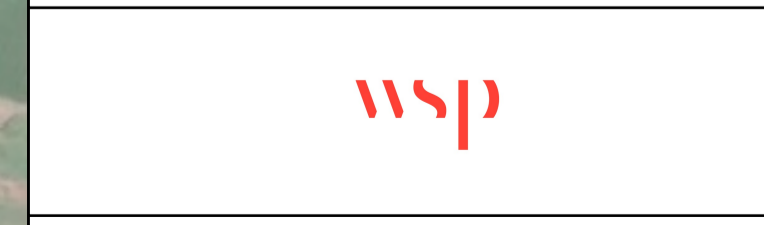
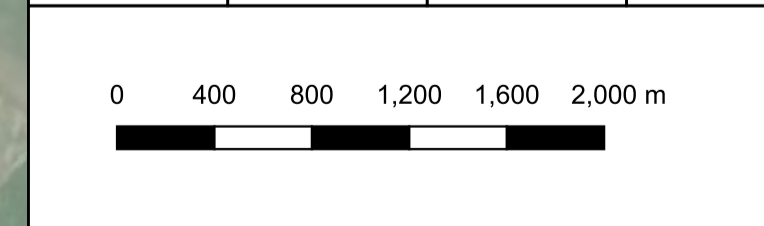
Drawing Status **V1.0**

Job Title
Cambridge to Cambourne

Drawing Title
Figure 1, Annex C - Barn Owl Desk study results

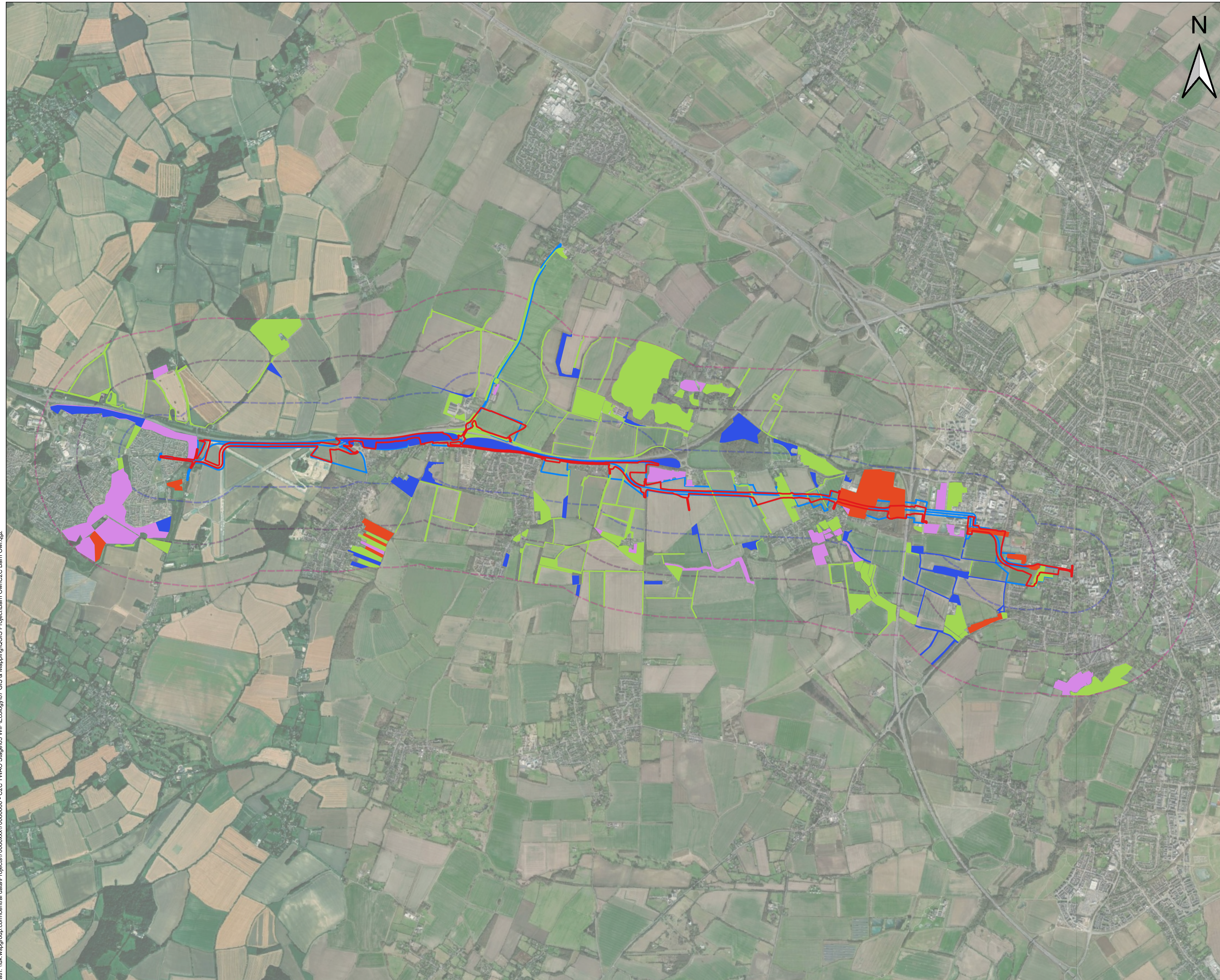
Scale at A1 **1:31,036.553865**

Drawn	UKMDP002		
Stage 1 Check	JF	Stage 2 Check	MP
		Originated	ZP
		Date	01/09/2023



Drawing Number **1**

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Legend

- C2C Scheme Boundary (DF4)
- BO_foraging_Suitability
- Unsuitable
- Type 1
- Type 2
- Type 3
- Site_Boundary
- 500m_Buffer
- 1km_Buffer
- 1.5km_Buffer

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Revision Details	By	Date	Suffix

Drawing Status: **V1.0**

Job Title: **Cambridge to Cambourne**

Drawing Title: **Figure 2, Annex C - Barn Owl field survey foraging habitat results**

Scale at A1: **1:20,608.089023**

Drawn: UKMDP002	
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Stage 1 Check: JF	Stage 2 Check: MP	Originated: ZP	Date: 01/09/2023
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0 300 600 900 1,200 1,500 m

wsp

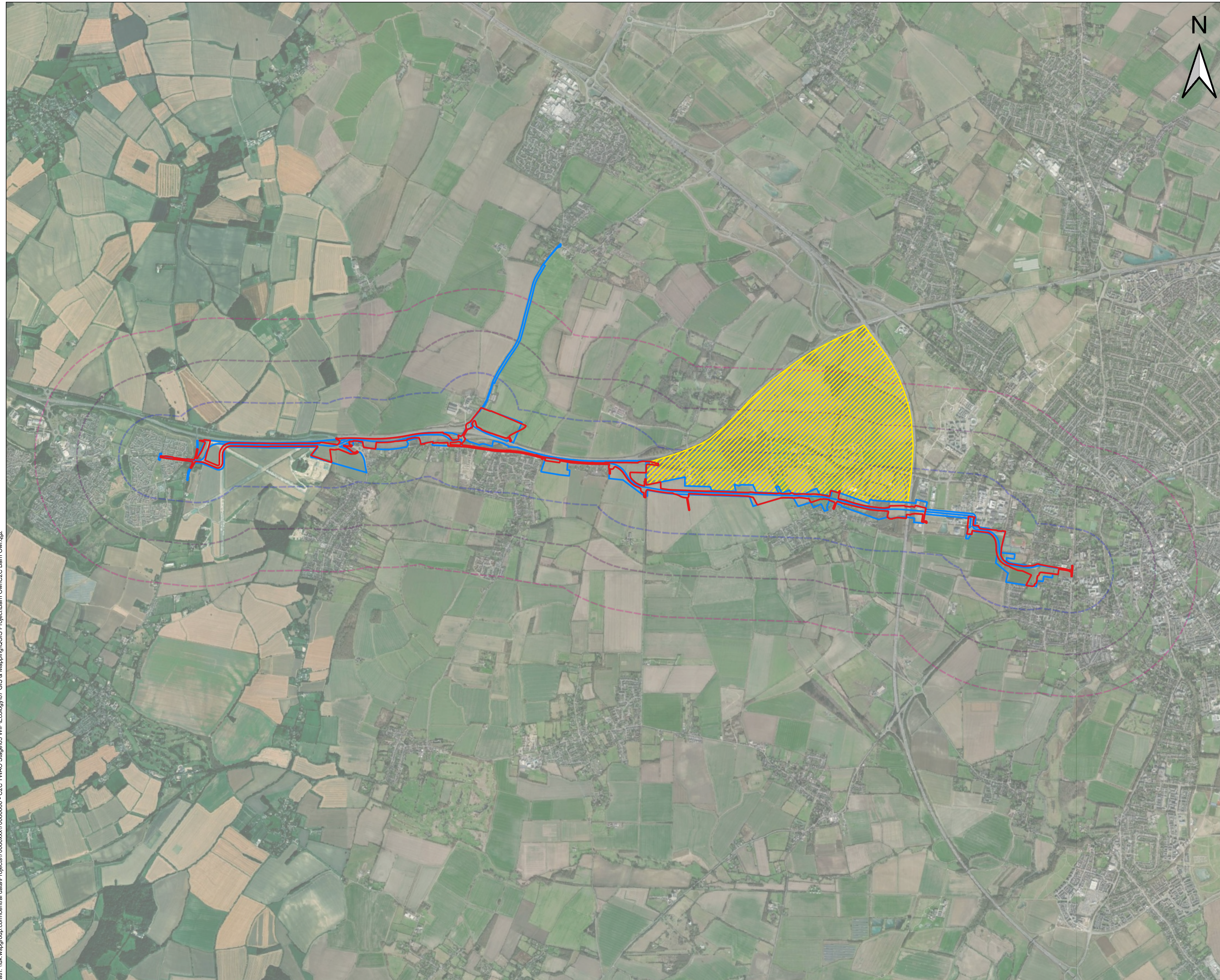
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- Legend
- C2C Scheme Boundary (DF4)
 - Site_Boundary
 - TAB
 - 500m_Buffer
 - 1km_Buffer
 - 1.5km_Buffer
- ESRI Satellite (ArcGIS/World_Imagery)



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	Check		

Drawing Status **V1.0**

Job Title

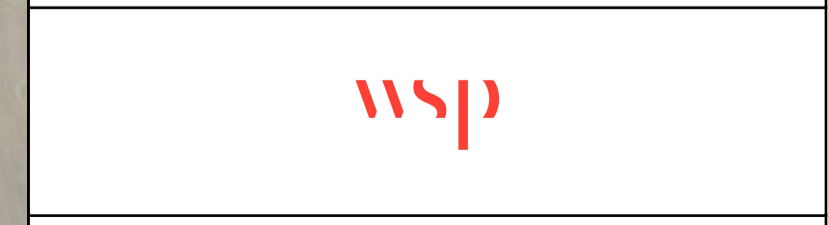
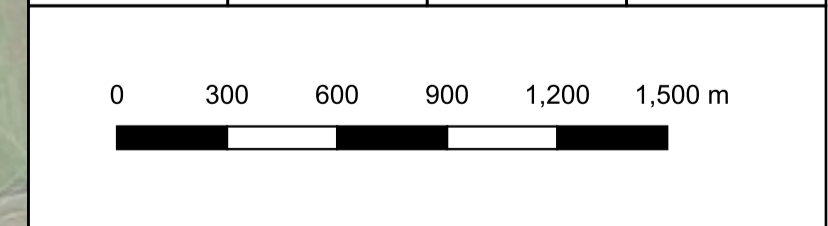
Cambridge to Cambourne

Drawing Title

Figure 3, Annex C - Barn Owl Traffic Accident Black-spot

Scale at A1 **1:20,608.089023**

Drawn	UKMDP002		
Stage 1 Check	JF	Stage 2 Check	MP
		Originated	ZP
		Date	01/09/2023



Drawing Number

1

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Legend

- C2C Scheme Boundary (DF4)
- Potential_BO_roost_-_Buildings
- No
- Roost
- Roost and nest
- Previous Scheme Boundary
- 500m_Buffer
- 1km_Buffer
- 1_5km_Buffer
- ESRI Satellite (ArcGIS/World_Imagery)

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Revision Details	By	Date	Suffix

Drawing Status V1.0

Job Title
Cambridge to Cambourne

Drawing Title
Figure 4, Annex C - Barn Owl Stage 2 - Building suitability

Scale at A1 1:19,176.127416

Drawn	UKMDP002		
Stage 1 Check	Stage 2 Check	Originated	Date
JF	MP	ZP	01/09/2023

Drawing Number 1

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Legend

- C2C Scheme Boundary (DF4)
- BO_nest_box
- Potential_BO_roost_-_Trees_(Points)
- Roost
- Roost and nest
- Previous Scheme Boundary
- 500m_Buffer
- 1km_Buffer
- 1_5km_Buffer
- ESRI Satellite (ArcGIS/World_Imagery)



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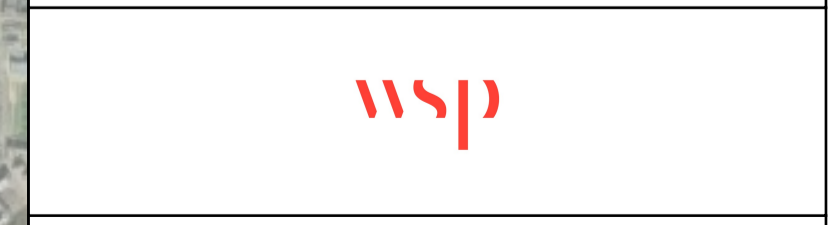
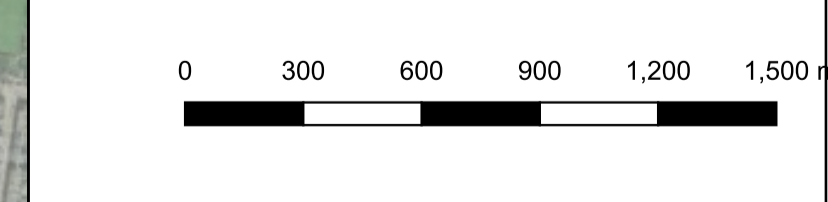
Drawing Status **V1.0**

Job Title
Cambridge to Cambourne

Drawing Title
Figure 5, Annex C - Barn Owl Stage 2 - Tree suitability and Barn Owl nest boxes

Scale at A1 **1:19,176.127416**

Drawn	UKMDP002		
Stage 1 Check	Stage 2 Check	Originated	Date
JF	XX	XX	01/09/2023



Drawing Number
1

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