



Hallam Land Management Ltd.

North West Bicester

BAT SURVEY REPORT

November 2021

FPCR Environment and Design Ltd

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CONTENTS

1.0 INTRODUCTION 2

2.0 LEGISLATION 2

3.0 METHODOLOGY..... 4

4.0 RESULTS 9

5.0 DISCUSSION & RECOMMENDATIONS..... 20

TABLES

- Table 1: Classification and Survey Requirements for Bats in Trees
- Table 2: Activity Transect Survey Conditions
- Table 3: Static Detector Deployment Numbers
- Table 4: Ground Based Tree Assessment Results

FIGURES

- Figure 1: Tree Location Plan
- Figures 2a-8c: Bat Transect Plans April – September
- Figure 9: Static Detector Location Plans

APPENDICES

- Appendix 1: Static Tables

1.0 INTRODUCTION

- 1.1 The following bat report has been prepared by FPCR Environment & Design Ltd. on behalf of Hallam Land Management. It provides details of all bat surveys undertaken and subsequently provides mitigation approaches at land north west of Bicester, Oxfordshire (central grid reference SP 56937 24922). This report should be read in conjunction with the Ecological Appraisal¹ for the site which includes the results of an Extended Phase 1 Habitat Survey. Surveys comprised: desktop study, potential roost surveys including ground-based tree assessments, bat activity transects and automated static bat detector surveys.

Site Location and Context

- 1.2 The site is located to the north west of Bicester, Oxfordshire, bordered by the A4095 and arable fields to the south, arable and residential buildings to the east, arable and Bucknell village to the north and arable to the west. The site comprises arable fields, pasture fields, and mixed woodland.

Redevelopment Proposals

- 1.3 The plans for the site based on the current plans include a mixed use development with associated access and infrastructure, re, green infrastructure including formal, semi-natural and amenity spaces and sustainable drainage systems (SUDs).

2.0 LEGISLATION

- 2.1 Before any proposals take place, measures must be taken to ensure that the legislation concerning bats is not breached as a result of works. Bats are afforded full protection under the Wildlife & Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 (as amended).
- 2.2 Under Regulation 43 of the Conservation of Habitats and Species Regulations 2017 (as amended) it is illegal to:
- Deliberately capture, injure or kill any wild animal of a European Protected Species (EPS),
 - Deliberately disturb wild animals of an EPS (affecting ability to survive, breed or rear young) – disturbance of animals includes in particular any disturbance which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young,
 - Deliberately disturb wild animals of an EPS (impairing ability to migrate or hibernate) – disturbance of animals includes in particular any disturbance which is likely to impair their ability in the case of hibernating or migratory species to hibernate or migrate,
 - Deliberately disturb wild animals of an EPS (affecting local distribution and abundance) – disturbance of animals includes in particular any disturbance which is likely to affect significantly the local distribution or abundance of the species to which they belong,

¹ FPCR, September 2021, Bicester, Preliminary Ecological Appraisal

- Deliberately disturb wild animals of an EPS (whilst occupying a structure of place used for shelter or protection) – intentionally or recklessly disturb any wild animal while it is occupying a structure or place which it uses for shelter or protection,
- Damage or destroy a breeding site or resting place of a wild animal an EPS.

2.3 Under the Wildlife and Countryside Act 1981 (as amended) it is illegal to:

- Recklessly or intentionally kill, injure or take any wild animals included in Schedule 5.
- Recklessly or intentionally damage or destroy, or obstruct access to any structure or place which any wild animal included in Schedule 5 uses for shelter or protection,
- Recklessly or intentionally disturb any such animal while it is occupying a structure or place which it uses for shelter or protection.

2.4 If impacts to bats or their roosts cannot be avoided a European Protected Species Licence from Natural England is required in order to allow proposals to derogate from the Legislation (Licences cannot be obtained to provide protection against offences under the Wildlife & Countryside Act 1981 (as amended)). As part of the application process a number of ‘Tests’ have to be met by the application.

2.5 Natural England Guidance Note: European Protected Species and the Planning Process – Natural England’s Application of the ‘Three Tests’ to Licence Applications (March 2011) states:

“In determining whether or not to grant a licence Natural England must apply the requirements of Regulation 53⁵ of the Regulations and, in particular, the three tests set out in sub-paragraphs (2)(e), (9)(a) and (9)(b)⁶.

*(1) **Regulation 53(2)(e)** states: a licence can be granted for the purposes of “preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment”.*

*(2) **Regulation 53(9)(a)** states: the appropriate authority shall not grant a licence unless they are satisfied “that there is no satisfactory alternative”.*

*(3) **Regulation 53(9)(b)** states: the appropriate authority shall not grant a licence unless they are satisfied “that the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.”*

2.6 Conservation status is defined as *“the sum of the influences acting on the species concerned that may affect the long term distribution and abundance of its population within its territory”*. It is assessed as favourable when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long term basis as a viable component of its natural habitats, and
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, or will probably continue to be, a sufficiently large habitat to maintain its populations on a long term basis.

- 2.7 These tests must not only reach agreement with Natural England when assessing a Licence application, they must also be assessed by the planning authority when determining a planning application.

3.0 METHODOLOGY

Desktop Study

- 3.1 The Multi Agency Geographic Information for the Countryside (MAGIC) website has been reviewed for the presence of any statutory designated sites of international (Special Conservation Area (SAC), Special Protection (SPA) or Ramsar Sites), national/regional (Site of Special Scientific, (SSSI)) or local nature conservation importance (Local Nature Reserves (LNR)) within 5km, 2km and 1km of the Site, respectively.
- 3.2 Consultation was also undertaken in July 2020 with Thames Valley Environmental Records Centre (TVERC) for the presence of non-statutory designated sites of nature conservation importance (Local Wildlife Sites (LWS), potential Local Wildlife Sites (pLWS) or Ecosites and statutory protected / notable species for within 1km of the Site.
- 3.3 Further inspection, using colour 1:25,000 Ordnance Survey (OS) maps and aerial photographs from Bing (<http://www.bing.com/maps>) was also undertaken in order to provide additional context and identify any features of potential importance for nature conservation in the wider landscape.

Field Surveys

Tree Surveys

Ground-Based Tree Assessments

- 3.4 Tree assessments were undertaken from ground level, with the aid of a torch and binoculars by licensed bat ecologists (Natural England licence number: 2015-14965-CLS-CLS) from FPCR on 12th October 2020, 23rd February 2021, and 23rd March 2021. During the surveys, Potential Roosting Features (PRF) for bats such as the following were sought (based on P16, British Standard, *Surveying for bats in trees and woodland* – Guide, October 2015):
- Natural holes (e.g. knot holes) arising from naturally shed branches or cavities created by branches tearing out from parent stems).
 - Man-made holes (e.g. cavities that have developed from flush cuts or branches previously pruned back to a branch collar).
 - Woodpecker holes.
 - Cracks/splits in stems or branches (horizontal and vertical)
 - Partially detached, loose or platy bark.
 - Cankers (caused by localised bark death) in which cavities have developed.
 - Other hollows or cavities, including butt rots.
 - Compression of forks with occluded bark, forming potential cavities.

- Crossing stems or branches with suitable roosting space between.
 - Ivy stems with diameters in excess of 50mm with suitable roosting space behind (or where roosting space can be seen where a mat of thinner stems has left a gap between the mat and the trunk).
 - Bat or bird boxes.
 - Other suitable places of rest or shelter.
- 3.5 Certain factors such as orientation of the feature, its height from the ground, the direct surroundings and its location in respect to other features, may reduce enhance or reduce the potential value.
- 3.6 Based on the above, trees were classified into general bat roost potential groups based on the presence of these features. Table 1 (below) broadly classifies the potential categories as accurately as possible as well as discussing the relevance of the features. This table is based upon Table 4.1 and Chapter 6 in *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (J., Collins (Bat Conservation Trust), 2016).
- 3.7 Although the British Standard Document (British Standard, *Surveying for bats in trees and woodland – Guide*, October 2015) groups trees with moderate and high potential, these have been separated below (as per Table 4.1 in The Bat Conservation Trust Guidelines) to allow more specific survey criteria to be applied.

Table 1: Classification and Survey Requirements for Bats in Trees

Classification of Tree	Description of Category and Associated Features (based on Potential Roosting Features listed above)	Likely Further Survey work
Confirmed Roost	Evidence of roosting bats in the form of live bats, droppings, urine staining, mammalian fur oil staining, etc.	A Natural England derogation licence application will be undertaken. This will require a combination of aerial assessment by roped access bat workers and nocturnal survey during appropriate period (May to August). Replacement roost sites commensurate with status of roost to be provided. Works to be undertaken under supervision using a good practice method statement.
High Potential	A tree with one or more Potential Roosting Features that are obviously suitable for larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter protection, conditions (height above ground level, light levels, etc) and surrounding habitat but unlikely to support a roost of high conservation status (i.e. larger roost, irrespective of wider conservation status).	Aerial assessment by roped access bat workers (if appropriate) and / or nocturnal survey during appropriate period (May to August). Following additional assessments, a tree may be upgraded or downgraded based on findings. If roost sites are confirmed and the tree or roost is to be affected by

Classification of Tree	Description of Category and Associated Features (based on Potential Roosting Features listed above)	Likely Further Survey work
	Examples include (but are not limited to); woodpecker holes, larger cavities, hollow trunks, hazard beams, etc.	proposals a licence from Natural England will be required. After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may still be appropriate.
Moderate Potential	A tree with Potential Roosting Features which could support one or more potential roost sites due to their size, shelter protection, conditions (height above ground level, light levels, etc) and surrounding habitat but unlikely to support a roost of high conservation status (i.e. larger roost, irrespective of wider conservation status). Examples include (but are not limited to); woodpecker holes, rot cavities, branch socket cavities, etc.	A combination of aerial assessment by roped access bat workers and / or nocturnal survey during appropriate period (May to August). Following additional assessments, a tree may be upgraded or downgraded based on findings. After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may still be appropriate. If a roost site/s is confirmed a licence from Natural England will be required.
Low Potential	A tree of sufficient size and age to contain Potential Roosting Features but with none seen from ground or features seen only very limited potential. Examples include (but are not limited to); loose/lifted bark, shallow splits exposed to elements or upward facing holes.	No further survey required but some good practice removal operations may be required
Negligible/No potential	Negligible/no habitat features likely to be used by roosting bats	None.

NB: The Conservation of Habitats & Species Regulations 2017 (as amended) affords protection to breeding sites or resting places at all times. For an area to be classified as a breeding site or resting place, the Regulations require there to be a reasonably high probability that the species will return to the sites and / or place.

- 3.8 Where features suitable to be used as a roost site were identified, evidence that bats had used the site as a roost where features, where accessible, was sought. Such evidence comprises live or dead bats, droppings, urine staining, and grease/scratch marks on wood.

Aerial Roped-Access Surveys

- 3.9 Where deemed necessary, further inspections were undertaken on 5th November 2021 by aerial roped access methods by FPCR ecologists (including a Licenced bat worker) with arborist tree

climbing qualifications (NPTC: Certificate to Climb Trees J/101/2449 and Perform Aerial Rescue A/101/2450).

- 3.10 Features identified as providing potential to support roosting bats during the climbing inspection were thoroughly examined using endoscopes, mirrors and torches. Evidence of bat occupation sought included: the physical presence of bats, droppings, urine staining, and mammalian oil staining.

Activity Surveys

Activity Transect Surveys

- 3.11 The primary objectives of transects completed was to identify foraging areas, commuting routes, species composition and species utilisation of the site.
- 3.12 This methodology takes into account guidance from the Bat Conservation Trust (BCT)² and the Joint Nature Conservation Committee (JNCC)³. The survey effort was determined from recommendations provided in BCT³ guidance.
- 3.13 The transect routes were determined prior to survey in order to cover most areas of the site and was designed to follow a route that would identify activity levels around the features of potential value to bats that are to be most affected by proposals (such as hedgerows, tree lines, dense scrub etc). The start and end points of the transect routes were varied as recommended by the current survey guidance to reduce survey bias. Dusk transects were commenced either prior to or at sunset and were a minimum of 3 hours in duration. Each transect was walked at a steady pace and when a bat passed by, the species, time and behaviour was recorded on a site plan to help to form a general view of the bat activity present on site and highlight any habitats types associated with bat activity.
- 3.14 Surveyors used Wildlife Acoustics Inc. Echo Meter Touch[®] bat detectors were utilised in conjunction with Echo Meter Touch[®] app and Apple Inc. iPad[®] during the transect surveys to detect bats and aid species identification.
- 3.15 Post-survey, bat calls were analysed using Kaleidoscope Viewer[®] (Wildlife Acoustics, Inc) software package, by taking measurements of the peak frequency, inter-pulse interval, call duration and end frequency. From this, the level of bat activity across the site in relation to the abundance of individual species foraging and commuting along habitats was assessed. Seven activity surveys were undertaken in 2021 across the months of April, May, June, July, August, and September. Due to the size of the site, three transect routes covering habitats across the site were completed.
- 3.16 All transects were undertaken when conditions were suitable (i.e. when the ambient air temperature exceeded 10°C and there was little wind and no rain) see Table 2.

² Bat Conservation Trust, 2016. *Bat Surveys for Professional Ecologists Good Practice Guidelines* 3rd edition.

³ JNCC (1999) *Bat Workers Manual*

Table 2: Activity Transect Survey Conditions

Date	Sunset/ Sunrise	Temperature °C	Rain (0-5)	Wind (0-5)	Cloud %
28 April 2021	20:24	10	0	1	90
25 May 2021	21:06	11	0	1	60
23 June 2021	21:28	16	0	1	10
26 July 2021	21:04	22	0	1	75
25 August 2021	20:07	17	0	1	100
20 September	19:07	18	0	0	10
21 September	06:49	9	0	1	0

- 3.17 Activity transect surveys were also undertaken in 2020 following the same methodology though for a minimum of two hours. These were conducted on 30 July 2020 and 7 September 2020. During these survey occasions due to a smaller red line at the time, the site was split into two transect routes. These identified the presence Annex 2 species and survey effort was increased to monthly surveys for 2021.

Automated Static Bat Detector Surveys

- 3.18 Static passive recording broadband detectors were deployed on site to supplement the manual transects surveys (see Figure 9). In addition, passive recording is recommended in guidance produced by the Bat Conservation Trust (2016)⁴.
- 3.19 Passive monitoring was undertaken using an automated logging system Wildlife Acoustics Inc. SM4Bat FS bat detectors with outputs saved to an internal storage device. Detectors used SMM-U2 microphones and were placed along linear features considered to be of value to bats, such as hedgerows, woodlands, watercourses, and tree lines.
- 3.20 Devices were placed in each location for an extended period of time of suitable weather conditions (little no rain/wind and temperatures above 10°C). The conditions over each of the survey period were however representative for the timing of the survey. Detectors were programmed to activate 30 minutes before dusk and recorded continuously until 30 minutes following sunrise.
- 3.21 For the purposes of analysis if the static detector was out over 5 nights the additional nights were only assessed for bat species listed on Annex II⁵ of the Habitats Directive. The recorded data were analysed using Kaleidoscope Viewer® (Wildlife Acoustics, Inc) software package to assess the amount of bat activity on site by recording the number of bat passes.
- 3.22 In accordance with the size of the site, the number of manual activity transect routes undertaken and the assessment of habitat suitability to support foraging and commuting bats, six static units were deployed on site for a minimum of 5 consecutive nights during the months of April, May, June and July.

⁴ Collins, J. (ed.)(2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

⁵ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

Table 3: Static Detector Deployment Numbers

Month	Unit Numbers					
April 2021	4	5	6	7	8	9
May 2021	1	2	3	8	9	10
June 2021	3	4	5	6	7	8
July 2021	7	8	9	10	11	12
August 2021	3	4	5	6	7	8
September 2021	4	5	6	7	8	9

4.0 RESULTS

Desktop Study

- 4.1 Seven records of bat species including common pipistrelle, soprano pipistrelle, brown long-eared, and noctule were recorded within a 1km radius of the site. Full desk study results are presented in the Preliminary Ecological Appraisal for the Site.

Field Surveys

Tree Surveys

Ground-Based Tree Assessments

- 4.2 Ground level assessments were completed on all trees across the site (Figure 1).

Confirmed Roosts

- 4.3 No bat roosts in tree features were confirmed during the ground-based assessments.

High Potential Trees

- 4.4 From the completed assessments, one tree was identified as offering high bat roosting potential.

Moderate Potential Trees

- 4.5 From the completed assessments, eight trees were identified as offering moderate bat roosting potential.

Low Potential Trees

- 4.6 From the completed assessments, two trees present on site were identified as offering low bat roosting potential.

- 4.7 The table below summarises the features which were identified during the ground-based assessment.

Table 4: Ground Based Tree Assessment Results

Tree No.	Tree Species	Features	Ground Based Tree Assessment - Potential for roosting Bats	Aerially Assessed	Nocturnal assessment required	Aerial Tree Final Assessment - Potential for roosting bats	Further Work Required
1	Ash, Fraxinus excelsior	Torn limb – South. Knot hole 6.5m – West.	Moderate	No	No	N/A	None
2	Ash, Fraxinus excelsior	Multiple woodpecker holes at top of stem. larger branch cavity at 4.5m.	High	No	Yes	N/A	Nocturnal Surveys
3	Ash, Fraxinus excelsior	Central main stem split 2 - 5m	Moderate	Yes	Yes	Moderate	Nocturnal Surveys
4	Ash, Fraxinus excelsior	–2 vertical knot holes at 5.5m – North. 3 knot holes on leader, at 4m, and at 2.5m - South	Moderate	Yes	No	Low	None
5	Ash, Fraxinus excelsior	Knot hole at 2.5m – South	Moderate	Yes	Yes	Moderate	Nocturnal Surveys
6	Apple, Malus domestica	–0.5m knot hole – East. 2 knot holes at 1m - South	Moderate	Yes	Yes	Moderate	Nocturnal Surveys
7	Ash, Fraxinus excelsior	Knot hole at 2.5m – South	Moderate	Yes	No	Negligible	None
8	Ash, Fraxinus excelsior	Main stem cavity at 2.5m - East	Moderate	Yes	No	N/A	Aerial Assessment
9	Elder, Sambucus nigra	Knot hole at 2m - North	Moderate	Yes	No	N/A	Aerial Assessment
M1	English Oak, Quercus robur	Several small holes	Low	No	No	N/A	None
M10	English Oak, Quercus robur	Hole in end of branch	Low	No	No	N/A	None

Aerial Tree Assessments

- 4.8 Aerial assessments were carried out on Trees T3, T4, T5, T6, and T7 as these are currently proposed to be affected during the redevelopment works. Changes to the final assessment potential confirmed during the aerial assessments, are included within the table above, as is any further work required.

Further Aerial Tree Assessments and Nocturnal Assessments

- 4.9 If any other of the above trees are to be affected during redevelopment, the appropriate assessments will be undertaken and results and actions required provided.
- 4.10 Works to affected trees will be undertaken under appropriate mitigation measures, including EPSL, where necessary.

Activity Surveys

Foraging and Commuting Habitat Suitability Assessment

- 4.11 A range of habitats are present on site including open grassland and arable fields, of lower value to bats, due to poor diversity and a resultant limited interest to invertebrate bat prey, with some good connecting habitats such as hedgerows and a watercourse linking with suitable off-site habitats in the local and wider environment.

Activity Transect Surveys

- 4.12 Figures 2a to 5c illustrate bat transect routes and results.

April Transects (see Figures 2a, 2b, 2c)

- 4.13 Surveys started at 20:24 and finished at 23:24. Bats were only recorded on transect 1, which had a total of 4 contacts. The first contact was a *Myotis* species bat at 22:42.
- 4.14 The three transect routes started and finished near Hawkwell Farm on Bucknell Road. Surveyors covered the site boundaries as well as the hedgerows within the site. Bat activity was low during the transect with bat species recorded limited to common pipistrelles and *Myotis* bat species (see Figure 2a).
- 4.15 Common pipistrelle registrations were located at locations 1, 2 and 3. The *Myotis* species registration was recorded at 22:42 at point count 6 on transect 1, close to the stream running through the southern area of the site.

May Transects (see Figures 3a, 3b, 3c)

- 4.16 Surveys started at 21:06 and finished at 00:06. Transect 1 had a total of 15 contacts, transect 2 had a total of 7 contacts, and transect 3 had a total of 8 contacts. The first contact was a common pipistrelle at 21:27 on transect 1.
- 4.17 Bat activity during this survey occasion was increased compared to April and was spread around the site. Bat species recorded during these transects included common pipistrelle, noctule, and *Nyctalus* bat species.
- 4.18 Common pipistrelle registrations were located across the site with no apparent clustering. The noctule registration was recorded at 21:37 at point count 2 on transect 3. *Nyctalus* species

registrations were located at location 5, point count 2, and point count 3 on transect 1, location 2 on transect 2, and location 3 on transect 3.

June Transects (see Figures 4a, 4b, 4c)

- 4.19 Surveys started at 21:28 and finished at 00:28. Transect 1 had a total of 20 contacts, transect 2 had a total of 4 contacts, and transect 3 had a total of 4 contacts. The first contact was a *Nyctalus* species at 21:33 on transect 1.
- 4.20 Species recorded on transect 1 included common and soprano pipistrelle, noctule, *Nyctalus* bat species, *Myotis* bat species and brown long-eared. Only common pipistrelles were recorded on transects 2 and 3, most of which were commuting individuals.
- 4.21 Transect 1 recorded a much higher number of individuals than transects 2 and 3 and of previous months, with most individuals showing foraging activity. Most of the foraging activity on the transects was associated with the stream that bisects the south of the site, and the hedgerow associated with the ditch running north-south to the east of the site. Recordings of noctules and brown long-eared bats were associated with the stream to the south and the woodland parcel to west of the survey area.

July Transects (see Figures 5a, 5b, 5c)

- 4.22 Surveys started at 21:04 and had durations of at least three hours. Transect 1 had a total of 29 contacts, transect 2 had a total of 18 contacts, and transect 3 had a total of 31 contacts. The first contact was a noctule on transect 3 at 21:11.
- 4.23 Bat activity was increased during this survey occasion with a larger number of registrations recorded during the three transect routes. Species recorded included common and soprano pipistrelles, noctules, *Nyctalus* bat species, and *Myotis* bat species. Activity consisted of both commuting and foraging bats. Activity on transects 1 and 3 were spread across the survey area. Activity on transect 2 was sparsely spread across the survey area with a concentration of activity around the stream and associated hedgerows to the north.

August Transects (see Figures 6a, 6b, 6c)

- 4.24 Surveys started at 20:07 and had durations of at least three hours. Transect 1 had a total of 21 contacts, transect 2 had a total of 13 contacts, and transect 3 had a total of 22 contacts. The first contact was a noctule on transect 1 at 20:23.
- 4.25 Bat activity during this survey occasion was similar to that of the July transects, with only a marginal reduction in bat contacts across the three transect routes. Species recorded included common and soprano pipistrelles, noctules, *Nyctalus* bat species, *Myotis* bat species, and brown long-eared bats. Activity consisted of both commuting and foraging bats. Activity on all transects was spread across the survey area.

September Dusk Transects (see Figures 7a, 7b, 7c)

- 4.26 Surveys started at 19:07 and had durations of at least three hours. Transect 1 had a total of 26 contacts, transect 2 had a total of 17 contacts, and transect 3 had a total of 16 contacts. The first contacts were noctules on transects 1 and 2 at 19:12.
- 4.27 Bat activity was similar to that of the July and August survey occasions for transects 1 and 2, but activity was reduced for transect 3. Species recorded included common and soprano pipistrelles, noctules, *Nyctalus* bat species, *Myotis* bat species, and barbastelles. Activity consisted of both

commuting and foraging bats. Activity on transects 1 and 2 were spread across the survey area. Activity on transect 3 was concentrated towards the north-west of the site area.

September Dawn Transects (see Figures 8a, 8b, 8c)

- 4.28 Surveys started at 03:48 and finished at 06:49. Transect 1 had a total of 5 contacts, transect 2 had zero contacts, and transect 3 had a total of 7 contacts. The first contact was a common pipistrelle on transect 1 at 03:48.
- 4.29 Bat activity was greatly decreased during this survey occasion with no contacts at all on transect 2. Species recorded included common and soprano pipistrelles, *Myotis* bat species, barbastelles, and brown long-eared bats. Activity consisted of both commuting and foraging bats. Activity on transect 1 was sparse but confined to areas of high activity seen on other survey occasions. Activity on transect 3 was concentrated along the road from Bicester to Bucknell which bisects the site, and along the north-western site boundary.

2020 Activity Surveys

- 4.30 The summer transect surveys undertaken in 2020 started at 20:57 and had durations of at least two hours. Across the two transects, a total of 37 bat contacts were recorded. Species recorded consisted of common pipistrelle, noctule, *Myotis* species, and brown long-eared.
- 4.31 The autumn transect surveys undertaken in 2020 started at 19:37 and had durations of at least two hours. Across the two transects, a total of 33 bat contacts were recorded. Species recorded consisted of common pipistrelle, noctule, *Myotis* species, *Nyctalus* species and brown long-eared.
- 4.32 Across the 2020 transect surveys, bat activity was spread out across the site area and was mostly associated with hedgerows and other linear features.

Automated Static Bat Detector Surveys

- 4.33 Statics were deployed to compliment the manual walked bat activity transects of the site. A total of 24 units were deployed with six units used each month from April until July. The locations where these statics were deployed can be seen in Figure 9.
- 4.34 Bat species recorded on site were common pipistrelle, noctule, *Nyctalus* species, *Myotis* species, brown long-eared, soprano pipistrelle, barbastelle, *Pipistrellus* species, and serotine. The order they appear in above is the most-frequently recorded species on site through to the least recorded during the survey period.

April Survey

- 4.35 In April, the static detectors recorded registrations ranging from 1 up to 1714. The majority of the registrations consisted of common pipistrelles, which were recorded on all units except unit 5. *Myotis* bat species were recorded on all units except unit 4.
- 4.36 The numbers of registrations on units 5 and 7 are notable as being extremely different from the other units. Unit 5 was located in a hedgerow to the west of the site and only recorded one bat registration. Unit 7 had significantly high activity recorded and was located in a hedgerow to the south of the parcel of woodland along the stream to the south of the site.

Table 5: April Static Survey Results

Unit number	Avg. registrations per hour	Total registrations	Most recorded species (number of registrations)	Other species recorded (number of registrations)
4	1.889	95	Common pipistrelle (94)	Brown long-eared (1)
5	0.020	1	<i>Myotis</i> species (1)	
6	0.477	24	Common pipistrelle (20)	<i>Myotis</i> species (2) Noctule (1) Soprano pipistrelle (1)
7	34.078	1714	Common pipistrelle (1594)	Noctule (59) <i>Myotis</i> species (50) Brown long-eared (7) <i>Nyctalus</i> species (2) Soprano pipistrelle (2)
8	0.219	11	Common pipistrelle (9)	<i>Myotis</i> species (2)
9	1.909	96	Common pipistrelle (78)	<i>Myotis</i> species (13) Soprano pipistrelle (3) Brown long-eared (2)

May Survey

- 4.37 In May, the detectors recorded registrations ranging from 174 to 474. The majority of these consisted of common pipistrelle bats. Other species of note included barbastelle bats which were recorded on units 1, 3, 8, and 9, and serotine bats of which one recording was made on unit 3. Unit 3 was located at the corner of hedges H19 and H20.

Table 6: May Static Survey Results

Unit number	Avg. registrations per hour	Total registrations	Most recorded species (number of registrations)	Other species recorded (number of registrations)
1	10.866	474	Common pipistrelle (284)	Noctule (75) <i>Myotis</i> species (59) Soprano pipistrelle (25) Barbastelle (15) <i>Nyctalus</i> species (8) Brown long-eared (8)
2	8.344	364	Common pipistrelle (330)	Noctule (16) Soprano pipistrelle (9) <i>Myotis</i> species (6) <i>Pipistrellus</i> species (2) Brown long-eared (1)
3	6.373	278	Common pipistrelle (228)	Noctule (23) Soprano pipistrelle (12) Barbastelle (10) <i>Nyctalus</i> species (2) <i>Myotis</i> species (2) Serotine (1)

Unit number	Avg. registrations per hour	Total registrations	Most recorded species (number of registrations)	Other species recorded (number of registrations)
8	6.465	282	Common pipistrelle (226)	Noctule (15) Soprano pipistrelle (23) <i>Myotis</i> species (10) Brown long-eared (4) Barbastelle (4)
9	9.536	416	Common pipistrelle (314)	Noctule (52) Soprano pipistrelle (35) <i>Myotis</i> species (10) <i>Nyctalus</i> species (2) Barbastelle (2) <i>Pipistrellus</i> species (1)
10	3.989	174	Common pipistrelle (145)	Noctule (17) Soprano pipistrelle (8) <i>Myotis</i> species (3) Brown long-eared (1)

June Survey

- 4.38 In June, the detectors recorded registrations ranging from 190 to 2585. On all units common pipistrelle bats were the most commonly recorded bat. A notably high 832 registrations of noctule bats were recorded on unit 3. Other bat recordings of note include barbastelle bats on units 4, 5, 6, and 8, showing a wide distribution across the site. One registration of a serotine bat was recorded on unit 4, which was located on the western end of hedge M8.
- 4.39 Unit 3 had a much higher number of registrations compared to other units, with high numbers of both common pipistrelles and noctules. Unit 3 was placed in a hedgerow at the southern-most point of the site, at the junction between Bucknell Road and the A4095.

Table 7: June Static Survey Results

Unit number	Avg. registrations per hour	Total registrations	Most recorded species (number of registrations)	Other species recorded (number of registrations)
3	62.175	2585	Common pipistrelle (1429)	Noctule (832) <i>Nyctalus</i> species (321) Brown long-eared (2) <i>Myotis</i> species (1)
4	20.565	855	Common pipistrelle (804)	Noctule (14) Barbastelle (15) <i>Nyctalus</i> species (10) <i>Myotis</i> species (4) Brown long-eared (3) Soprano pipistrelle (3) <i>Pipistrellus</i> species (1) Serotine (1)

Unit number	Avg. registrations per hour	Total registrations	Most recorded species (number of registrations)	Other species recorded (number of registrations)
5	9.789	407	Common pipistrelle (349)	Noctule (14) Brown long-eared (14) <i>Nyctalus</i> species (10) Soprano pipistrelle (8) <i>Myotis</i> species (6) Barbastelle (5)
6	4.570	190	Common pipistrelle (130)	Noctule (19) Brown long-eared (15) Barbastelle (8) <i>Nyctalus</i> species (7) Soprano pipistrelle (5) <i>Myotis</i> species (4) <i>Pipistrellus</i> species (2)
7	12.387	515	Common pipistrelle (425)	Noctule (61) <i>Nyctalus</i> species (11) <i>Pipistrellus</i> species (10) Brown long-eared (5) <i>Myotis</i> species (3)
8	26.626	1107	Common pipistrelle (1071)	Soprano pipistrelle (12) <i>Myotis</i> species (9) Noctule (8) Brown long-eared (3) <i>Pipistrellus</i> species (2) Barbastelle (1) <i>Nyctalus</i> species (1)

July Survey

In July, registrations ranged from 135 to 3271. Overall, there was much higher bat activity recorded by statics in July compared to other months. For all units except unit 11, the most recorded species was common pipistrelle. For unit 11, noctules were the most recorded bat species. A significant number of barbastelle bat registrations for a single unit was recorded this month from detector unit 9. A total of 42 registrations were recorded across the five nights. Unit 9 was located near the western boundary of the site. Barbastelles were also recorded by unit 12, which was located just north of the stream that runs across the south of the site.

Table 8: July Static Survey Results

Unit number	Avg. registrations per hour	Total registrations	Most recorded species (number of registrations)	Other species recorded (number of registrations)
7	69.461	3271	Common pipistrelle (3052)	<i>Myotis</i> species (89) Noctule (85) Soprano pipistrelle (21) <i>Nyctalus</i> species (13) <i>Pipistrellus</i> species (7) Brown long-eared (4)

Unit number	Avg. registrations per hour	Total registrations	Most recorded species (number of registrations)	Other species recorded (number of registrations)
8	2.867	135	Common pipistrelle (103)	Noctule (17) <i>Nyctalus</i> species (5) Soprano pipistrelle (4) <i>Myotis</i> species (3) Brown long-eared (2) <i>Pipistrellus</i> species (1)
9	59.862	2819	Common pipistrelle (2220)	<i>Myotis</i> species (432) Noctule (62) Barbastelle (42) Soprano pipistrelle (33) Brown long-eared (28) <i>Nyctalus</i> species (2)
10	16.967	799	Common pipistrelle (697)	Noctule (30) <i>Myotis</i> species (29) Soprano pipistrelle (23) Brown long-eared (20)
11	66.785	3145	Noctule (1982)	Common pipistrelle (644) <i>Nyctalus</i> species (407) Brown long-eared (110) Soprano pipistrelle (2)
12	27.670	1303	Common pipistrelle (891)	<i>Nyctalus</i> species (196) Noctule (142) Brown long-eared (27) <i>Myotis</i> species (23) Soprano pipistrelle (13) <i>Pipistrellus</i> species (9) Barbastelle (2)

August Survey

In August, registrations ranged from 256 to 6945. Again, there was much higher bat activity recorded by statics in August compared to previous months. For units 4, 6, 7, and 8, the most recorded species was common pipistrelle. For unit 3, *Nyctalus* species bats were the most recorded bat species. For unit 5, noctules were the most recorded bat species. Barbastelles were recorded by all static bat detectors during this survey occasion, with significant numbers of registrations on units 4 (48) and 6 (79), Unit 4 was located along the north-western site boundary, and unit 6 was located on a hedgerow just south of the southern on-site stream.

Table 9: August Static Survey Results

Unit number	Avg. registrations per hour	Total registrations	Most recorded species (number of registrations)	Other species recorded (number of registrations)
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Unit number	Avg. registrations per hour	Total registrations	Most recorded species (number of registrations)	Other species recorded (number of registrations)
3	12.025	673	<i>Nyctalus</i> species (273)	Noctule (227) Common pipistrelle (137) <i>Myotis</i> species (20) Brown long-eared (12) Soprano pipistrelle (3) Barbastelle (1)
4	12.328	690	Common pipistrelle (414)	Noctule (84) <i>Myotis</i> species (51) Barbastelle (48) <i>Nyctalus</i> species (36) Soprano pipistrelle (30) Brown long-eared (18) <i>Pipistrellus</i> species (9) Nathusius' pipistrelle (1)
5	30.267	1694	Noctule (1461)	Common pipistrelle (163) <i>Nyctalus</i> species (36) <i>Myotis</i> species (21) Soprano pipistrelle (7) Brown long-eared (4) Barbastelle (1) <i>Pipistrellus</i> species (1)
6	124.089	6945	Common pipistrelle (5152)	Noctule (717) Soprano pipistrelle (479) <i>Nyctalus</i> species (344) <i>Myotis</i> species (139) Barbastelle (79) Brown long-eared (33) <i>Pipistrellus</i> species (1)
7	4.574	256	Common pipistrelle (256)	<i>Myotis</i> species (68) Noctule (41) Soprano pipistrelle (35) Barbastelle (10) Brown long-eared (10) <i>Nyctalus</i> species (1)
8	22.191	1242	Common pipistrelle (536)	Noctule (262) <i>Nyctalus</i> species (142) <i>Myotis</i> species (63) Soprano pipistrelle (53) Barbastelle (32) Brown long-eared (154)

September Survey

In September, registrations ranged from 225 to 1715, with an outlier of 7 registrations on static 7. Static 7 had a memory card error and therefore most of the data from the five nights it was recording was lost. This survey occasion had reduced activity when compared to July and August. For all functional units except unit 6, the most recorded species was common pipistrelle. For unit 6, noctules were the most recorded bat species. The largest number of barbastelle bat registrations for a single unit was recorded this month from detector unit 4. A total of 237

registrations were recorded across the five nights. Unit 4 was located midway along the stream to the north of the site. Barbastelles were also recorded by all over working units, showing distribution of activity across the whole site.

Table 10: September Static Survey Results

Unit number	Avg. registrations per hour	Total registrations	Most recorded species (number of registrations)	Other species recorded (number of registrations)
4	26.550	1712	Common pipistrelle (951)	Soprano pipistrelle (378) Barbastelle (237) <i>Myotis</i> species (60) Noctule (56) <i>Nyctalus</i> species (12) Brown long-eared (11) <i>Pipistrellus</i> species (7)
5	6.793	438	Common pipistrelle (207)	Noctule (140) <i>Myotis</i> species (46) Soprano pipistrelle (21) <i>Nyctalus</i> species (13) Barbastelle (7) Brown long-eared (3) Serotine (1)
6	10.995	709	Noctule (343)	Common pipistrelle (166) <i>Nyctalus</i> species (104) Soprano pipistrelle (48) <i>Myotis</i> species (21) Brown long-eared (20) Barbastelle (4) <i>Pipistrellus</i> species (3)
7	0.529	7	<i>Nyctalus</i> species (2) <i>Myotis</i> species (2) Brown long-eared (2)	Noctule (1)
8	3.489	225	Common pipistrelle (80)	<i>Myotis</i> species (52) Noctule (35) Soprano pipistrelle (33) Barbastelle (9) Brown long-eared (9) <i>Nyctalus</i> species (7)
9	6.110	394	<i>Nyctalus</i> species (166)	Noctule (138) Common pipistrelle (54) <i>Myotis</i> species (20) Soprano pipistrelle (5) Barbastelle (3) Brown long-eared (6) <i>Pipistrellus</i> species (2)

2020 Static Detector Surveys

- 4.40 Seasonal bat activity recorded in 2020 was comparable to activity levels and species composition of bat activity recorded across the 2021 surveys, although summer unit 2 did not record any bat registrations. Serotine bats were not recorded at all during the 2020 surveys.

- 4.41 Autumn unit 6 recorded 122 registrations of barbastelle over five nights, comparatively higher than activity found across the 2021 survey period. This static was deployed in the hedgerow associated with the stream in the south of the site, near the south-western site boundary.

Table 11: 2020 Static Survey Results

Unit number	Avg. registrations per hour	Total registrations	Most recorded species (number of registrations)	Other species recorded (number of registrations)
Summer 1	11.324	546	Common pipistrelle (307)	<i>Myotis</i> species (63) Brown long-eared (54) Noctule (52) <i>Nyctalus</i> species (30) Barbastelle (21) Soprano pipistrelle (15) <i>Pipistrellus</i> species (4)
Summer 2	0	0	-	-
Autumn 6	59.748	3601	Common pipistrelle (2788)	<i>Myotis</i> species (322) Noctule (186) Soprano pipistrelle (132) Barbastelle (122) Brown long-eared (26) <i>Nyctalus</i> species (20) <i>Pipistrellus</i> species (5)
Autumn 7	21.503	1296	Common pipistrelle (427)	<i>Nyctalus</i> species (415) Noctule (341) <i>Myotis</i> species (57) Soprano pipistrelle (23) Barbastelle (18) Brown long-eared (13) <i>Pipistrellus</i> species (2)

5.0 DISCUSSION & RECOMMENDATIONS

Bat Roosts

Trees

- 5.1 The ground-based tree assessment identified one tree with features considered to have high potential (T2) to support roosting bats and eight trees with features considered to have moderate potential to support roosting bats. All these trees lie within the development site boundary. Whilst the number of trees across the site is much higher than this, the majority of the tree standards are young and not mature enough to support potential roost features.
- 5.2 Trees T1, T2, T8, and T9 are within hedgerows anticipated as being retained. Trees T1, T8, and T9 are considered to have moderate potential to support roosting bats and if affected will need aerial climbing assessments as required by current guidance. Tree T2 is considered to have high potential to support roosting bats and will require nocturnal assessments if affected by proposals.

- 5.3 Trees T3, T4, T5, T6, T7 are anticipated as likely to be removed and therefore have been subject to aerial assessments. During the aerial assessments, no evidence of roosting bats was recorded; trees T3, T5, and T6 were assessed as having moderate bat potential and will therefore require two nocturnal surveys between May and August (inclusive) on each tree, before any felling or other tree works can occur to confirm the absence/otherwise of a roost. Should a roost be discovered at this time, a further survey would be required during this period to support an EPSL application for removal. Mitigation as part of the licence would be likely to entail the erection of bat boxes as alternative/replacement habitat prior to removal and the appropriate timing of works and sensitive removal methods.
- 5.4 Tree T4 was assessed as having low bat potential following aerial assessment and no further survey required. If this tree is felled it is advised to be soft felled. This entails felling the tree as one intact piece and lowering it to the ground as gently as is possible. Following this, the intact tree will need to remain on the ground for 48 hours, to allow any bats within the tree to leave, before the tree can be cut up further and/or moved.
- 5.5 Tree T7 was assessed as having negligible bat potential following aerial assessment. No requirements are needed in terms of protection to bats.

Bat Activity

- 5.6 Static detectors located around the site recorded a relatively low number of registrations considering the number of detectors deployed over the survey period and the size of the site. With an average of 176 registrations per night per static detector unit across the 120 nights of deployment, the site is not considered exceptional for bat activity.
- 5.7 Registration of barbastelle bat, the only Annex II species recorded on site, recorded 535 registrations spread across the development site. 237 of these registrations were recorded over the five-night period in September by static bat detector unit 4. This was deployed in the area to be retained within green infrastructure to the north of the site. As the current proposals show the retention of this corridor, the development is likely not to have any significant impact on barbastelle populations assuming artificial lighting recommendations detailed below are incorporated into works.
- 5.8 Other registrations of barbastelles are not considered significant given the optimal foraging habitat off-site and the retained woodland features on-site. Most static detectors with barbastelle registrations recorded low levels of barbastelle bat calls over each five-night period, between 1 and 15. Exceptions are July unit 9 (42 calls), August unit 4 (48 calls), August unit 6 (79 calls), and August unit 8 (32 calls). July unit 9 and August unit 4 were deployed in the area to be retained within green infrastructure to the west of the site. August units 6 and 8 were deployed in hedgerows within the development area, but which are proposed to be retained. All other units with low levels of barbastelle calls were also deployed within hedgerows proposed to be retained within the development area. Given the low levels of activity, this should not require any further mitigation.
- 5.9 Serotine bats were recorded by static detectors on two occasions, with a single registration each. These were recorded on May unit 3 and June unit 4. May unit 3 was deployed in a hedgerow centrally located within the proposed development area that is due to be retained. June unit 4 was deployed in a hedgerow within the proposed development area that is due to be retained on the western boundary of the development area.

- 5.10 Areas where connections to the wider landscape are present or where there is an increased diversity of habitats will inevitably result in a larger number of registrations because the connectivity to a wide range of habitats, roosts and foraging opportunities are required by all bat species.
- 5.11 The transect surveys did not record any further bat species on site. Activity during the transects was spread across the site with some higher concentrations found around the stream to the south of the site and the stream to the north of the site. This is not unexpected as these habitats are likely to support a greater invertebrate prey and good connective habitat and the levels of activity in these areas was not unexpected.

Redevelopment Enhancements

- 5.12 Hedgerows and wooded areas across the site are recommended for retention wherever possible, together with the streams running across the development area where increased bat activity has been recorded. The retention of these features as green corridors and landscape buffers will allow bats to enter the development area and continue to use the area for foraging and commuting. However, this is dependent on minimising disturbance to these areas, particularly where segments of hedgerow are to be removed, as described below in the hop-overs and lighting sections. This is particularly important due to the presence of barbastelle bats within the site area, as these are a light-sensitive species and require an adequate amount of canopy cover. The addition of the proposed SUDs features should provide areas of standing water at least during periods of inundation with areas damp vegetation in drier periods which will increase the abundance of prey items for bat species on the site given that only one small pond currently exists within the site boundary.
- 5.13 Green infrastructure should seek to provide habitats of greater value to bats, with areas of herb rich grassland, scrub and wetland to provide a foraging resource, with well-structured linear wood-edge habitats to provide movement corridors. Any trees felled as part of the development should be used to create a number of log piles located in the public greenspaces and along the retained hedgerows and streams. This will provide additional habitat for insects which will increase the amount of prey items available to foraging bat species.
- 5.14 The current proposals are sympathetic to the existing bat species given the large amount of greenspace being made available and the retained linear features described above. It is considered that with the above recommendations the green infrastructure being retained and created is sufficient for the existing bat species populations on site.
- 5.15 As a number of immature trees are to be lost as part of the development and there is a lack of existing natural roosting sites available across the site, a number of bat boxes should be erected within the retained woodland and hedgerow areas to increase the available roosting habitat available. Thirty bat boxes should be erected across the site in areas of high bat activity. Recommended locations and distributions would include fifteen bat boxes in the copse south of the farm and to the north of the stream, nine boxes in the retained hedgerow to the west of Bucknell Road, and the remaining six boxes where feasible along the stream to the north of the site. Boxes should be erected between three and four meters and installed on trunks with no surrounding branches or vegetation to allow clear flight paths. Three boxes should be installed on each tree at the same height, facing north, south-east and south-west. A range of models should be used consisting of the below types to suit a range of species including barbastelle. The

maternity box will provide a larger cavity for maternity roosts to use, and the wooden slot boxes will provide roosting areas for individual barbastelle bats.

5.16 Suitable boxes include:

- Twelve Vincent Pro boxes
- Two large colony box such as Schwegler 1FS
- Six Miramare bat boxes
- Ten 1FD boxes

Hop-overs

5.17 In order to minimise any potential impact to commuting and foraging routes, in the event that any hedgerows are to be broken (e.g., to incorporate proposed accesses), the retained hedgerows should be reinforced with native species planting to create hop-overs to aid crossing of these breaks for bats. This is particularly important on the new road and bridge that crosses the stream to the south of the site. These measures are detailed in Highways Agency Interim Advice Note Nature Conservation Advice in Relation to Bats and require the retention or planting of semi-mature / standards to grow above the level of vehicle movement. Where the proposed breach of the hedgerow exceeds 7m in length the planting will also include the implementation of standard trees adjacent to the road/footpath which will grow to be above the level of vehicle movement. The lower branches of such trees should be regularly pruned back to the trunk to ensure that the most suitable flight line is above the maximum traffic height (where applicable low-level lighting columns may also be used in this instance to reduce the likelihood of the bats using the lower tree regions). The trees growth merges with that of the existing hedgerow to create an alternative route over the road. The implementation of such 'hop-overs' will allow continued echolocation across the break thereby allowing continued usage of the hedgerow as a foraging/commuting area. It will also reduce the potential for road traffic accidents to bats (and for birds).

5.18 Whilst the hop-overs will take a time to establish, the tree standards to be used shall be of an appropriate size and will be planted early in the development cycle. Whilst the breach will be present during the construction period until the hop-over is established due to the small size of the proposed breaches the impacts upon bats potentially commuting along them is considered to be minor.

Artificial Lighting

5.19 Light spill onto sensitive bat habitat resources from development lighting could impact on bats commuting and foraging along the retained site boundaries, particularly the stream and associated retained hedgerow along the south of the site, and newly-created habitats.

5.20 In particular, the presence of the highly light sensitive species barbastelle is of particular concern and must be accommodated accordingly, including with an adequate amount of canopy cover. Light spill onto habitats will risk causing barbastelles to avoid the area as they are a slow-flying woodland bat and have evolved to emerge later after dusk when light levels have fallen to avoid predation. The lighting and layout of the proposed redevelopment will be designed to minimise light-spill onto habitats both within and adjacent to it that are used by the local bat population foraging or commuting. This will be achieved by ensuring that there is both a buffer along the edges of the site and that the design of lighting is based upon guidelines presented in the

Institute of Lighting Professionals 'Guidance Note 8 Bats and Artificial Lighting' 2018, Bat Conservation Trust & Institute of Lighting Engineers 'Bats and Lighting in the UK - Bats and Built Environment Series', the Bat Conservation Trust 'Artificial Lighting and Wildlife Interim Guidance' and the Bat Conservation Trust 'Statement on the impact and design of artificial light on bats'. Therefore, the lighting scheme will include the following:

- The strategic use of landscaping and planting to avoid light spill on sensitive habitats, including the retained woodland areas. The retained woodland belt to the west and all edges of the site boundary should be buffered with additional planting to prevent light spill which will encourage use by bats. Additional LUX levels should be no greater than 1LUX for this habitat area.
- The avoidance of direct lighting of existing trees, scrub, woodland, or proposed areas of habitat creation / landscape planting. This is particularly important for this site due to the presence of light sensitive barbastelle bats. Any lighting should be directed away from retained or created habitats.
- Unnecessary light spill will be controlled through a combination of directional lighting, low level lighting columns, hooded / shielded luminaires and strategic planting. Smart lighting should be considered for footpaths and areas of lighting around the edges of the development area to ensure lighting is only provided when necessary.
- All new column mounted luminaires shall be fitted with flat glass where appropriate to aid 0% upward light discharge which will reduce light pollution for larger bat species found foraging over the site such as noctule and serotine.
- Where located adjacent to green corridors and retained habitats, lights should be installed facing away from the habitats and will be fitted with rear light baffles or cowls to prevent light spill behind them.

5.21 Overall, the comprehensive and detailed survey effort indicates levels of bat activity that are not considered exceptional, given the numbers of bats recorded during both static and transect surveys across the area. With the implementation of the mitigation proposed above, residual effects on the local populations of all bat species including barbastelle are likely to be negligible.

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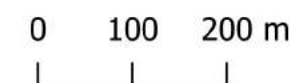
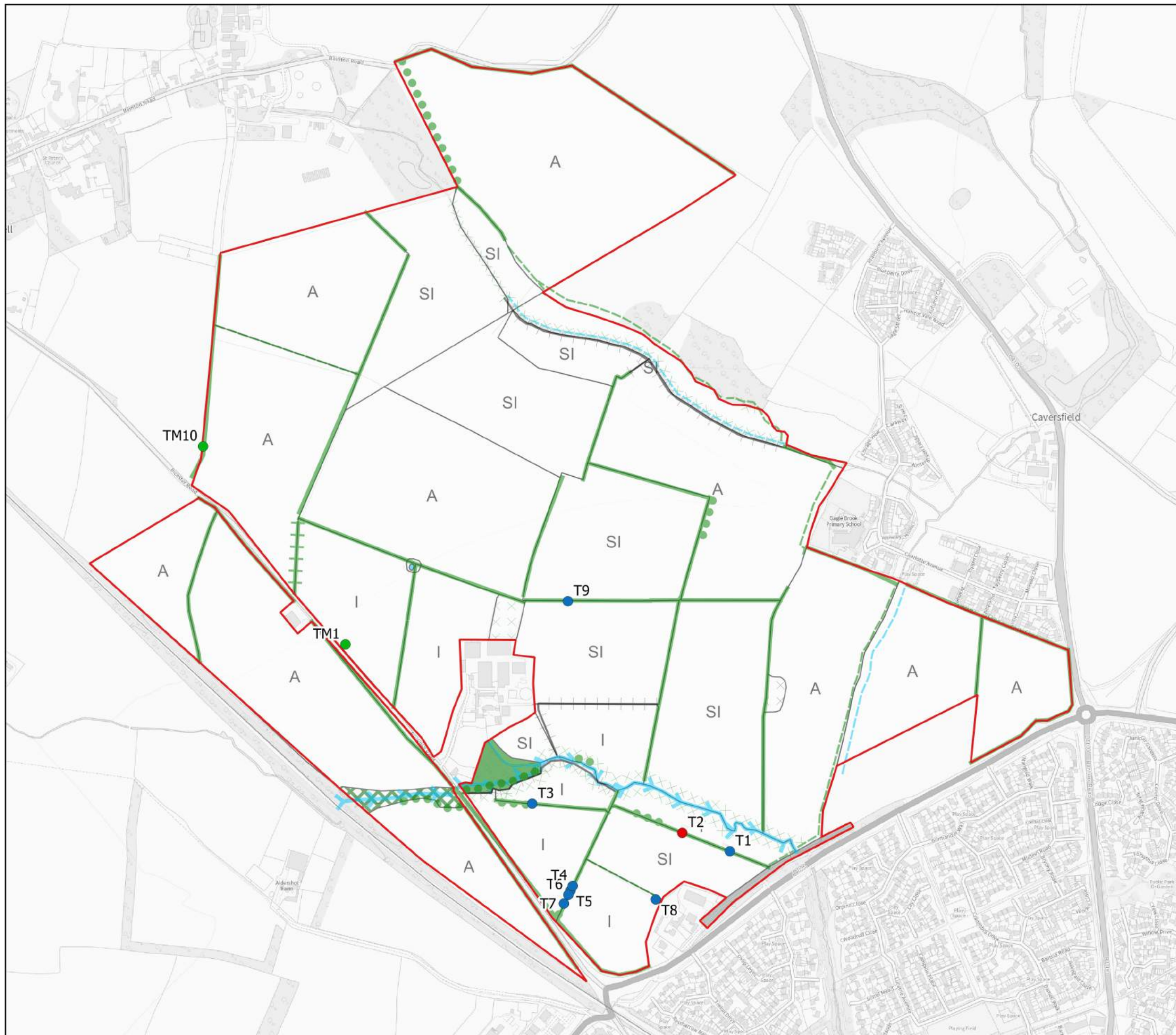
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Key:

 Site Boundary

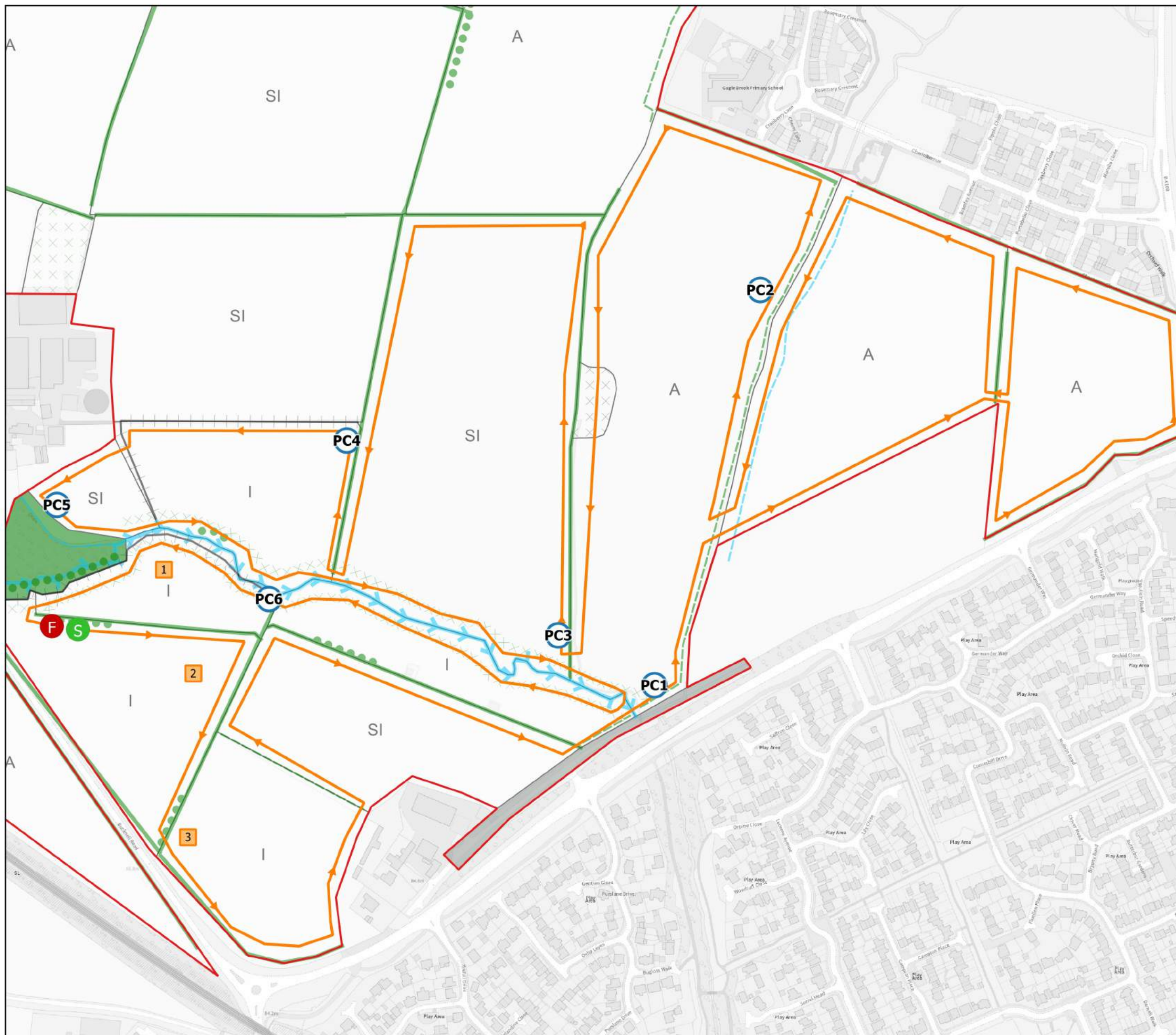
Tree Potential

-  High
-  Low
-  Moderate




client
Hallam Land
project
**Land North of Bicester,
Bicester**
drawing title
TREE LOCATION PLAN

scale @ A3
1:8000
drawing / figure number
Figure 1
drawn
SFW / AMS
rev
-
date
3/9/2021



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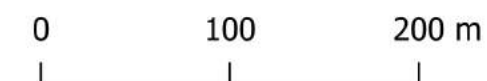
Key:

- Site Boundary
- S Start point
- F Finish point
- PC Point Count (with ref.)
- Transect Route

Bat Contacts (with ref.)

- 1 Common Pipistrelle

Plan Ref	Time	Species	Behaviour	Passes
PC1	20:36-20:39			-
PC2	21:32-21:35			-
PC3	21:45-21:48			-
PC4	21:57-22:00			-
PC5	22:20-22:23			-
PC6	22:40-22:43			-
6A	22:42	Myotis	Commuting	1
1	22:47	Common pipistrelle	Foraging	5
2	22:52	Common pipistrelle	Commuting	1
3	22:56	Common pipistrelle	Commuting	2



Client: **Hallam Land**
 Project: **Land North of Bicester, Bicester**
 Drawing Title: **BAT TRANSECT PLAN - ROUTE 1 (28.04.21)**

Scale: A3 1:4000
 Drawing / Figure Number: **Figure 2a**
 Drawn: SFW / AMS
 Date: 2/9/2021

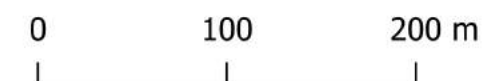
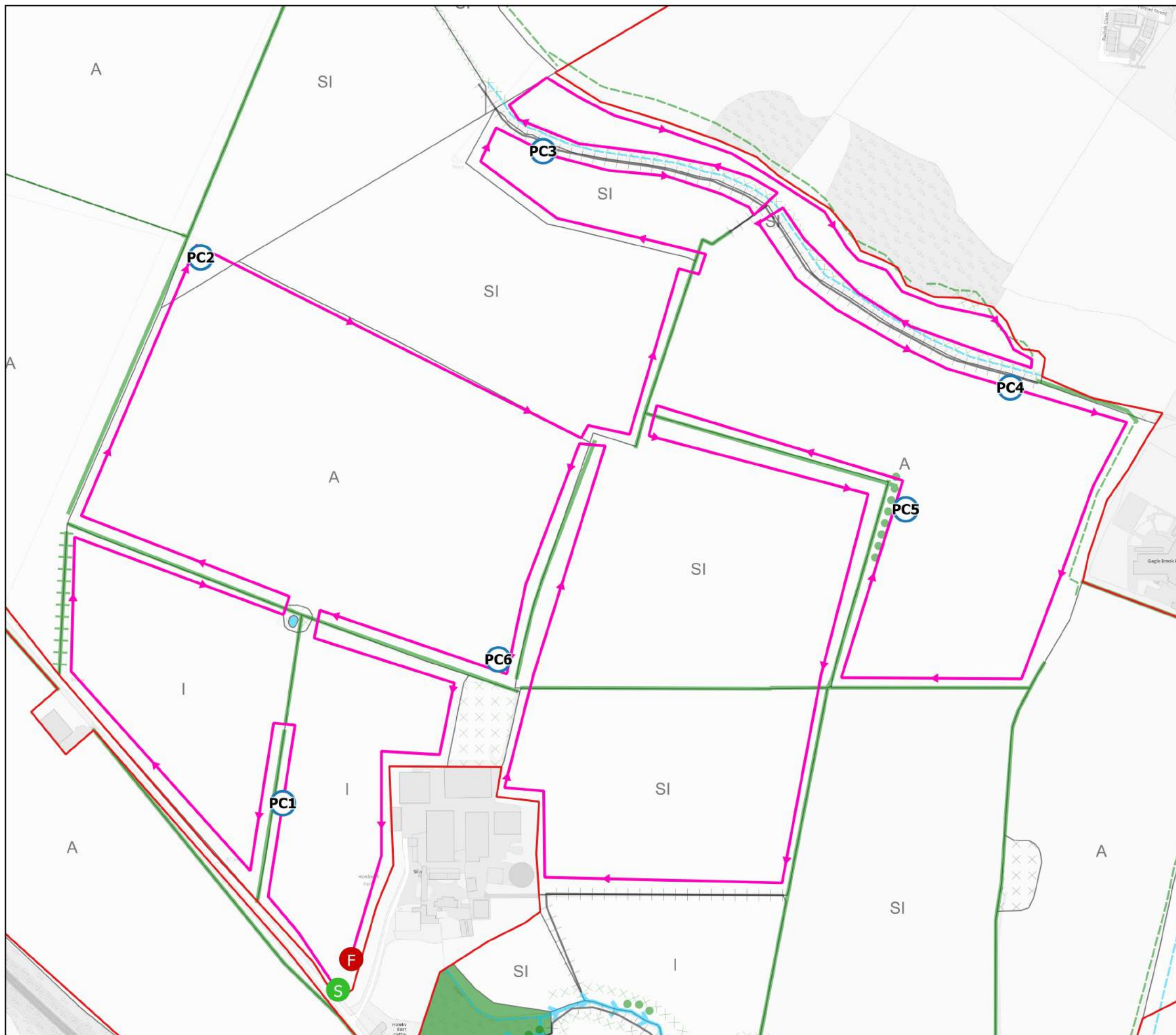
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Key:

-  Site Boundary
-  Start point
-  Finish point
-  Point Count (with ref.)
-  Transect Route

Plan Ref	Time	Species	Behaviour	Passes
PC1	20:27-20:30			
PC2	20:56-20:59			
PC3	21:18-21:21			
PC4	21:52-21:55			
PC5	22:13-22:16			
PC6	23:06-23:09			




Client: Hallam Land
Project: Land North of Bicester, Bicester
Drawing Title: BAT TRANSECT PLAN - ROUTE 2 (28.04.21)
 scale: A3 1:4000
 drawing / figure number: **Figure 2b**
 drawn: SFW / AMS
 base: 1/9/2021
 rev: -

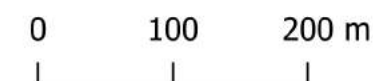
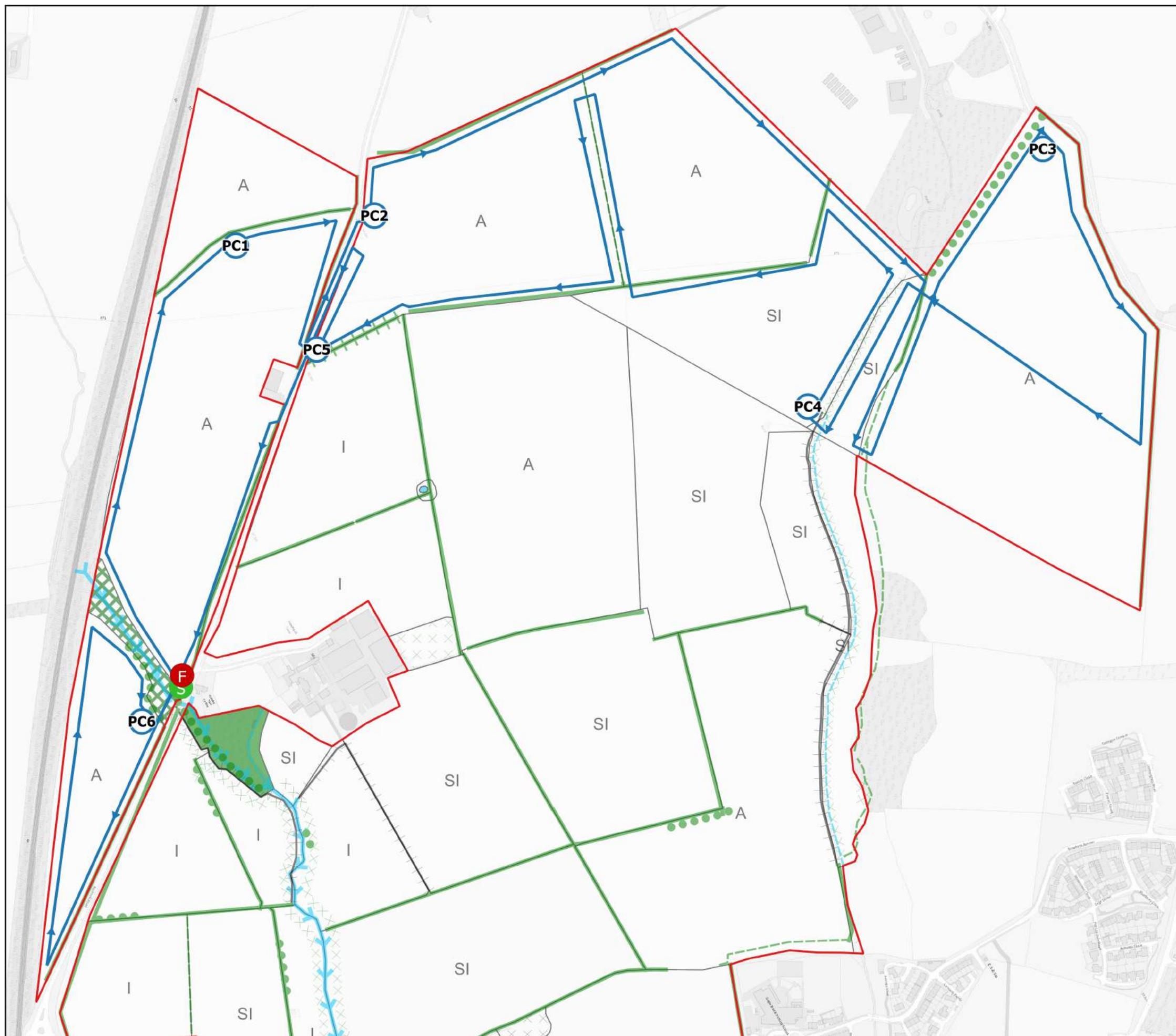
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Key:

- Site Boundary
- Start point
- Finish point
- Point Count (with ref.)
- Transect Route

Plan Ref	Time	Species	Behaviour	Passes
PC1	20:44-20:47			
PC2	21:14-21:17			
PC3	21:44-21:47			
PC4	22:08-22:11			
PC5	22:50-22:53			
PC6	22:59-23:02			



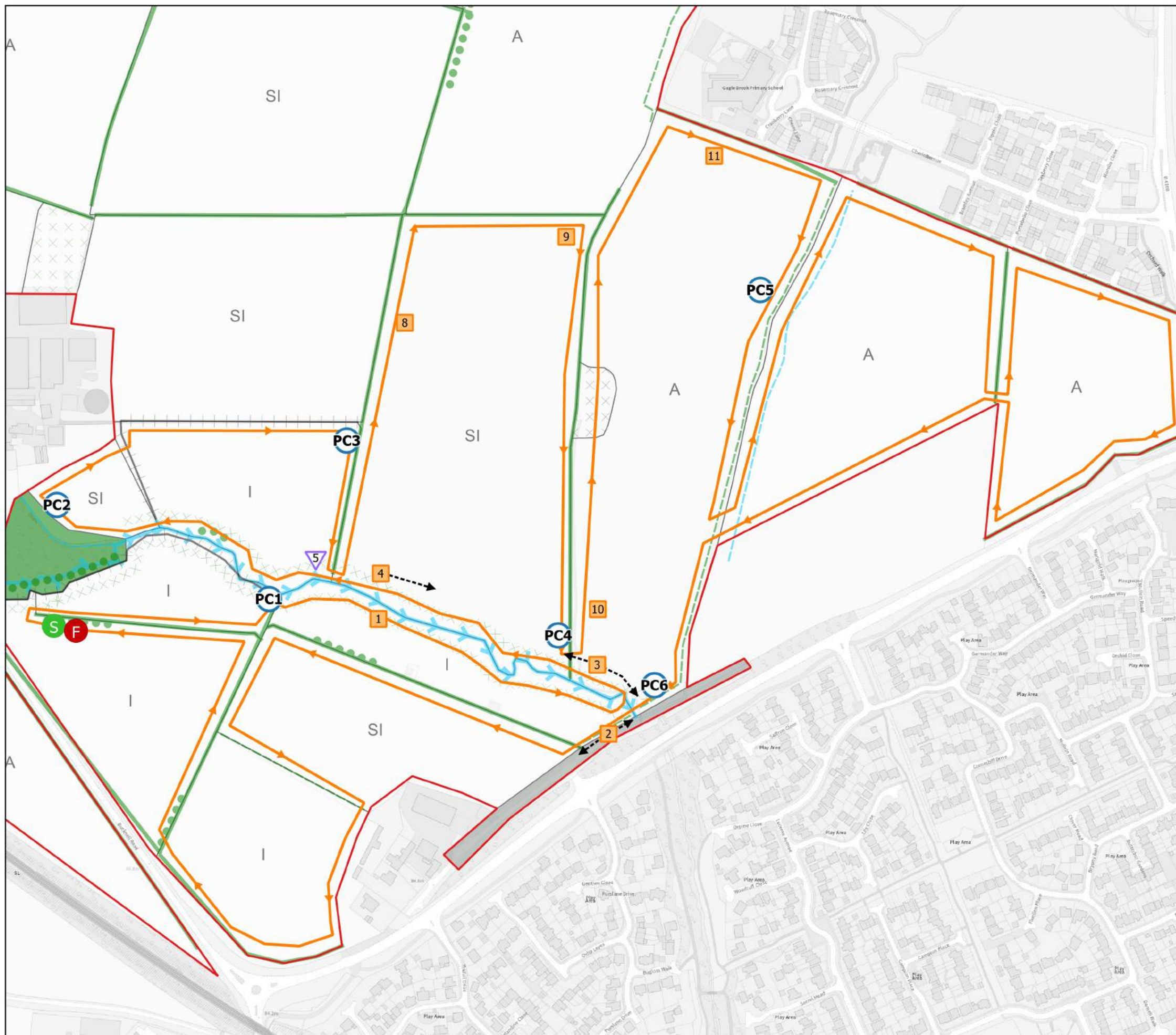

 client: Hallam Land
 project: Land North of Bicester, Bicester
 drawing title: BAT TRANSECT PLAN - ROUTE 3 (28.04.21)
 scale: A3 1:5600
 drawn: SPW / AMS
 base: 1/9/2021
Figure 2c

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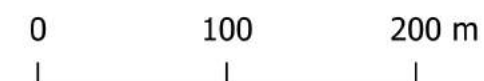
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Key:

- Site Boundary
- S Start point
- F Finish point
- PC Point Count (with ref.)
- ← Transect Route
- Bat Contacts (with ref.)**
- 1 Common Pipistrelle
- ▽ Nyctalus Species



Plan Ref	Time	Species	Behaviour	Passes
PC1	21:21			-
1	21:27	Common Pipistrelle	Commuting	1
2	21:32	Common Pipistrelle	Foraging	3
3	21:35	Common Pipistrelle	Foraging	2
4	21:38	Common Pipistrelle	Foraging	4
5	09:50	Nyctalus	Commuting	1
PC2	21:45-21:51			-
2A	21:50	Nyctalus	Commuting	1
2B	21:50	Common Pipistrelle	Foraging	3
PC3	21:57-22:02			-
3A	21:57	Common Pipistrelle	Foraging	3
3B	21:59	Nyctalus	Commuting	1
6	22:04	Common Pipistrelle	Foraging	2
7	22:08	Common Pipistrelle	Foraging	1
8	22:10	Common Pipistrelle	Foraging	1
9	22:16	Common Pipistrelle	Foraging	3
PC4	22:31-22:36			-
4A	22:33	Common Pipistrelle	Foraging	2
10	22:48	Common Pipistrelle	Foraging	1
PC5	22:59-23:04			-
PC6	23:39-23:44			-



Client: **Hallam Land**
 Project: **Land North of Bicester, Bicester**
 Drawing Title: **BAT TRANSECT PLAN - ROUTE 1 (25.05.21)**

Scale: A3 1:4000
 Drawing / Figure number: **Figure 3a**
 Drawn: SFW / AMS
 Date: 2/9/2021

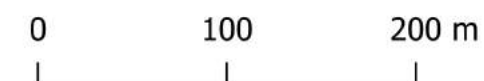
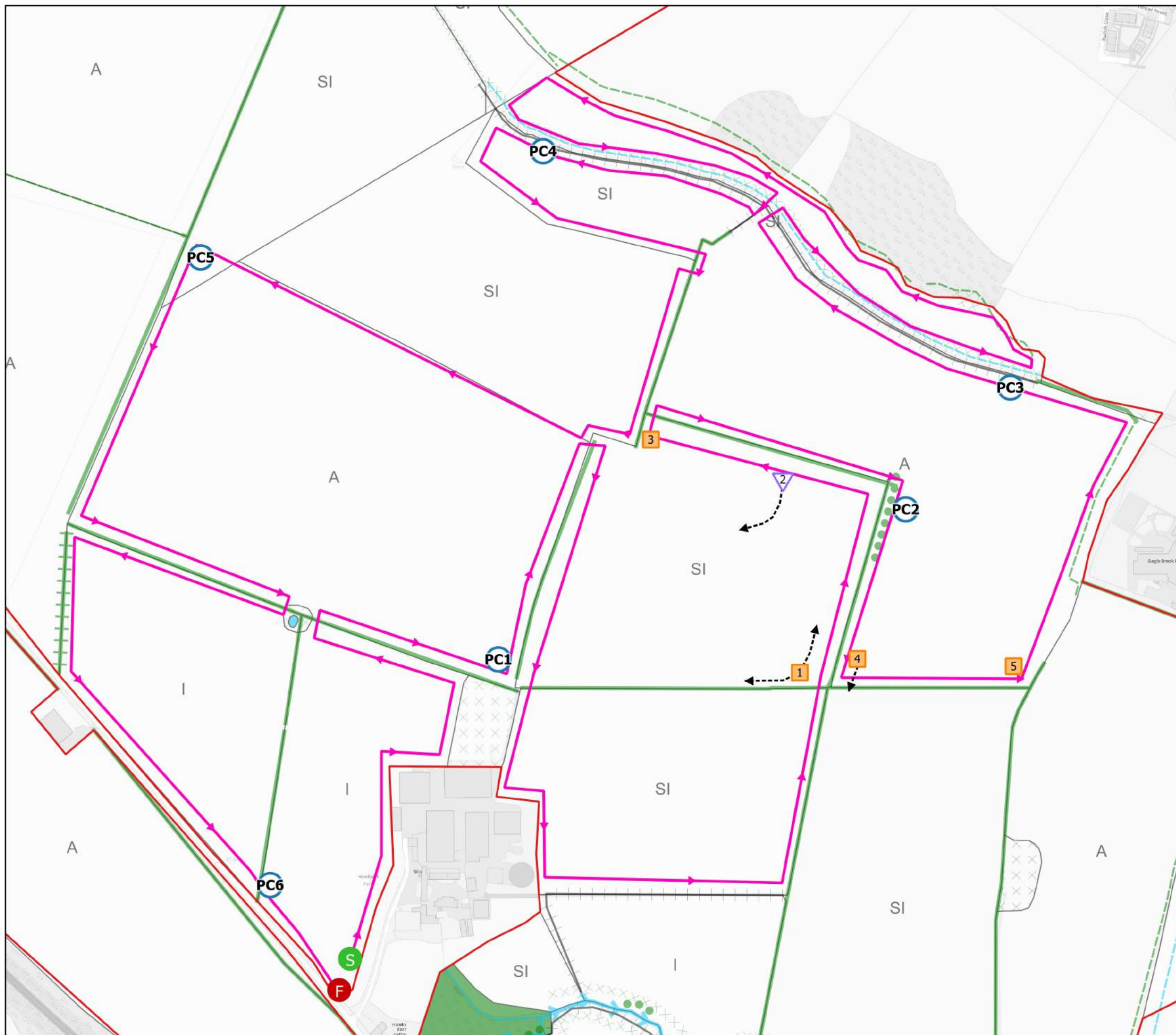
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Key:

- Site Boundary
- S Start point
- F Finish point
- PC1 Point Count (with ref.)
- Transect Route
- Bat Contacts (with ref.)**
- 3 Common Pipistrelle
- ▽ Nyctalus Species

Plan Ref	Time	Species	Behaviour	Passes
PC1	21:20-21:25			-
1	21:53	Common pipistrelle	Foraging	2
2	21:59	Nyctalus	Foraging	2
3	22:02	Common pipistrelle	Foraging	1
PC2	22:08-22:13			-
2A	22:11	Common pipistrelle	Foraging	Continuous
2B	22:15	Common pipistrelle	Foraging	1
4	22:18	Common pipistrelle	Foraging	2
5	22:23	Common pipistrelle	Foraging	2
PC3	22:31-22:36			-
PC4	23:06-23:11			-
PC5	23:32-23:37			-
PC6	23:57-00:03			-



Client: **Hallam Land**
 Project: **Land North of Bicester, Bicester**
 Drawing Title: **BAT TRANSECT PLAN - ROUTE 2 (25.05.21)**

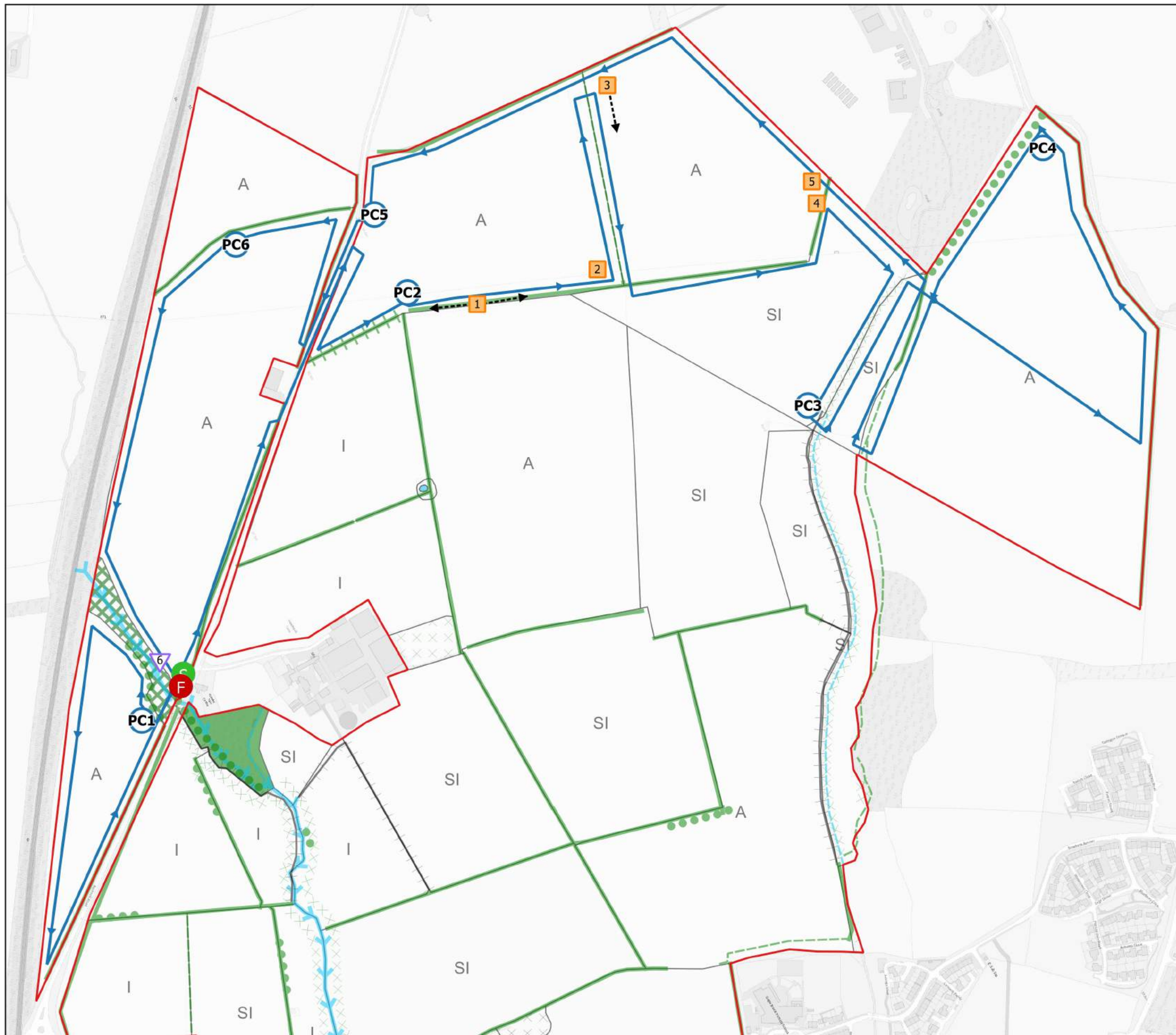
Scale: A3 1:4000
 Drawing / Figure Number: **Figure 3b**
 Drawn: SFW / AMS
 Date: 1/9/2021
 Rev: -

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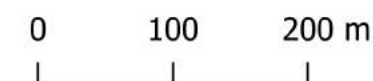
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Key:

- Site Boundary
- S Start point
- F Finish point
- PC1 Point Count (with ref.)
- Transect Route
- Bat Contacts (with ref.)**
- 1 Common Pipistrelle
- ▽ Nyctalus Species



Plan Ref	Time	Species	Behaviour	Passes
PC1	21:06-21:11			-
PC2	21:37-21:42			-
2A	21:37	Noctule	Foraging	2
1	21:46	Common pipistrelle	Foraging	Continuous
2	21:51	Common pipistrelle	Commuting	1
3	21:55	Common pipistrelle	Foraging	2
4	22:04	Common pipistrelle	Commuting	1
PC3	22:10-22:15			-
PC4	22:33-22:38			-
4A	22:34	Common pipistrelle	Commuting	1
5	22:47	Common pipistrelle	Commuting	1
PC5	22:57-23:02			-
PC6	23:15-23:20			-
6	23:39	Nyctalus	Commuting	1



Client: **Hallam Land**
 Project: **Land North of Bicester, Bicester**
 Drawing Title: **BAT TRANSECT PLAN - ROUTE 3 (25.05.21)**

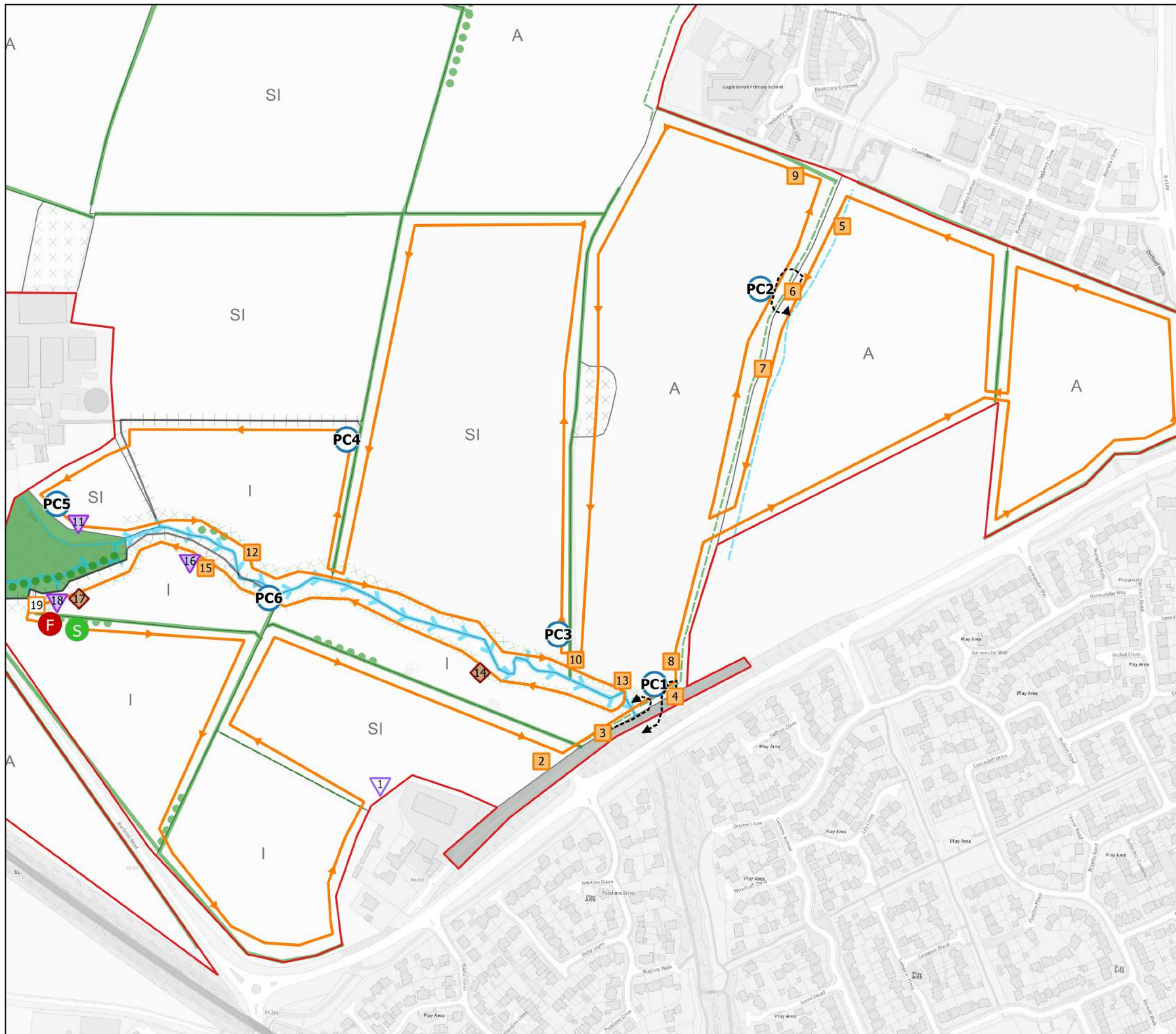
Scale: A3 1:5600
 Drawing / Figure number: **Figure 3c**
 Drawn: SPW / AMS
 Date: 2/9/2021
 Rev: -

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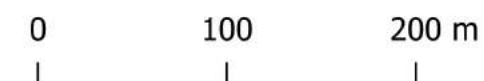
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Key:

- Site Boundary
- Start point
- Finish point
- Point Count (with ref.)
- Transect Route
- Common Pipistrelle
- Brown Long-eared
- Nyctalus Species
- Noctule

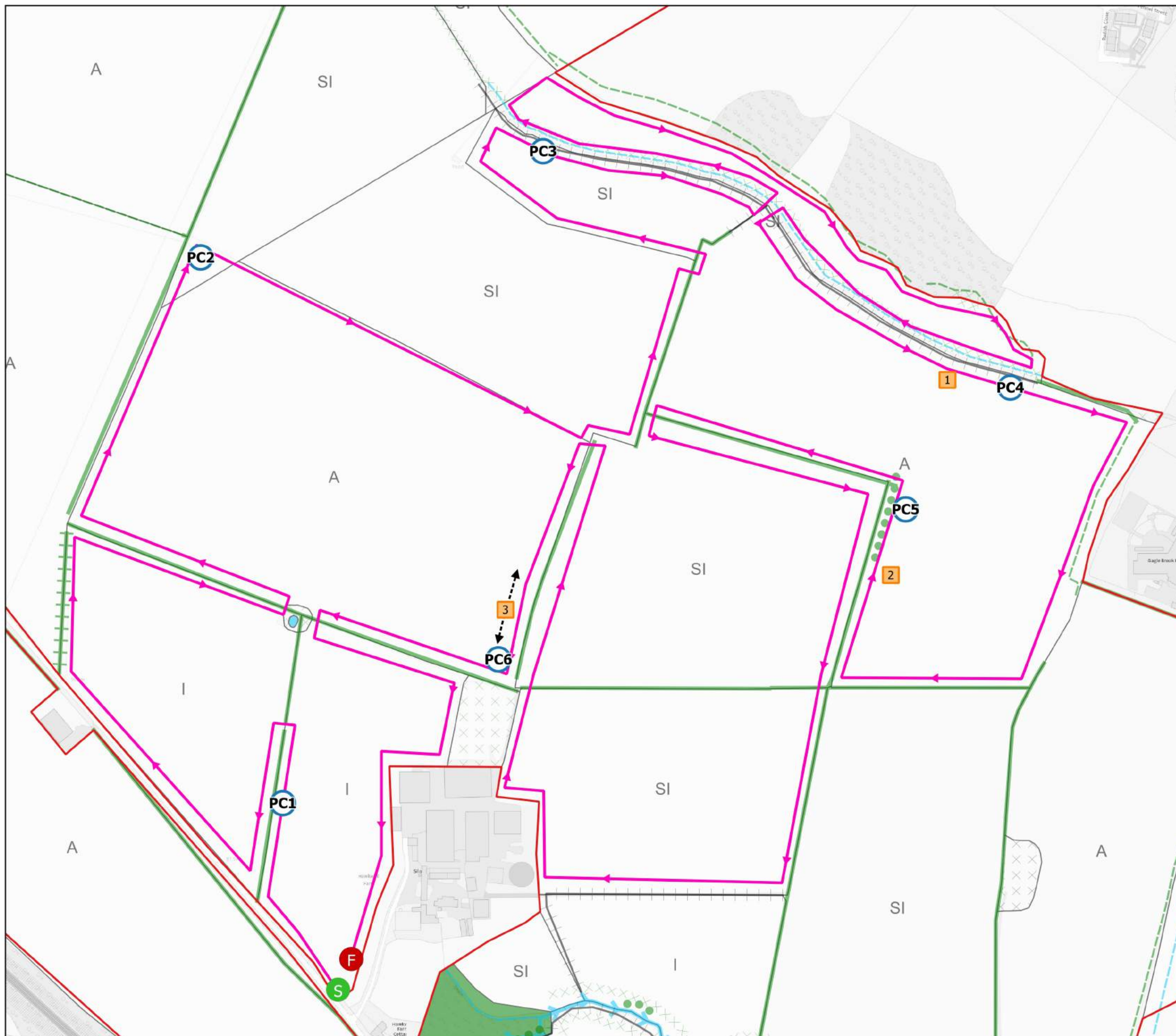


Plan Ref	Time	Species	Behaviour	Passes
1	21:33	Nyctalus sp.	Foraging	Continuous
2	22:02	Common pipistrelle	Foraging	3
3	22:03	Common pipistrelle	Foraging	Continuous
PC1	22:05-22:08			-
4	22:05	Common pipistrelle	Foraging	Continuous
5	22:34	Common pipistrelle	Commuting	1
6	22:36	Common pipistrelle	Foraging	2
7	22:45	Common pipistrelle	Foraging	Continuous
8	22:54	Common pipistrelle	Foraging	4
PC2	23:01-23:04			-
9	23:07	Common pipistrelle	Foraging	2
10	23:21	Common pipistrelle	Foraging	2
PC3	23:21-23:24			-
PC4	23:35-23:38			-
PC5	23:43-23:46			-
11	23:47	Noctule	Foraging	4
12	23:50	Common pipistrelle	Foraging	1
13	23:59	Common pipistrelle	Foraging	Continuous
14	00:02	Brown Long-eared	Commuting	1
PC6	00:07-00:10			-
6A	00:07	Myotis	Foraging	1
15	00:12	Common pipistrelle	Foraging	Continuous
16	00:12	Noctule	Foraging	1
17	00:14	Brown Long-eared	Foraging	1
18	00:14	Noctule	Foraging	Continuous
19	00:14	Pipistrelle sp.	Foraging	Continuous



Client: **Hallam Land**
 project: **Land North of Bicester, Bicester**
 drawing title: **BAT TRANSECT PLAN - ROUTE 1 (23.06.21)**

scale: A3 1:4000
 drawing / figure number: **Figure 4a**
 drawn: SFW / AMS
 issue: 2/9/2021



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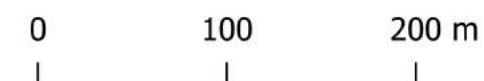
Key:

- Site Boundary
- S Start point
- F Finish point
- PC Point Count (with ref.)
- Transect Route

Bat Contacts (with ref.)

- 1 Common Pipistrelle

Plan Ref	Time	Species	Behaviour	Passes
PC1	21:33-21:36			-
PC2	21:59-22:02			-
PC3	22:21-22:24			-
3A	22:23	Nyctalus sp.	Commuting	1
1	22:59	Common pipistrelle	Commuting	1
PC4	23:00-23:03			-
2	23:21	Common pipistrelle	Commuting	1
PC5	23:24-23:27			-
PC6	00:00-00:03			-
3	00:00	Common pipistrelle	Foraging	Continuous



Client: Hallam Land
 Project: Land North of Bicester, Bicester
 Drawing Title: BAT TRANSECT PLAN - ROUTE 2 (23.06.21)
 Scale: A3 1:4000
 Drawing / Figure Number:
 Date: 2/9/2021
 Rev: -

Figure 4b

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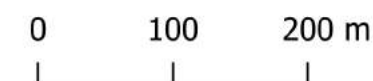
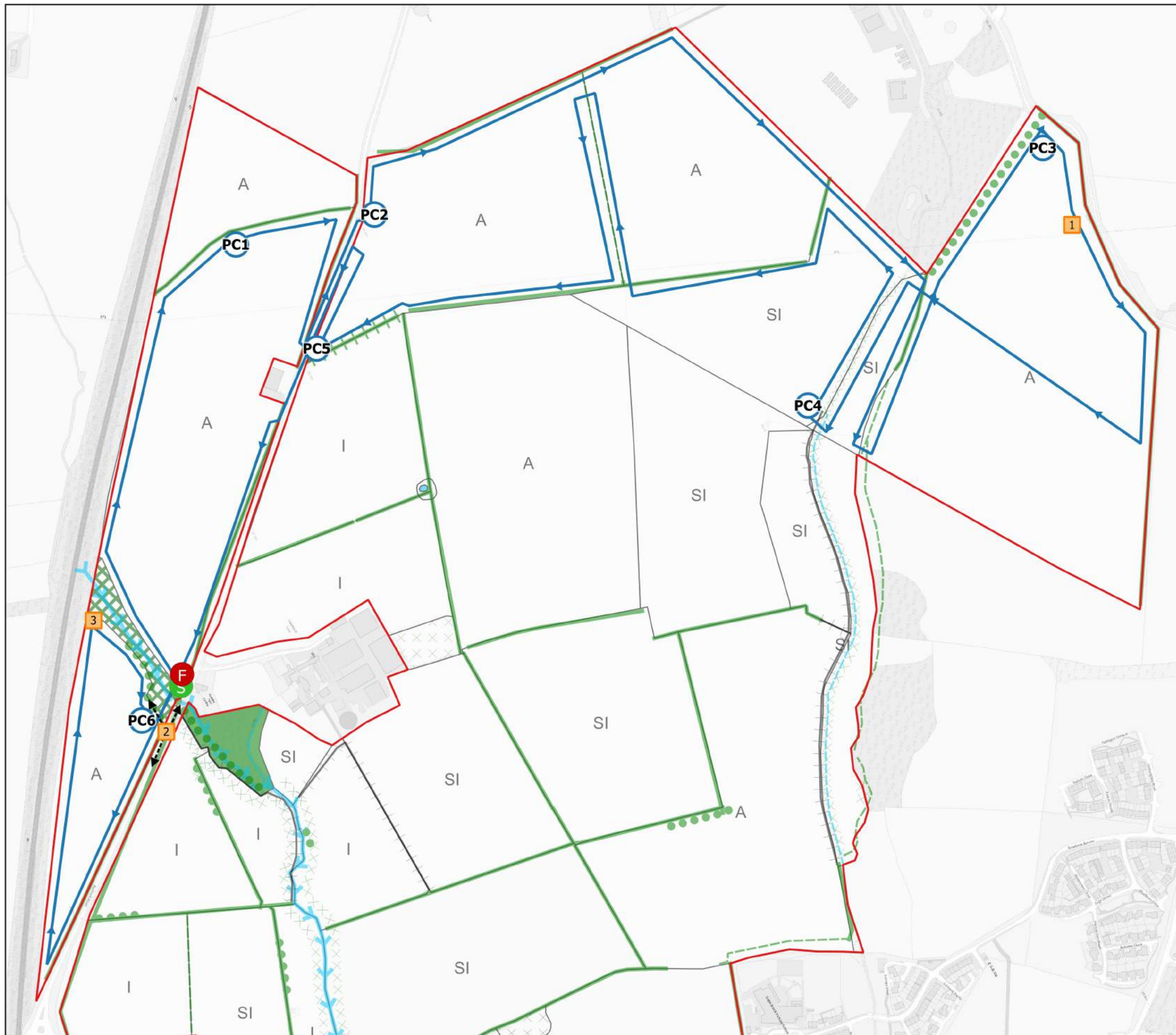
Key:

- Site Boundary
- S Start point
- F Finish point
- PC1 Point Count (with ref.)
- Transect Route

Bat Contacts (with ref.)

- 1 Common Pipistrelle

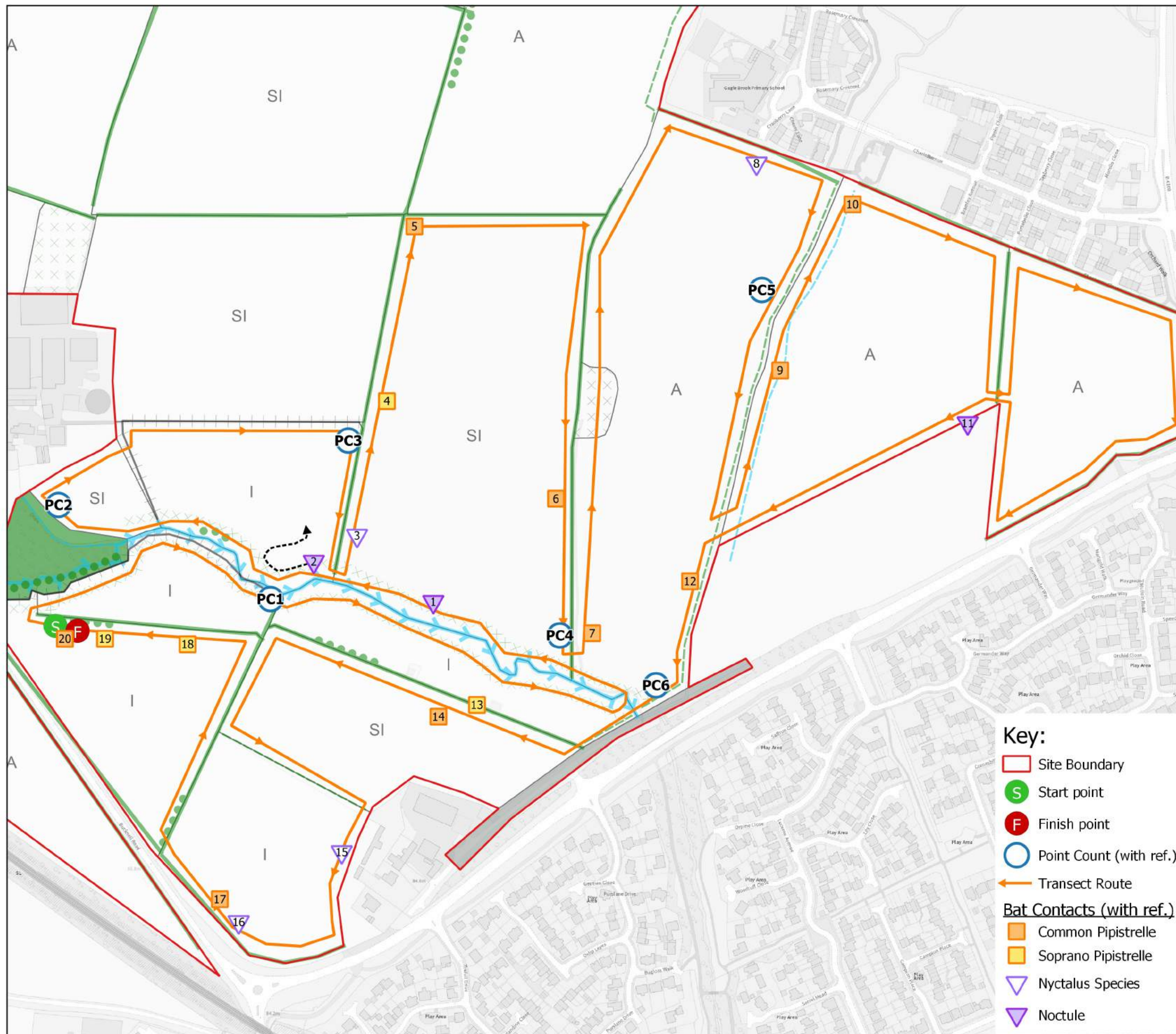
Plan Ref	Time	Species	Behaviour	Passes
PC1	21:33-21:36			-
PC2	21:59-22:02			-
PC3	22:21-22:24			-
3A	22:23	Nyctalus sp.	Commuting	1
1	22:59	Common pipistrelle	Commuting	1
PC4	23:00-23:03			-
2	23:21	Common pipistrelle	Commuting	1
PC5	23:24-23:27			-
3	00:00	Common pipistrelle	Foraging	Continuous
PC6	00:00-00:03			-




 Client: Hallam Land
 Project: Land North of Bicester, Bicester
 Drawing title: BAT TRANSECT PLAN - ROUTE 3 (23.06.21)
 Scale: A3 1:5600
 Drawn: SPW / AMS
 Date: 2/9/2021
Figure 4c

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Plan Ref	Time	Species	Behaviour	Passes
PC1	21:07-21:12			-
1	21:24	Noctule	Commuting	1
2	21:29	Noctule	Foraging	Continuous
PC2	21:38-21:43			-
2A	21:39	Common pipistrelle	Foraging	4
2B	21:41	Noctule	Commuting	1
2C	21:42	Noctule	Foraging	Continuous
PC3	21:47-21:52			-
3A	21:50	Common pipistrelle	Commuting	1
3	21:54	Nyctalus sp.	Foraging	3
4	21:57	Soprano pipistrelle	Commuting	1
5	22:00	Common pipistrelle	Commuting	2
6	22:09	Common pipistrelle	Commuting	1
PC4	22:12-22:17			-
4A	22:14	Common pipistrelle	Foraging	2
7	22:17	Common pipistrelle	Foraging	1
8	22:28	Nyctalus sp.	Commuting	1
PC5	22:31-22:36			-
5A	22:33	Soprano pipistrelle	Commuting	1
5B	22:35	Soprano pipistrelle	Foraging	1
9	22:46	Common pipistrelle	Foraging	3
10	22:51	Common pipistrelle	Commuting	1
11	23:05	Noctule	Commuting	1
12	23:11	Common pipistrelle	Commuting	1
PC6	23:17-23:22			-
6A	23:20	Common pipistrelle	Commuting	1
6B	23:20	Myotis sp.	Commuting	1
13	23:29	Soprano pipistrelle	Commuting	1
14	23:30	Common pipistrelle	Commuting	1
15	23:37	Nyctalus sp.	Commuting	1
16	23:41	Nyctalus sp.	Foraging	Continuous
17	23:41	Common pipistrelle	Foraging	4
18	23:49	Soprano pipistrelle	Commuting	1
19	23:54	Soprano pipistrelle	Commuting	1
20	00:00	Common pipistrelle	Commuting	2



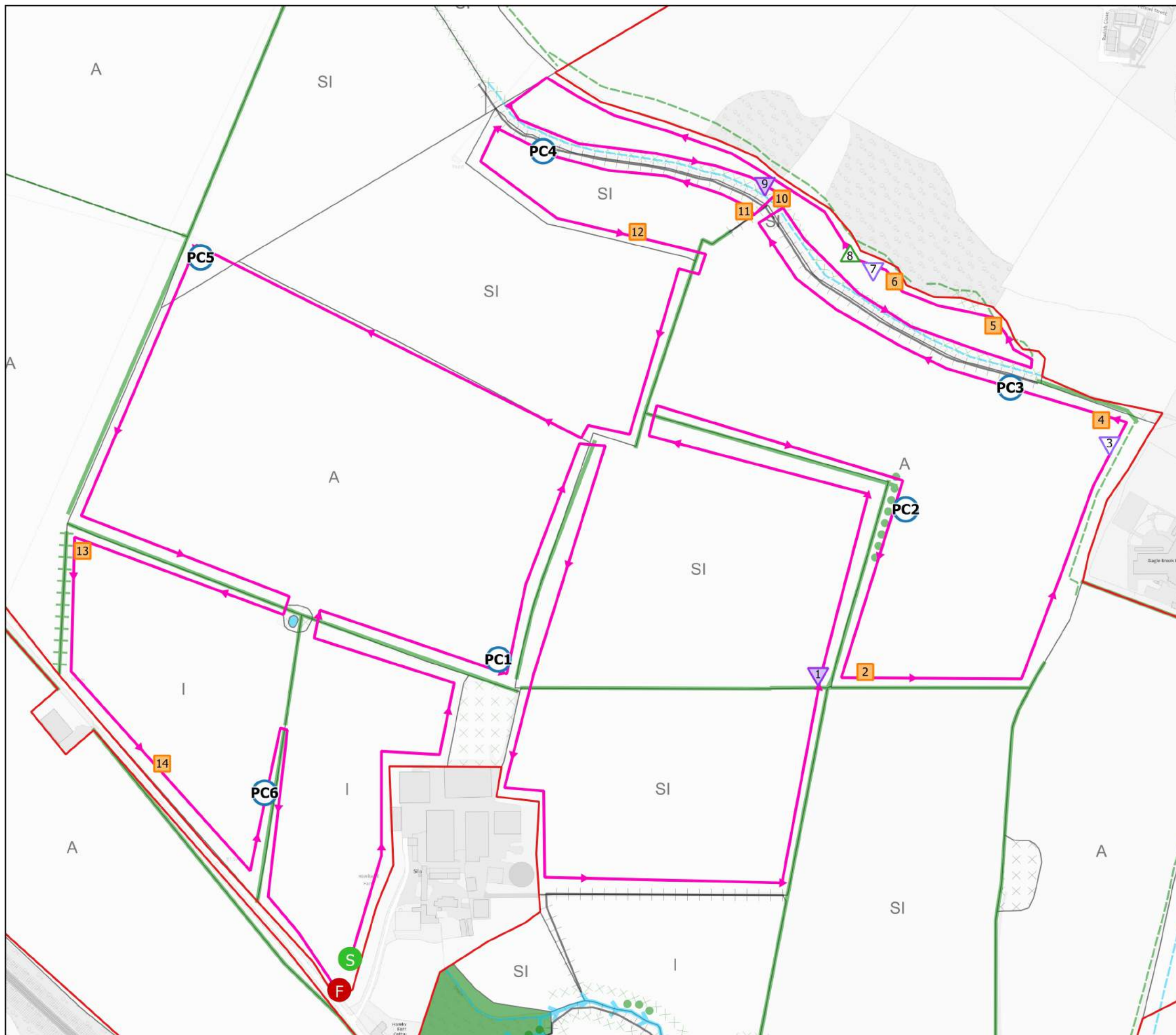
Client: **Hallam Land**
 project: **Land North of Bicester, Bicester**
 drawing title: **BAT TRANSECT PLAN - ROUTE 1 (26.07.21)**
 scale: A3 1:4000
 drawing / figure number: **Figure 5a**
 drawn: SFW / AMS
 issue: 2/9/2021

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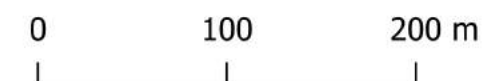
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Key:

- Site Boundary
- S Start point
- F Finish point
- PC1 Point Count (with ref.)
- ▶ Transect Route
- Bat Contacts (with ref.)**
- 1 Common Pipistrelle
- △ Myotis Species
- ▽ Nyctalus Species
- ▽ Noctule



Plan Ref	Time	Species	Behaviour	Passes
PC1	21:07-21:12			-
1	21:41	Noctule	Commuting	1
PC2	21:52-21:57			-
2A	21:52	Common pipistrelle	Foraging	6
2	22:01	Common pipistrelle	Commuting	1
3	22:05	Nyctalus	Foraging	2
4	22:08	Common pipistrelle	Foraging	2
PC3	22:12-22:17			-
3A	22:13	Noctule	Commuting	1
5	22:32	Common pipistrelle x2	Foraging	Continuous
6	22:35	Common pipistrelle	Foraging	Continuous
7	22:36	Nyctalus	Foraging	2
8	22:37	Myotis sp.	Commuting	1
9	22:50	Noctule	Foraging	2
10	22:51	Common pipistrelle	Foraging	4
11	22:55	Common pipistrelle	Foraging	3
PC4	23:02-23:07			-
4A	23:05	Common pipistrelle	Foraging	3
12	23:09	Common pipistrelle	Foraging	Continuous
PC5	23:25-23:30			-
5A	23:28	Common pipistrelle	Foraging	3
13	00:00	Common pipistrelle	Foraging	1
14	00:03	Common pipistrelle	Foraging	2
PC6	00:08-00:13			-

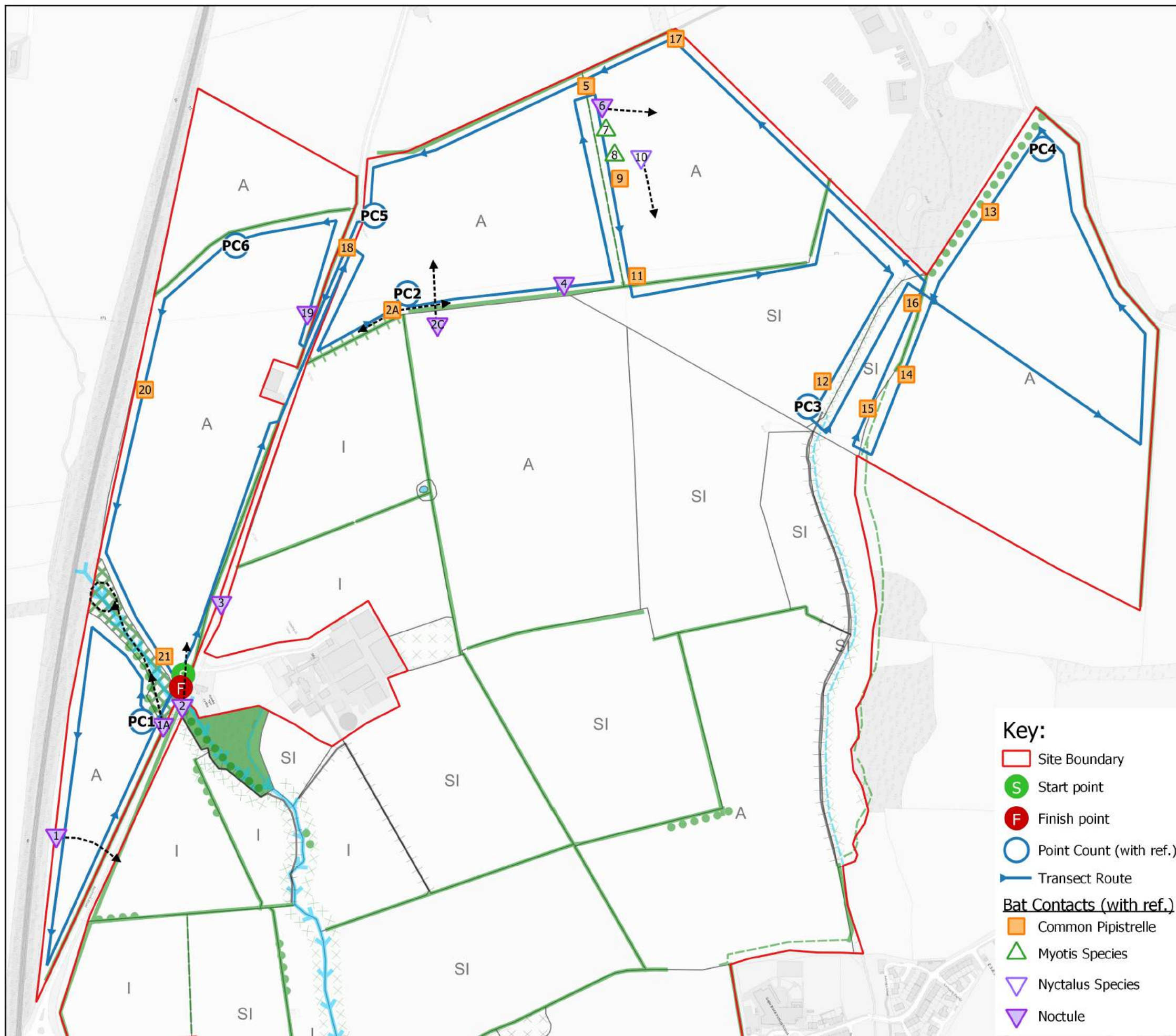


Client: **Hallam Land**
 Project: **Land North of Bicester, Bicester**
 Drawing Title: **BAT TRANSECT PLAN - ROUTE 2 (26.07.21)**

Scale: A3 1:4000
 Drawing / Figure Number: **Figure 5b**
 Drawn: SFW / AMS
 Date: 2/9/2021
 Rev: -

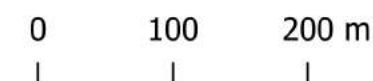
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- Key:**
- Site Boundary
 - Start point
 - Finish point
 - Point Count (with ref.)
 - Transect Route
 - Bat Contacts (with ref.)**
 - Common Pipistrelle
 - Myotis Species
 - Nyctalus Species
 - Noctule

Plan Ref	Time	Species	Behaviour	Passes
PC1	21:09-21:14			-
1A	21:11	Noctule	Foraging	Continuous
1	21:30	Noctule	Commuting	2
2	21:40	Noctule	Commuting	2
3	21:42	Noctule	Commuting	2
PC2	21:57-22:02			-
2A	22:00	Common pipistrelle	Foraging	Continuous
2B	22:01	Soprano pipistrelle	Commuting	1
2C	22:02	Noctule	Commuting	1
4	22:06	Noctule	Commuting	1
5	22:15	Common pipistrelle	Foraging	Continuous
6	22:17	Noctule	Foraging	3
7	22:17	Myotis sp.	Commuting	1
8	22:20	Myotis sp.	Commuting	1
9	22:21	Common pipistrelle	Foraging	Continuous
10	22:22	Nyctalus sp.	Foraging	Continuous
11	22:32	Common pipistrelle	Foraging	4
12	22:44	Common pipistrelle	Commuting	2
PC3	22:45-22:50			-
3A	22:45	Common pipistrelle	Commuting	2
3B	22:47	Brown Long-eared	Commuting	1
3C	22:48	Common pipistrelle	Commuting	1
PC4	23:06-23:11			-
4A	23:07	Soprano pipistrelle	Commuting	1
4B	23:10	Noctule	Commuting	2
13	23:16	Common pipistrelle	Commuting	1
14	23:19	Common pipistrelle	Foraging	4
15	23:25	Common pipistrelle	Foraging	3
16	23:30	Common pipistrelle	Commuting	2
17	23:38	Common pipistrelle	Foraging	5
PC5	23:45-23:50			-
5A	23:45	Common pipistrelle	Foraging	3
18	23:51	Common pipistrelle	Foraging	2
19	23:54	Noctule	Commuting	2
20	00:08	Common pipistrelle	Foraging	3
21	00:13	Common pipistrelle	Commuting	1



Client: **Hallam Land**
 Project: **Land North of Bicester, Bicester**
 Drawing Title: **BAT TRANSECT PLAN - ROUTE 3 (26.07.21)**

Scale: A3
1:5600
Drawing / Figure number: **Figure 5c**

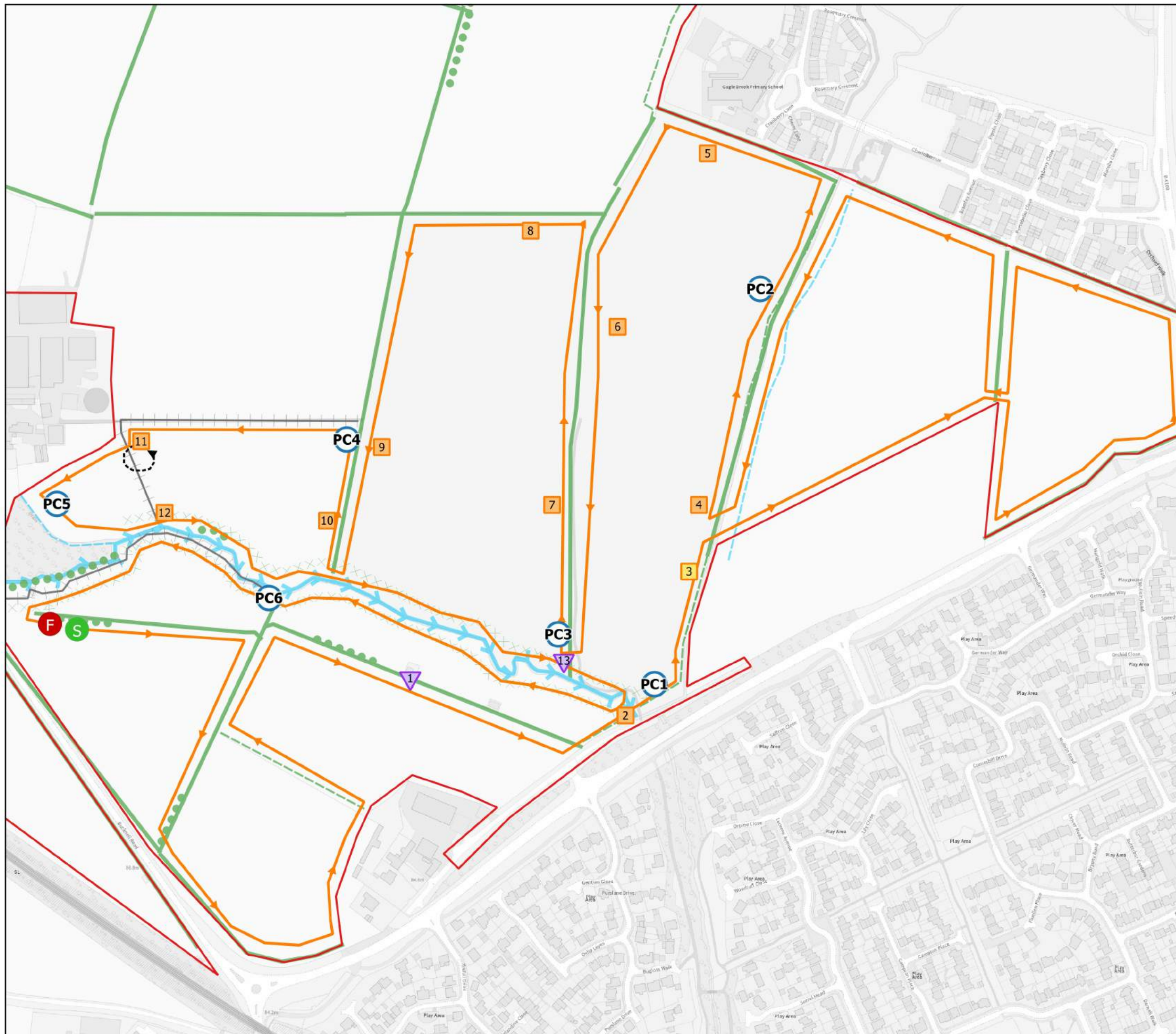
Drawn: SFW / AMS
 Date: 2/9/2021

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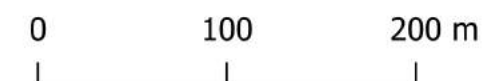
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Key:

- Site Boundary
- S Start point
- F Finish point
- PC Point Count (with ref.)
- ← Transect Route
- Bat Contacts (with ref.)**
- 5 Common Pipistrelle
- 11 Soprano Pipistrelle
- ▽ Noctule



Plan Ref	Time	Species	Behaviour	Passes
1	20:23	Noctule	Foraging	Continuous
2	20:30	Common pipistrelle	Commuting	1
PC1	20:32-20:37			-
3	20:39	Soprano pipistrelle	Commuting	1
4	20:50	Common pipistrelle	Commuting	1
PC2	21:08-21:13			-
PC2a	21:11	Common pipistrelle	Commuting	1
5	21:21	Common pipistrelle	Commuting	1
6	21:28	Common pipistrelle	Commuting	1
PC3	21:37-21:42			-
PC3a	21:38	Common pipistrelle	Foraging	3
7	21:44	Common pipistrelle	Commuting	1
8	21:57	Common pipistrelle	Foraging	Continuous
9	22:12	Common pipistrelle	Foraging	Continuous
10	22:17	Common pipistrelle	Commuting	1
PC4	22:18-22:33			-
PC4a	22:19	Common pipistrelle	Commuting	1
11	22:32	Common pipistrelle	Foraging	5
PC5	22:36-22:41			-
PC5a	22:36	Myotis	Commuting	2
PC5b	22:37	Common pipistrelle	Foraging	Continuous
PC5c	22:40	Myotis	Foraging	Continuous
12	22:43	Common pipistrelle	Foraging	Continuous
13	22:54	Noctule	Commuting	1
PC6	23:03-23:08			-
PC6a	23:03	Brown Long-eared	Foraging	3
PC6b	23:04	Soprano pipistrelle	Commuting	1



Client: **Hallam Land**
 Project: **Land North of Bicester, Bicester**
 Drawing Title: **BAT TRANSECT PLAN - ROUTE 1 (25.08.21)**

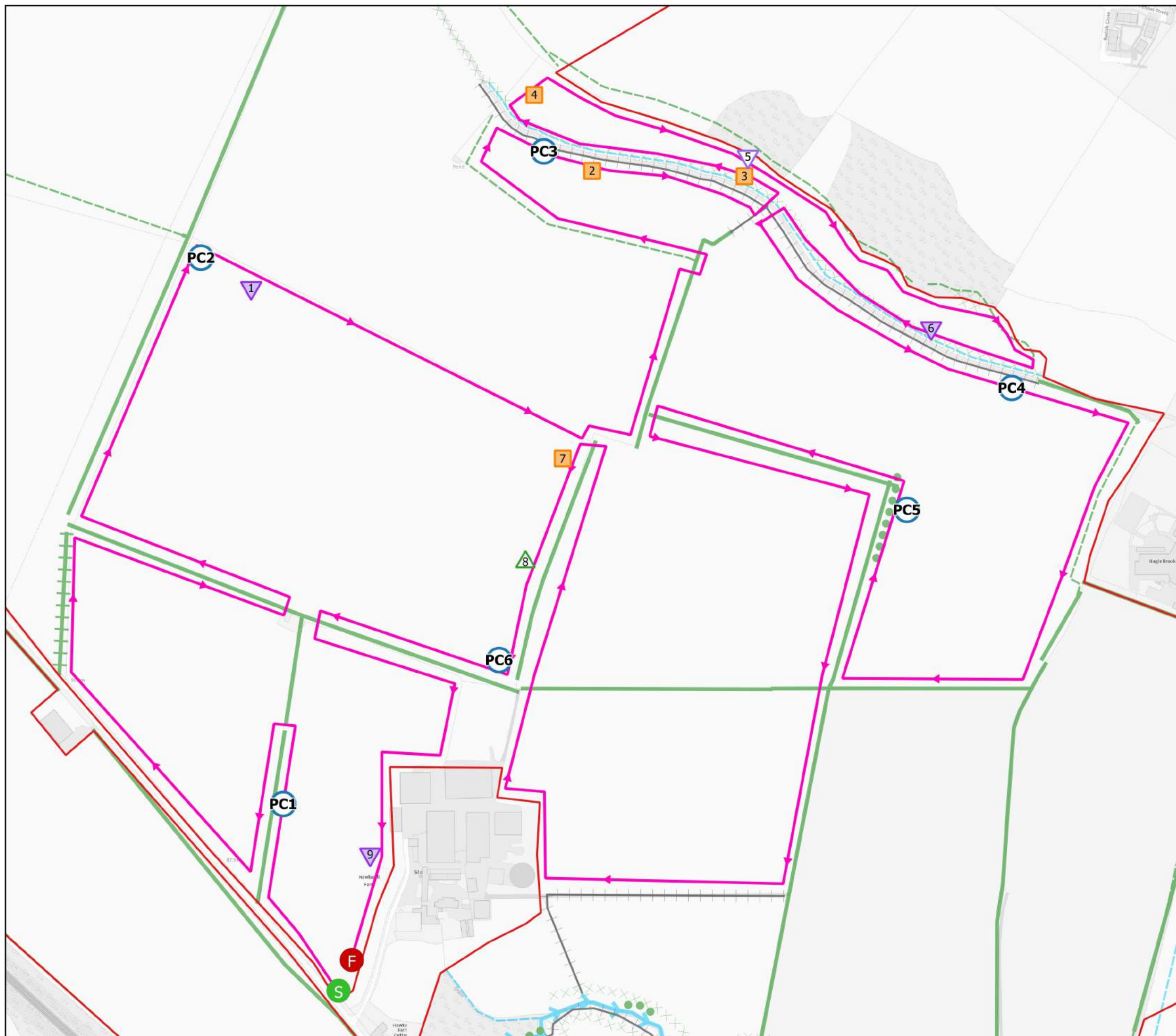
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 Drawing / Figure number: **Figure 6a**
 Drawn: SFW / AMS
 Date: 2/11/2021

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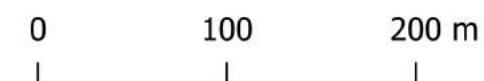
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Key:

- Site Boundary
- S Start point
- F Finish point
- PC Point Count (with ref.)
- ▶ Transect Route
- Bat Contacts (with ref.)**
- 4 Common Pipistrelle
- △ Myotis Species
- ▽ Noctule



Plan Ref	Time	Species	Behaviour	Passes
PC1	20:16-20:21			-
PC2	20:39-20:44			-
PC2a	20:40	Noctule	Foraging	3
1	20:46	Noctule	Commuting	1
PC3	21:02-21:07			-
PC3a	21:02	Common pipistrelle	Foraging	Continuous
2	21:09	Common pipistrelle	Foraging	5
3	21:16	Common pipistrelle	Commuting	1
4	21:20	Common pipistrelle	Foraging	Continuous
5	21:24	Nyctalus sp.	Commuting	1
6	21:56	Noctule	Commuting	1
PC4	22:05-22:10			-
PC4a	22:06	Common pipistrelle	Foraging	2
PC5	22:24-22:29			-
PC5a	22:25	Common pipistrelle	Commuting	1
PC6	22:58-21:03			-
7	22:47	Common pipistrelle	Commuting	1
8	22:50	Myotis	Foraging	2
9	23:11	Noctule	Commuting	1



Client: **Hallam Land**
 Project: **Land North of Bicester, Bicester**
 Drawing Title: **BAT TRANSECT PLAN - ROUTE 2 (25.08.21)**

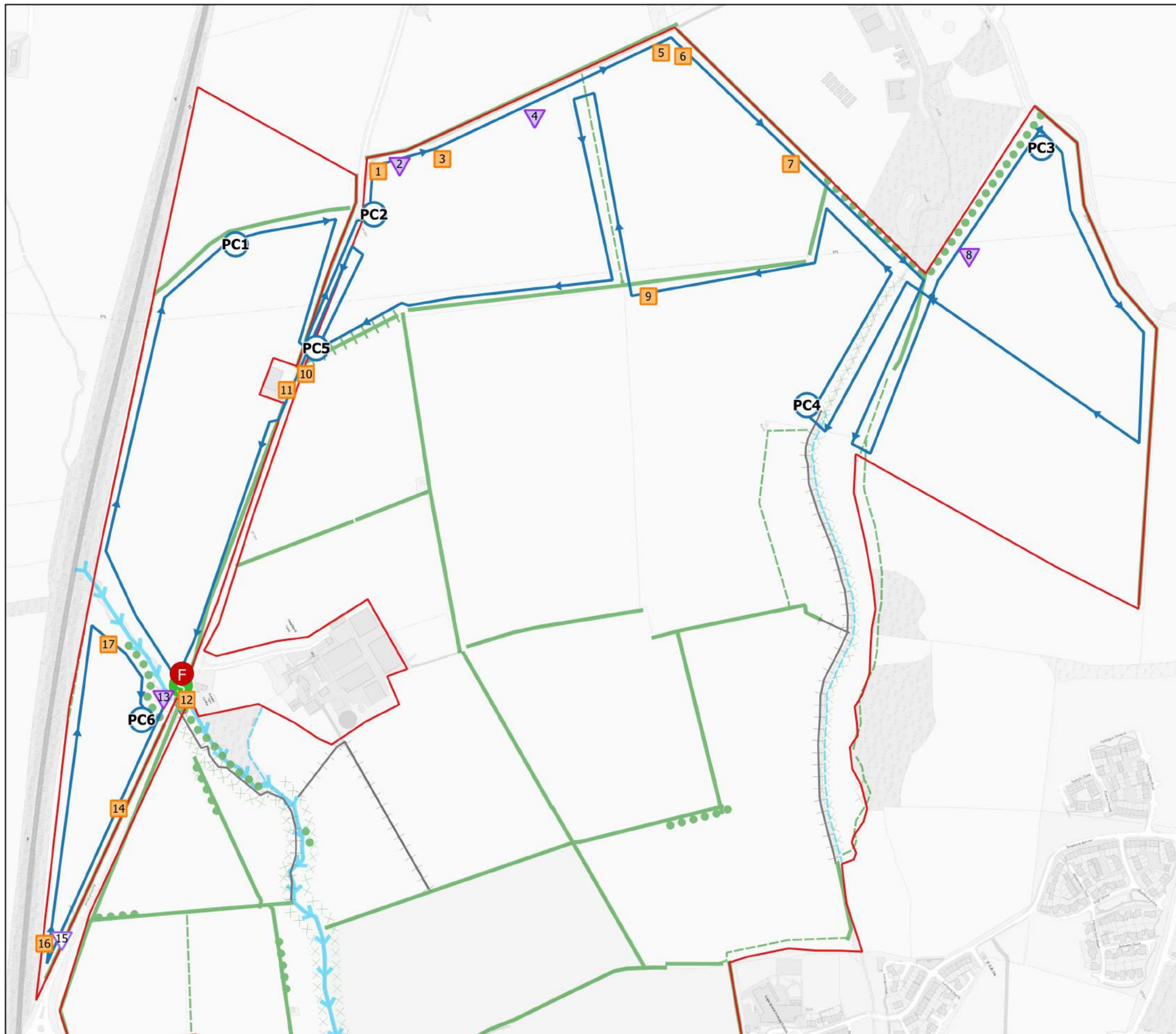
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 Drawn: SFW / AMS
 Date: 2/11/2021
 Rev: -

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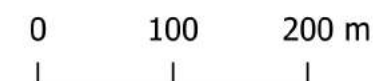
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Key:

- Site Boundary
- Start point
- Finish point
- Point Count (with ref.)
- Transect Route
- Common Pipistrelle
- Nyctalus Species
- Noctule



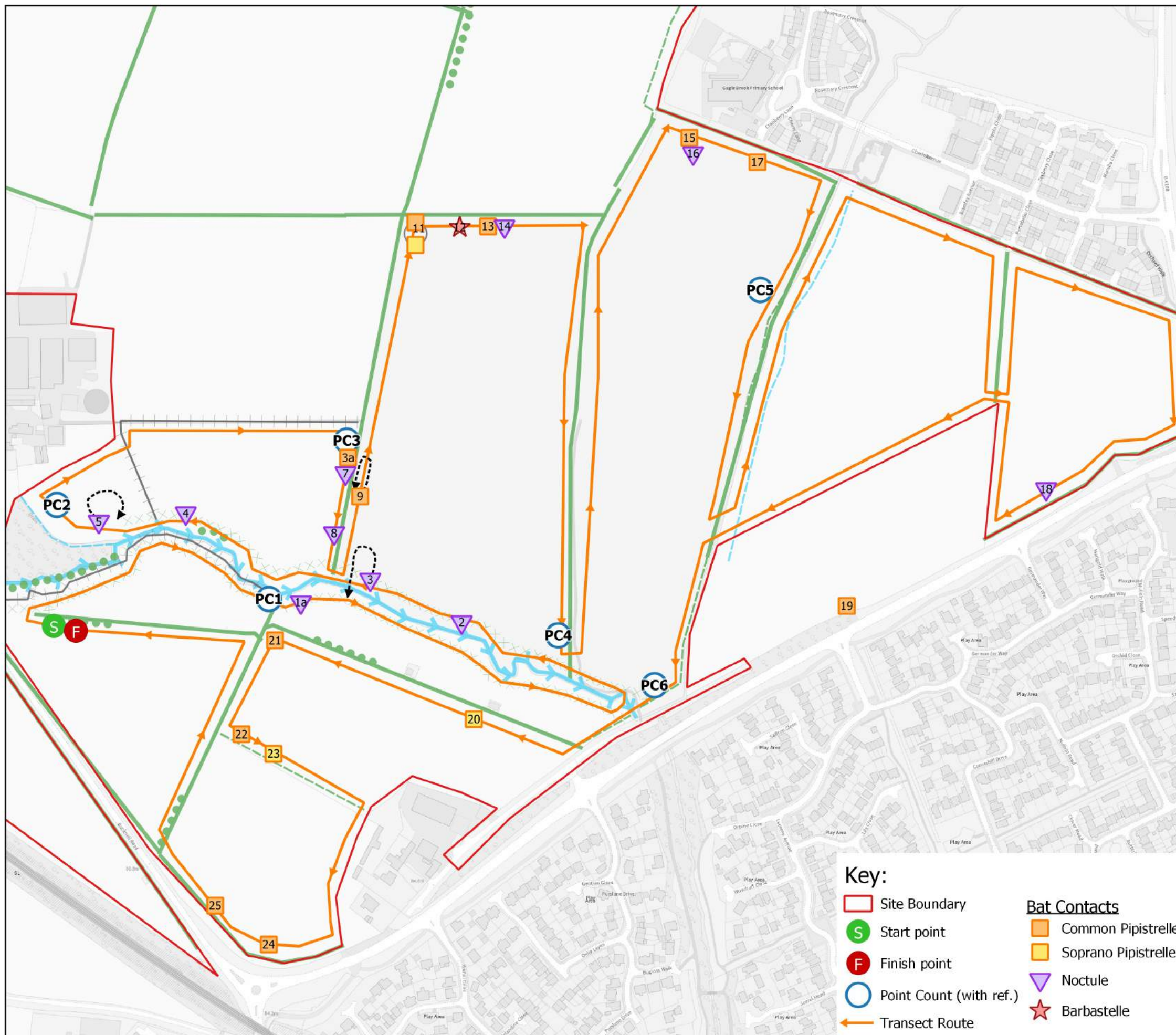
Plan Ref	Time	Species	Behaviour	Passes
PC1	20:20-20:25			-
PC2	20:38-20:43			-
PC2a	20:39	Noctule	Foraging	3
1	20:44	Common pipistrelle	Foraging	4
2	20:45	Noctule	Commuting	1
3	20:45	Common pipistrelle	Foraging	5
4	20:49	Noctule	Commuting	1
5	20:52	Common pipistrelle	Foraging	Continuous
6	21:00	Common pipistrelle	Commuting	1
7	21:03	Common pipistrelle	Commuting	1
8	21:15	Noctule	Foraging	2
PC3	21:18-21:23			-
PC3a	21:19	Noctule	Foraging	2
PC3b	21:21	Common pipistrelle	Foraging	2
PC4	21:47-21:52			-
PC4a	21:51	Common pipistrelle	Commuting	1
9	22:03	Common pipistrelle	Commuting	1
PC5	22:22-22:27			-
5a	22:25	Common pipistrelle	Foraging	5
10	22:31	Common pipistrelle	Commuting	1
11	22:33	Common pipistrelle	Commuting	1
12	22:44	Common pipistrelle	Foraging	2
13	22:44	Noctule	Foraging	2
14	22:49	Common pipistrelle	Commuting	1
15	22:51	Nyctalus	Commuting	1
16	22:52	Common pipistrelle	Commuting	1
17	22:58	Common pipistrelle	Foraging	2
PC6	23:01-23:06			-



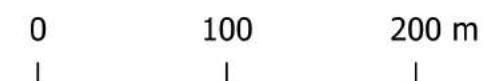
Client: Hallam Land
 Project: Land North of Bicester, Bicester
 Drawing Title: BAT TRANSECT PLAN - ROUTE 3 (25.08.21)
 Scale: A3 1:5600
 Drawn: SFW / AMS
 Issue: 2/11/2021
 Drawing / Figure Number: -
Figure 6c

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Plan Ref	Time	Species	Behaviour	Passes
PC1	19:11-19:16			
1a	19:12	Noctule	Communiting	3
2	19:27	Noctule	Communiting	1
3	19:30	Noctule	Foraging	3
4	19:33	Noctule	Foraging	4
5	19:36	Noctule	Foraging	Continuous
PC2	19:37-19:42			
PC3	19:47-19:52			
3a	19:50	Common Pipistrelle	Foraging	2
7	19:51	Noctule	Communiting	1
8	19:54	Noctule	Foraging	2
9	19:57	Common Pipistrelle	Foraging	Continuous
10	20:06	Soprano Pipistrelle	Communiting	1
11	20:06	Common Pipistrelle	Foraging	4
12	20:07	Barbastelle	Communiting	1
13	20:08	Common Pipistrelle	Foraging	Continuous
14	20:08	Noctule	Foraging	1
PC4	20:16-20:21			
15	20:30	Common Pipistrelle	Foraging	4
16	20:30	Noctule	Communiting	1
17	20:32	Common Pipistrelle	Communiting	1
PC5	20:35-20:40			
18	21:07	Noctule		
19	21:09	Common Pipistrelle	Communiting	1
PC6	21:16-21:21			
20	21:30	Soprano Pipistrelle	Communiting	1
21	21:35	Common Pipistrelle	Communiting	1
22	21:38	Common Pipistrelle	Foraging	3
23	21:39	Soprano Pipistrelle	Foraging	1
24	21:44	Common Pipistrelle	Foraging	2
25	21:49	Common Pipistrelle	Communiting	1



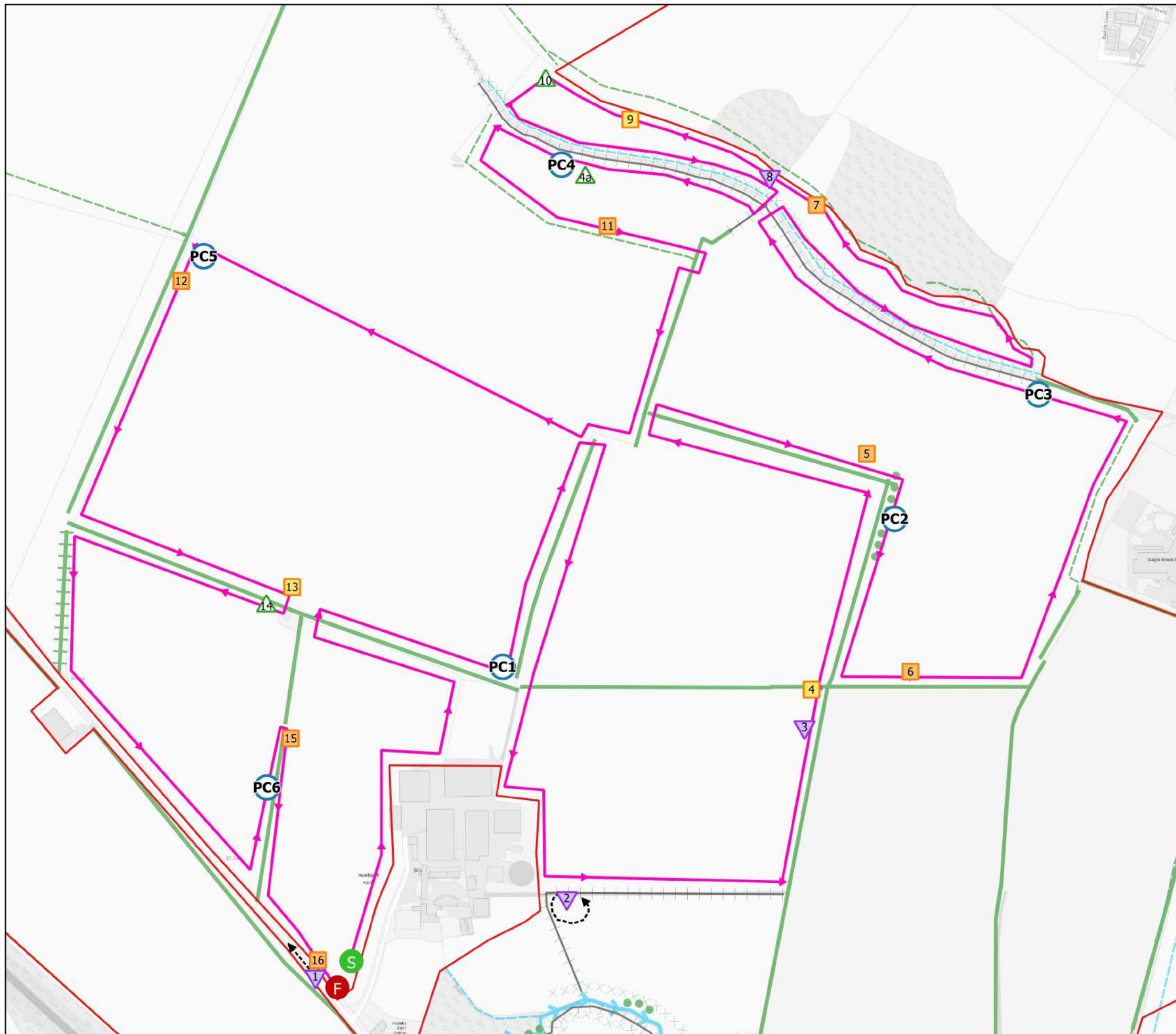
Client: Hallam Land
 Project: Land North of Bicester, Bicester
 Drawing Title: BAT TRANSECT PLAN - ROUTE 1 (20.09.21)
 Scale: A3 1:4000
 Drawing / Figure Number: Figure 7a
 Drawn: SFW / AMS
 Date: 25/10/2021

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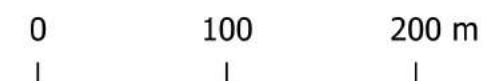
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Key:

- Site Boundary
- S Start point
- F Finish point
- PC1 Point Count (with ref.)
- ▶ Transect Route
- Bat Contacts (with ref.)**
- 5 Common Pipistrelle
- 4 Soprano Pipistrelle
- △ Myotis Species
- ▽ Noctule

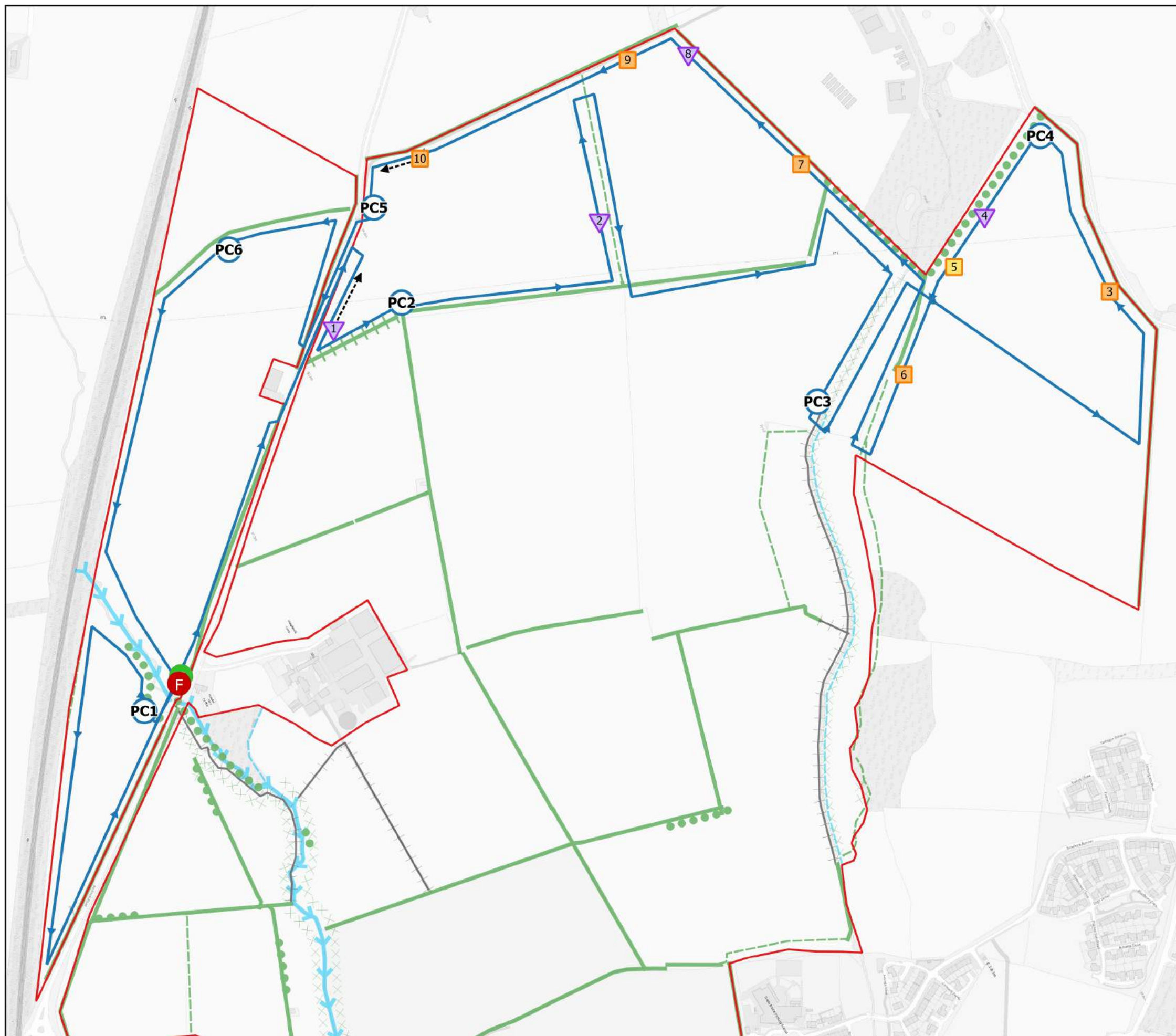


Plan Ref	Time	Species	Behaviour	Passes
1	19:12	Noctule	Foraging	1
PC1	19:20-19:25			-
2	19:42	Noctule	Foraging	1
3	19:47	Noctule	Commuting	1
4	19:48	Soprano pipistrelle	Commuting	2
5	19:59	Common pipistrelle	Foraging	Continuous
PC2	20:01-20:06			-
6	20:10	Common pipistrelle	Foraging	Continuous
PC3	20:25-20:30			-
7	20:47	Common pipistrelle	Foraging	3
8	20:49	Noctule	Commuting	1
9	20:50	Soprano pipistrelle	Foraging	Continuous
10	20:51	Myotis sp.	Commuting	1
PC4	20:59-21:04			-
4a	21:03	Myotis sp.	Commuting	1
11	21:06	Common pipistrelle	Foraging	Continuous
PC5	21:18-21:23			-
12	21:24	Common pipistrelle	Commuting	1
13	21:31	Soprano pipistrelle	Foraging	Continuous
14	21:32	Myotis sp.	Foraging	2
PC6	21:44-21:49			-
15	21:50	Common pipistrelle	Commuting	1
16	22:01	Common pipistrelle	Foraging	3



Client: **Hallam Land**
 Project: **Land North of Bicester, Bicester**
 Drawing Title: **BAT TRANSECT PLAN - ROUTE 2 (20.09.21)**

Scale: A3 1:4000
 Drawing / Figure Number: **Figure 7b**
 Drawn: SFW / AMS
 Date: 25/10/2021
 Rev: -



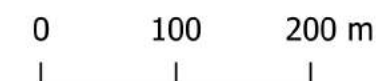
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Key:

- Site Boundary
- S Start point
- F Finish point
- PC1 Point Count (with ref.)
- Transect Route

Plan Ref	Time	Species	Behaviour	Passes
PC1	19:08-19:13			-
1	19:22	Noctule	Commuting	1
PC2	19:26-19:31			-
2	19:38	Noctule	Commuting	1
PC3	19:55-20:00			-
3a	19:56	Soprano pipistrelle	Foraging	Continuous
3b	19:59	Noctule	Commuting	1
3	20:14	Common pipistrelle	Commuting	1
PC4	20:19-20:24			-
4a	20:19	Common pipistrelle	Foraging	Continuous
4b	20:20	Barbastelle	Commuting	1
4	20:27	Noctule	Commuting	1
5	20:33	Soprano pipistrelle	Commuting	1
6	20:37	Common pipistrelle	Foraging	3
7	20:48	Common pipistrelle	Commuting	1
8	20:50	Noctule	Commuting	1
9	20:53	Common pipistrelle	Foraging	2
10	20:58	Common pipistrelle	Foraging	3
PC5	21:00-21:05			-
5a	21:04	Common pipistrelle	Foraging	2
PC6	21:20-21:25			-
6a	21:20	Common pipistrelle	Commuting	1



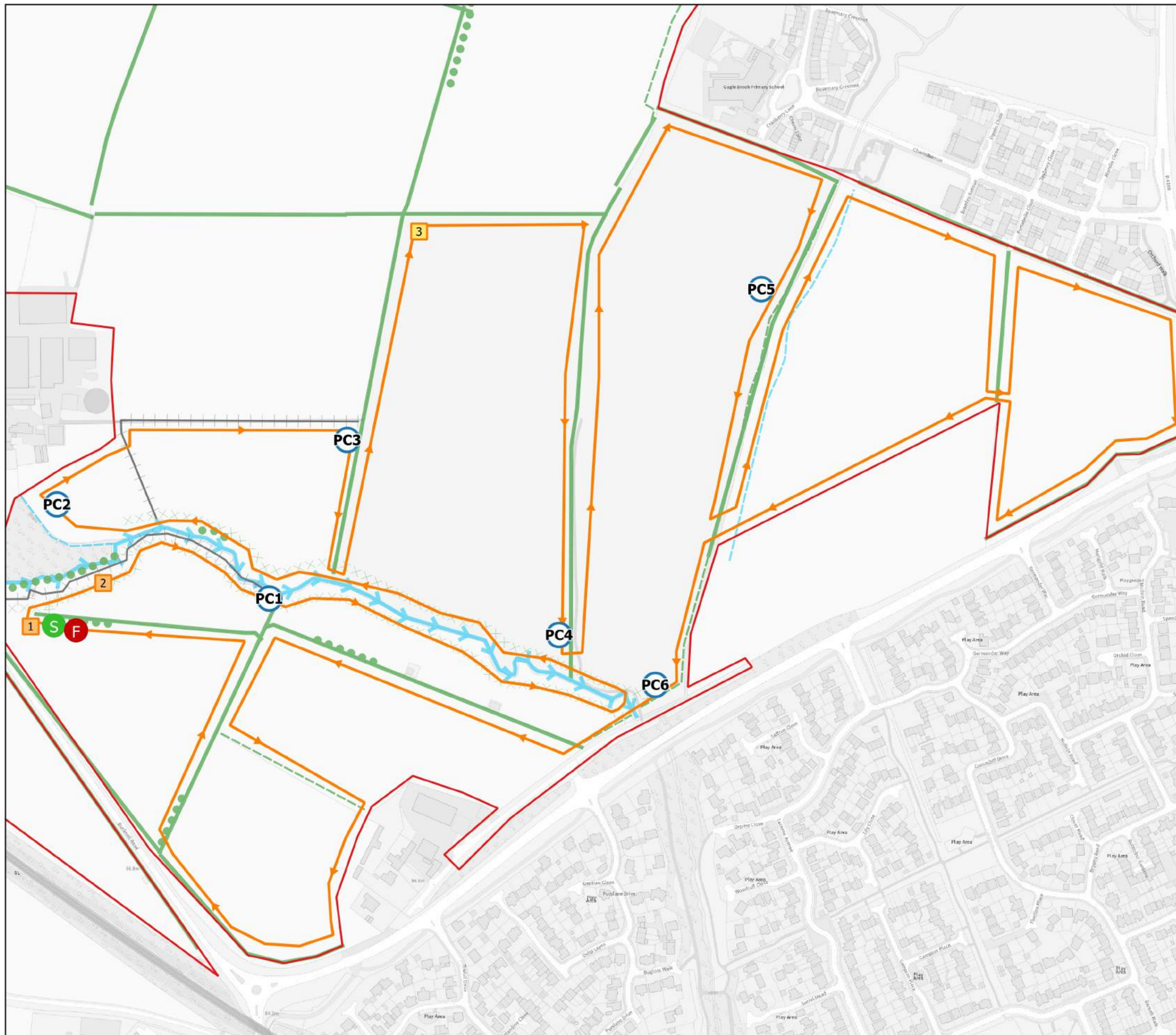

Client: Hallam Land
Project: Land North of Bicester, Bicester
Drawing Title: BAT TRANSECT PLAN - ROUTE 3 (20.09.21)
 scale: A3 1:5600 drawn: SFW / AMS issue: 2/11/2021
 drawing / figure number: rev: -
Figure 7c

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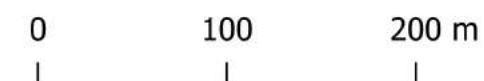
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Key:

- Site Boundary
 - S Start point
 - F Finish point
 - PC Point Count (with ref.)
 - Transect Route
- Bat Contacts (with ref.)**
- Common Pipistrelle
 - Soprano Pipistrelle



Plan Ref	Time	Species	Behaviour	Passes
1	03:48	Common pipistrelle	Foraging	3
2	03:53	Common pipistrelle	Commuting	1
PC1	03:57-04:02			-
1a	04:01	Brown long-eared	Commuting	1
PC2	04:21-04:26			-
2a	04:22	Myotis sp.	Commuting	1
PC3	04:32-04:37			-
3	04:47	Soprano pipistrelle	Commuting	1
PC4	05:06-05:11			-
PC5	05:20-05:31			-
PC6	06:04-06:09			-





Client: **Hallam Land**
 Project: **Land North of Bicester, Bicester**
 Drawing Title: **BAT TRANSECT PLAN - ROUTE 1 (21.09.21)**

Scale: A3 1:4000
 Drawing / Figure number: **Figure 8a**
 Drawn: SFW / AMS
 Date: 2/11/2021
 Rev: -

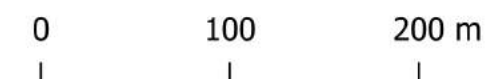
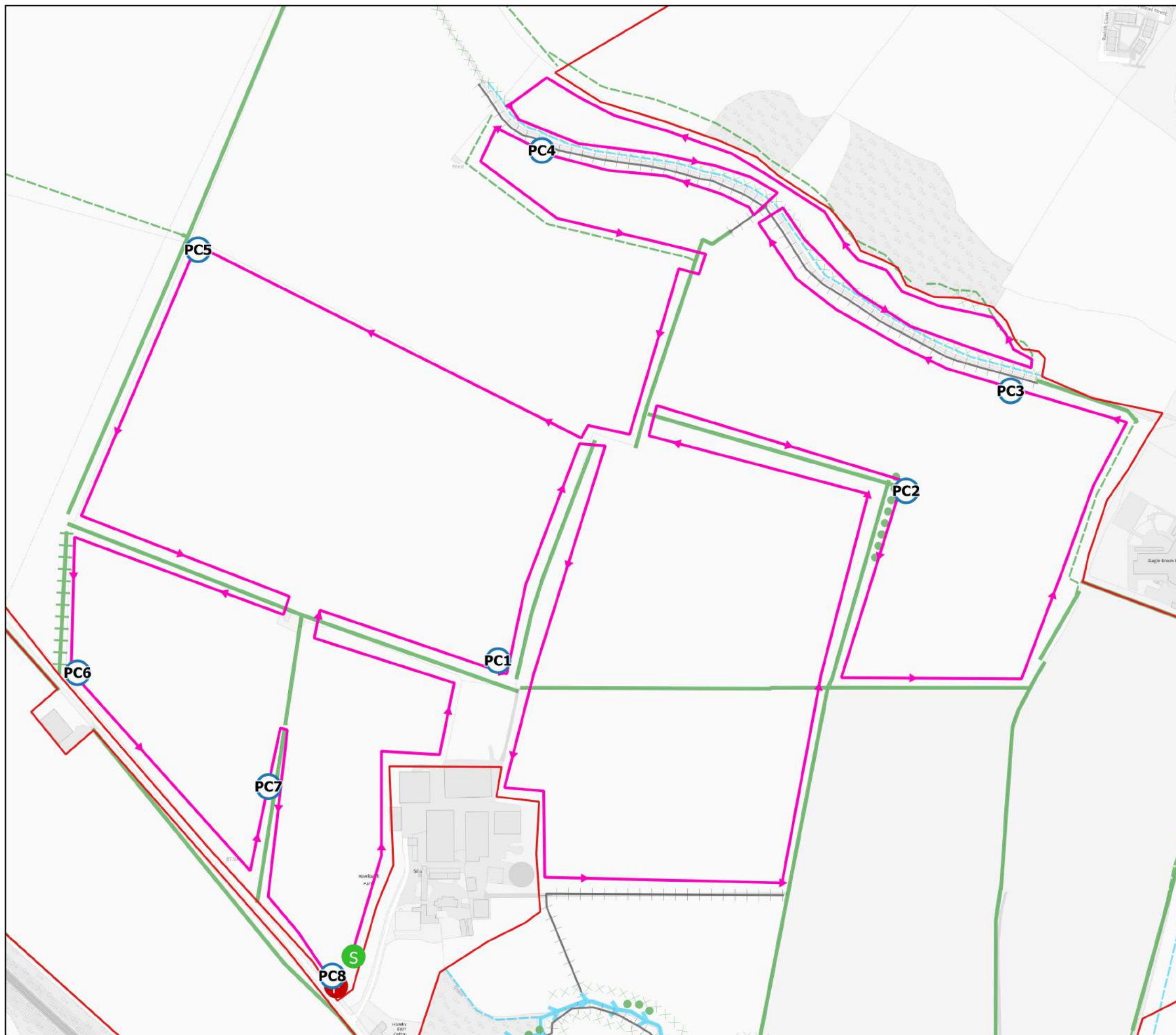
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Key:

-  Site Boundary
-  Start point
-  Finish point
-  Point Count (with ref.)
-  Transect Route

Plan Ref	Time	Species	Behaviour	Passes
PC1	03:58-04:03			-
PC2	04:28-04:33			-
PC3	04:44-04:49			-
PC4	05:16-05:21			-
PC5	05:40-5:50			-
PC6	06:05-06:15			-
PC7	06:23-06:33			-
PC8	06:39-06:49			-



Client: Hallam Land
 Project: Land North of Bicester, Bicester
 Drawing Title: BAT TRANSECT PLAN - ROUTE 2 (21.09.21)

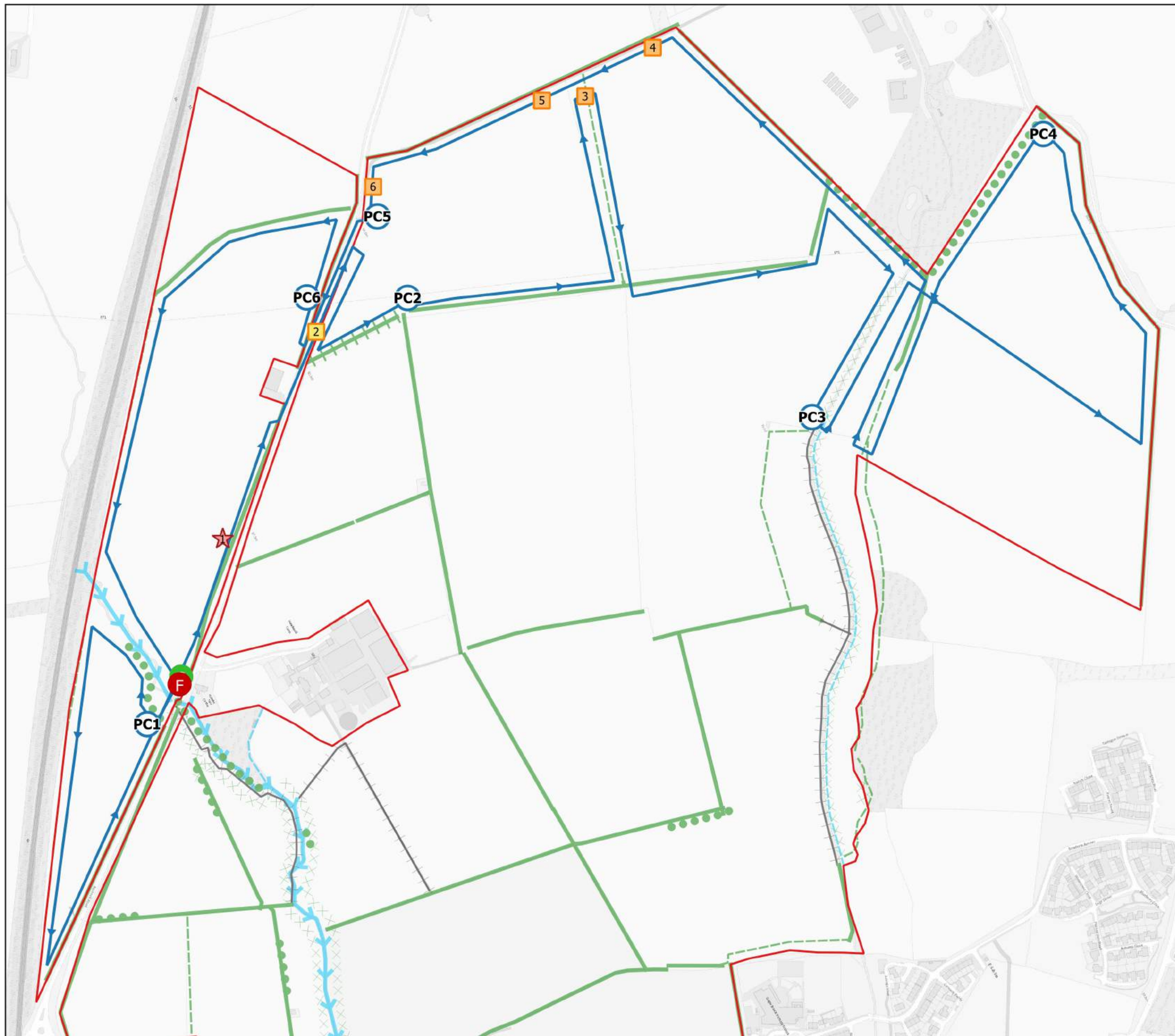
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 Date: 2/11/2021
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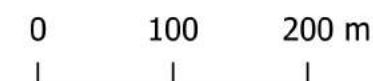
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Key:

- Site Boundary
- S Start point
- F Finish point
- PC Point Count (with ref.)
- Transect Route
- Bat Contacts (with ref.)**
- ★ Barbastelle
- Common Pipistrelle
- Soprano Pipistrelle



Plan Ref	Time	Species	Behaviour	Passes
PC1	3:49-03:54			-
1	04:05	Barbastelle	Commuting	1
2	04:09	Soprano pipistrelle	Foraging	4
PC2	04:17-04:22			-
3	04:30	Common pipistrelle	Foraging	2
PC3	04:45-04:50			-
PC4	05:13-05:17			-
4	05:42	Common pipistrelle	Foraging	3
5	05:46	Common pipistrelle	Foraging	3
6	05:54	Common pipistrelle	Commuting	1
PC5	06:00-06:05			-
5a	06:02	Common pipistrelle	Foraging	2
PC6	06:25-06:30			-



Client: Hallam Land
Project: Land North of Bicester, Bicester
Drawing Title: BAT TRANSECT PLAN - ROUTE 3 (21.09.21)
 scale: A3 1:5600 drawn: SFW / AMS issue: 2/11/2021
 drawing / figure number: rev: -
Figure 8c

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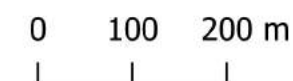
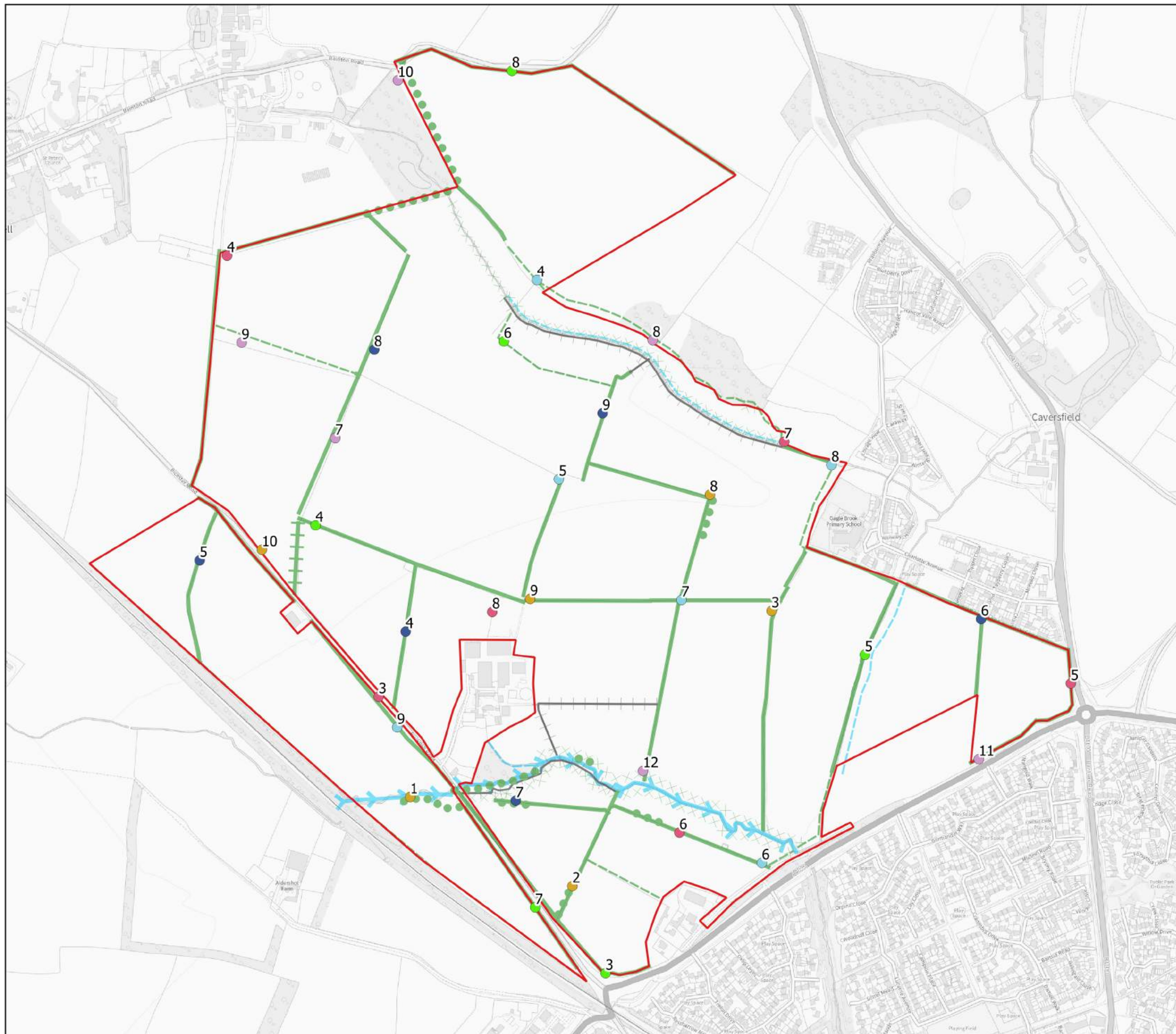
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Key:

Site Boundary

Static Detector Locations

- April
- May
- June
- July
- August
- September



Client: Hallam Land
Project: Land North of Bicester, Bicester
Drawing Title: STATIC DETECTOR LOCATION PLAN

Scale: A3 1:8000
Drawing / Figure Number: Figure 9
Drawn: SFW / AMS
Date: 2/11/2021