



Gladman Developments Ltd.

Land at the Hill, Littlebourne

Revised Ecological Appraisal

September 2023

FPCR Environment and Design Ltd

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1.0 NON-TECHNICAL SUMMARY

- 1.1 A residential development of up to 300 units, with associated landscaping and infrastructure, is proposed on a site located at the south-western edge of the village of Littlebourne, Kent.
- 1.2 The site lies within 15km of nine sites of international importance for nature conservation, namely (in order of proximity): Stodmarsh SPA/Ramsar; Blean Complex SAC; Parkgate Down SAC; Tankerton Slopes & Swalecliffe SAC; Lydden & Temple Ewell Downs SAC; The Swale SPA/SAC/Ramsar; Thanet Coast & Sandwich Bay SPA/Ramsar; Thanet Coast SAC; and Wye & Crundale SAC, the latter seven of which are more than 10km from the site. A Habitat Regulations Assessment (HRA) and Appropriate Assessment will be required, and FPCR have conducted a sHRA (September 2023) to inform the Local Planning Authority for their own assessment.
- 1.3 There are no Sites of Special Scientific Interest (SSSI) located within 2km of the site: except those included within the Stodmarsh SPA/Ramsar designation.
- 1.4 The site is largely of low ecological value and predominantly comprises cultivated arable farmland. Semi-mature trees, hedgerows, and a stream form the boundaries of the site. Of the five hedgerows within the survey area, four were of moderately high to high value under the Hedgerow Evaluation Grading System (HEGS), one was considered to be of moderate value. None of these hedgerows were assessed as being 'important' in accordance with the Hedgerow Regulations 1997. Four of the five hedgerows were Habitats of Principal Importance under the Natural Environment and Rural Communities (NERC) Act 2006.
- 1.5 No trees were identified as providing bat roost potential within the site boundaries and seasonal activity surveys identified ten species/species groups, dominated by commonly occurring and widespread species that were typically recorded in association with linear features.
- 1.6 Desktop studies identified that dormice *Muscardinus avellanarius* records exist in the nearby woodland to the west. Presence/likely absence surveys during 2021 found no evidence of dormouse presence on-site and are not a development constraint.
- 1.7 Reptile surveys conducted on-site in 2021 found a low population of grass snake and common lizard occurring in the field margins. The proposals for the site have the capacity to provide mitigation for the small numbers of reptiles present. A program of passive displacement will be adopted to carefully move reptiles from the working area, into retained habitat.
- 1.8 Water vole field signs were identified along the east-west section of the stream, which bisects the field in 2021. Implementation of wide buffer between the development and the stream will protect the species from disturbance, while provision of habitat enhancement measures, including attenuation features will provide additional habitat. Displacement, under licence from Natural England, may be required to facilitate works associated with the crossing between the northern and southern extents of the site.
- 1.9 Green infrastructure in the development will include attenuation features, allotments, a community orchard, public open greenspace, and tree belts. Further opportunities to enhance the development include planting native species in these areas of green infrastructure (GI), with an emphasis on species bearing nectar, berries, fruit, and nuts, to enhance the foraging opportunities, provision of bat and bird boxes, dead wood habitat and insect houses, and gaps should be left under garden fencing to allow movement of mammals and amphibians. These will all retain and enhance the use of the site by wildlife.

2.0 INTRODUCTION

- 2.1 The following Ecological Appraisal has been prepared by FPCR Environment and Design Ltd., on behalf of Gladman Developments Ltd., for land at the Hill, Littlebourne, Kent (central OS Grid Reference TR 20340 57416).
- 2.2 It provides the results of an initial Phase 1 Habitat and Preliminary Protected Species survey undertaken during January 2021, update walkovers conducted in June 2021 and May 2023, and subsequent protected species surveys, conducted throughout 2021 and spring/summer 2023. The objective of these surveys was to gain an understanding of the baseline ecology of the application site, and immediate surrounding area, and to determine whether the application site supports, or has the potential to support, protected, rare or otherwise notable species.
- 2.3 Please also see separate Badger Survey, Breeding Bird Survey and Shadow Habitats Regulations reports.

Site Context

- 2.4 The application site, approximately 15.77 ha in area, comprises the northern and southern extents of one larger arable field, bisected by a stream passing east to west. The field is bordered by arable margins, scattered scrub, and tall ruderal vegetation. The eastern edge of the northern extent of the field was bound by the stream, which passes north along the eastern boundary. Hedgerows form the northern and western boundaries of the northern extent, and the northern and south-eastern boundaries of the southern extent.
- 2.5 The site is situated on the south-western periphery of Littlebourne, east of Canterbury. The surrounding landscape to the north, south and west was predominantly comprised of a mosaic of arable farmland and woodland, including parts of the Trenley Park Woods Local Wildlife Site (LWS). Howlett's Wild Animal Park lies directly to the south. Canterbury Road (A257) runs along the northern boundary of the site, with Bekesbourne Lane directly parallel with the south-easternmost boundary.

Development Proposals

- 2.6 The proposals comprise a residential development of up to 300 units, with associated infrastructure. Approximately 6.79ha of green infrastructure (GI) will be incorporated, which will include allotments, a community orchard, trees and scrub, species-rich grassland, wetland, and public open space.
- 2.7 Sustainable drainage and wetland, including a Water Recycling Centre (WRC) will be implemented adjacent to the stream on the eastern boundary of the northern field extent, and the northeast corner of the southern field extent. These will form part of buffer strips that include attenuation ponds that will incorporate features of ecological benefit.
- 2.8 Habitat loss will be predominantly restricted to cultivated arable land, with associated margins. The majority of the hedgerow extent, and the stream on the eastern boundary will be retained, with the exception of a few small losses to the hedgerows along Canterbury Road and Bekesbourne Lane to facilitate vehicular and pedestrian access. New hedgerows and several lines of trees will be planted throughout.

- 2.9 Biodiversity Net Gain was calculated using the DEFRA Biodiversity Metric 4.0. Initial baseline conditions were determined by way of a walkover survey, which classified and graded habitats and hedgerows on-site. Loss of habitats and new land use were then estimated using Development Framework Plan **09538-FPCR-XX-XX-DR-L-0001 Issue P13 (2023)**.

3.0 METHODOLOGY

Background

- 3.1 In order to compile existing baseline information, relevant ecological information was requested from both statutory and non-statutory nature conservation organisations including;
- Kent and Medway Biological Records Centre (KMBRC)
- 3.2 The Multi Agency Geographic Information for the Countryside (MAGIC) website (www.magic.defra.gov.uk) has been reviewed for the presence of any statutory designated sites of international, national, or local conservation importance within 15km, 2km and 1km of the study area, respectively.
- 3.3 Further inspection of colour 1:25,000 OS base maps (www.ordnancesurvey.co.uk) and aerial photographs from Google Earth (www.maps.google.co.uk) was also undertaken in order to provide additional site context and identify any features of potential importance for nature conservation in the wider countryside.
- 3.4 The search area for biodiversity information was related to the significance of sites and species and potential zones of influence, as follows:
- European Protected Sites - 15km search around the application site for Internationally Important designated sites; comprised of Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar Sites.
 - Nationally Protected Sites - 2km search around the application site for Nationally Important designated sites; comprising Sites of Special Scientific Interest (SSSIs), and National Nature Reserves (NNRs).
 - Local Protected Sites - 1km search around the application site for locally protected and Non-statutory Designated Sites e.g., LNRs, County Wildlife Sites (CWS), Sites of Importance for Nature Conservation (SINC) and Local Wildlife Sites (LWS).
 - Legally protected and notable species: 1-2km search around the application site. Includes species protected under the Wildlife and Countryside Act 1981 (as amended)¹, the Conservation of Habitats and Species Regulations (Amendment) (EU Exit) (2019)², Protection of Badgers Act 1992³, and notable fauna included on the Biodiversity Action Plan, Red Data Book (RDB)⁴, Birds of Conservation Concern (BoCC) red & amber listed birds⁵ and Species of Principal Importance under the Natural Environment and Rural Communities Act (NERC) 2006⁶.

¹ Act of Parliament, (1981). The Wildlife and Countryside Act 1981 (as amended), London: HMSO

² Conservation of Habitats and Species Regulations 2019 (EU Exit) (as amended) <http://www.legislation.gov.uk/ukxi/2019/579/made>

³ *The Protection of Badgers Act 1992 (as amended)*. London: HMSO [Online]. Available from: <https://www.legislation.gov.uk/ukxi/2017/1012/contents/made>

⁴ The Vascular Plant Red Data List for Great Britain (2005), Cheffings, C. and Farrell, L. (Eds)

⁵ *Birds of Conservation Concern 5 (2021)*. British Trust for Ornithology [Online]. Available from: <http://www.bto.org/our-science/publications/birds-conservation-concern>

⁶ International Union for Conservation of Nature (IUCN), Red List 2012

- 3.5 Data sets have been restricted in the most part to the last ten years, this is to ensure that recent, most relevant, records of protected/notable species are reflected and prioritised. However, where a protected/notable species has been recorded over ten years ago, and there are no more recent records, then these have also been included in the summary of results.

Field Surveys

Habitats / Flora

- 3.6 The initial survey was undertaken on 12th January 2021, and followed the methodology outlined in the Handbook for Phase 1 Habitat Survey (JNCC)⁷, to identify specific habitats and features of ecological interest. Update walkover surveys were conducted on 7th June 2021 and 17th May 2023. These surveys comprised a systematic walkover of the application site mapping and broadly describing the principal habitat types and identifying the dominant plant species / communities present within each.
- 3.7 Each habitat was described based on botanical merit, with target notes used where appropriate to highlight features, or habitats, of particular interest. Structural features, such as trees, were considered regarding their ecological value and their potential to provide suitable habitats for protected species.
- 3.8 Consideration was given to the presence of invasive species listed on Schedule 9 of the Wildlife and Countryside Act (WCA)1981 (as amended) and under the Weed Act 1959⁸. Any rare or notable flora including those listed as priorities in the Post 2010 UK Biodiversity Framework⁹, species listed under the NERC Act, Local Biodiversity Action Plan (LBAP) Priority Species/Habitats, any IUCN Red listed, Red Data Book (RDB) and any national, regional, county or vice – county rarities were duly noted.

Hedgerows

- 3.9 Hedgerows were surveyed individually using the Hedgerow Evaluation and Grading System (HEGS)¹⁰. This method of assessment includes noting down canopy species composition, associated ground flora and climbers, structure of the hedgerow (including height, width, and gaps), number, and species of mature trees, and associated features, such as banks, ditches, and grass verges.
- 3.10 Each hedgerow is given a grade using HEGS with the suffixes '+' and '-', representing the upper and lower limits of each grade respectively. These grades represent a continuum on a scale from 1+ (the highest score and denoting hedges of the greatest nature conservation priority) to 4- (representing the lowest score and hedges of the least nature conservation priority) as follows:
- Grade -1, 1, 1+ High to Very High Value
 - Grade -2, 2, 2+ Moderately High to High Value
 - Grade -3, 3, 3+ Moderate Value
 - Grade -4, 4, 4+ Low Value

⁷ JNCC. (1990). Handbook for Phase 1 Habitat Survey – a technique for environmental audit. Peterborough: JNCC

⁸ Act of Parliament. (1959). The Weed Act 1959. London: HMSO

⁹JNCC and Defra (on behalf of the Four Countries' Biodiversity Group). 2012. *UK Post-2010 Biodiversity Framework*. July 2012

¹⁰ Clements, D. & Toft, R. (1992). *Hedgerow Evaluation and Grading System (HEGS) – a methodology for the ecological survey, evaluation and grading of hedgerows*. Countryside Planning and Management

- 3.11 Hedgerows graded 1 or 2 are considered to be a priority for nature conservation.
- 3.12 The hedgerows were also assessed for their potential ecological value under the Hedgerow Regulations 1997 (Statutory Instrument No: 1160)¹¹ to determine whether they qualified as 'Important Hedgerows' under the Regulations. This broadly follows the above methodology, although an average number of canopy species per 30m is calculated, dependant on the length of hedgerow. Additional features which enhance hedgerows, when found in association with the hedge, such as mature trees, ditches, hedge banks and connections are also considered. This methodology is broadly consistent with that outlined in The Hedgerow Survey Handbook (DEFRA, 2007)¹².
- 3.13 Hedgerows were also assessed to determine if they met the habitat descriptions for Hedgerow Habitat of Principal Importance as listed within Section 41 of the NERC Act, (i.e., whether they consisted of 80% or more native species). Hedgerows are also considered a priority habitat in the Kent Biodiversity Action Plan¹³.
- 3.14 It should be noted that hedgerows may also qualify as important under the Archaeological criteria of this Act, which is beyond the scope of this assessment.

Fauna

- 3.15 During the surveys of the application site, observations, signs, or suitable habitat for any species protected under Part 1 of the Wildlife and Countryside Act 1981 (as amended), the Conservation of Habitats and Species Regulations (As amended, 2019) and the Protection of Badgers Act 1992 were noted, with particular attention being given to the potential presence of bats, great crested newt *Triturus cristatus*, badger *Meles meles*, hazel dormouse *Muscardinus avellanarius* and reptiles. Due consideration was also given to any other species included on Schedule 5 of the WCA 1981 (as amended) that may be present.
- 3.16 Throughout the survey, consideration was also given to the existence and use of the application site by other protected species, or locally notable fauna, such as species of principal importance, as listed on Section 41 of the NERC Act (2006), red & amber listed Birds of Conservation Concern (BoCC), and any Local Biodiversity Action Plan (LBAP) or Red Data Book (RDB) species.
- 3.17 The standard survey methodology was extended to assess the potential presence of protected species within features such as buildings and trees. These features were individually assessed for their ecological value and potential to provide suitable habitats for protected species.

Bats

Tree Roost Assessments

- 3.18 Tree assessments were undertaken from ground level, with the aid of a torch and binoculars (where appropriate). These surveys were undertaken in January and June 2021 by an experienced ecologist from FPCR.

¹¹ *The Hedgerow Regulations 1997 – Statutory Instrument 1997 No. 1160*. [Online]. London: HMSO. Available at: <http://www.legislation.gov.uk/ukSI/1997/1160/contents/made>

¹² DEFRA (2007). *Hedgerow Survey Handbook: A standard procedure for local surveys in the UK*

¹³ Kent Nature Partnership Biodiversity Strategy – 2018 – 2044 (2019) Kent Nature Partnership

- 3.19 During the survey Potential Roosting Features (PRF) for bats such as the following were sought (Based on p.16, British Standard 8596:2015 Surveying for bats in trees and woodland, October 2015)¹⁵:
- Natural holes (e.g., knot holes) arising from naturally shed branches or branches previously pruned back to a branch collar
 - Man-made holes that have developed from flush cuts or cavities created by branches tearing out from parent stems
 - Woodpecker holes
 - Cracks/splits in stems or branches (horizontal and vertical)
 - Partially detached or loose bark plates
 - Cankers (caused by localised bark death) in which cavities have developed
 - Other hollows or cavities, including butt rots
 - Compression of forks with included 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; and
 - Other suitable places of rest or shelter.
- 3.20 Certain factors, such as orientation of the feature, its height from the ground, direct surroundings, and its location in respect to other features may enhance or reduce the potential value.
- 3.21 Trees were classified into general bat roost potential groups based upon 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 the Bat Conservation Trust (BCT) guidance¹⁶.
- 3.22 Although the British Standard 8596:2015 document groups trees with moderate and high potential, these have been separated below (as per Table 4.1 in BCT Guidelines) to allow more specific survey criteria to be applied, particularly with reference to the definition of a breeding site or resting place as described in the Habitat Regulations.

¹⁵ Surveying for Bats in Trees and Woodland – Guide. British Standards Institution. BS8596:2015, UK

¹⁶ Collins, J. (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

Table 1. Bat Roosting Potential Categories for Trees

Classification of Tree	Description of Category and Associated Features (based on Potential Roosting Features listed above)	Likely Further Survey Work / Actions
Confirmed Roost	Evidence of roosting bats in the form of live / dead bats, droppings, urine staining, mammalian fur oil staining, etc.	<p>A Natural England derogation licence application will be required if the tree or roost site is affected by the development or proposed arboricultural works. This will require a combination of aerial assessment by roped access bat workers (where possible, health and safety constraints allowing) and nocturnal survey during appropriate periods (e.g., nocturnal survey - May to August) to inform on the licence.</p> <p>Works to tree undertaken under supervision in accordance with the approved good practice method statement provided within the licence.</p> <p>However, where confirmed roost site(s) are not affected by works, work under a precautionary good practice method statement may be possible.</p>
High Potential	<p>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.</p> <p>Examples include (but are not limited to); woodpecker holes, larger cavities, hollow trunks, hazard beams, etc.</p>	<p>Aerial assessment by roped access bat workers (if appropriate) and / or nocturnal survey during appropriate period (May to August).</p> <p>Following additional assessments, tree may be upgraded or downgraded based on findings.</p> <p>If roost sites are confirmed and the tree or roost is to be affected by proposals a licence from Natural England will be required.</p> <p>After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may still be appropriate.</p>
Moderate Potential	<p>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).</p> <p>Examples include (but are not limited to); woodpecker holes, rot cavities, branch socket cavities, etc.</p>	<p>A combination of aerial assessment by roped access bat workers and / or nocturnal survey during appropriate period (May to August).</p> <p>Following additional assessments, tree may be upgraded or downgraded based on findings.</p> <p>After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may still be appropriate.</p> <p>If a roost site/s is confirmed a licence from Natural England will be required.</p>
Low Potential	<p>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.</p> <p>Examples include (but are not limited to); loose/lifted bark, shallow splits exposed to elements or upward facing holes.</p>	<p>No further survey required but a precautionary working method statement may be appropriate.</p>
Negligible / No potential	Negligible/no habitat features likely to be used by roosting bats	None.

* The Conservation of Habitats & Species Regulations 2017 (as amended) affords protection to “breeding sites” and “resting places” of bats. The EU Commission’s Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC, February 2007 states that these are places “where there is a reasonably high probability that the species concerned will return”.

Manual Activity Transect Surveys

- 3.23 BCT guidance (2016) recommends that *'the type of survey undertaken, and the amount of effort expended should be proportionate to the predicted impacts of the proposed activities on bats'*. This draws on the ecologist's assessment of the roosting, commuting and foraging habitats present within the site and their suitability for bats. *Table 4.1* within the BCT guidance identifies the characteristics of the habitats which fall within each level of suitability (Negligible, Low, Moderate and High), with survey effort proportional to the evaluation, as identified in *Table 8.1* of the BCT guidance.
- 3.24 Under this guidance the application site, was considered to be of low-moderate habitat suitability and falls under the seasonal survey requirement. This requires activity transects and static surveys to be done on a seasonal basis, spring (April/May), summer (June to August) and autumn (September/October).
- 3.25 The primary objective of transect surveys is to identify foraging areas, commuting routes, and general species utilisation of the application site. In line with the BCT guidance, the transect route for each manual activity survey was pre-determined prior to the commencement of the survey and designed to ensure representative coverage of the various habitat types present across most of the application site and wider survey area.
- 3.26 In addition to the walked transect element of the manual activity survey, the route included several stops at point counts. The point counts were strategically located throughout the application site, and wider survey area, to ensure a comprehensive coverage of the various habitats present, with particular attention given to areas likely to be impacted by the development. In line with BCT guidance point counts were standardised at five minutes long, during which time all bat activity was recorded. Dusk surveys commenced at sunset and continued for two to three hours after.
- 3.27 Transects were walked at a steady pace using an Apple iPad mini, with an Echo Meter Touch (Wildlife Acoustics Version 2.0.4) microphone. The associated software identifies and tags sound files that it suggests are bat passes; with the data recorded during these surveys supplemented by written notes documenting bat activity present on site, identifying any key foraging, and commuting routes.
- 3.28 Post-survey, bat calls were analysed using Kaleidoscope Viewer version 5.1.3 (Wildlife Acoustics Inc.), by taking measurements of the peak frequency, inter-pulse interval, call duration and the end frequency of individual pulses. Analysis was undertaken by experienced ecologists from FPCR. From this, the level of bat activity across the site could be assessed, taking into account the species assemblage and spatial variation in activity across the different habitats present within the application boundaries.
- 3.29 The timings and weather conditions for the transect surveys are detailed in *Table 2* below.

Table 2. Nocturnal Activity Survey Timings and Weather Conditions

Survey Ref./ Date	Survey Type	Start Time	Sunset/rise Time	Finish Time	Weather Conditions (temp °C; cloud cover %; wind; and rain)
Transect 1 – 19 th May 2021	Dusk Transect	20:45	20:45	22:48	11 - 8°C, 50-60% cloud cover, light air, no rain
Transect 2 – 19 th July 2021	Dusk Transect	21:01	21:01	23:08	17 - 16°C, no cloud cover, no wind, no rain
Transect 3 – 22 nd September 2021	Dusk Transect	18:55	18:55	20:55	21 - 18°C, 20-30% cloud cover, no wind, no rain

Automated Activity Surveys

- 3.30 Static, broadband detectors were deployed on-site during 2021 to supplement the transect surveys. These automated, passive logging systems (Wildlife Acoustics Inc. Song Meter SM4BAT FS detectors, with SMM_U2 mics), herein referred to as SM4BAT or static detectors, save all acoustic recordings onto an internal storage device (SD card) for later analysis. These were positioned at locations where habitats would be impacted as a result of development, and at locations that were considered to be suitable as possible bat navigational / foraging routes.
- 3.31 During each season two SM4BAT detectors were placed in a suitable location within the application site for a minimum of five nights of suitable and / or typical weather conditions. Each detector was programmed to activate 30 minutes before dusk, and to record continuously until 30 minutes after sunrise each day. The output from each detector was then subject to acoustic analysis, using the software package Kaleidoscope Viewer version 5.1.3 (Wildlife Acoustics Inc.).
- 3.32 The SM4BAT detector records sound files of up to 12 seconds in length before a new file is created. The analysis of the files recorded by the SM4BAT can highlight the presence of more than one bat if they are recorded simultaneously on the same sound file. However, it is not possible to determine whether consecutive sound files have been recorded as the result of a single bat passing the detector, as it commutes across the landscape, or by one bat repeatedly triggering the detector as it forages in close proximity for an extended period. Therefore, each sound file is counted as a single bat pass or registration. The number of bat registrations reflects the relative importance of the detector's location, by calculating the bat registrations per hour.
- 3.33 The timings of each automated activity survey undertaken, and a corresponding description of the static detector unit locations are detailed in *Table 3* below, with the locations also shown on *Figure 2 – Phase 1 Habitat Plan*.

Table 3. Static Detector Survey Dates

Position (Figure 2)	Periods Recorded	Area Covered
A	19 th – 24 th May 2021	At the southern end of hedgerow H1, on the corner with the perpendicular hedge (off-site)
B	19 th – 24 th May 2021	Centrally along hedgerow H2 along the northern boundary of the application site
C	12 th – 17 th July 2021	At the northern end of hedgerow H1, on the corner with the perpendicular hedge (H2)
D	12 th – 17 th July 2021	At western end of hedgerow H3, perpendicular with Bekesbourne Lane
E	22 nd – 27 th Sept 2021	At eastern end of hedgerow H5, which passes parallel with Bekesbourne Lane
F	22 nd – 27 th Sept 2021	Eastern end of hedgerow H2 along the northern boundary of the application site

Dormouse Survey

- 3.34 Dormouse presence / likely absence surveys were undertaken in accordance with current good practice guidelines, as outlined within *The Dormouse Conservation Handbook*¹⁷. Surveys involved installing standard dormouse nest tubes, at approximately 20m intervals, within areas of suitable habitat on-site, between 1.5 and 2m above ground level.

¹⁷ Bright, Morris & Mitchell-Jones (2006) *The Dormouse Conservation Handbook*. English Nature, Peterborough.

- 3.35 Fifty tubes were installed on 9th April 2021, with surveys of the tubes undertaken between May and November (inclusive) 2021, in order to ascertain presence / likely absence of dormice. The survey results are used in conjunction with an index of probability, which indicates the likelihood of finding dormice during this active period (see *Table 4*).

Table 4. Index of Probability for Recording Dormice in Nesting Tubes

Month	Index of Probability
April	1
May	4
June	2
July	2
August	5
September	7
October	2
November	2

- 3.36 The survey has been scored for effort according to the method developed from the South West Dormouse Project¹⁸. The scoring system provides an overall index of effort by multiplying the sum of the months the tubes were checked, by the number of tubes used. A score of 20 (or above) is deemed a thorough survey.
- 3.37 The number of tubes used is based on 50 as a standard (i.e., 50 = 1), with fewer tubes reducing the overall score and more tubes increasing the score (i.e., 25 tubes halves the score to 0.5 and 100 tubes doubles the score to 2).

Herpetofauna

- 3.38 Habitats were evaluated for their potential to support amphibians and reptiles (collectively termed herpetofauna), following guidance set out within the Herpetofauna Workers Manual¹⁹, these include aquatic habitats, south facing banks and field margins, transitional areas between long and short vegetation, as well as other habitats or features that provide basking, hibernation, and/or sheltering opportunities.

Habitat Suitability Index (HSI)

- 3.39 Where access was granted and where there were no barriers to dispersal, waterbodies within a 250m radius of the site were assessed, using the Habitat Suitability Index (HSI), to determine their suitability to support great crested newts (GCN).
- 3.40 The HSI score provides a measure of the likelihood that a waterbody will support breeding newts²⁰. In general, waterbodies with a higher score are more likely to support GCN than those with a lower score, and there is a positive correlation between HSI scores and waterbodies with newts recorded. Ten separate attributes are assessed for each waterbody:

¹⁸ Chanin & Woods (2003) English Nature Report No. 524 on nest tube surveying. English Nature, Peterborough.

¹⁹ Gent, T., & Gibson, S. [Eds.]. (2003) *Herpetofauna Workers Manual*. Peterborough: Joint Nature Conservation Committee.

²⁰ Oldham, R.S., Keeble, J., Swan, M.J.S., & Jeffcote, M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal* 10 (4), 143 - 155

- Geographic location
- Pond area
- Pond drying
- Water quality
- Shade
- Presence of waterfowl
- Presence of fish
- Number of linked ponds
- Terrestrial habitat; and
- Macrophytic vegetation coverage

3.41 A score is assigned according to the most appropriate criteria level set within each attribute, and a total score is calculated of between 0 and 1. Pond suitability is then determined according to the following scale:

Table 5: Habitat Suitability Index Scores and Pond Suitability

HSI Score	Pond Suitability
<0.5	Poor
0.5 – 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

Reptiles

- 3.42 A strategic reptile survey, assessing presence/likely absence of UK species, was undertaken within the application site, at specific locations that were identified as offering potential, suitable reptile habitat. These surveys were undertaken based on the methodologies detailed in the Herpetofauna Workers Manual²¹, the Froglife Advice Sheet 10 - Reptile Survey²² and Reptiles: Guidance for Developers²³.
- 3.43 Methods of survey involved a search for basking reptiles on/under naturally occurring and strategically positioned artificial refugia. These were placed in locations that offered the most suitable habitat for common reptiles, i.e., structurally diverse grassland habitats, with areas of bare ground or short vegetation, and field margins.
- 3.44 Seventy-five artificial refugia (0.5m² sections of roofing felt) were placed within the site, in habitats considered most suitable for reptiles on 9th April 2021. Suitable habitat was limited to the semi-improved grassland margins along the banks of the stream, tall ruderal vegetation along the southern edge of the southern field extent, and the small area of semi-improved grassland to the southwest of the stream (TN1 *Figure 2*).

²¹ Gent, T & Gibson, S (2003) Herpetofauna Worker's Manual. JNCC, Peterborough.

²² Froglife (2016) Reptile Survey; an introduction to planning, conducting, and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife, Halesworth.

²³ English Nature (2004) Reptiles: guidance for developers. English Nature, Peterborough.

3.45 This is in accordance with Froglife Advice Sheet 10 (2016), which recommends that refugia should be placed at a density of between five and ten per hectare of suitable habitat. Refugia were left to 'bed in' for approximately 2 weeks, followed by seven separate surveys, each of which will be undertaken in accordance with the following guidelines:

- At temperatures of between 9°C - 20°C
- On sunny / cloudy days with little or no wind
- Approaching refugia from downwind, avoiding casting a shadow, and with care so as to not disturb basking animals when checking; and
- That lifting and replacing tins is undertaken with particular care when checking for the presence of reptiles underneath in hot weather, to avoid potential harm to any animals taking refuge underneath.

3.46 Seven surveys were completed in total, as per guidelines, with the date and weather conditions for each survey detailed in *Table 6* below:

Table 6. Reptile Survey Dates and Weather Conditions

Survey Occasion	Date & Time	Weather
1	11/05/2021 11:30	Sunny and bright conditions, with light breeze, cloud cover 10-20%, no rain, 17°C
2	19/05/2021 18:30	Sunny intervals, with light breeze, cloud cover 90-100%, light rain, rain earlier in the day, 14°C
3	26/05/2021 09.45	Sunny conditions, with light/moderate breeze, cloud cover 70-80%, no rain, 12°C
4	07/06/2021 09:10	Sunny, clear, and bright conditions, with light air, cloud cover 0-10%, no rain, 19°C
5	23/09/2021 09:30	Sunny, clear, and bright conditions, with light air, cloud cover 10-20%, no rain, 15°C
6	07/10/2021 10:00	Sunny, clear, and bright conditions, with light air, cloud cover 0-10%, no rain, 13°C
7	13/10/2021 13:25	Sunny, clear, and bright conditions, with light breeze, cloud cover 10-20%, no rain, 13°C

3.47 Reptile populations were assessed in accordance with specific criteria per population level, as stated in the Key Reptile Site Register²⁴. This system classifies populations of individual reptile species into three population categories, that in turn provide an assessment of the importance of the population (*Table 7*). These categories are based on the peak number of adult animals observed during individual survey occasions.

Table 7. Key Reptile Site Survey Assessment Categories (Froglife Advice Sheet 10)

Species	Low Population (No. of Individuals)	Good Population (No. of Individuals)	Exceptional Population (No. of Individuals)
Adder	<5	5-10	>10
Common lizard	<5	5-20	>20
Grass snake	<5	5-10	>10
Slow worm	<5	5-20	>20

²⁴ Froglife (2016) *Reptile Survey; an introduction to planning, conducting, and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10*. Froglife, Halesworth.

Constraints

- 3.48 Desk study: The species data collated for the desk study is derived from records submitted by members of the public and from specialist volunteer group surveys. It does not represent a definitive list of species that occur in the local area, and the absence of records does not necessarily imply the absence of a given species.
- 3.49 Bats: Due to the variable properties of bat echolocation calls it is not always possible to identify a series of echolocation calls down to species level. In most cases, it was possible to identify to genus level, which is suitable to allow potential affects to be assessed and appropriate mitigation designed. The static detector units also do not discern between individual bats or a single bat passing the microphone several times and therefore, the data recorded can only provide an indication of the level bat of activity, recorded as bat registrations per unit time, and not the number of bats present.
- 3.50 Reptiles: Due to the intervention of a local resident, the first reptile survey was completed with around half the complement of artificial refugia set out in April. Missing refugia were replaced and labelled with a notice for the public to avoid disturbing them. Subsequent surveys were completed with the number of refugia originally deployed in April. In September, some refugia were damaged by the plough, and so were redeployed before continuing the survey.
- 3.51 Water Vole: late in the year the section of S1 parallel with the eastern edge of the application site was cleared of debris and re-profiled as part of routine farm management work, leaving the banks relatively bare of vegetation; no water vole burrows were observed. The east-west section of S1, which divides the field, was dense vegetation making a search for possible water vole burrows more difficult and some evidence may have been missed.

4.0 RESULTS

Desk Study

Statutory and Non-Statutory Sites of Nature Conservation Importance

Statutory Sites of International Conservation Value

- 4.1 The nearest of these is Stodmarsh SPA and Ramsar wetland. The site, also designated as a SAC, lies approximately 2.3km north of the site boundary. Stodmarsh supports several uncommon wetland invertebrate and plant species, and provides wintering habitats for a wide variety of wetland birds. It is especially notable in winter for supporting significant numbers of Hen Harrier *Circus cyaneus* and Bittern *Botaurus stellaris*.
- 4.2 Blean Complex SAC lies approximately 5.9km north of the site, at its nearest extent, and comprises a complex network of woodlands that encompasses of Church Woods (Blean) SSSI, East Blean Woods SSSI and Ellenden Wood SSSI. It is designated for its importance as an oak-hornbeam forest habitat, for which it is one of only two known outstanding localities in the UK.
- 4.3 Parkgate Down SAC is situated approximately 11.4km southwest and comprises a 6.92ha area of dry grassland and deciduous woodland. The site is designated for its semi-natural dry grassland and scrubland facies on calcareous substrates that supports an outstanding assemblage of orchid species, including the nationally rare monkey orchid *Orchis simia* and late spider orchid *Orphrys fuciflora* and the nationally scarce musk orchid *Herminium monorchis* and lady orchid *Orchis purpurea*.
- 4.4 Tankerton Slopes & Swalecliffe SAC lies approximately 11.3km northwest of the site. The area has been designated for its importance in supporting Fisher's estuarine moth *Gortyna borellii lunata*, which has a localised population distribution in the UK due to its specific habitat requirements. Tankerton slopes & Swalecliffe supports the entire north Kent population of this moth, which in turn constitutes approximately 20% of the UK population. The site's north facing slopes are composed of London Clay and support a tall herb community dominated by its food plant (hog's fennel *Peucedanum officinale*), together with areas of neutral grassland that are also required by the species for egg laying.
- 4.5 Lydden & Temple Ewell Downs SAC is sited approximately 12.4km southeast of the site and comprises a 62.77ha area dominated by dry grassland, with limited extents of deciduous woodland and heathland also present. The site is designated for supporting semi-natural dry grassland and scrubland facies on calcareous substrates, an annex I listed priority habitat and important orchid site.
- 4.6 The Swale Ramsar, SPA, SAC and SSSI, lies approximately 12.8km northwest of the site boundary and includes the largest remaining area of freshwater grazing marsh in Kent. These habitats chiefly comprise mudflats, saltmarsh, and freshwater grazing marsh, the latter being intersected by extensive dykes and fleets.
- 4.7 The area is particularly notable for the internationally important numbers of wildfowl and waders, both overwinter and on passage, as well as important breeding populations of several bird species. Also associated with the various constituent habitats of the site are outstanding assemblages of plants and invertebrates.

- 4.8 Thanet Coast & Sandwich Bay SPA and Ramsar site lies approximately 13.1km east of the application site at its nearest point. The two areas are coastal in nature, consisting of a long stretch of rocky shore, with adjoining areas of estuary, sand dune, maritime grassland, saltmarsh, and grazing marsh. The wetland habitats support 15 British Red Data Book invertebrates, as well as several nationally scarce species. The site attracts internationally important numbers of turnstone *Arenaria interpres*, and nationally important wintering populations of four wader species: ringed plover *Charadrius hiaticula*, golden plover *Pluvialis apricaria*, grey plover *P. squatarola* and sanderling *Calidris alba*, as well as Lapland bunting *Calcarius lapponicus*. The site is also used by large numbers of migratory birds.
- 4.9 Thanet Coast SAC is a 2,815ha area that lies coincident with part of the eastern length of coastline included within the Thanet Coast & Sandwich Bay SPA boundary. The area largely comprises marine habitat and coastal inlets, with mudflats, estuaries, and lagoons. Two priority annex I habitats are represented in the SAC site that are primary reasons for its designation; reefs on soft chalk and submerged or partially submerged sea caves. The Thanet coast supports 20% of the UK resource for reef of this type and hosts several endemic algal species. An extensive network of chalk caves, the second largest in the UK, is also found along the coastline, which supports various endemic algae and lichens.
- 4.10 Wye & Crundale SAC is located approximately 13.5km southwest of the application site and hosts the annex I listed priority habitat “semi-natural dry grassland and scrubland facies on calcareous substrates” that support an important assemblage of orchid species, including several rare, scarce, and uncommon orchids, including late spider orchid, burnt orchid *Orchis ustulata*, and lady orchid *Orchis purpurea*.

Statutory Sites of National Conservation Value

- 4.11 There are no statutorily designated sites of national importance, located within 2km of the site. However, several of the SPA, Ramsar and SAC boundaries overlap with those of SSSI sites that share their extents. The nearest of these is Stodmarsh SSSI, 2.3km north, which closely follows the boundaries of the SPA and Ramsar site.

Non-Statutory Sites of Local Conservation Interest

- 4.12 There are two Local Wildlife Sites (LWS) present within 1km of the site, the closest of which is Trenley Park Wood, Fordwich, located 0.15km to the northwest of the site at its nearest extent (*Figure 1: Consultation Plan*). The woodland complex is comprised of a large network of neighbouring stands of ancient woodland, connected via a series of hedgerows and narrow woodland belts situated between them. All LWS within 1km of the site are listed along with a description of their defining attributes in *Table 8* below.

Table 8. Non-Statutory Sites of Local Conservation Value within 1km

Site Name	Designation	Approximate Distance & Direction from Site	Summary Description
Trenley Park Wood, Fordwich	LWS	0.15km NW	An extensive woodland area on stony, coarse, well-drained soils. The woodlands are a part of Trenley Park, the oldest documented deer park in Kent. The area designated as the Local Wildlife Site consists of a large ancient woodland complex on acid soils, with some former sand pits.

Site Name	Designation	Approximate Distance & Direction from Site	Summary Description
			These are compartmentalised and fragmented by roads, agricultural land, and sand pits. Management varies, some are actively coppiced, others are unmanaged. Flora is varied, and the woods support notable populations of woodland birds.
Littlebourne Stream	LWS	0.32km SE	An area of wetland comprised of a mix of wet grassland, deciduous woodland, watercress beds and standing water associated with the Little Stour River, and connecting ditches and dikes, that passes southwest across the site.

Protected / Notable Species Records

- 4.13 Records of protected or otherwise notable taxa provided by KMBRC, within 1-2km of the application site boundary, are listed in *Table 9* below. Locations of these records are presented on *Figure 1: Consultation Plan*.
- 4.14 While historical records were provided, only those dating back to 2010 were included, while bird records were limited to those included on the BoCC Amber/Red lists, or on the Wildlife and Countryside Act Schedule 1, unless otherwise considered a notable species.
- 4.15 A proportion of the bird data provided by KMBRC was of low resolution, with 4-figure or fewer grid references. The resolution of these records is not detailed enough to enable them to be plotted accurately on the consultation plan. These notable species included, but were not limited to, white-fronted goose *Anser albifrons*, greylag goose *A. anser*, grey partridge *Perdix perdix*, lapwing *Vanellus vanellus*, stock dove *Columba oenas*, short-eared owl *Asio flammeus*, skylark *Alauda arvensis*, yellow wagtail *Motacilla flava*, starling *Sturnus vulgaris*, house sparrow *Passer domesticus*, marsh tit *Parus palustris*, linnet *Carduelis cannabina*, yellowhammer *Emberiza citrinella*, and corn bunting *Miliaria calandra*.
- 4.16 Several bat records were returned, four of which referred to roosts; one of which contained common pipistrelles (located 1.69km southwest of the application site), one with unidentified *Pipistrellus* species (located 0.43km northeast), and two that supported brown long-eared bats (located 1.57km and 1.59km northeast). In addition, there were three records corresponding to hibernating bats, each presumed to have been found at a hibernation roost. These were of Natterer’s bat, unidentified *Myotis* species, and a brown long-eared bat, all three of which were located 0.71km southeast of the site.
- 4.17 Records of other notable species, older than ten years, were also identified from within the local area. These included invertebrates such as stag beetle *Lucanus cervus*; mammals such as European otter *Lutra lutra*, brown hare *Lepus europaeus*, and harvest mouse *Micromys minutus*; and several bird and bat species.

Table 9. Protected and Notable Species Records

Species	Dates	Relevant Legislation	Approximate Location Relative to Site
Birds			
Cetti’s warbler <i>Cettia cetti</i>	2019	WCA1	Multiple records, nearest located 1.9km south

Species	Dates	Relevant Legislation	Approximate Location Relative to Site
Golden plover <i>Pluvialis apricaria</i>	2017	Annex1	Multiple records, nearest located 1.90km south
Grey wagtail <i>Motacilla cinerea</i>	2013 - 2014	BoCC Red	Multiple records, nearest located 1.90km south
Lesser black-backed gull <i>Larus fuscus</i>	2014	BoCC Amber	Multiple records, nearest located 1.90km south
Ring ouzel <i>Turdus torquatus</i>	2019	BoCC Red, NERC41	Multiple records, nearest located 1.90km south
Short-eared owl <i>Asio flammeus</i>	2016	BoCC Amber, Annex1	Single record, located 1.90km south
Whinchat <i>Saxicola rubetra</i>	2015	BoCC Red, NERC41	Two records, nearest located 1.90km south
Terrestrial Mammals			
Hazel dormouse <i>Muscardinus avellanarius</i>	2011	WCA5, NERC41, UKBAP	Single record, located 0.66km northwest
European water vole <i>Arvicola amphibius</i>	2011	WCA5, NERC41, UKBAP	Single records, located 0.61km northeast
Harvest Mouse <i>Micromys minutus</i>	2014	NERC41, UKBAP	Single record, located 1.73km southwest
Western European Hedgehog <i>Erinaceus europaeus</i>	2010 - 2016	NERC41, UKBAP	Multiple records, nearest located 0.32km southeast
Mammals (Bats)			
Common pipistrelle <i>Pipistrellus pipistrellus</i>	2010-2013	WCA5, HabsDirA4, UKBAP	Multiple records, nearest located 0.21km north
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	2011-2016	WCA5, HabsDirA4, NERC41, UKBAP	Two records, nearest located 0.24km northeast
Pipistrelle species <i>Pipistrellus sp.</i>	2012	WCA5, HabsDirA4, UKBAP	Single record, located 0.44km northeast
Brown long-eared species <i>Plecotus auritus</i>	2005 – 2010	WCA5, HabsDirA4, NERC41, UKBAP	Multiple records, nearest located 0.70km southeast
Myotis species <i>Myotis sp.</i>	2011	WCA5, HabsDirA4, UKBAP	Single record, located 0.70km southeast
Daubenton's Bat <i>Myotis daubentonii</i>	2011 - 2014	WCA5, HabsDirA4, UKBAP	Multiple records, nearest located 0.51km east
Natterer's Bat <i>Myotis nattereri</i>	2011	WCA5, HabsDirA4, UKBAP	Single record, located 0.70km southeast
Reptiles			
Adder <i>Vipera berus</i>	2010 - 2011	WCA5, NERC41	Two records, nearest located 1.47km northwest
Common lizard <i>Zootoca vivipara</i>	2011 - 2014	WCA5, NERC41	Multiple records, nearest located on northeast site boundary
Grass snake <i>Natrix helvetica</i>	2011-2018	WCA5, NERC41	Two records, nearest located 1.20km north
Slow worm <i>Anguis fragilis</i>	2011	WCA5, NERC41	Multiple records, nearest located 1.37km northwest
Fish			
European eel <i>Anguilla anguilla</i>	2012 - 2019	UKBAP, NERC41	Multiple records, nearest located 0.49km northeast
Brown trout <i>Salmo trutta</i>	2019	UKBAP, NERC41	Multiple records, nearest located 1.37km northeast
Invasive Species			
Japanese knotweed <i>Fallopia japonica</i>	2012 - 2013	WCA9	Multiple records, nearest located 0.43km southwest

Species	Dates	Relevant Legislation	Approximate Location Relative to Site
<p>Key: NERC41 – Section 41 of the Natural Environment and Rural Communities Act 2006; HabsDirA4 – Habitats Directive Annex IV species; UKBAP – UK Biodiversity Action Plan Species; LBAP – Local Biodiversity Action Plan; WCA1/ WCA5/ WCA9 – species listed on Schedule 1, Schedule 5, and Schedule 9 of the Wildlife and Countryside Act 1981 respectively; BoCC Red/ BoCC Amb – Species of High or Medium Conservation Concern respectively, Annex 1 – EU Wild Birds Directive 2009 Annex1</p>			

Field Results- Habitats and Flora

- 4.18 Habitat descriptions of the application site (red line boundary) are provided below, with their distributions mapped on *Figure 2: Phase 1 Habitat Plan*.
- 4.19 The application site is comprised of a single, large arable field, divided into two separate compartments (north and south) by a stream (S1) that passes east to west across it. The 'northern extent' comprises the area of field north of the stream, bordered by hedgerows to the west and north, the stream to the east and south. The wider field extends further to the west however, with the site (i.e., the red line boundary) demarcated on its western edge by an invisible line that extends southwest across the field, perpendicular from the southern end of hedgerow H1.
- 4.20 The 'southern extent' of the field comprises arable land south of the stream, contiguous in character with the northern extent, and is similarly bordered with associated boundary features, including a farm track and tall ruderal vegetation along the southern edge with Howlett's Wildlife Park, and hedgerows to the north and east, bordering the neighbouring residential areas and Bekesbourne Lane, respectively.

Arable – Cereal Crop c1c

- 4.21 A bulk of the application site, both the northern and southern extents, consists of a large arable field bisected by a stream (S1), which runs east to west, before bending northwards along the eastern boundary towards Canterbury Road.
- 4.22 During the initial survey in January, both the northern and southern arable field extents contained a ley crop, which by the time of the update survey in June 2021 had been replaced with domestic barley. Survey in June 2023 found the field continued to be under active arable cultivation, again, with a barley crop. A narrow sterile strip, approximately 0.5-1m in width, surrounded the crop on all sides. These consisted of narrow weed free strips of bare ground, forming a buffer between the crop and arable margins.
- 4.23 Arable margins, approximately 0.5-1m in width, bordered the arable crop on all sides, between the sterile strips and boundary hedgerows. These margins initially supported a limited number of ephemeral species, including groundsel *Senecio vulgaris*, red deadnettle *Lamium purpureum*, creeping buttercup *Ranunculus repens* and dove's foot cranesbill *Geranium molle*.
- 4.24 By June 2021, the margins along the base of hedgerows H1, H2, and H3, had become increasingly dominated with well-established tall ruderal species, predominantly composed of abundant hemlock *Conium maculatum*, cow parsley *Anthriscus sylvestris*, nettle *Urtica dioica*, curled dock *Rumex crispus*, and common mallow *Malva sylvestris*, with frequently occurring false oat grass *Arrhenatherum elatius* throughout.
- 4.25 Cropland is not subject to condition assessments on account of its primary usage as an agricultural environ.

Semi-improved Grassland – Modified grassland

- 4.26 Few areas of grassland were present within the application site itself, with the majority of the area dominated by arable land, with associated arable margins and a wide strip of bare ground along the eastern boundary, parallel with S1.
- 4.27 However, a narrow strip of species-poor semi-improved grassland was present along the banks of the east-west section of S1, which passes across the field, contiguous with a small area of grassland at its western end (*Figure 2 - TN1*). These areas of grassland supported an assemblage of tall grass species, typical of improved, cultivated land, including abundant perennial rye grass *Lolium perenne*, rough meadow grass *Poa trivialis*, soft brome *Bromus hordeaceus*, cock's foot *Dactylis glomerata*, Yorkshire fog *Holcus lanatus* and false oat grass, as well as limited herbaceous species, including locally frequent/occasional cow parsley, common knapweed *Centaurea nigra*, cut-leaved cranesbill *Geranium dissectum*, creeping buttercup, smooth tare *Vicia tetrasperma*, hairy tare *V. hirsuta*, common vetch *Vicia sativa*, and common sorrel *Rumex acetosa*.
- 4.28 An area of grassland, with species typical of wetter ground, was also present in the eastern extent of S1, evident due to the limited presence of hard rush *Juncus inflexus*, tufted hair grass *Deschampsia cespitosa* and greater willowherb *Epilobium hirsutum*.
- 4.29 Informal vehicle tracks going through the semi-improved grassland strip, parallel with S1, provided a source of disturbance, resulting in the establishment of several ephemeral species, including creeping buttercup, ribwort plantain *Plantago lanceolata*, annual meadow grass *Poa annua*, and creeping thistle *Cirsium arvense*.
- 4.30 The modified grassland was determined to be in '**moderate**' condition.

Tall Ruderal – Urban: Sparsely vegetated land – Ruderal/Ephemeral

- 4.31 Areas of unmanaged tall ruderal vegetation were located around the southwest and southeast peripheries of the southern arable field extent, adjacent to Howlett's Wildlife Park and Bekesbourne Lane, respectively. These were comprised of common nettle, greater burdock *Arctium lappa*, hogweed *Heracleum sphondylium*, mugwort *Artemisia vulgaris*, broad-leaved dock *Rumex obtusifolius* and cow parsley. Occasional ornamental species were identified along the residential boundaries including stinking iris *Iris foetidissima*, greater periwinkle *Vinca major* and pendulous sedge *Carex pendula*.
- 4.32 The ruderal vegetation on-site was as considered as 'urban – sparsely vegetated land'. These habitats were assessed as in '**poor**' condition, due to their limited species diversity and lack of structural variation.

Trees and Treelines

- 4.33 A total of three mature common lime *Tilia x europaea* trees (T6-8), were located at the western extent of stream S1, with a sparse understorey of scrub, comprised of bramble, privet *Ligustrum vulgare*, holly *Ilex aquifolium* and blackthorn *Prunus spinosa*. The ground flora layer underneath these trees was dominated by common ivy, as well as sparse, occasionally occurring herbaceous species, including wood avens *Geum urbanum*, cuckoopint *Arum maculatum*, cow parsley and cleavers *Galium aparine*. On the border of these trees, within a small area of grassland, there was a small apiary, comprised of four inactive beehives (*Figure 2 -TN1*).

- 4.34 A defunct treeline was identified along the north-eastern boundary of the application site, comprised of approximately 80 recently felled trees, cut down to 1-1.5m tall stumps (*Figure 2 - TN2*), with a dense bed of nettles and cleavers around the base of the stumps. Five remaining mature common lime trees (T1-T5) were located along this boundary.
- 4.35 All the individual standard trees along the eastern boundary with the stream, and in the grassland at the southwest corner of the site, were assessed as in **'good'** condition according to Metric 4.0 criteria.

Scrub

- 4.36 Stands of sparse scrub were identified along the periphery of the site, as well as along stream S1. These areas of scrub habitat were unmanaged and comprised typical scrub species, including scattered elder *Sambucus nigra*, rose *Rosa sp.* and bramble *Rubus fruticosus* agg. In addition, this scrub habitat generally supported climber species, including travellers joy *Clematis vitalba* and ivy *Hedera helix*.

Bare Ground

- 4.37 A large strip of bare ground, approximately 20m wide, was located along the eastern boundary of the application site, adjacent to stream S1. During the January survey, it was presumed that this bare ground had been cleared to facilitate the tree felling works along that boundary, as well as to provide an access track for the farm. This area of bare ground supported a sparse assemblage of ground flora, comprised of ephemeral species, including red dead nettle, groundsel, annual meadow grass and perennial sow thistle *Sonchus arvensis*. By June 2021, the bare ground had been further colonised by additional ephemeral weeds, including scented mayweed *Matricaria chamomilla*, and pineapple weed *M. discoidea*.

Stream – Watercourse: ditches

- 4.38 Stream S1 flows south along the eastern boundary of the application site, then passes east to west across the field, bisecting it into two separate compartments, one to the north and one to the south (*Figure 3: Waterbody Location Plan*). The stream appears to provide the main land drainage for both field compartments.
- 4.39 The stream banks were steeply sloping (45-50°), approximately 3-4m apart and 2-3m high, which supported both inundated and tall ruderal species, including white dead nettle, hedge bedstraw *Galium mollugo*, cuckoo flower *Cardamine pratensis* and Russian comfrey *Symphytum x uplandica*. The main channel of the stream was approximately 0.5-1m wide and less than 0.5m deep, with the water level no more than 10cm deep along much of its length. The water flows over a loamy – sand substrate. The north-south section of channel had been excavated early in 2021 to improve water flow. This channel supported a variety of marginal and inundated plant species, including fool's water-cress *Apium nodiflorum*, lesser water parsnip *Berula erecta*, greater (hoary) willowherb *Epilobium hirsutum* and water cress *Nasturtium officinale*.
- 4.40 The stream was assessed under the condition criteria for 'ditches' in Metric 4.0, divided into two separate sections; the north-south section on the eastern boundary and the east-west section that bisects the field. The former section of ditch was determined to be in **'poor'** condition and the latter in **'moderate'** condition, respectively.

Hedgerows

- 4.41 Two hedgerows formed the northern and western boundaries of the northern field extent, with a further three forming the boundaries of the southern field extent (forming its northern and eastern boundaries). None of these hedgerows were considered important under the Hedgerow Regulations 1997, due to a lack of species diversity.
- 4.42 The majority of the hedgerows (H1, H2, H3, and H5) were found to provide moderately high to high conservation value in accordance with HEGS, largely due to their native species content, large number of mature standard trees, and/or largely intact structure, with few/no gaps. The exception to this was hedgerow H4, which was a short residential hedgerow comprised entirely of non-native Leyland cypress *Cupressus x leylandii*.
- 4.43 All hedgerows, with the exception of H4, contained over 80% native species and were therefore identified as Habitats of Principal Importance under Section 41 of the NERC Act (2006).
- 4.44 *Table 10* provides a summary of hedgerow survey results.

Table 10: Summary of Hedgerow Survey Results

Ref	Canopy Sp.	Length (m)	Notes	BNG Condition Score (Metric 4.0)	HEGS Value and Score	Important Under REGS
H1	<i>Sn, Ag, Fe, Ia, Pa, Rf</i>	185	Residential boundary treeline with limited hedgerow. 1-2 native species dominance. 20+ mature standards. 13 young trees. 30-10% gaps. Three connections, small bank present.	Moderate	2+ Moderately High to High value	Not Assessed (Residential Boundary)
H2	<i>Cm, Ap, Ia, Qr, Ag, Rf</i>	245	Field boundary. 1-2 native species dominance. 15 mature standards. 12 young trees. 10-0% gaps. One connection.	Moderate	2 Moderately High to High value	Not Important 2 sp./30m
H3	<i>Sn, Ag, Ia, Pa, Lo, Rosa sp., Rf, Ps</i>	183	Residential boundary treeline with limited hedgerow. Mixed native species dominance. 20+ mature standards. 7 young trees. 30-10% gaps. One connection.	Moderate	2+ Moderately High to High value	Not Assessed (Residential Boundary)
H4	<i>Cup x ley</i>	20	Residential boundary hedge. Non-native species dominance. No standard trees. No gaps. Two connections.	Poor	3+ Moderate value	Not Assessed (Residential Boundary)
H5	<i>Tp, Ag, Cm, Ac, Ia, Sn, Rf</i>	232	Field boundary treeline with limited hedgerow. 1-2 native species dominance. 20+ mature standards. 20+ young trees. 30-10% gaps. One connection.	Moderate	2 Moderately High to High value	Not Important 2 sp./30m

Key to hedgerow species: *Ac* *Acer campestre* Field maple, *Ag* *Alnus glutinosa* Alder, *Ap* *Acer pseudoplatanus* Sycamore, *Cm* *Crataegus monogyna* Hawthorn, *Cup x Ley* *Cupressus x leylandii* Leyland Cypress, *Fe* *Fraxinus excelsior* Ash, *Ia* *Ilex aquifolium* Holly, *Lo* *Ligustrum ovalifolium* Garden Privet, *Pa* *Prunus avium* Wild Cherry, *Ps* *Prunus spinosa* Blackthorn, *Qr* *Quercus robur* Pedunculate oak, *Rf* *Rubus fruticosus* agg. Bramble aggregate, *Rosa* sp. Rose species, *Sn* *Sambucus nigra* Elder, *Tp* *Tilia platyphyllos* Large-leaved lime.

Defra 4.0 Metric Baseline Score

- 4.45 The site baseline largely comprises low value habitats and delivers a total of 32.88 habitat units. At present the existing hedgerows bordering the site deliver 7.09 hedgerow units. As the scheme will be removing only very small sections of hedgerow length there will be no significant net loss. There are several new hedgerows shown in the current development plan, mainly short sections bordering areas of GI, as well as numerous lines of avenue trees, which will amply compensate for the hedgerow loss anticipated.

Pre-intervention – Baseline Habitats (Figures 10 and 11)

- 4.46 The principal contributor to existing habitat units, pre-intervention, is from the cropland, entirely comprised of cultivated cereal. Arable crops are considered low distinctiveness habitats and are given an automatic condition score within the metric. The cereal crop that dominates the site delivers 28.25 habitat units.
- 4.47 A small extent of grassland, considered improved due to exposure from fertiliser and herbicide treatment from farming, was present along the section of stream that bisects the field, and at the southwest corner of the site. Considered as modified grassland in moderate condition under the criteria set out in the metric, these areas of grassland deliver 2.79 habitat units.
- 4.48 Narrow margins comprised of tall ruderal species bordered the arable field in several areas. These were considered as sparsely vegetated land – ruderal/ephemeral in the metric and assessed to be in poor condition. A wide extent of bare ground was also present along the eastern site boundary. These are both habitats of low distinctiveness and deliver a further 0.93 and 0.91 habitat units, respectively.

Post-intervention – Proposed Habitats and Hedgerows (Figure 12 and 13)

- 4.49 The development area will be a matrix of houses, gardens, and sealed surfaces, such as smaller roads and driveways. The guidance set out within the metric suggests a 70:30 split between sealed surfaces and vegetated gardens. This means that the unit total for this area would be 4.95, provided entirely by the gardens.
- 4.50 Sustainable drainage features have been scored simply as SuDS basins in moderate condition. These do not include the area set-aside as a Water Recycling Centre, which is considered to comprise built infrastructure. The SuDS features will deliver a total of 0.75 habitat units. The SuDS basins are not anticipated to hold permanent water, but will be associated with native marginal planting, creating wetland habitat of benefit to bats, birds, amphibians, and invertebrates.
- 4.51 Allotments are low distinctiveness habitats; though will be of at least moderate condition and so will deliver a further 0.63 habitat units. The proposed community orchard on-site has been assessed under two categories, the first as further allotment area, with the aim to achieve an informal community orchard (0.26 habitat units), with the second alternative approach aiming to achieve a traditional orchard in moderate condition (0.4 units).
- 4.52 The remaining area is green infrastructure. Areas of greenspace specified as ‘amenity open space’ and verges along roadsides and pavements have been considered modified grassland in moderate condition (9.31 units), with the rest, specified as featuring a variety of species rich grass mixes, were considered as ‘other neutral grassland’ managed for nature (8.83 units). This will require a relatively species rich sward containing 6-8 species per square metre.

- 4.53 Native, mixed species scrub in moderate condition has been factored into the calculations for areas of structural planting featured in GI. These areas can provide 11.25 habitat units. It is possible in the proposals to implement the areas of scrub along the southern and western site boundaries in extensive enough blocks to reach a target condition of good, in which case, mixed scrub habitat could achieve 14.12 habitat units.
- 4.54 This preliminary calculation has also included 44 individual urban trees, with a target of medium size and poor condition that achieve 4.52 habitat units. In metric 4.0 these features score well, provided they are native species and are under a suitable management regime.
- 4.55 A total of 275m native species rich hedgerows are being planted in proposals providing a total of 0.92 habitat units. The very limited loss of hedgerow for vehicle and pedestrian access will be further compensated for with the provision of several lines of avenue trees throughout the residential footprint. These have been included as linear tree lines in moderate condition, achieving 1.75 habitat units.

Fauna

Bats

- 4.56 The site supports a limited diversity of habitats and is dominated primarily by arable farmland. However, some habitat suitable to support bats, including standard trees, hedgerows, field margins and a stream, were identified on-site that provide possible opportunities for foraging, and which may also offer routes for bats to commute into suitable neighbouring habitat (woodland, rivers, and grassland) present in the wider landscape.

Trees

- 4.57 Several trees were present around the peripheries of the application site, predominantly as standards growing within the hedgerows that border both the site, and southern field extent, as well as a cluster of three mature trees at the western end of stream (S1). These all appeared to be semi-mature and in relatively good health; consequently, none were identified to support any potential roost features for bats.

Manual Activity Transect Surveys

- 4.58 Manual activity transects were undertaken in May, July, and September 2021 (corresponding to the spring, summer, and autumn seasons, respectively), during which contacts from six different species/species groups, were recorded. Results for each survey are summarised in Appendix B. The survey conducted in July recorded the most bats, with 20 contacts in total, while fewest contacts were recorded during the May transect (14 in total).
- 4.59 Contacts from bats were well distributed across the application site. Activity, most frequently from common and soprano pipistrelles, originated predominantly from individuals commuting along boundary hedgerows around the peripheries of the site. Foraging activity was limited to a few contacts from pipistrelles, recorded in association with the field margin along the southernmost boundary of the southern field extent and along hedgerows H3, H4, and H5 (that border the southern field extent).

- 4.60 Most of the registrations from the less commonly recorded bat species/species groups originated from individuals that were recorded commuting along linear features that formed the boundaries of the southern field extent, with a single contact from unidentified *Nyctalus* species detected at the field edge, near the stand of mature lime trees at the southern end of S1, and a brown long-eared bat detected along hedgerow H1. Further contacts from brown long-eared bats were recorded in the south, near the boundary with the local wildlife park (Howlett's); these comprised no more than one or two passes.

Automated Activity Surveys

- 4.61 The following paragraphs detail the findings of the automated activity surveys. In this context, the term 'registration' refers to a unique sound file created over the course of several seconds. Based on this, numerous 'registrations' does not necessarily refer to multiple bats (unlike the manual activity survey section above, where the number of bats can often be visually identified), as one bat may create a number of registrations, for example an individual foraging in close proximity to the microphone for a sustained period of time.

Overall Summary

- 4.62 Six static recording units have been deployed, successfully covering five days during May, July and September 2021; during which ten species/species groups were recorded, consisting of common pipistrelle (comprising 72.70% of total data), soprano pipistrelle (14.09%), *Pipistrellus* sp. (5.27%), *Myotis* sp. (5.23%), noctule (0.87%), *Nyctalus* sp. (0.76%), brown long-eared bat (0.51%), Nathusius' pipistrelle (0.48%), serotine (0.07%), and unidentified *Nyctalus/Eptesicus* species (0.03%).
- 4.63 Of the static detector units deployed during 2021; unit C, deployed in July at the northern end of hedgerow H1, which forms the western site boundary, recorded the greatest count of registrations (3477 in total). Unit A, set-out in May and positioned centrally along hedgerow H2, which runs parallel to Canterbury Road, recorded the fewest registrations (33 in total). Activity levels ranged between 295 and 1195 registrations across the remaining static units deployed throughout 2021, with most recording fewer than 900 registrations.
- 4.64 No Annex II species have been identified on-site, with a large proportion of the registrations recorded originating from widespread, and relatively commonly occurring, bat species and species groups; dominated by pipistrelles (~90% of registrations).
- 4.65 Please see *Figure 2: Phase 1 Plan* for static (passive) detector unit locations, and Appendices C and D for full results.

Birds

- 4.66 Habitats within the application site considered suitable for use by nesting birds were limited to boundary features; comprised of hedgerows and standard trees, whereby it would be expected that a range of typical urban/woodland edge birds will be present.
- 4.67 Incidental observations of birds, encountered during protected species surveys undertaken throughout the breeding season (April to June inclusive), largely comprised commonly occurring and widespread species typical of farmland edge habitats, and included blackbird *Turdus merula* and robin *Erithacus rubecula*, which were both identified in hedgerows bordering both the northern and southern extents of the field.

- 4.68 Notable species, such as dunnock *Prunella modularis* (included on the BoCC amber list), were frequently heard singing from hedgerows H2 (northernmost site boundary) and H3 (bordering the southern field extent). A pair of linnets *Carduelis cannabina* (BoCC red list) were observed in May, moving together between hedgerow H2 and the defunct tree line along S1. The occurrence of these species in suitable breeding habitat, often singing, or observed as a pair, suggests these are likely to be breeding on-site, or in the wider local area.
- 4.69 Woodpigeons *Columba palumbus* and black-headed gulls *Chroicocephalus ridibundus* (both amber listed) were observed flying over the site on several occasions. Consequently, neither were observed to be directly exploiting a resource provided by the site and are therefore considered likely to be non-breeding species.
- 4.70 It is expected, given the habitat available on-site, that other species typical of suburban habitats, such as house sparrow *Passer domesticus* and starling *Sternus vulgaris* (both of which were seen in the nearby village of Littlebourne), as well as notable farmland bird species, including yellowhammer (which are known to be present in the local area), are also likely to occur on-site and the local area.
- 4.71 Breeding bird surveys were conducted between May and June 2023, the results of which are discussed in detail in the accompanying Breeding Bird Survey Report (FPCR, July 2023).

Dormice

- 4.72 The two hedgerows, H1 and H2, which border the northern extent of the application site support several native fruiting species, such as hawthorn, holly, bramble, and rose, all of which provide suitable potential foraging resources for dormice. Hedgerows bordering the southern field extent also contained a similar composition of woody species suitable to support dormice.
- 4.73 However, possible dispersal into the wider landscape via these hedgerows is limited, with the nearest substantial area of neighbouring woodland habitat, at the southern edge of Trenley Park Woods, separated from the site by Canterbury Road (A257).
- 4.74 Presence/likely absence surveys were conducted during 2021, during which no evidence of dormouse presence i.e., nests or live dormice, were identified (*Table 11 and Figure 7: Dormouse Survey Plan*).

Table 11. Dormouse Survey Results 2021

Survey	Date	Score	Dormouse Evidence Recorded (with ref. to <i>Figure 7</i>)
1	11 th May 2021	4	No dormouse evidence identified
2	07 th Jun 2021	2	No dormouse evidence identified
3	20 th Jul 2021	2	No dormouse evidence identified
4	19 th Aug 2021	5	No dormouse evidence identified
5	20 th Sep 2021	7	No dormouse evidence identified
6	07 th Oct 2021	2	No dormouse evidence identified
Total Score		22	

Great Crested Newt (GCN)

- 4.75 No recent records of GCN were returned from consultation with KMBRC, with the last record from the area, which dated back to 1990, located in the local village of Wickhambreaux, more than 1.75km northeast of the application site.
- 4.76 An on-site stream (S1) and two ditches (D1 and D2) were identified within 250m of the application site (*Figure 3: Waterbody Location Plan*). D1 and D2 are both part of a network of ditches that pass along the edge of Trenley Park Woods, situated off-site to the north.
- 4.77 The stream (S1) passes southwards along the eastern site boundary, then bends southwest, bisecting the arable field compartment into two separate sections. Given the fast water flow, it is considered unlikely to provide suitable breeding habitat for GCN, as newts generally avoid moving watercourses.
- 4.78 Ditches D1 and D2 were located approximately 190m northwest and separated from the site by a wide expanse of deciduous woodland (Trenley Park), residential properties along Pineside Road and Hillcrest, and the A257. Given these ditches were found on third party land, neither was subject to HSI assessments during the initial walkover.
- 4.79 Habitat within the application site suitable to support GCN during their terrestrial phase was very limited, given the dominance of arable habitat, which is generally considered sub-optimal for the species.
- 4.80 Within the surveyed area, north and south of the stream, hedgerow bases, small areas of tall ruderal vegetation, and patchily distributed scrub on the field margins, and the banks of the stream, provide some isolated patches of potential suitable habitat; however, these are separated from other areas of nearby suitable terrestrial or breeding habitat, by Bekesbourne Lane, residential estates, and further expanses of cultivated land.

Reptiles*Field Surveys*

- 4.81 *Table 12* below summarises the total number of reptiles recorded during the survey period in spring, summer, and autumn 2021.

Table 12. Reptiles Recorded During Each Survey

Survey Date	Male adult	Female adult	Juvenile	Unknown Adult
11/05/21	-	-	-	-
19/05/21	-	-	CL x 1	CL x 1
26/05/21	-	-	-	-
07/06/21	CL x 1	CL x 1	GS x 2	GS x 2
29/09/21	-	-	-	-
07/10/21	-	-	-	-
13/10/21	-	-	-	-

Key: CL – Common Lizard, GS – Grass snake

- 4.82 Sightings of common lizards consisted of small numbers of adults, all of which were observed in the southern extent of the site. Three of these lizards (including one juvenile) were observed within the margins of the arable field that pass alongside both banks of stream S1 (which divides the field into separate compartments), with a fourth adult lizard found near the disused beehives at the stream's southern end (*Figure 8: Reptile Survey Plan*).
- 4.83 Four grass snakes (adults and juveniles) were recorded in June. Three were found on 7th June, under refugia positioned among the tall ruderal component of the field margin at the base of hedgerow H2, which forms that the northernmost site boundary. Two records of juvenile individuals were also noted, one of which was recorded in the vegetation on the southern bank of S1 (and therefore in the southern field extent).
- 4.84 An additional, incidental observation of a single juvenile grass snake was also reported, having been found during the water vole survey conducted on 4th June, located in the field margin along the northern site boundary.
- 4.85 In accordance with the Key Reptile Site Register (Froglife Advice Sheet 10, Table 2), the application site is considered to support a 'low population' of both common lizards and grass snakes. Given juveniles of both species were identified within the application boundaries, it is also considered that the small populations of both reptile species are likely to breeding on, or nearby the application site.

Water Vole

- 4.86 A shallow, slow flowing stream (S1) passes southwards along the eastern boundary of the application site, subsequently bending southwest, bisecting the arable field into two separate compartments. This watercourse was found to provide suitable supporting habitat for water voles, supporting a diverse assemblage of aquatic and marginal plants, present throughout the channel, including willowherbs, water parsnip, and water-cress, while the banks supported an assemblage of common grasses and tall ruderal herbs, which in combination, provide varied foraging opportunities for water voles. The relatively steep banks (45-60° angle), shaped in a simple V-shaped profile, were composed of a loamy substrate (like that of the field), suitable for excavation by water voles for burrows and shelter.
- 4.87 Evidence of digging, and several burrow entrances, were identified along the banks, just above the water line, during the initial walkover in January 2021. While these excavations were of a character suggestive of water vole, they were roughly excavated, irregularly shaped and relatively narrow. Given these features, and due to the timing of the initial habitat survey, their excavation by water voles could not be definitively confirmed.
- 4.88 On 4th June, evidence of feeding activity, characteristic of water vole, was identified along the east-west length of S1, indicating water vole have used the area in passing as a foraging resource. Nearby were a small number of scattered droppings from water voles (*Figure 9: Riparian Mammal Survey Plan*).
- 4.89 A second survey was conducted in September 2021, during which further evidence of feeding, comprised of collections of vegetation cut at a characteristic 45-degree angle (possible feeding stations), were identified at three other locations, all of which were also distributed along the east-west section of S1. No other evidence of water vole occupation, including burrows or latrines, was identified during either survey.

5.0 DISCUSSION AND RECOMMENDATIONS

- 5.1 The following section provides an evaluation of the application site and identifies the likely ecological constraints associated with the proposed development, based on detailed protected species surveys conducted during 2022 and 2023. Where appropriate, measures for the avoidance, mitigation, and compensation of any likely potential impacts together with any enhancements are discussed.

Statutory and Non-Statutory Designated Sites

Statutory Sites

- 5.2 Stodmarsh SAC/SPA and Blean Complex SAC are both situated within 10km of the application site, and within their respective zones of influence. Due to their proximity to the application site and zones of influence, a project specific Habitats Regulations Assessment was undertaken to determine whether the proposals would lead to a Likely Significant Effect on these designated sites. Please refer to the accompanying *Shadow Habitats Regulations Assessment (FPCR, October 2023)*, to be submitted separately, for the results of this assessment.
- 5.3 The HRA concluded that the development proposals would not result in likely significant effects on either Stodmarsh or Blean Complex, given the intervening distance and scale of the scheme, which would not result in notable increases in recreational pressure or changes in air quality from increased traffic flow. While it was determined that there was no hydrological linkage between the application site and Stodmarsh, an aerated reed bed system (see section 5.9 – 5.12 below) will be implemented to handle wastewater treatment on-site, minimising nutrient input into local watercourses.
- 5.4 Several other internationally designated sites fall within 15km of the application site, but well outside their zones of influence; these were scoped out of further assessment.
- 5.5 No additional nationally important statutory sites, including SSSIs and National Nature Reserves, were identified within 2km of the application site. However, the site does fall within the impact risk zone for two SSSIs; Stodmarsh, whose boundaries overlap with the SPA/SAC, and Chequer's Wood & Old Park, located 2.3km and 2.4km from the site boundaries, respectively. Due to the intervening distances involved in travelling to either SSSI from the application site, and the alternative recreational opportunities present in the wider area, and afforded by the proposed GI for the site, it is not considered that either Stodmarsh, or Chequer's Wood, would be visited on a regular basis.
- 5.6 Pre-existing infrastructure to manage visitors at Stodmarsh NNR will also help to minimise the impact of the small numbers of new residents likely to make the trip. Therefore, public pressures upon the designated habitats would remain negligible.

Non-Statutory Sites

- 5.7 There are two non-statutory sites of local importance within 1km of the site; Trenley Park Wood LWS located 0.15km northwest and Littlebourne Stream LWS, located approximately 0.34km southeast.

- 5.8 Trenley Park Wood has been fragmented by farmland and roads, comprising several woodland compartments. The nearest of which to the application site is bordered along its southern edge by the A257 Canterbury Road, with an access track passing northwards through the middle, signposted as a public footpath. A network of footpaths criss-crosses through, and around, the woodland edge, guiding people along specified routes. These start at the western edge of Littlebourne and go between the various woodland compartments and into Canterbury. Access into the woodland interior outside of these footpaths is limited however, as the woodland edge is very dense, or would require entry from the A257, which itself is a busy road and poses an inherent danger for people on foot.
- 5.9 Littlebourne Stream LWS, located 0.34km southeast, comprises the Little Stour River, and associated grassland, deciduous woodland and connecting ditches and dikes, including Silver Dike. The LWS is not directly accessible by the public. A footpath, accessible from Bekesbourne Lane, follows the northernmost edge of the LWS. The southern edge of the footpath is fenced with barbed wire, preventing entry into either the neighbouring farmland, or the marshy grassland fields that are associated with the Little Stour River system. Given the well-established, pre-existing track and exclusionary fencing, it is unlikely that there will be any significant impact on the LWS site from an increase in visitor numbers and any impact will therefore be negligible.
- 5.10 The shadow Habitats Regulations Assessment details the conclusions of a study commissioned by Dover District Council to determine the connectivity of the district's wastewater treatment works (WwTW) at Dambridge, and the Stodmarsh statutory site. It was determined that Stodmarsh lies upstream of the point at which the Little Stour, into which Dambridge WwTW discharges, enters the Great Stour, and does not therefore feed into the Stodmarsh system, making any impact to the Stodmarsh SAC/SPA from wastewater negligible.
- 5.11 However, it is acknowledged that the additional wastewater from the operational development is likely to increase pressure on Newnham Valley WwTW (the WwTW expected to handle wastewater from the site), which has issues with failing infrastructure that has led to groundwater, on occasion, flooding sewerage at the Newnham Valley site, requiring removal via tankers to a neighbouring WwTW. To avoid this, Water Environment Ltd. propose implementing an on-site Water Recycling Centre to remove excess nutrients before discharge into the Nail Bourne, another tributary of the Little Stour.
- 5.12 The on-site Water Recycling Centre will be designed and operated by Severn Trent Connect (STC), an Ofwat-licensed water company. An outline proposal for this proposed treatment system is appended to Water Environment's Water Quality Assessment Report (2023).
- 5.13 A Water Recycling Centre has been put forward as an appropriate mitigation measure to handle on-site treatment. Management of excess nutrient input will also benefit Littlebourne Stream LWS.
- 5.14 Similarly to statutory designated sites, any potential risks from increased recreational pressure on these nearby LWS sites will be further minimised by areas of GI, open space, and play areas implemented as part of the proposals. These will be designed to provide focal points, with circular walking routes and dog bins placed at key points. Given the inclusion of alternative open space within the proposed development, which provide both a means to exercise dogs safely, and secure play areas for local families; it is considered that the likely impacts of the development proposals on surrounding LWS sites will be negligible.

Habitats/Flora

- 5.15 The degree to which habitats receive consideration within the planning system relies on several mechanisms, including:
- Inclusion within specific policy (e.g., veteran trees, ancient woodland, and linear habitats in NPPF, or non-statutory site designation),
 - Identification as a habitat of principal importance for biodiversity under NERC (2006) and consequently identification as a Priority Habitat within England and the local area.
- 5.16 Under NPPF the development should seek to contribute a net gain in biodiversity with an emphasis on improving ecological networks and linkages where possible. It is recommended that hedgerows, where possible, are to be retained, buffered, and enhanced to ensure the site's connectivity into the wider area is maintained. The hedgerows bordering the site were found to contain native species and, as such, qualify as habitats of principal importance under NERC (2006). All hedgerows are important in their functions as corridors, as well as foraging and nesting habitats for wildlife, and as such are identified as priority habitats.
- 5.17 The cultivated arable habitat is of low intrinsic and conservation importance, with no rare or notable species recorded. The arable margins contained a limited species assemblage and given their widespread and common occurrence around the site and local area; these are considered to be of negligible conservation value.
- 5.18 Five hedgerows were recorded along the field boundaries. None of which were assessed as 'important' under the Hedgerow Regulations 1997: on the basis of their species composition and association with residential boundaries. Under HEGS assessments of conservation value conducted in 2021; one hedgerow was classified as moderate (H4), and four as moderately high to high (H1, H2, H3 and H5). All (except for H4) are classed as habitats of principal importance under the NERC Act (2006) due to a dominance of native species, and therefore require consideration under the NPPF.
- 5.19 Small sections of hedgerows H2 and H5 are likely to be removed for pedestrian and vehicular access off Canterbury Road and Bekesbourne Lane, respectively. However, much of the length of the two hedgerows that border both extents of the application site will be retained and enhanced with additional planting, and buffered, maintaining the function of these hedges as wildlife corridors. Further hedgerow planting and tree lines across the site will further improve connectivity, providing green corridors into the wider landscape.
- 5.20 Hedgerows will be managed to maximise their nature conservation potential, with traditional hedge laying methods used, if possible, otherwise with a regime of trimming on a three-year rotational basis once established. Any gaps will be planted up with native fruit or nut bearing species. Hedgerows will also benefit from the creation of wide headlands to promote the establishment of a diverse floral assemblage, including species which are currently absent or poorly represented; these should be of at least 2m in width and comprise a diverse tussock forming grassland mix, which would further increase the value of the hedgerows as a wildlife corridor.
- 5.21 All of the mature trees present within the application site will be retained and protected by fencing off the Root Protection Areas (RPAs); these will protect specimens from damage and soil compaction during construction works.

- 5.22 Preference in planting schemes will be given to native species, with an emphasis on species bearing nectar, berries, fruit, and nuts, as these enhance the foraging opportunities for local wild fauna, including birds and invertebrates. Suitable small tree species for inclusion in hedgerows and garden planting schemes could include field maple *Acer campestre*, silver birch *Betula pendula*, wild cherry *Prunus avium*, bird cherry *P. padus*, holly *Ilex aquifolium*, crab apple *Malus sylvestris* and rowan *Sorbus aucuparia*. Other shrub species suitable for inclusion within the soft landscaping design include hawthorn *Crataegus monogyna*, hazel *Corylus avellana*, blackthorn *Prunus spinosa*, dog rose *Rosa canina*, honeysuckle *Lonicera periclymenum* and wild privet *Ligustrum vulgare*.
- 5.23 Where possible, planting within the proposed development will seek to provide additional habitat for urban and suburban wildlife. While native species are often of value to biodiversity generally, it is now clear that many cultivated varieties and exotic plants are also good for wildlife, provided that their flowers are not too complex. Hybrid varieties, which may produce little or no pollen, or nectar, and so are not of interest to bees, butterflies, or other pollinating insects, should not be used.
- 5.24 The planting strategy, both within private and public areas, will therefore combine a range of native species, and where appropriate, such as in gardens and more formal areas, with a range of ornamental species with an accepted value for biodiversity. A range of small shrubs, low growing woody species, grasses, and perennials, would provide a range of forms, sizes, and finer scale variation to enhance the future structural and three-dimensional complexity of the site.

Biodiversity Net Gain

- 5.25 Biodiversity Net Gain calculations based on the outline proposals demonstrate that the application site has the capacity at Reserved Matters to deliver a measurable 10% net gain for habitats and hedgerows, in line with the advice from Kent County Council. The hypothetical scores are summarised in *Table 13* below, as calculated using Metric 4.0 and based on the anticipated provision of green infrastructure post intervention, as detailed in paragraphs 4.49 to 4.55. There is scope for additional enhancements, such as provision of urban trees and the management of a proportion of the SUDs and grassland features for biodiversity. Hedges will largely be retained in the current proposals, with ample provision of new linear habitat, comprised of additional hedgerows and tree lines, so they will not be a constraint.

Table 13: Biodiversity Net Gain Results

Habitats	On-site Baseline	32.88
	On-site post intervention	40.63
	Total Change	+7.75 (+23.57%)
Hedgerows	On-site Baseline	7.09
	On-site post intervention	9.38
	Total Change	+2.29 (+32.37%)

Fauna

- 5.26 The presence of protected species is a material consideration in any planning decision, it is essential that the presence or otherwise of protected species, and the extent to which they are affected by proposals is established prior to planning permission being granted. Furthermore, where protected species are present, and proposals may result in harm to the species or its habitat, steps should be taken to ensure the long-term protection of the species, such as through attaching appropriate planning conditions for example.

5.27 In addition to protected species, there are those that are of other conservation merit, such as species of principal importance for the purpose of conserving biodiversity under the NERC Act (2006). These are recognised in the NPPF which advises that when determining planning applications, the LPA should aim to conserve and enhance biodiversity by applying a set of principles including:

- *If significant harm resulting from a development cannot be avoided....., adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused; and*
- *Development proposals where the primary objective is to conserve or enhance biodiversity should be encouraged.*

5.28 The implications that various identified species, or those that are thought reasonably likely to occur, may have for the developmental design and programming considerations are outlined below.

Bats

Trees

5.29 No trees were identified on-site that supported potential roost features, therefore there are no constraints associated with their removal, with regards to bats. It is suggested however, that surveys are updated prior to any tree removal, to ensure that new roosting features have not developed from tree disease or damage in the intervening time.

Activity Surveys

5.30 The range and quality of habitats on-site, and bordering it, are considered to be of 'low' ecological value to bats, which can be attributed to the relatively small size of the site, dominance of arable habitat and limited features of interest for bats, including isolated hedgerows and a narrow, shallow watercourse.

5.31 During the seasonal surveys (automated and transect) ten bat species/species groups were recorded; the majority of which were commonly occurring and ubiquitous species, such as pipistrelles and noctules, that are typically found in a range of open habitats (including farmland), and whose presence within, and bordering, the application site is consequently not considered exceptional.

5.32 No annex II species were recorded on-site during surveys. Activity recorded during automated bat activity surveys was dominated by pipistrelles (common, soprano, and unidentified), which proportionally comprised the bulk of the registrations recorded on static detectors (92%), with each of the remaining species/species groups, except *Myotis* species (5%), each comprising less than 1% of the registrations recorded.

5.33 Most contacts from bats recorded during transect surveys comprised low numbers of passes from commuting individuals, which were travelling along linear boundary features, including hedgerow intersections, stream S1, and around the group of mature lime trees at the western end of S1. Few contacts from foraging bats, limited to common and soprano pipistrelles, were scattered widely, recorded near the woodland edge at the southern end of H5, at either end of H3, along hedgerows H1 and H2, and the southernmost field boundary. Given the sporadic records of foraging activity, with no discernible pattern of activity, it is unlikely the application site forms a significant foraging resource for the local bat population.

Mitigation and Enhancements for the Local Bat Population

- 5.34 Boundary hedgerows and treelines are to be retained and enhanced, wherever feasible, however there may be some localised loss of hedgerow length along the northern and south-eastern boundaries (H2 and H5). Additional open spaces and green infrastructure will be included in the design that will be created to provide ecological enhancement, including new attenuation ponds, and a community orchard, in addition to new tree avenues and garden planting (*Figure 14*). These areas of greenspace will incorporate native species that will enhance invertebrate diversity on-site, which will in turn, increase the foraging potential for the local bat population. Early flowering native shrubs should be planted, such as hawthorn, blackthorn, hazel, honeysuckle *Lonicera sp.*, and ivy.
- 5.35 Where gaps are required through existing, or new linear features, such as hedgerows H2 and H5, it is recommended that these are kept as small as possible; if they are larger than 7m in width then it is advised that habitat 'hop-overs' are provided (*Figure 14*). These can be created through planting and management of taller shrubs and trees on either side of the gap, which effectively 'pushes' the flight lines of bats (and birds) over any roads, avoiding potential vehicle collisions and exposure to artificial lighting.
- 5.36 The development should also seek to provide new refuge opportunities for the local bat population by installing at least 10 bat boxes on mature trees, and/or incorporated within the built fabric of residential dwellings (*Figure 14*). This would be undertaken in accordance with National and Local Planning Policy, helping to enhance biodiversity within the local area. Bat boxes and bricks should be arranged around the development in a range of positions and aspects, providing bats with a variety of alternative roost sites.
- 5.37 To minimise impacts on bats, proposals will adopt a sensitive external lighting scheme which will be designed to minimise light spill on retained and proposed habitats of value to commuting and foraging bats. The lighting scheme would be designed with regard to current guidance provided by the Bat Conservation Trust and the Institution of Lighting Professionals²⁷ and adopt the following principles:
- The avoidance of direct lighting of existing trees, hedgerows, scrub, woodland, or proposed areas of habitat creation/landscape planting
 - Buffer zones and GI are not to be illuminated
 - The implementation of 'hop-overs' adjacent to any hedgerow gaps greater than 7m wide 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)
 - During the construction period, no lighting should be used in proximity to boundary features, if needed lights will be directionally focused/shrouded, such measures would be detailed within a Construction and Environmental Management Plan (CEMP)
 - Lighting that is incorporated into the development design should comprise low pressure sodium lights, as they emit at one wavelength so attract less insects or LED lighting
 - Directional lighting and avoidance of upward lighting and/or light spillage

²⁷ Bats and artificial lighting in the UK: Bats and the Built Environment series. Bat Conservation Trust and Institution of lighting professionals Guidance note 08/18 (2018).

- Lighting columns to be as short as possible, although in some locations taller columns would allow reduced horizontal spill; and
 - Security lighting on properties backing on to sensitive hedgerows and woodland will be low wattage LED, which will be installed on properties at the construction stage to forestall a future homeowner installing unsuitable lighting which could impact on bats.
- 5.38 Roads and buildings in close proximity to new areas of GI and existing boundary habitats will have lighting sensitively positioned, so as to avoid illumination of canopies, which can disrupt flight patterns of bats.

Breeding Birds

- 5.39 All birds are protected whilst on the nest. Any vegetation, such as scrub or trees, that need removing, should be outside of the bird breeding season (March to August/September). If this is not possible, vegetation must be checked prior to any removal by an experienced ecologist. If active nests are identified within vegetation, they will be left untouched and suitably buffered until all young birds have fledged.
- 5.40 Mature trees and hedgerows, on the edge of arable farmland, provide nesting habitat on-site, and immediate local area, suitable to support several of the farmland species for which records were returned from KMBRC, or incidentally observed on-site, including linnet. These potential breeding habitats will be largely retained and enhanced as part of the proposed development. These boundary habitats, at the interface of woodland, suburban land, and farmland, also provide nesting opportunities for several other hedge/scrub nesting birds, including sparrows, thrushes, and warblers.
- 5.41 Arable land comprises the bulk of the habitat that will be lost due to development. However, given the relatively small size of both extents of the larger arable field, and the presence of additional arable habitat in the immediate vicinity of the site, it is likely that any farmland specialist birds presently utilising the application site, including the small numbers of linnet, would be displaced to neighbouring habitat, at least in the short term. New hedgerow planting and open space on-site will be of some benefit to linnet, once established.
- 5.42 It is recommended that consideration be given to the provision of bird boxes, including a mix of 7-10 boxes for cavity and open nesting species, affixed to suitable retained/new trees, and at least 40 universal swift bricks, to be incorporated into the built fabric of new dwellings, which will enhance available nesting opportunities for a variety of urban edge and garden species (*Figure 14*). This biodiversity measure will help contribute to the requirements of the NPPF. New avenues of standard native trees, garden hedgerows, and community orchard, included in the development proposals will further increase nesting and foraging opportunities for birds.

Great Crested Newts

- 5.43 No records of GCN were identified within 1km of the application site through consultation with local records centres. Stream (S1) on the eastern site boundary and passing east-west between the northern and southern field extents, was not considered suitable for GCN, due to the flow of water, which is thought to be a deterrent to breeding newts.
- 5.44 The application site provides few opportunities for GCN, and although there are small, limited areas of sub-optimal habitat for their terrestrial life stages, there are no ponds/waterbodies on-site, or close by, from which GCN can breed.

- 5.45 Two additional drainage ditches (D1 and D2) were identified within 250m of the application site. Both ditches were located on the northern edge of Trenley Park Woods LWS, northwest of the application site, separated from it by extensive woodland habitat and Canterbury Road (A257). Consequently, these waterbodies/courses are not well linked to the application site, requiring GCN to cross woodland, residential estates, and a busy A road to reach it.
- 5.46 It is concluded that there are no opportunities for GCN to breed on the application site and that ponds/ditches in the surrounding area are sufficiently separated from the application boundaries by distance and dispersal barriers, whereby the scant terrestrial habitats on-site would not be accessible from these surrounding areas. It is concluded that there are no constraints to the development from this species.

Hazel Dormice

- 5.47 One hazel dormouse record, from within the last ten years, was provided by Kent & Medway Biological Record Centre within 1km of the application boundary. The record was located 0.7km northwest, within Old Wood, part of Trenley Park Wood LWS.
- 5.48 Strategic presence/likely absence surveys conducted between May and November 2021 recorded no evidence of dormouse presence on-site.
- 5.49 It is considered that the retention and enhancement of most pre-existing treelines and hedgerows on-site will be of benefit to dormice, if they are present within the site, or local area. Additional native species hedgerow and scrub planting, included within the proposed GI, will provide further foraging and nesting habitat for the species, as well as increasing possible connectivity to habitats in the wider landscape.

Reptiles

- 5.50 The majority of the reptile species records, returned via consultation with KMBRC, were identified as occurring 1.5km or more to the northwest, within the Oldridge Woods complex. However, a single record of a common lizard was identified on the north-eastern site boundary (along H2), dating from 2014.
- 5.51 The application site provides some possible refuge and foraging habitat for reptiles, in the form of field margins, hedgerow bases and scattered scrub, as well as in and around the stream that passes along the eastern boundary.
- 5.52 Reptile presence/likely absence surveys identified two species of native UK reptiles, common lizard and grass snake. Common lizards were recorded solely within the grassland margins along the banks of the stream, while four of the five grass snake records, including two adults, and an incidental record of a juvenile, were observed within the field margin associated with hedgerow H2, along the northernmost site boundary.
- 5.53 Given the low numbers of reptiles recorded, a passive displacement program will be implemented to nudge reptiles currently utilising the site into retained areas of neighbouring habitat. The process involves two cuts during the reptile active season (April – October); the first to 200mm, followed by a second to 50mm 1-2 hours later, to allow reptiles to move of their own volition. Arisings will be removed to prevent forming potential refuges. Habitat clearance will work in a westerly direction along hedgerow H2 and the east-west section of S1, to 'push' reptiles into retained habitat along hedgerow H1 and the southernmost boundary, respectively. The working area will then be trimmed regularly to prevent suitable habitat reforming.

- 5.54 All areas of suitable habitat that are to be retained should be fenced off, preventing machinery or materials entering these areas, which may otherwise result in damage to reptile habitat and/or cause injury or death to reptiles.
- 5.55 GI provision for the proposed development will include grassland buffers around the northern and southern edges of the built environment, as well as more extensive areas of greenspace along the western and eastern edges of the site, the latter of which is associated with the provision of an attenuation pond at the northern end of S1, with a further attenuation feature at the eastern end of H4. These new areas of habitat, if sensitively managed, will enhance commuting and foraging opportunities for reptiles (*Figure 14*).
- 5.56 Areas of new grassland should be sown with a tussock forming grass mix, such as Emorsgate EM10, and managed on a rotational basis every 2-3 years between October and February, to ensure habitat mosaics are established and maintained. Management of grassland within the completed development should also avoid the use of broad-spectrum pesticides, and cuttings should, where possible, be composted on-site in sunlit areas to provide reptiles with suitable nesting sites.
- 5.57 Provision of additional wood/scrub piles and hibernacula in strategic locations would also provide further opportunities for shelter and basking, and also provide potential habitat for amphibians and invertebrates (*Figure 14*).

Riparian Mammals

- 5.58 A single record of a water vole was returned from the Little Stour River, located 0.61km to the northeast; however, there are no direct, obvious linkages between the stream and the application site.
- 5.59 Evidence of water vole was identified along the east to west section of the stream, which bisects the field. Excavations indicative of water vole were identified during the initial survey in January 2021. Two subsequent presence/likely absence surveys were conducted later in 2021, during which a feeding station, feedings signs, and scattered droppings were identified.
- 5.60 No evidence of water vole activity was identified along the north to south section of the stream on the eastern site boundary.
- 5.61 Water vole mitigation designed into the development proposals includes provision for 'wide fringes' of natural habitat, forming a 10-15m greenspace buffer between the stream and the residential development footprint (*Figure 14*). The buffer was formerly 20-30m; however, no habitat suitable for burrowing lies beyond the edge of the ditch bank, with the adjoining field in current use as arable land. Subsequently any burrows in the ditch are unlikely to extend beyond the region of 3-5m from the bank of the ditch. Therefore the 10-15m protective buffer provides above and beyond the required distance of 5m from the bank top, to ensure no water vole habitat is damaged as a result of works. These buffer distances are in accordance with accepted guidance in the Water Vole Mitigation Handbook²⁸.

²⁸ Dean, M., Strachan, R., Gow, D., and Andrews, R. (2016) The Water Vole Mitigation Handbook (Mammal Society Mitigation Guidance Series). Eds Fiona Matthews and Paul Chanin. The Mammal Society, London,

- 5.62 Enhancement of the site to support water vole will also be implemented, including additional native species marginal and aquatic planting along the both the fringes of the stream and in/around new SuDS basins, offering a new foraging resource and cover for water voles. This may be achieved by seeding the banks with a tussock forming grassland sward and plug planting marginal species within the watercourse to cover at least 20% of the surface area of the wetted channel²⁹.
- 5.63 The proposals also include footpath and road routes across the east-west section of the stream. The development proposals will need to ensure that the favourable conservation status of water voles on-site will be maintained.
- 5.64 A Water Vole Mitigation Strategy will be conditioned at Reserve Matters to detail appropriate mitigation to be implemented at the construction stage. As a minimum, this will include recommendation for further survey of the watercourse for evidence of riparian mammals, including water vole.
- 5.65 Should water vole burrows be identified in areas to be impacted by the footpath and road crossings, then an application for a Natural England displacement licence will be required to facilitate works. Relocation by displacement is considered to be the most appropriate action in this instance, given the small number of voles likely to be affected, and the narrow stretch of water course to be impacted by the engineering works associated with the crossings.
- 5.66 Displacement necessitates the removal of up to 50m of bankside vegetation either side of a watercourse, in early spring (February to April), to make the habitat unsuitable and force voles to relocate away from the working area²⁸. However, the width of ditch to be affected by the works to build the road/path crossings measures approximately 25m, much less than maximum 50m width allowed by the Water Vole mitigation guidance.
- 5.67 The remainder of the stream will require enhancement, as detailed in paragraph 5.62, to ensure that the habitat is suitable to receive the displaced voles.
- 5.68 Further habitat enhancement measures for water voles should be implemented on-site, including ensuring that the stream supports a slow, stable flow year round, and prescribing a management regime whereby cutting is limited to once every 2-years and alternated between either side of the bank.

Other Species

West European Hedgehog

- 5.69 Several records of west European hedgehog were returned through consultation with local records centres within 1km of the site boundary, three of which occurred less than 0.1km from the application boundaries in neighbouring residential estates. Hedgehogs are a generalist species and require large areas of contiguous habitat. Threats to hedgehog include loss of habitat, reduced habitat quality, and habitat fragmentation.

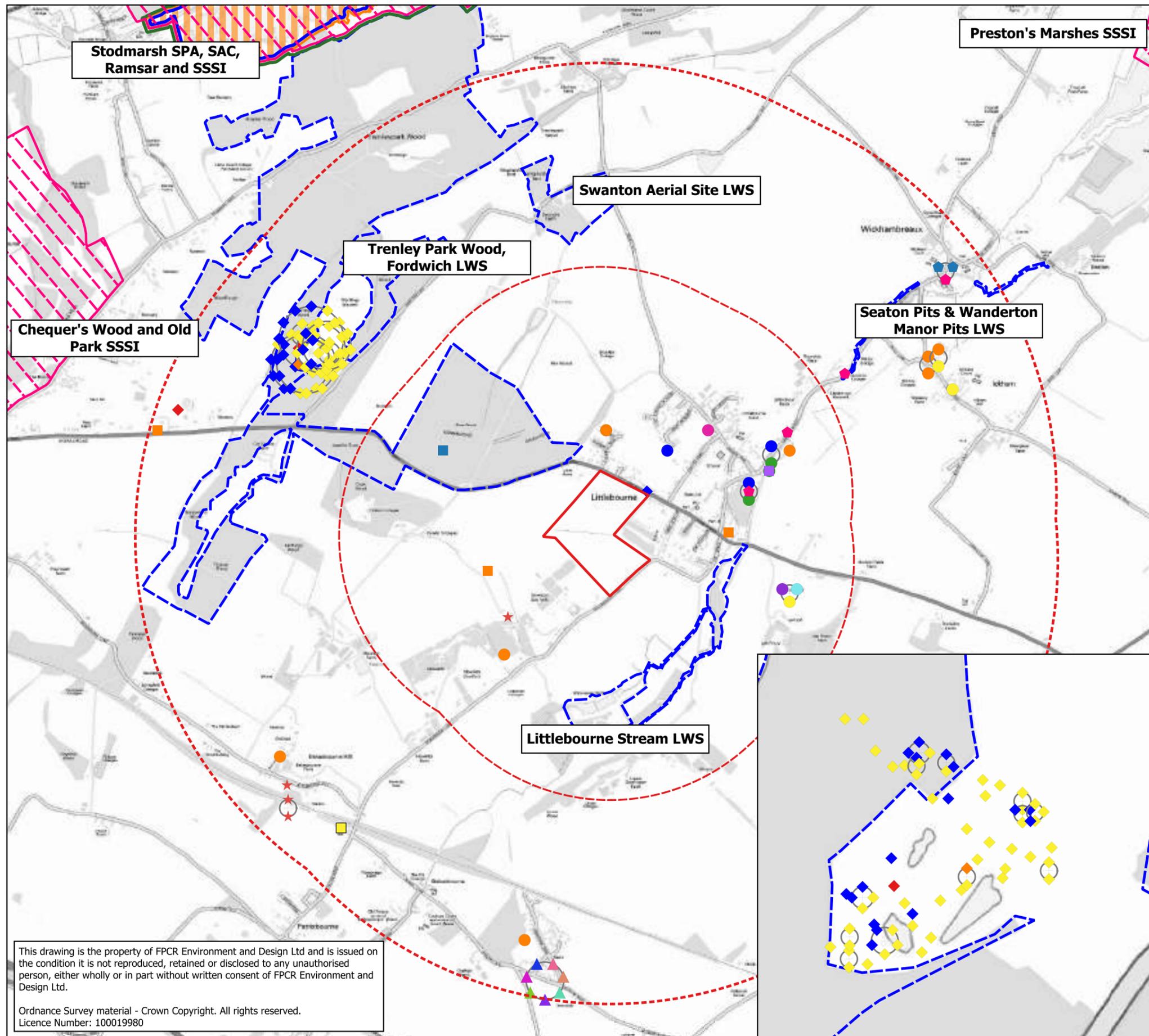
²⁹ Dean, M., Strachan, R., Gow, D., and Andrews, R. (2016) The Water Vole Mitigation Handbook (Mammal Society Mitigation Guidance Series). Eds Fiona Matthews and Paul Chanin. The Mammal Society, London,

- 5.70 Hedgerows can provide food, shelter from predators and can be important for nesting sites during hibernation. They are also vital corridors facilitating movement³². The matrix of gardens and green spaces in towns and cities can also be of benefit to hedgehogs and can support the highest densities of the species³³. As such, the loss of small sections of hedgerow H2 will have a negligible impact on the local hedgehog population. Residential garden fences should have small holes cut at the bottom (approximately 13cm x 13cm³⁴) to maintain connectivity and enable free movement for this species. Hedgerow highway signs can also be purchased from the People's Trust for Endangered Species, which will advise residents why there are holes present and will help encourage them to keep them open.

³² Henry Johnson, (2015) Conservation Strategy for West-European Hedgehog (*Erinaceus europaeus*) in the United Kingdom (2015-2025) People's Trust for Endangered Species (PTES)

³³ Hubert, P., Julliard, R., Biagianti, S. & Marie-Lazarine, P. (2011) Ecological factors driving the higher hedgehog (*Erinaceus europaeus*) density in an urban area compared to the adjacent rural area. *Landscape and Urban Planning*, 103, 34-43

³⁴ Hedgehog Street [ONLINE] Available at <http://www.hedgehogstreet.org/pages/link-your-garden.html>



- Key**
- Site Boundary
 - 2km search area
 - 1km search area
- Designated sites**
- RAMSAR Sites
 - Special Area of Conservation (SAC)
 - Special Protection Area (SPA)
 - Site of Special Scientific Interest (SSSI)
 - Local Wildlife Site (LWS)
 - Ancient Woodland Inventory Sites
- Protected & Notable Species**
- Brown/Sea Trout
 - European Eel
 - Adder
 - Common Lizard
 - Grass Snake
 - Slow-worm
 - European Water Vole
 - Harvest Mouse
 - Hazel Dormouse
 - West European Hedgehog
- Invasive Non-native Species**
- Japanese Knotweed
- Daubenton's Bat
 - Myotis species
 - Natterer's Bat
 - Brown Long-Eared Bat
 - Common Pipistrelle
 - Soprano Pipistrelle
 - Pipistrellus species
 - Cetti's Warbler
 - Golden Plover
 - Grey Wagtail
 - Lesser Black-backed Gull
 - Ring Ouzel
 - Short-eared Owl
 - Wheatear
 - Whinchat
 - White Stork

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Gladman Developments Ltd.
Land at Evenhill, Littlebourne, Kent

fpcr CONSULTATION PLAN

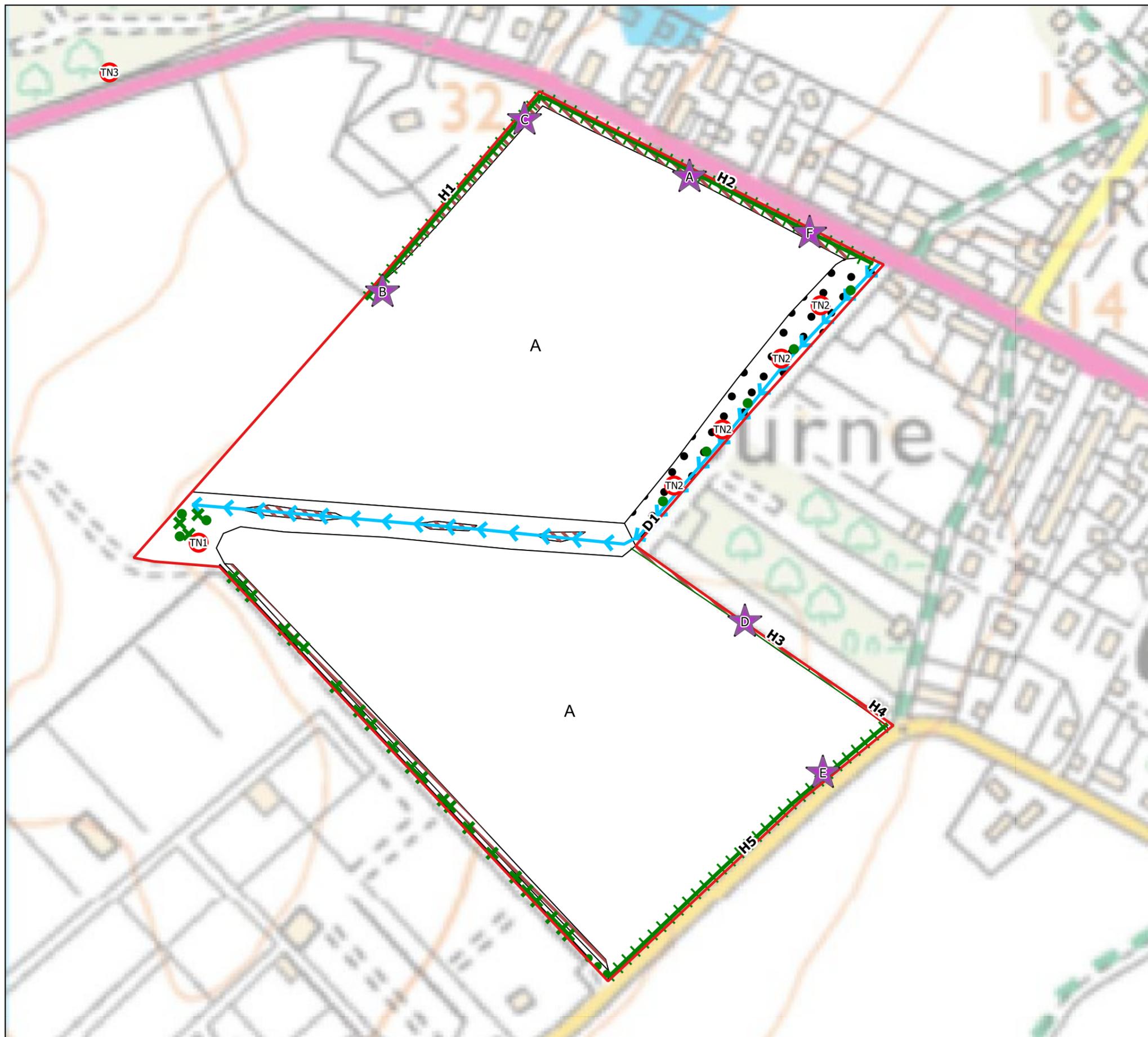
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drawing / figure number **Figure 1**
drawn PJP
issue date 17/1/2023
rev

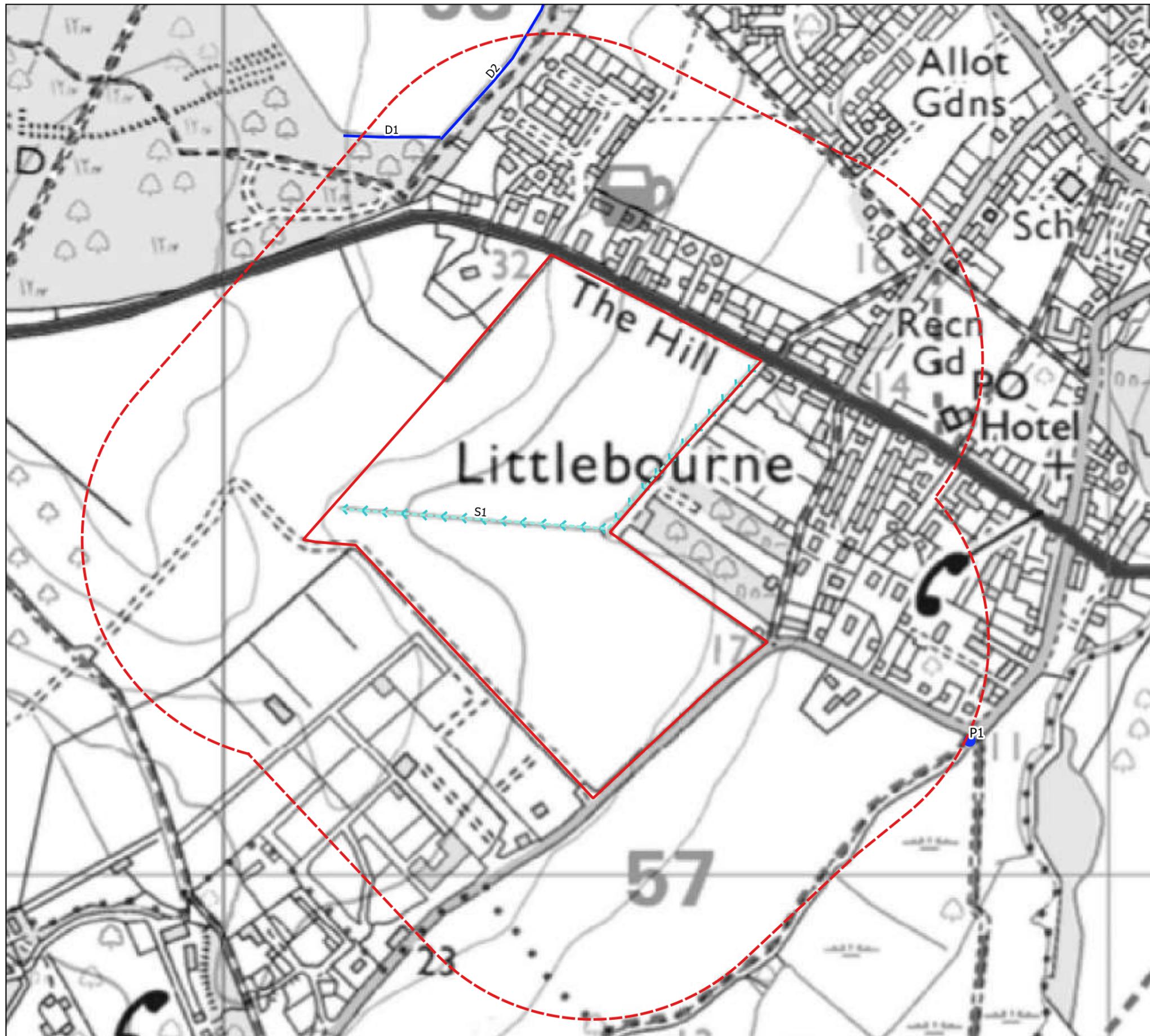
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Key

- Site Boundary
 - Phase 1 Habitats**
 - Bare ground
 - Other tall herb and fern - ruderal
 - Poor semi-improved grassland
 - Cultivated/disturbed land - arable
 - ← Running water
 - Fence
 - Hedges: Introduced shrub
 - Hedge with trees - species-poor
 - Hedge with trees - native species-rich
 - Broadleaved treeline
 - ✕ Scrub - scattered
 - ⊙ Target note
 - Broadleaved standard tree
 - ★ Static Detectors
- A) 19th - 24th May 2021 Unit 21
 B) 19th - 24th May 2021 Unit 22
 C) 12th - 17th July 2021 Unit 9
 D) 12th - 17th July 2021 Unit 10
 E) 22nd - 27th September 2021 Unit 22
 F) 22nd - 27th September 2021 Unit 27





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Key

- Site Boundary
- 250m Search Area
- Watercourse (with ref.)
- Ditch (with standing water)
- ←→ Stream
- Small Waterbody (Pond)

Gladman Developments Ltd.

Land at Evenhill,
Littlebourne, Kent

WATERBODY LOCATIONS PLAN

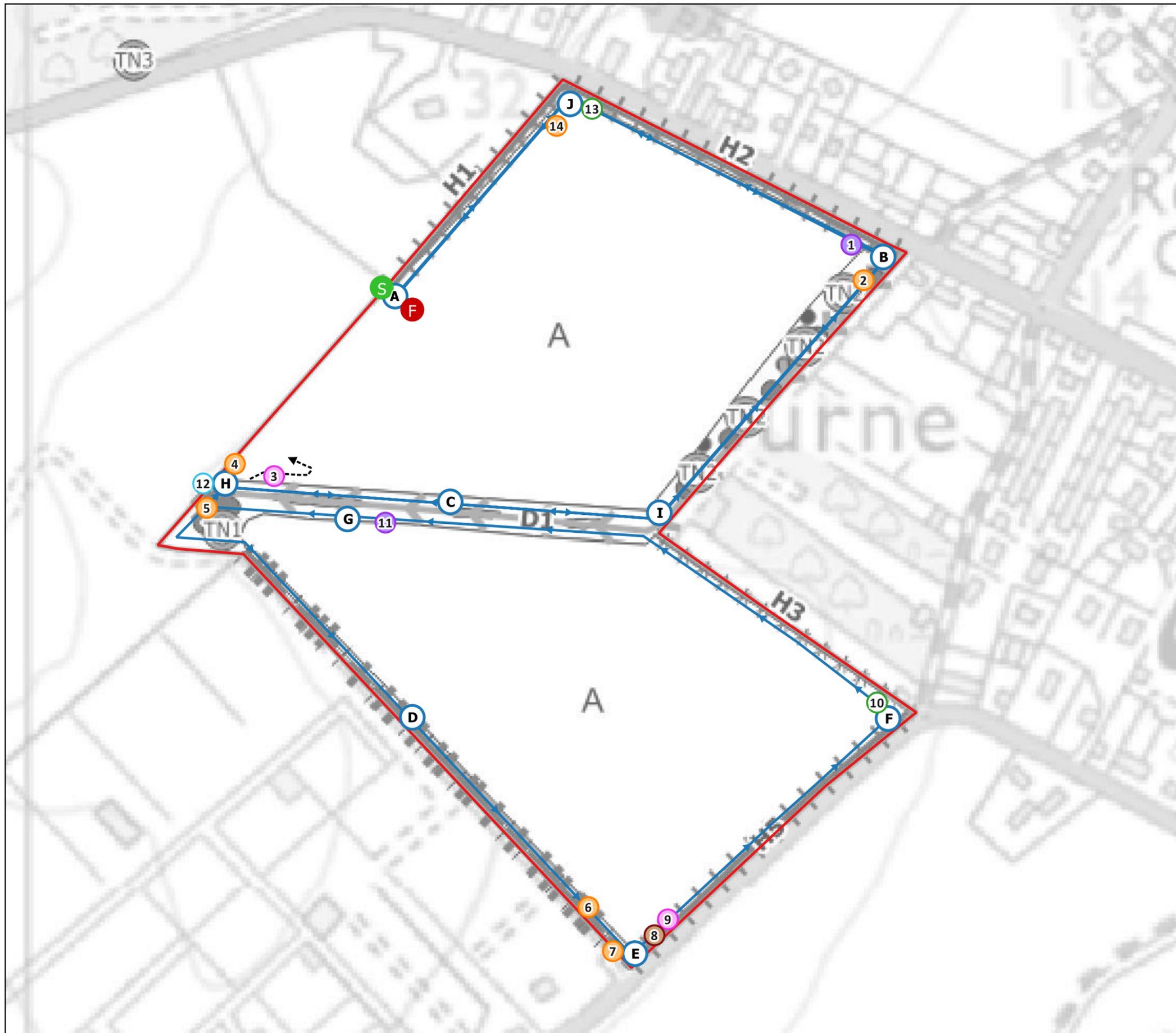
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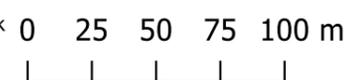
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Key:

- Site Boundary
 - S Start point
 - F Finish point
 - Point Count (with ref.)
 - Transect Route
 - - - > Flight Arrow
- Common Pipistrelle
 - Soprano Pipistrelle
 - Brown Long-eared
 - Myotis Species
 - Nyctalus Species
 - Noctule



Plan Reference	Time	Species	Passes	Behaviour
Start	20:45			
PCA	20:45-20:50	No bats		
1	20:59	Noctule	1	Commuting
PCB	21:00-21:05	Ref 2		
2	21:04	Common pipistrelle	2	Commuting
PCC	21:09-21:14	No bats		
3	21:21	Soprano pipistrelle	2	Commuting
4	21:23	Common pipistrelle	1	Commuting
5	21:26	Common pipistrelle	1	Commuting
PCD	21:28-21:33	No bats		
6	21:37	Common pipistrelle	4	Foraging
PCE	21:38-21:43	Ref 3		
7	21:43	Common pipistrelle	1	Commuting
8	21:44	Brown long-eared bat	1	Commuting
9	21:47	Soprano pipistrelle	1	Commuting
PCF	21:52-21:57	Ref 5		
10	21:57	Myotis sp.	1	Commuting
PCG	22:06-22:11	No bats		
11	22:12	Noctule	1	Commuting
PCH	22:17-22:22	Ref 7		
12	22:17	Nyctalus sp.	1	Commuting
PCI	22:26-22:31	No bats		
PCJ	22:38-22:43	Ref 8-9		
13	22:40	Myotis sp.	1	Commuting
14	22:43	Common pipistrelle	1	Commuting
Finish	22:48			



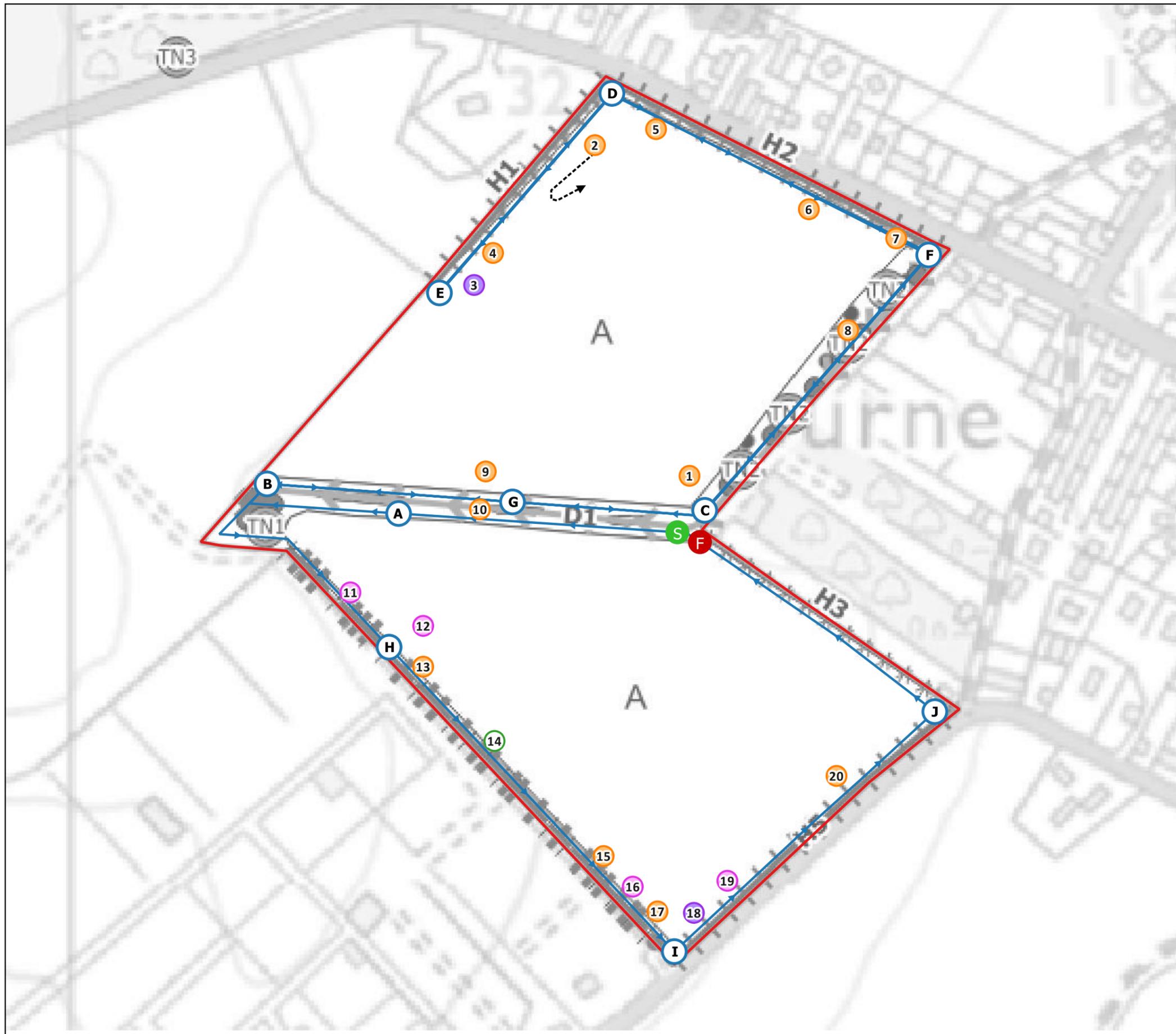
fpcr Gladman Developments Ltd.
 Land at Evenhill,
 Littlebourne, Kent
BAT TRANSECT PLAN - SPRING (19.05.2021)
 scale @ A3 1:2,750 drawn PJP issue date 17/1/2023
 drawing / figure number **Figure 4** rev

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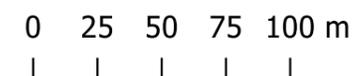
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Key:

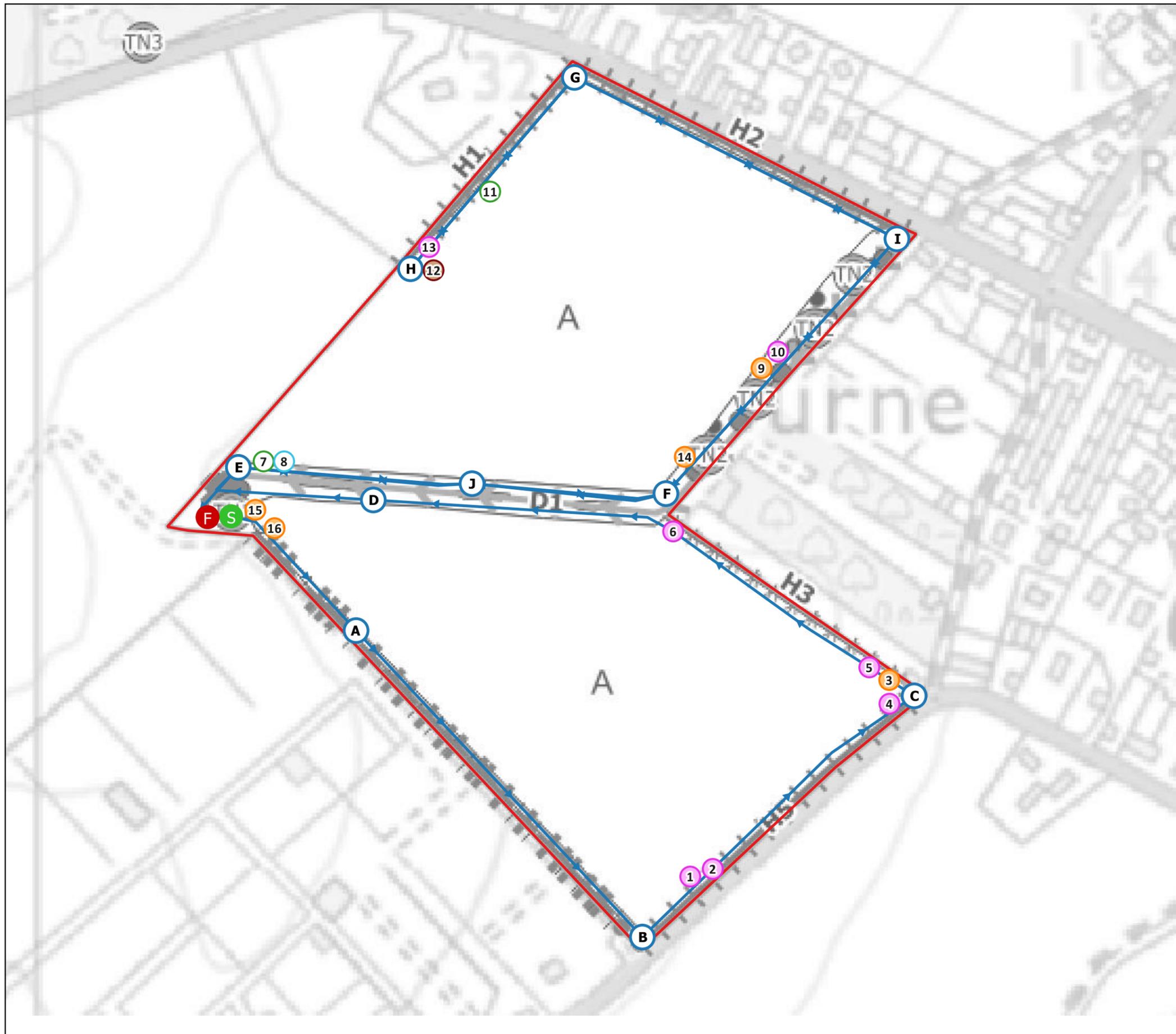
- Site Boundary
- S Start point
- F Finish point
- Point Count (with ref.)
- Transect Route
- - - > Flight Arrow
- Bat Contacts**
- Common Pipistrelle
- Soprano Pipistrelle
- Myotis Species
- Noctule



Plan Reference	Time	Species	Passes	Behaviour
Start	21:01			
PCA	21:11-21:16	No bats		
PCB	21:18-21:23	No bats		
PCC	21:27-21:32	No bats		
1	21:38	Common pipistrelle	3	Commuting
PCD	21:39-21:44	Ref 2		
2	21:41-43	Common pipistrelle x2	continuous	Foraging
PCE	21:52-21:57	Ref 3		
3	21:57	Noctule x2	2	Foraging
4	21:58	Common pipistrelle	2	Commuting
5	22:00	Common pipistrelle	5	Foraging
6	22:02	Common pipistrelle	1	Commuting
PCF	22:06-22:11	Ref 7		
7	22:08	Common pipistrelle	1	Commuting
8	22:13	Common pipistrelle	4	Foraging
PCG	22:19-22:24	Ref 9-10		
9	22:20-23	Common pipistrelle	continuous	Foraging
10	22:24	Common pipistrelle	3	Foraging
11	22:28	Soprano pipistrelle	4	Foraging
PCH	22:31-22:36	Ref 12-14		
12	22:31-35	Soprano pipistrelle	4	Foraging
13	22:31-35	Common pipistrelle	continuous	Foraging
14	22:35	Myotis Sp.	1	Commuting
15	22:37	Common pipistrelle	3	Foraging
16	22:41	Soprano pipistrelle	4	Foraging
PCI	22:42-22:47	Ref 17-18		
17	22:43	Common pipistrelle	3	Foraging
18	22:44	Noctule	4	Foraging
19	22:48	Soprano pipistrelle	2	Commuting
20	22:49	Common pipistrelle	3	Foraging
PCJ	22:53-22:58			
Finish	23:03			



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 Land at Evenhill,
 Littlebourne, Kent
BAT TRANSECT PLAN - SUMMER (19.07.21)
 scale @ A3 1:2,750 drawn PJP issue date 17/1/2023
 drawing / figure number **Figure 5** rev



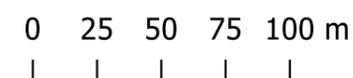
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Key:

- Site Boundary
 - S Start point
 - F Finish point
 - Point Count (with ref.)
 - Transect Route
 - - - > Flight Arrow
- Bat Contacts**
 - Common Pipistrelle
 - Soprano Pipistrelle
 - Brown Long-eared
 - Myotis Species
 - Nyctalus Species

Plan Reference	Time	Species	Passes	Behaviour
Start	18:55			
PCA	19:01-19:06	No bats		
PCB	19:10-19:15	No bats		
1	19:17	Soprano pipistrelle	1	Commuting
2	19:17	Soprano pipistrelle	1	Commuting
PCC	19:20-19:25	Ref 3-5		
3	19:21	Common pipistrelle	2	Commuting
4	19:21	Soprano pipistrelle	4	Foraging
5	19:25	soprano pipistrelle	2	Commuting
6	19:28	Soprano pipistrelle	3	Foraging
PCD	19:33-19:38	No bats		
PCE	19:40-19:45	Ref 7		
7	19:41	Myotis sp.	1	Commuting
8	19:43	Nyctalus sp.	1	Commuting
PCF	19:51-19:56	No bats		
9	19:57	Common pipistrelle	1	Commuting
10	19:58	Soprano pipistrelle	1	Commuting
PCG	20:04-20:09	No bats		
11	20:13	Myotis sp.	1	Commuting
PCH	20:14-20:19	Ref 12-13		
12	20:15	Brown long-eared bat	1	Commuting
13	20:17	Soprano pipistrelle	2	Commuting
PCI	20:26-20:31	No bats		
14	20:35	Common pipistrelle	2	Commuting
PCJ	20:39-20:44	No bats		
15	20:51	Common pipistrelle	1	Commuting
16	20:55	Common pipistrelle	1	Commuting
Finish	20:55			



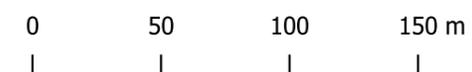


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Key:

- Site Boundary
- Indicative Tube Locations (with tube numbers)



fpcr Gladman Developments Ltd.
 Land at Evenhill,
 Littlebourne, Kent

DORMOUSE SURVEY PLAN
 scale @ A3 1:2,750 drawn PJP issue date 17/1/2023
 drawing / figure number **Figure 7** rev



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Key

□ Site Boundary

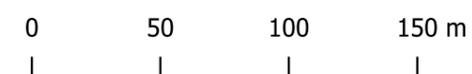
● Reptile Tin

Species Identified

● Common Lizard

● Grass Snake

(with max. number of adult individuals or juveniles, denoted by #J.)



Gladman Developments Ltd.

Land at Evenhill,
Littlebourne, Kent

REPTILE SURVEY RESULTS PLAN

scale @ A3
1:2,750

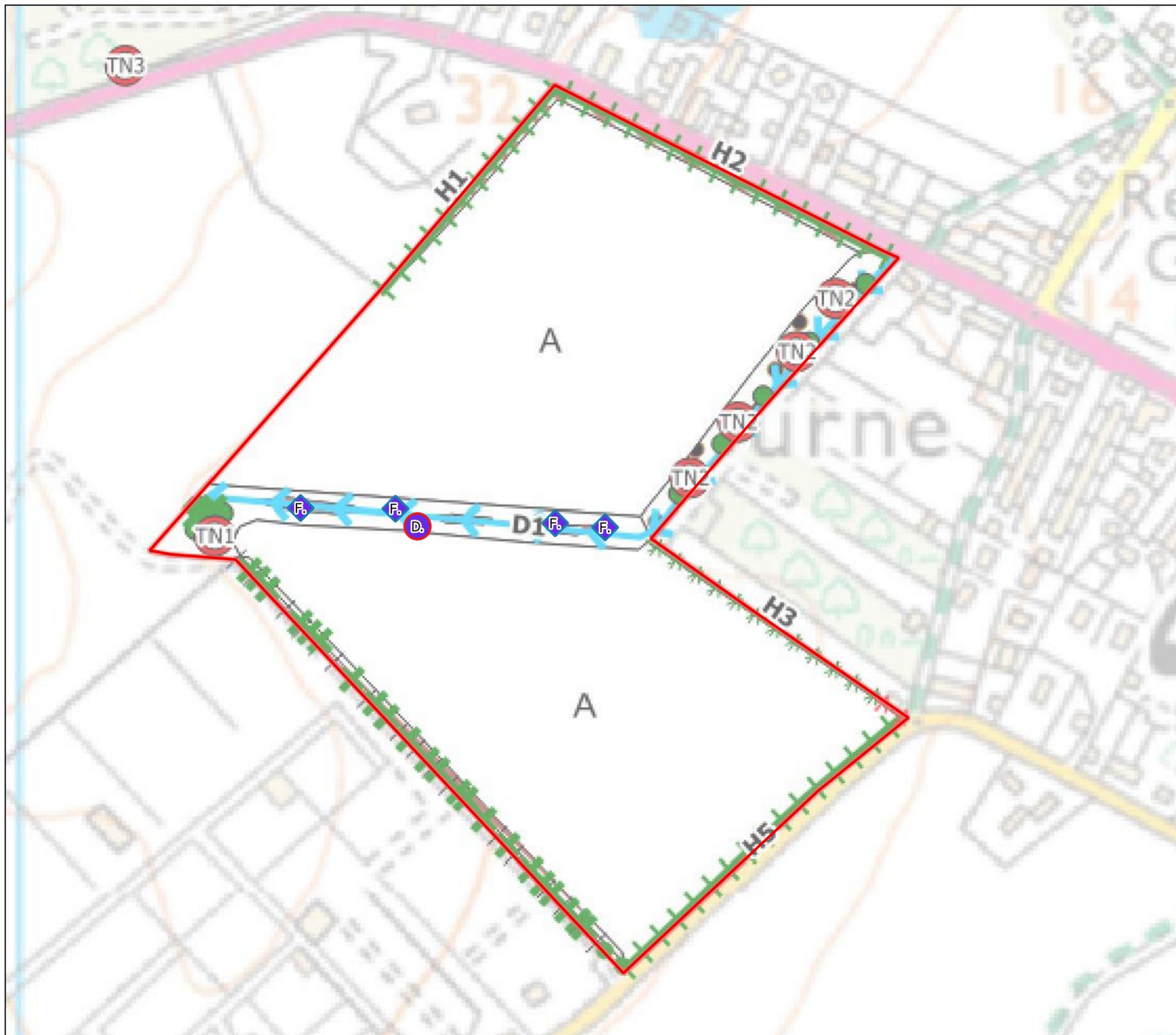
drawn
PJP

issue date
17/1/2023



drawing / figure number
Figure 8

rev



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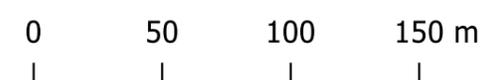
Key:

Site Boundary

Riparian Mammals

Water Vole Droppings

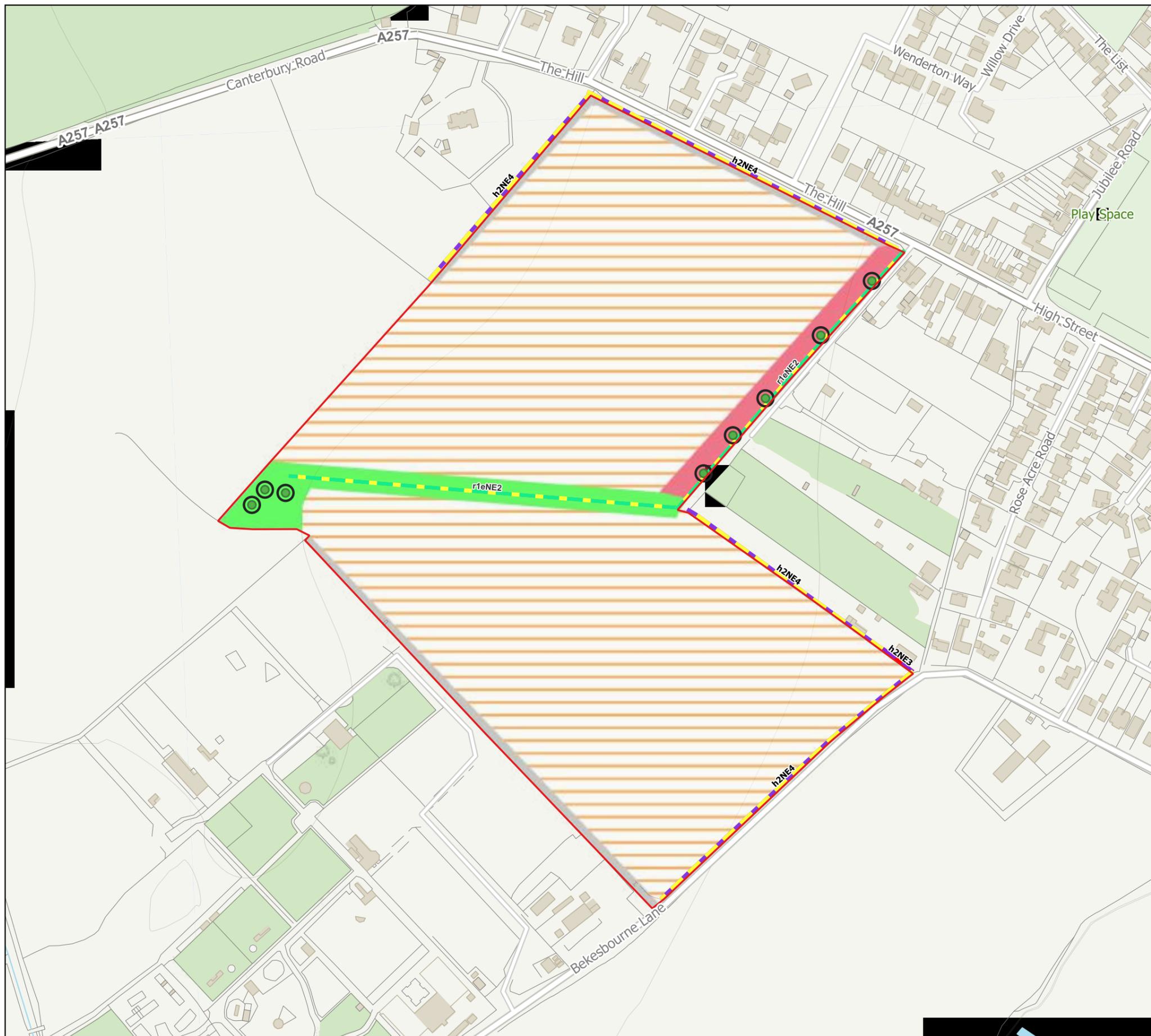
Water Vole Feeding Evidence



Gladman Developments Ltd.
 Land at Evenhill,
 Littlebourne, Kent
RIPARIAN MAMMAL SURVEY PLAN

scale @ A3
 1:2,750
 drawn
 PJP
 issue date
 17/1/2023

drawing / figure number
Figure 9
 rev



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Key

Baseline Habitats

-  Cereal crops
-  Modified grassland
-  Ruderal/Ephemeral
-  Tall herb communities (H6430)
-  Bare ground

Baseline Hedgerows

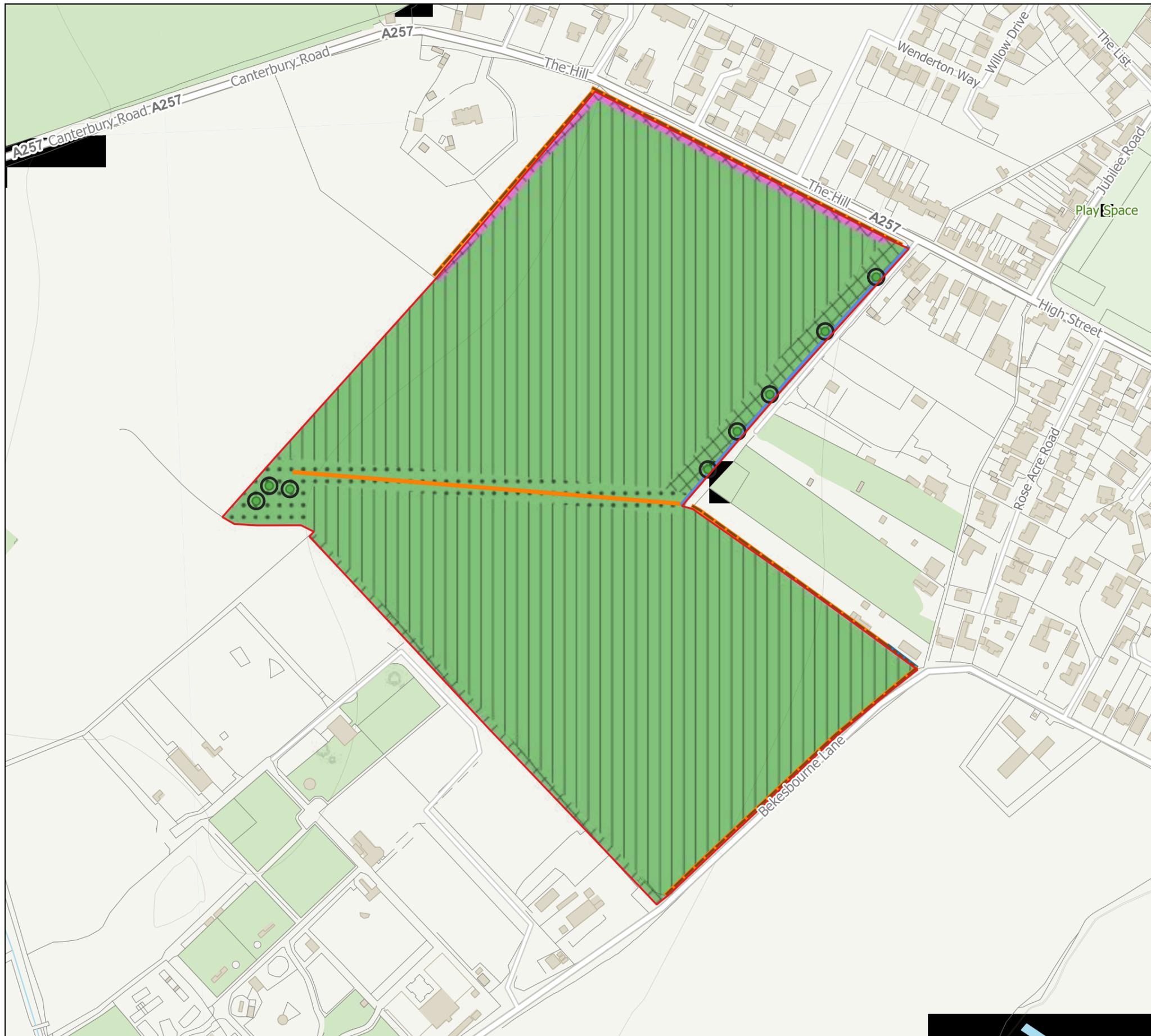
-  Non-native and ornamental hedgerow
-  Native hedgerow with trees

Baseline Watercourses

-  Ditches

Baseline Trees

-  Existing Large Rural Tree



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Key

Baseline Habitat Condition

Moderate

Poor

Condition Assessment N/A

Baseline Habitat Distinctiveness

High

Low

Baseline Hedgerow Condition

Moderate

Poor

Baseline Hedgerow Distinctiveness

Medium

V.Low

Baseline Watercourse Condition

Moderate

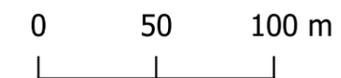
Poor

Baseline Watercourse Distinctiveness

Medium

Baseline Individual Tree Condition

Good



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Key

Proposed Habitats

- Allotments
- Artificial unvegetated, unsealed surface
- Developed land; sealed surface
- Mixed scrub
- Modified grassland
- Other neutral grassland
- Sustainable drainage system
- Traditional orchards
- Residential

Proposed Hedgerows

- Non-native and ornamental hedgerow
- Line of trees
- Native hedgerow
- Native hedgerow with trees

Proposed Trees

- Large Rural Tree
- Proposed Medium Urban Tree



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Key

Proposed Habitat Condition

-  Moderate
-  N/A - Other
-  Condition Assessment N/A

Proposed Habitat Distinctiveness

-  High
-  Medium
-  Low
-  V.Low

Proposed Hedgerow Condition

-  Moderate
-  Poor

Proposed Hedgerow Distinctiveness

-  Medium
-  Low
-  V.Low

Proposed Individual Tree Condition

-  Poor
-  Good





Key

- Site Boundary
- Species-specific Enhancements**
- B Bird box
- Insect hotel
- ◆ Reptile refugia
- Swift bricks
- ◆ Bat box
- Linear Habitat**
- +— Retained hedgerow
- Urban tree line
- +— New hedgerow
- ✕ Structural Landscape Planting - trees and scrub
- Created Habitat**
- Allotments
- Amenity grassland
- Community Orchard
- SuDS
- Wildflower grassland

POLICY STANDARD CANTERBURY DISTRICT LOCAL PLAN TO 2045 (DRAFT)		
Green Infrastructure Type	Local Plan Requirement	P
Semi natural & natural space	4.0 per 1000 population = 2.88ha	
Parks & gardens	0.8ha per 1000 population = 0.57ha	
Amenity green space & green corridors	2.25ha per 1000 population = 1.62ha	
LEAPs & LAPs facilities	0.25ha per 1000 population = 0.18ha	
Allotments / Growing Area	0.575ha per 1000 population = 0.27ha	



client
Gladman Developments Ltd.
project
Land at the Hill,
Littlebourne
drawing title
ECOLOGICAL PARAMETERS PLAN

scale @ A3
1:2500
drawn
PJP
issue date
20/9/2023

drawing / figure number
Figure 14
rev
-

Appendix A: Species List and Target Notes

Field Margins and Ephemeral Arable Weeds

Common Name	Latin Name
Annual meadow grass	<i>Poa annua</i>
Barren brome	<i>Bromus sterilis</i>
Bittersweet	<i>Solanum dulcamara</i>
Cock's foot grass	<i>Dactylis glomerata</i>
Common field speedwell	<i>Veronica persica</i>
Common hogweed	<i>Heracleum sphondylium</i>
Common knapweed	<i>Centaurea nigra</i>
Common poppy	<i>Papaver rhoeas</i>
Common sorrel	<i>Rumex acetosa</i>
Common vetch	<i>Vicia sativa</i>
Creeping buttercup	<i>Ranunculus repens</i>
Creeping thistle	<i>Cirsium arvense</i>
Curled dock	<i>Rumex crispus</i>
Dandelion	<i>Taraxacum officinale agg.</i>
Dove's-foot cranesbill	<i>Geranium molle</i>
False oat-grass	<i>Arrhenatherum elatius</i>
Field bindweed	<i>Convolvulus arvensis</i>
Field madder	<i>Sherardia arvensis</i>
Great lettuce	<i>Lactuca virosa</i>
Greater plantain	<i>Plantago major</i>
Ground ivy	<i>Glechoma hederacea</i>
Groundsel	<i>Senecio vulgaris</i>
Hairy tare	<i>Vicia hirsuta</i>
Hard rush	<i>Juncus inflexus</i>
Horsetail sp.	<i>Equisetum sp.</i>
Meadow foxtail	<i>Alopecurus pratensis</i>
Nipplewort	<i>Lapsana communis</i>
Oxeye daisy	<i>Leucanthemum vulgare</i>
Pendulous sedge	<i>Carex pendula</i>
Perennial ryegrass	<i>Lolium perenne</i>
Perforate St. John's wort	<i>Hypericum perforatum</i>
Periwinkle	<i>Vinca major</i>
Pineapple weed	<i>Matricaria discoidea</i>
Prickly sow-thistle	<i>Sonchus asper</i>
Red campion	<i>Silene dioica</i>
Red-dead nettle	<i>Lamium purpureum</i>
Red valerian	<i>Centranthus ruber</i>
Ribwort plantain	<i>Plantago lanceolata</i>
Rough chervil	<i>Chaerophyllum temulum</i>
Rough meadow grass	<i>Poa trivialis</i>
Scented mayweed	<i>Matricaria chamomilla</i>
Smooth sow-thistle	<i>Sonchus oleraceus</i>
Smooth tare	<i>Vicia tetrasperma</i>
Soft brome	<i>Bromus hordeaceus</i>
Spear leaved orache	<i>Atriplex prostrata</i>
Spear thistle	<i>Cirsium vulgare</i>
Stinking iris	<i>Iris foetidissima</i>
Tall fescue	<i>Festuca arundinacea</i>
Tufted hair grass	<i>Deschampsia cespitosa</i>
White clover	<i>Trifolium repens</i>

White-dead nettle	<i>Lamium album</i>
Yorkshire fog	<i>Holcus lanatus</i>

Hedgerow and Scrub (including ground flora)

Common Name	Latin Name
Alder	<i>Alnus glutinosa</i>
Ash	<i>Fraxinus excelsior</i>
Blackthorn	<i>Prunus spinosa</i>
Bramble	<i>Rubus fruticosus agg.</i>
Cherry (wild)	<i>Prunus avium</i>
Cleavers	<i>Galium aparine</i>
Common hogweed	<i>Heracleum sphondylium</i>
Cuckoopint	<i>Arum maculatum</i>
English oak	<i>Quercus rober</i>
Elder	<i>Sambucus nigra</i>
Field maple	<i>Acer campestre</i>
Garden privet	<i>Ligustrum ovalifolium</i>
Ground ivy	<i>Glechoma hederacea</i>
Hawthorn	<i>Crataegus monogyna</i>
Holly	<i>Ilex aquifolium</i>
Ivy	<i>Hedera helix</i>
Large-leaved lime	<i>Tilia platyphyllos</i>
Leyland cypress	<i>Cupressus x leylandii</i>
Rose species	<i>Rosa sp.</i>
Sycamore	<i>Acer pseudopiantanus</i>
Traveller's joy	<i>Clematis vitalba</i>
White bryony	<i>Bryonia alba</i>
White-dead nettle	<i>Lamium album</i>

Tall Ruderal

Common Name	Latin Name
Alexander's	<i>Smyrniolus satrum</i>
Broad-leaved dock	<i>Rumex obtusifolius</i>
Cleavers	<i>Galium aparine</i>
Common hogweed	<i>Heracleum sphondylium</i>
Common mallow	<i>Malva sylvestris</i>
Common nettle	<i>Urtica dioica</i>
Cow parsley	<i>Anthriscus sylvestris</i>
Curled dock	<i>Rumex crispus</i>
Cut-leaved crane's-bill	<i>Geranium dissectum</i>
Greater burdock	<i>Arctium lappa</i>
Hemlock	<i>Conium maculatum</i>
Mugwort	<i>Artemisia vulgaris</i>
Prickly sow-thistle	<i>Sonchus asper</i>
Smooth sow-thistle	<i>Sonchus oleraceus</i>
Spear thistle	<i>Cirsium vulgare</i>
Wood avens	<i>Geum urbanum</i>

Ditch and stream vegetation (marginal and aquatic)

Common Name	Latin Name
Cuckoo flower	<i>Cardamine pratensis</i>
Fool's water-cress	<i>Apium nodiflorum</i>
Greater willowherb	<i>Epilobium hirsutum</i>
Hedge bedstraw	<i>Galium mollugo</i>
Horsetail sp.	<i>Equisetum sp.</i>
Ivy-leaved speedwell	<i>Veronica hederifolia</i>
Lesser water-parsnip	<i>Berula erecta</i>
Russian comfrey	<i>Symphytum x uplandicum</i>
Water-cress	<i>Nasturtium officinale</i>
Welsh poppy	<i>Papaver cambricum</i>
White-dead nettle	<i>Lamium album</i>
Wood avens	<i>Geum urbanum</i>

Target Notes (TN) – (Figure 2 Phase 1 Plan)

- 1) Area of species poor semi-improved grassland to the east of a small group of three mature common lime trees, within which are four beehives. These were established to be part of a currently inactive, defunct apiary.
- 2) A line of ~80 felled trees parallel, and directly adjacent to the ditch in which S1 flows. These trees were all cut down to stumps approximately 1m tall. By the time of the update walkover in June 2021 the bases of these were surrounded by nettles and cleavers
- 3) Off-site area of woodland, part of Trenley Park Woods, also surveyed for badger evidence during the initial phase 1 survey in January 2021. No evidence identified

APPENDIX B: Bat Transect Survey Results Descriptions 2021

Date	Total Contacts	Species Recorded (No. Contacts)	Activity Summary
19 th May 2021 Figure 4	14	Common pipistrelle (6), soprano pipistrelle (2), <i>Myotis</i> species (2), noctule (2), <i>Nyctalus</i> species (1), Brown long-eared bat (1)	<p>Six species / species groups were recorded, with most contacts originating from common pipistrelles. Most contacts were recorded in association with the boundary features (hedgerows and woodland). Activity from common pipistrelles largely comprised single passes from individuals commuting along linear features, with one record of a foraging common pipistrelle recorded on the woodland edge on the southernmost boundary.</p> <p>Similar numbers of registrations from noctules, soprano pipistrelles and unidentified <i>Myotis</i> species were recorded. Commuting passes from noctule were associated with hedgerow H1 on the northern boundary, and over stream S1, which bisects the two field extents. Soprano pipistrelles were identified commuting along hedgerow H5 and stream S1, and <i>Myotis</i> species were detected commuting at the junctions of H1 and H2, and H4 and H5.</p> <p>The remaining contacts, one each from brown long-eared bats and unidentified <i>Nyctalus</i> species, comprised low numbers of passes from individuals commuting along linear features around the southern field extent. A single contact from a <i>Nyctalus</i> species was recorded near the mature trees at the southern end of S1, while the brown-long-eared contact was recorded along H5.</p>
19 th July 2021 Figure 5	20	Common pipistrelle (13), soprano pipistrelle (4), noctule (2), <i>Myotis</i> species (1)	<p>Four species/species groups were recorded, with the majority of contacts originating from common pipistrelles. Most contacts were recorded in association with linear boundary features, including hedgerows, treelines, and woodland edge. Three contacts from foraging common pipistrelles were identified along the stream, one along the north-south section, two along the east-west section. A further two were observed foraging together along hedgerow H1, which forms the north-western site boundary. The remaining eight contacts were of commuting individuals passing along hedgerows/field margins.</p> <p>Soprano pipistrelles were the next most frequently recorded species, three of which comprised several passes from foraging individuals, and one a commuting individual. All four of which were detected along the southern field boundary with Howlett's and H5 (around the southern field extent).</p> <p>The remaining contacts, two from noctules and one from an unidentified <i>Myotis</i> species, comprised low numbers of passes from individuals commuting around the site. A contact comprising a pair of commuting noctule, was detected along hedgerow H1, while the other noctule contact was recorded at the southern end of H5.</p>
22 nd September 2021 Figure 6	16	Soprano pipistrelle (7), Common pipistrelle (5), <i>Myotis</i> species (2), <i>Nyctalus</i> species (1), Brown long-eared bat (1)	<p>Five species / species groups were recorded with most contacts originating from soprano pipistrelles. Most contacts were recorded in association with the boundary features to the south and east, along hedgerows H3, H4 and H5. Activity from soprano pipistrelles largely comprised low numbers of passes from individuals commuting along linear features, with two records of a foraging soprano pipistrelles recorded at the western end of H3, and the intersection of hedgerows H4 and H5.</p> <p>Common pipistrelles were the next most frequently recorded species, all of which comprised one or two passes from commuting individuals. One was observed near PCC, two near the mature trees at the western end of stream S1, and two travelling along the eastern site boundary.</p> <p>Single passes from two commuting unidentified <i>Myotis</i> species were recorded, one off site near Point Count E, the other travelling along hedgerow H1, bordering the north-western edge of the application site.</p> <p>The remaining contacts, one each from brown long-eared bats and unidentified <i>Nyctalus</i> species, comprised single passes from individuals. The <i>Nyctalus</i> was recorded commuting along the western end of stream S1, near Point Count E, while the brown long-eared bat was recorded at the southern end of H1, near PCH.</p>

APPENDIX C: Bat Static Survey Results Descriptions 2021

Survey Period	Unit Reference / Location	Total Registrations Over 5 nights	Species recorded (in order of abundance and total number of registrations)	Summary of Activity
19 th – 24 th May 2021	Unit A (21): Located centrally along northern boundary hedgerow (H2)	33	<i>Myotis</i> sp. (12), common pipistrelle (8), soprano pipistrelle (7), <i>Nyctalus</i> sp (3), <i>Pipistrellus</i> sp (2), noctule (1)	<p>Unidentified <i>Myotis</i> species were the most frequently recorded bat species during the recording period, comprising 36% of contacts. Activity from <i>Myotis</i> bats was recorded on two survey nights, peaking on 19th/20th May (with 9 registrations). Registrations were predominantly recorded between the hours of 21:00 and 23:00, with a small peak in activity between 22:00 and 23:00. A further period of activity was recorded between 03:00 and 04:00 in the morning.</p> <p>Common and soprano pipistrelles comprised the next frequently recorded species, comprising 24 and 21% of total registrations, respectively. Soprano pipistrelles were recorded every night except the last, in similarly low numbers, while common pipistrelles were only recorded on two nights (19th/20th and 22nd/23rd). Activity from both species was widely distributed over the course of a given night.</p> <p>The remaining species/species groups were recorded sporadically at low frequency throughout the recording period (representing approximately 20% of contacts). <i>Nyctalus</i> species, <i>Pipistrellus</i> species, and noctule were recorded irregularly over the survey period, in very low numbers (<5 registrations each), with activity occurring sporadically over the course of a given night.</p>
19 th – 24 th May 2021	Unit B (22): Located at intersection of hedgerow (H1) and perpendicular off-site hedgerow	302	common pipistrelle (143), soprano pipistrelle (127), <i>Pipistrellus</i> sp (21), noctule (4), <i>Myotis</i> sp. (4), Brown long-eared bat (2), <i>Nyctalus</i> sp (1)	<p>Common and soprano pipistrelles were the most frequently recorded bat species during the recording period, comprising nearly 90% of contacts. Activity from both pipistrelle species was recorded every night, peaking on 22nd/23rd May, with 70 and 100 registrations, respectively. Low numbers of registrations from both species, of <10, were recorded on three recording nights (20th/21st, 21st/22nd, and 23rd/24th). Pipistrelles were recorded during most hours of the night, varying in number over the course of the night, with peaks in activity between 21:00 and 22:00, and again between 23:00 and 00:00. <i>Pipistrellus</i> species were recorded on two nights in similar numbers, with a peak in activity between 21:00 and 22:00.</p> <p>The remaining species/species groups were recorded sporadically at low frequency throughout the recording period (representing no more than 4% of contacts). Noctule, <i>Nyctalus</i> species, <i>Myotis</i> species, and brown long-eared were all recorded on single nights, except the brown long-eared bats, which were recorded on two separate survey nights. Each species/species group was recorded sporadically in very low numbers (<5 registrations each).</p>

Survey Period	Unit Reference / Location	Total Registrations Over 5 nights	Species recorded (in order of abundance and total number of registrations)	Summary of Activity
12 th – 19 th July 2021	Unit C (9): At the northern end of hedgerow H1, on the corner with perpendicular hedge (H2)	3477	common pipistrelle (3203), <i>Myotis</i> sp. (137), soprano pipistrelle (79), noctule (17), <i>Nyctalus</i> sp (15), Brown long-eared bat (13), Nathusius' pipistrelle (7), <i>Pipistrellus</i> sp (6)	<p>Common pipistrelles were the most frequently recorded bat species, comprising 92% of contacts and were recorded every night, peaking on 15th/16th July (848 registrations). Registrations occurred evenly throughout a given night. Soprano pipistrelles were recorded in lower numbers, and were also recorded every night, with peak of 25 on 12th/13th July and slight peaks in activity between the hours of 22:00-23:00 and 02:00-03:00 each night. Unidentified <i>Myotis</i> comprised the next frequently recorded species group, comprising nearly 4% of total registrations. <i>Myotis</i> species were recorded every night, peaking at 53 registrations on 15th/16th July. Activity occurred throughout the night, peaking between 01:00 and 03:00 hours. Noctule and <i>Nyctalus</i> species were recorded in similar numbers, together comprising 1% of registrations. Noctule were recorded every night, while <i>Nyctalus</i> were recorded on every night except the 12th/13th July, both species peaking at 6 registrations. Noctule activity primarily occurred 21:00-23:00 and 03:00 and 05:00 hours, while <i>Nyctalus</i> species activity was evenly distributed between 22:00 and 04:00 hours.</p> <p>The remaining species/species groups were recorded sporadically at low frequency throughout the recording period (representing approximately 0.75% of contacts). Brown long-eared bats, <i>Pipistrellus</i> species, and Nathusius' pipistrelle were recorded irregularly over the survey period, in very low numbers (<15 registrations each), with activity occurring sporadically over the course of a given night.</p>
12 th – 19 th July 2021	Unit D (10): At western end of hedgerow H3, perpendicular with Bekesbourne Lane	295	common pipistrelle (113), <i>Myotis</i> sp. (84), soprano pipistrelle (46), noctule (26), <i>Nyctalus</i> sp (13), Nathusius' pipistrelle (5), Serotine (4), <i>Pipistrellus</i> sp (3), <i>Nyctalus/Eptesicus</i> (1)	<p>Common pipistrelles were the most frequently recorded bat species during the recording period, comprising 38% of contacts and were recorded every night, peaking on 15th/16th July (54 registrations). Activity levels were greatest between the hours of 22:00-23:00 and 03:00-04:00. Soprano pipistrelles were also recorded every night, peaking on 15th/16th July (18 registrations), with a slight peak in activity during the night between 02:00-03:00 hours. Unidentified <i>Myotis</i> comprised the next frequently recorded species group, comprising 28% of total registrations. <i>Myotis</i> species were recorded every night, peaking at 24 registrations on 15th/16th July. Activity occurred throughout the night, peaking during the early hours of the morning (00:00 and 03:00 hours). Noctule and <i>Nyctalus</i> species were both recorded every night, peaking at 13 and 5 registrations on the 12th/13th and 13th/14th July, respectively. Noctule activity primarily occurred 21:00-23:00 and 03:00 and 05:00 hours, while <i>Nyctalus</i> species activity was more evenly distributed, with a slight peak between 22:00 and 00:00 hours.</p> <p>The remaining species/species groups were recorded sporadically at low frequency throughout the recording period (representing approximately 0.75% of contacts). Nathusius' pipistrelle, serotine, <i>Pipistrellus</i> species, and <i>Nyctalus/Eptesicus</i> species were recorded irregularly over the survey period, in very low numbers (<5 registrations each), with activity occurring sporadically over the course of a given night.</p>

Survey Period	Unit Reference / Location	Total Registrations Over 5 nights	Species recorded (in order of abundance and total number of registrations)	Summary of Activity
22 nd – 27 th September 2022	Unit E (22): At north-eastern end of hedgerow H5, which passes parallel with Bekesbourne Lane	1135	common pipistrelle (523), soprano pipistrelle (506), <i>Myotis</i> sp. (67), Nathusius' pipistrelle (11), <i>Nyctalus</i> sp (11), Brown long-eared bat (9), noctule (4), <i>Pipistrellus</i> sp (3), <i>Nyctalus/Eptesicus</i> (1)	<p>Common and soprano pipistrelles were the most frequently recorded bat species during the recording period, together comprising 90% of contacts and were each recorded every night, both peaking on 26th/27th September (314 and 292 registrations, respectively). Activity from both species occurred throughout the night, with common pipistrelle and soprano pipistrelle activity greatest between the hours of 03:00-05:00 and 03:00-07:00, respectively. Unidentified <i>Myotis</i> comprised the next frequently recorded species group, comprising 6% of total registrations. <i>Myotis</i> species were recorded every night, peaking at 15 registrations on 23rd/24th, 24th/25th, and 25th/26th September. Activity occurred evenly throughout the night. Nathusius' pipistrelle and <i>Nyctalus</i> species were both recorded every in equal numbers (1% each) night in similarly low numbers. Nathusius' pipistrelle activity primarily occurred between 19:00-22:00 hours, while <i>Nyctalus</i> species activity was more sporadically distributed.</p> <p>The remaining species/species groups were recorded sporadically at low frequency throughout the recording period (representing approximately 1.5% of contacts). Brown long-eared bats, noctule, <i>Pipistrellus</i> species, and <i>Nyctalus/Eptesicus</i> species were recorded irregularly over the survey period, in very low numbers (<10 registrations each), with activity occurring sporadically over the course of a given night.</p>
22 nd – 27 th September 2022	Unit F (27): Eastern end of hedgerow H2, along the northern application site boundary	854	common pipistrelle (442), <i>Pipistrellus</i> sp (286), soprano pipistrelle (94), <i>Myotis</i> sp. (15), Brown long-eared bat (7), Nathusius' pipistrelle (6), <i>Nyctalus</i> sp (3), noctule (1)	<p>Common, soprano, and unidentified <i>Pipistrellus</i> species were the most frequently recorded bat species during the recording period, together comprising 96% of contacts and were each recorded every night, peaking on 24th/25th, 23rd/24th, and 25th/26th September (212, 30, and 140 registrations, respectively). Activity from all three species occurred throughout the night, with common pipistrelle activity greatest around the hours of 20:00-00:00. Soprano pipistrelle activity peaked at 19:00-20:00 and again between 01:00 and 02:00 hours. <i>Pipistrellus</i> species activity, much of which comprised isolated social and contact calls, was relatively consistent through the night, with a slight peak between 21:00 and 22:00 hours.</p> <p>Unidentified <i>Myotis</i> comprised the next frequently recorded species group, comprising 1.75% of total registrations. <i>Myotis</i> species were recorded every night in similar numbers, peaking at six registrations on 26th/27th September. Activity occurred sporadically throughout the night.</p> <p>The remaining species/species groups were recorded sporadically at low frequency throughout the recording period (representing approximately 2% of contacts). Brown long-eared bats, Nathusius' pipistrelle, <i>Nyctalus</i> species, and noctule were recorded irregularly over the survey period, in very low numbers (<10 registrations each), with activity occurring sporadically over the course of a given night.</p>

APPENDIX D: Bat Static Summary of Results 2021

Data Collected from the Static Bat Detectors – May, July, and September 2021

Recording Period	Species Recorded and Data Analysis (in order of peak numbers recorded)															
	Unit No.	Survey Hours	Total Avg. per hour	Total Registrations	Common Pipistrelle			Soprano Pipistrelle			Pipistrellus Species			Myotis species		
					Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour
19/05/2021 - 24/05/2021	1	45:18:51	0.728	33	8	6	0.177	7	4	0.154	2	1	0.044	12	9	0.265
19/05/2021 - 24/05/2021	2	45:18:50	6.665	302	143	70	3.156	127	100	2.803	21	12	0.463	4	3	0.088
12/07/2021 - 17/07/2021	3	44:26:55	78.225	3477	3203	848	72.061	79	25	1.777	6	3	0.135	137	53	3.082
12/07/2021 - 17/07/2021	4	44:27:04	6.637	295	113	54	2.542	46	18	1.035	3	2	0.067	84	24	1.890
22/09/2021 - 27/09/2021	5	65:07:48	17.427	1135	523	314	8.030	506	292	7.769	3	1	0.046	67	15	1.029
22/09/2021 - 27/09/2021	6	65:07:48	13.112	854	442	212	6.786	94	30	1.443	286	140	4.391	15	6	0.230
		309:47:15	19.678	6096	4432	848	14.307	859	292	2.773	321	140	1.036	319	53	1.030

Noctule			Nyctalus Species			Long-eared Bat Sp.			Nathusius' Pipistrelle			Serotine			Nyctalus/Eptesicus		
Period Total	Peak Count	Av. Per Hour	Period Total	Period Total	Peak Count	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour
1	1	0.022	3	2	0.066	0	0	0.000	0	0	0.000	0	0	0.000	0	0	0.000
4	4	0.088	1	1	0.022	2	1	0.044	0	0	0.000	0	0	0.000	0	0	0.000
17	6	0.382	15	6	0.337	13	5	0.292	7	3	0.157	0	0	0.000	0	0	0.000
26	13	0.585	13	5	0.292	0	0	0.000	5	2	0.112	4	4	0.090	1	1	0.022
4	2	0.061	11	4	0.169	9	5	0.138	11	5	0.169	0	0	0.000	1	1	0.015
1	1	0.015	3	2	0.046	7	3	0.107	6	3	0.092	0	0	0.000	0	0	0.000
53	13	0.171	46	6	0.148	31	5	0.097	29	5	0.094	4	4	0.013	2	1	0.006