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Gladman Developments Ltd

Phase 2 Henthorn Road, Clitheroe

ECOLOGICAL APPRAISAL

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1.0 NON-TECHNICAL SUMMARY

- 1.1 The Site comprised three field compartments of improved grassland with sections of moderately species-rich neutral semi-improved grassland associated with a wet ditch and Pendleton Brook. The field boundaries of the Site were formed by native hedgerows.
- 1.2 Proposals suggest that development will result in the loss of improved grassland, which was considered to be of low nature conservation value. Areas of neutral grassland and field boundaries were considered to be of value at a local level and are to be retained within greenspace. Recommendations have also been made for appropriate future management.
- 1.3 Three Biological Heritage Sites (BHSs) were found within 1km of the Site, no negative impacts are anticipated in relation to the proposed development.
- 1.4 Indian balsam, a non-native invasive species, was recorded along the banks of Pendleton Brook. A Management Strategy is provided addressing control of Indian balsam.
- 1.5 Six mature trees with potential as bat roost sites were identified within the Site. Five of these trees are retained and buffered within greenspace. A single tree (T1) with **Low** bat potential as a bat roost will be lost to facilitate proposals. A pre-commencement check of PRFs to ensure the continued absence of roosting bats within T1 is required before it is felled.
- 1.6 A bat activity survey was undertaken in autumn comprising static bat detectors and transect surveys. From this survey, the level of bat activity was considered to be unexceptional, with activity concentrated along the hedgerows and mature trees.
- 1.7 A single breeding bird survey completed in June 2019 revealed that seven notable species used the Site; four of these were confirmed or probable breeders. Kingfishers were observed on a number of occasions hunting along the Pendleton Brook. Any works along the banks should be checked immediately prior to commencement to ensure that the area is absent of nest tunnels for legal compliance purposes.
- 1.8 An Environmental DNA (eDNA) survey for GCN was undertaken on a single offsite pond to the south. As the result was negative it is considered unlikely that GCN present a constraint to the development.
- 1.9 A potential otter holt was recorded along the northern bank of Pendleton Brook, located on the application boundary.. Precautionary measures have been recommended to avoid impacts during the construction phase and further measures to avoid potential impacts during the operational phase along with monitoring.
- 1.10 No evidence of water vole was recorded during the survey and as such this species is not considered to pose a constraint to development. As this species has been recorded further down the catchment, suitable habitat would be rechecked if required prior to any works to riverbanks.
- 1.11 No reptiles have been found onsite, considering the absence of reptile records from consultees, the absence of these species can be considered with reasonable confidence from the five surveys that were completed. It is therefore considered unlikely that reptiles present a constraint to the development.
- 1.12 The report identifies a number of potential ecological enhancements which can be applied to successfully integrate biodiversity into site design.

2.0 INTRODUCTION

- 2.1 This report has been prepared by FPCR Environment and Design Ltd. on behalf of Gladman Development Ltd. It provides the results of an Extended Phase 1 Habitat Survey and a series of protected species surveys undertaken at a site off Henthorn Road, Clitheroe (central grid reference: SD 7296 4058) between June and October 2019.
- 2.2 The site was approximately 6.9ha in extent and encompassed two compartments intersected by Henthorn Road. Surveys were undertaken on the Survey Area, indicated by the red line/ survey boundary on the figures and referred to as 'Site' throughout the report.
- 2.3 The Site comprised three improved grassland field compartments, with small areas of semi-improved neutral grassland and ruderal vegetation. The site boundaries mainly comprised hedgerows, with Pendleton Brook bordering the southern extent of the site. A further wet ditch intersected the southern field compartments, running north east to south west into the Brook. Land use beyond the Site to the south and west was predominantly rural and largely pastoral in nature. Immediately to the north of the Site was the built residential form of Clitheroe.
- 2.4 Proposals are for a residential development with associated green infrastructure and an attenuation area, as shown on the Framework Plan.
- 2.5 The objective of the assessment was to gain an understanding of the baseline ecology of the Site and immediate surrounding area and to determine whether the Site supports, or has the potential to support, protected species and the potential for effects. This assessment involved a desk study, Extended Phase 1 Habitat survey, assessment of trees with features with the potential as bat roosts, a badger *Meles meles* survey, great crested newt *Triturus cristatus* eDNA assessment, bat activity surveys, a breeding bird survey and reptile surveys.

3.0 METHODOLOGY

Desk Study

- 3.1 To support the field survey and further compile existing baseline information relevant to the Site, ecological information was sought from third parties, including records of protected or notable species and sites designated for nature conservation interest. Organisations contacted included:
- Lancashire Environment Record Network (LERN)
- 3.2 Online sources of ecological data were also sought including:
- Multi Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk);
- 3.3 The search area of interest varied depending upon the likely significance and zone of influence of the data requested, as follows:
- A minimum of a 10km radius around the Site was searched for sites with an international statutory designation; Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar sites;

- A minimum of a 2km radius around the Site for sites of national/regional importance with a statutory designation of Site of Special Scientific Importance (SSSI) or National Nature Reserve (NNR);
- Up to a 1km radius around the Site for sites of local importance with statutory designation of Local Nature Reserve (LNR), or non-statutory designation of Site of Importance for Nature Conservation (SINC) or the equivalent Local Wildlife Site (LWS); and
- 1km search area for records of notable / protected species (i.e. including Species of Principal Importance under S41 of the Natural Environment and Rural Communities Act (NERC) 2006 and local biodiversity action plan species.

Field Survey – Habitats

Extended Phase 1 Habitat Survey

- 3.4 The Extended Phase 1 habitat survey is a survey technique recommended by Natural England that largely follows guidance from JNCC 2010¹, with the scale of recording of habitat parcels adjusted to provide more detail for smaller sites. The survey comprised a walkover of the Site, mapping the principal habitat types and identifying a representative species list for each habitat. The abundance of species was quantified using the DAFOR scale, ranging from Dominant to Abundant, through Frequent and Occasional to Rare.
- 3.5 Any habitats suitable for, or features with the potential to support, protected or notable species were also assessed and recorded with the survey.

Hedgerows

- 3.6 Hedgerows were surveyed using the Hedgerow Evaluation and Grading System (HEGS)². This method of assessment includes recording canopy species composition, associated ground flora and climbers, structure of the hedgerow including height, width and gaps, associated features including number and species of mature trees, banks, ditches and grass verges.
- 3.7 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 – High to very high value
 - Grade 2 – Moderately high to high value
 - Grade 3 – Moderate value
 - Grade 4 – Low value
- 3.8 Hedgerows were also assessed against the Wildlife and Landscape criteria contained within Statutory Instrument No: 1160 – The Hedgerow Regulations 1997³ to determine whether they qualified as 'Important Hedgerows' under the Regulations.

¹ JNCC (2010) Handbook for Phase 1 habitat survey – a technique for environmental audit, ISBN 0 861396367

² Clements, D.K. & Tofts, R.J. (1992) Hedgerow Evaluation and Grading System (HEGS): A methodology for the ecological survey, evaluation and grading of hedgerows.

³ DEFRA (1997) The Hedgerow Regulations 1997: A Guide to the Law and Good Practice, London, HMSO

- 3.9 The above surveys were undertaken by Ian Hunter MCIEEM, BSBI Field Identification Skill Certificate (FISC) level 5 from FPCR on the 27th June 2019.

Field Surveys – Protected Species

Badgers

- 3.10 Land within the development area was surveyed at the same time as habitat and hedgerow surveys as outlined above and broadly followed methodologies outlined by Harris et al (1989)⁴. This involves a walkover of the Site searching for field signs which would indicate the presence of badgers as follows:
- Setts: including earth mounds and evidence of bedding and or runways between identified setts
 - Latrines: often located close to setts; at territory boundaries or adjacent to favoured feeding areas
 - Prints and established track or runways;
 - Hairs caught on rough wood or fencing;
 - Other evidence: including snuffle holes, feeding and playing areas and scratching posts. The identification of these latter signs on their own does not necessarily provide conclusive evidence of the presence of badgers. A number of such signs need to be seen in conjunction before badgers can be confirmed as being present.

Bats

Ground Level Assessment of Trees

- 3.11 The tree assessments for roost potential were undertaken from ground level, with the aid of a torch and binoculars where required. During the survey Potential Roosting Features for bats such as the following were sought⁵:
- Natural holes (e.g. knot holes) arising from naturally shed branches or branches previously pruned back to a branch collar.
 - Man-made holes (e.g. cavities 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, loose or bark plates.
 - Cankers (caused by localised bark death) in which cavities have developed.
 - Other hollows or cavities, including butt rots.
 - Compression of forks with occluded bark, forming potential cavities.
 - Crossing stems or branches with suitable roosting space between.

⁴ Harris, S., Cresswell, P. & Jeffries, D. (1989) Surveying for badgers. Occasional Publication of the Mammal Society No. 9. Mammal Society, Bristol.

⁵ BS 8596:2015 (2015) Surveying for bats in trees and woodland. Pg. 16

- Ivy stems with diameters in excess of 50mm with suitable roosting space behind (or where roosting space can be seen where a mat of thinner stems has left a gap between the mat and the trunk).
 - Bat or bird boxes.
 - Other suitable places of rest or shelter.
- 3.12 Certain factors such as orientation of the feature, its height from the ground, the direct surroundings and its location in respect to other features, may enhance or reduce the potential value.
- 3.13 Based on the above, trees were classified into general bat roost potential groups based on the presence of these features. Table 1 (below) broadly classifies the potential categories as accurately as possible as well as discussing the relevance of the features. This table is based upon Table 4.1 and Chapter 6 in Bat Surveys for Professional Ecologists: Good Practice Guidelines⁶.
- 3.14 Although the British Standard Document groups features with moderate and high potential, these have been separated below (as per Table 1.1 in The Bat Conservation Trust Guidelines) to allow more specific survey criteria to be applied.

Table 1: Bat Survey Protocol 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.	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. Works to tree undertaken under supervision in accordance with the approved good practice method statement provided within the licence. However, where confirmed roost site(s) are not affected by works, work under a precautionary good practice method statement may be possible.

⁶ Collins, J (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines. Bat Conservation Trust

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

NB The Conservation of Habitats & Species Regulations 2017 (as amended) affords protection to “breeding sites” 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”.

Detailed Potential Roosting Feature (PRF) Inspection Survey in Trees (Aerial Inspection)

- 3.15 PRF inspection surveys were undertaken on any trees that were classified as providing medium or high levels of bat roosting potential in the preliminary assessment, that will be impacted by the proposals. These surveys included a detailed inspection for PRFs using endoscopes, mirrors, torches and cameras and were accessed by appropriately licensed and experienced ecologists using arborist tree-climbing techniques. During this survey, each feature is inspected for evidence of current or past occupation by bats and also its potential suitability to support roosting bats. Individual features were re-assessed using the criteria outlined in Table 1 which was used to reclassify the tree and inform any further survey effort or mitigation as outlined below.
- 3.16 This assessment was completed by suitably experienced and licensed ecologist Sam Newbold (Natural England Class Licence Registration Number: 2017-32666-CLS-CLS) on the 10th October 2019.
- 3.17 In accordance with Chapter 6 in Bat Surveys for Professional Ecologists: Good Practice Guidelines⁷, where this inspection categorised a PRF or tree as containing moderate or high bat roosting potential then further surveys would be necessary. Where a PRF or tree was categorised as low then no further surveys are likely to be necessary but precautionary methods for works to the tree would be recommended. If a tree was considered to provide negligible bat roosting potential, then no further action would be necessary in respect of bats.

Bat Activity Surveys

- 3.18 From the results of Phase 1 Habitat Survey & preliminary protected species survey it was considered that the Site broadly represented **low** value habitat for bats⁸. As such seasonal bat transects and static bat detector monitoring surveys were recommended to support the ecological assessment.

Static Bat Detector Surveys

- 3.19 Passive (static) monitoring was undertaken using an automated logging system Song Meter® SM4BAT FS bat detectors (Wildlife Acoustics Inc.) with its output saved to an internal storage device. SM4BAT FS devices were positioned to record bat contacts at those static locations for five consecutive nights per season. This information was used to derive an index of activity and species composition at different points within the Site. SM4BAT FS devices were placed along features considered to be of value to bats, such as along riparian corridors, hedgerows and tree lines.
- 3.20 Devices were placed in each location for an extended period of time of suitable weather conditions (little no rain/wind and temperatures above 10°C). Detectors were programmed to activate 30 minutes before dusk and recorded continuously until 30 minutes following sunrise. The output from this detector was subjected to computer analysis using the Kaleidoscope software package

⁷ Collins J, (2016), Bat Surveys for Professional Ecologists: Good Practice Guidelines. Bat Conservation Trust

⁸ Collins, J (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines. Bat Conservation Trust

(Wildlife Acoustics Inc.). The analysis of the SM4BAT FS files recorded can highlight the presence of more than one bat if 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 registration. The number of bat registrations does however reflect the relative importance of the location of the detector by calculating the bat registrations per hour.

- 3.21 The location of the deployed static detector during the autumn bat activity survey is shown on Figure 3. This was deployed during the following period; 13th – 18th September 2019.

Bat Transect Surveys

- 3.22 The primary objective of transect activity surveys was to identify foraging areas, commuting routes and species utilisation of the Site.
- 3.23 The transect route was determined prior to survey in order to sample most of the on-site habitats with those areas considered to provide the greater levels of suitability for bats the main focus. These included point counts to identify activity levels around the features of potential value to bats and areas of the Site that are to be most affected by the development proposals (i.e. hedgerows / treelines / scrub habitats / riparian corridors). Each point count consisted of 5 minutes, during which all bat activity was recorded.
- 3.24 Transect surveys commenced approximately at sunset and were 2 to 3 hours in duration.
- 3.25 Each transect was walked at a steady pace and when a bat passed by, the species, time and behaviour was recorded on a Site plan. This information provides a general view of the bat activity present on Site and identifies the key foraging area and commuting routes.
- 3.26 The survey was undertaken by appropriately experienced ecologists from FPCR and was walked at a steady pace using Wildlife Acoustics Inc. Echo Meter Touch® PRO bat detectors in conjunction with Echo Meter Touch® app and an Apple Inc. iPad® to provide back-up information and enable identification of bats encountered.
- 3.27 Post-survey, bat calls recorded were analysed using Wildlife Acoustics, Inc. Kaleidoscope software packages by taking measurements of the peak frequency, inter-pulse interval, call duration and end frequency. Analysis was undertaken by suitably experienced and licensed bat ecologists from FPCR. From this, the level of bat activity across the Site in relation to the abundance of individual species foraging and commuting along habitats was assessed.
- 3.28 All transects were undertaken when conditions were suitable (i.e. when the ambient air exceeded 10°C and when there was little/no wind or rain). The results of the autumn transect survey are shown in Figure 3. Table 2 below provides the survey timings and weather conditions.

Table 2: Bat Activity Transect Survey Conditions

Transect Date	Season	Sunset	Start Time	End Time	Start Temp (°C)	End Temp (°C)	Wind (BF)	Rain	Cloud cover (%)
19/09/19	Autumn	19:17	19:16	21:17	15	13	0	0	0

Barn Owl

- 3.29 In combination with the above bat assessments, all trees within the Site were visually assessed for the existence of large cavities with the potential for use by nesting or roosting barn owl *Tyto alba*. Additional signs, such as pellets and faecal splashing were also searched for on or around potential perches.

Breeding Birds

- 3.30 The survey methodology employed was broadly based on that of territory mapping as used for the British Trust for Ornithology (BTO) Common Bird Census (CBC) (1983)⁹. Standard BTO species codes and symbols for bird activities were used to identify birds and denote activity, sex and age where appropriate. Birds were considered to be holding a territory and therefore utilising the Site for breeding activities if they were displaying breeding behaviours, such as: singing, nest building, food carrying or territorial defence. If birds did not display such behaviours, e.g. were only observed flying over the Site, these were considered non breeders and therefore did not have a territory.
- 3.31 To help inform the population status of breeding birds on the Site, one survey was undertaken in the morning of 27th June 2019 by FPCR ornithologist George Watola MCIEEM. The surveyor followed a route around the boundary of the Site, affording an overview of the entire Site. Table 3 provides the survey date and weather conditions.

Table 3: Breeding Bird Survey Date and Weather Conditions

Date	Cloud Cover	Rain	Wind	Visibility
27.06.19	0%	None	Light breeze	Excellent

Great Crested Newts

Habitat Suitability Index (HSI)

- 3.32 An assessment was undertaken on ponds within 500m and within connective habitat of the Site (see Figure 4), for their suitability to support great crested newts by a great crested newt class licence holder. The Habitat Suitability Index provides a measure of the likely suitability that a water-body has for supporting newts (Evaluating the suitability for the Great Crested Newt¹⁰). Generally, ponds with a higher score are more likely to support great crested newts than those with a lower score and there is a positive correlation between HSI scores and ponds with newts recorded. Ten separate attributes are assessed for each pond to calculate the suitability of the ponds to support GCN:

- Location within the UK
- Pond area
- Frequency of pond drying
- Water quality
- % shade
- Presence of water-fowl
- Presence of fish
- Number of other ponds within 1km
- Quality of surrounding terrestrial habitat
- % cover by macrophytes

⁹ Marchant, J.H. (1983) BTO Common Birds Census Instructions. British Trust for Ornithology, Tring 12pp.

¹⁰ 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, Vol. 10(4), 143-155.

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

Table 4: HSI Assessment Scale

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

Environmental DNA Sampling

- 3.34 Environmental DNA or eDNA sampling is a method used to detect GCN occupancy within waterbodies, using traces of DNA shed into the pond. In June 2019 one pond was considered for eDNA sampling located approximately 50m from the southern survey boundary. The sampling was carried out in accordance with protocols recommended by Natural England.
- 3.35 Sampling was undertaken on the 27th June 2019 by Ian Hunter MCIEEM (Natural England Licence Registration Number: 2015-17739-CLS-CLS) who collected samples of water from around the pond. This comprised taking samples of agitated water from 20 locations around the pond and mixing thoroughly. 15ml of this water was then placed into each of six sterile tubes containing preservatives, precipitates and a DNA sequence that was used for degradation control. This was then transported under suitable conditions to the FERA laboratory at Sand Hutton, York for analysis. Details of the analysis methodologies are included in *Appendix B: Environmental DNA Analysis Report*. Following analysis, results provided by the laboratory could have one of the three outcomes, details of which are provided in Table 5 below.

Table 5: Description of Possible Results of eDNA Analysis

Result	Description
Positive	A positive result means that eDNA from GCN was detected and they have been present within the water in the 20 days before sampling. An eDNA score would be provided indicating the number of positive replicates from a series of twelve.
Negative	DNA from GCN was not detected; in the case of negative samples the DNA extract is further tested for PCR inhibitors and degradation of the sample.
Inconclusive	Controls indicate degradation or inhibition of the sample, therefore the lack of detection of GCN DNA is not conclusive evidence for determining the absence of the species in the sample provided. Degradation can occur through poor storage of the samples or kits and inhibition can occur through unexpected chemicals in the sample.

Otter

- 3.36 The survey methodology detailed below is generally used to determine the status of otters within a survey area. The methodology follows that detailed within the New Rivers and Wildlife Handbook¹¹ and Channin (2003)^{12&13}.
- 3.37 Due to the unlikely event of actual observation, the survey concentrated on locating field signs indicating otter presence or recent use by otter. Such field signs include;
- Spraints – characteristic sweet-smelling, black tar-like (where fresh/relatively recent i.e. within a few weeks) or grey crumbly (when old) faecal deposits usually containing fish scales, bones and occasionally invertebrate exoskeletons and bird feathers.
 - Footprints – In good substrate typically asymmetrical and showing five toes arched around a large pad and, depending on substrate, webbing and claw marks. Poorer, generally coarser substrates do not often enable the identification of otter footprints.
- 3.38 Additional signs of otter presence may occur, although without additional evidence are usually not conclusive proof of current otter presence, such as:
- Feeding remains – Remains of fish and aquatic invertebrates
 - Slides/haul-outs – Routes into and out of the water, which are usually associated with terrestrial routes such as short cuts around meanders or along traditionally, used otter paths/routes.
 - Couches/hovers – above ground resting place. Usually associated with cover such as dense scrub, rushes or reed, flood debris or fallen trees. Many couches are rarely used whilst others more so. Difficult to prove use without radio tracking.
 - Holts – below ground resting site usually associated with sprainting. Sometimes used with greater frequency than couches and can be important for breeding (natal holts) where other signs are usually absent. Notoriously difficult to find or prove without radio tracking.
- 3.39 A survey of Pendleton Brook, which borders the Site along the southern boundary, was undertaken on the 10th October 2019 by Kate Haymes ACIEEM from FPCR.

Reptiles

- 3.40 The reptile presence / likely absence surveys were undertaken considering the methodologies detailed in published guidance.^{14&15} This involved the placement of refugia tiles / tins comprising approximately 0.5m² pieces of bitumen roofing felt and corrugated steel sheeting painted black on one side. These were placed in locations that offered the most suitable habitat for common reptiles, i.e. structurally diverse vegetated habitats and those adjacent to watercourses.
- 3.41 The refuges were left to 'bed-down' for at least a two-week period. Figure 5 shows the distribution of refugia and the habitats in which they were placed.

¹¹ RSPB (1994) The National Rivers Authority and the RSNC.

¹² Channin, P (2003) *Ecology of the European Otter*. Conserving Nature 2000. Rivers Ecology Series No. 10. English Nature, Peterborough.

¹³ Channin, P (2003) *Ecology of the European Otter*. Conserving Nature 2000. Rivers Ecology Series No. 10. English Nature, Peterborough.

¹⁴ Froglife (1999) Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation *Froglife Advice Sheet 10*. Froglife, Halesworth

¹⁵ Gent, A.H. and Gibson, S.D (1998) *Herpetofauna Workers Manual*. Peterborough, Joint Nature Conservation Committee

- 3.42 Following the 'bed-down' period, surveys involved a search for basking reptiles on or under the refugia, on or under naturally occurring refugia and within suitable habitat. When checking refugia each tile / mat was approached from downwind and care was taken to avoid casting a shadow, so as not to disturb basking animals. The mats / tins were always lifted with care as to avoid any potential harm to any animals underneath them.
- 3.43 At total of 5 survey occasions had been undertaken within the accepted survey window.

Water vole

- 3.44 An initial habitat assessment was made by Ian Hunter MCIEEM from FPCR to determine whether or not the waterbody supports the habitat preferences of water voles such as:
- Dry areas above water level for nesting, either in burrows or above-ground woven nests;
 - Steep bank profiles;
 - Suitable bank substrate for burrowing;
 - Daily water level fluctuations;
 - Herbaceous marginal and bankside vegetation; and
 - Suitable water depth.
- 3.45 A further detailed field survey was conducted on the 10th October 2019.
- 3.46 The more detailed survey involved identification of evidence of water vole activity within at least 5m of the channel of any waterbody / water course. These presence and absence surveys were undertaken by an experienced ecologist using the standard methodology of Dean *et al.* (2016)¹⁶. This involved searching the banks/margins of the waterbodies for evidence of:
- *Latrines* - distinct piles of water vole droppings found near nest sites, at the ranges of territorial boundaries and where the animals enter and leave the water. The presence of droppings is the only field sign which can be used reliably on its own;
 - *Burrows* - burrow entrances are typically wider than high with a diameter between 4-8cm. Generally, these burrow entrances are located at the water's edge;
 - *Feeding Stations* - areas with distinct neat piles of chewed lengths of vegetation along pathways or haul out platforms along the water's edge;
 - *Footprints* - identifiable prints in soft margins of the watercourse;
 - *Runways* - low tunnels that are pushed through the vegetation and often leading to burrows or feeding stations; and
 - *Nest Balls* – rugby sized ball of vegetation lay within a tuft of vegetation above the water line.

¹⁶ Dean, M., Strachan, R., Gow, D & Andrews, (2016) The Water Vole Mitigation Handbook. The Mammal Society Guidance Series. Eds F. Matthews & P. Chanin. The Mammal Society, London.

Limitations

- 3.47 Where bat calls could not be identified to species level, for example due to the lower quality of those recordings or where there are similarities between species echolocation calls (particularly for *Myotis* and *Pipistrellus* genus bats) making a definite identification difficult, a likely species identification is provided. This is based on the features displayed by the calls when analyses using the Kaleidoscope© data analysis software package and taking into account the geographical location of the Site and the habitats present. It was therefore considered that;
- Pipistrelle species bats were either common or soprano pipistrelle;
 - *Nyctalus* species bats were likely to be noctule;
 - Given the known species distributions of *Myotis* species locally, *Myotis* species bats were likely to be whiskered / Brandt's *Myotis mystacinus* / *brandtii*, Natterer's *Myotis nattereri* or Daubenton's *Myotis daubentoni*.
- 3.48 The first opportunity to undertake a bat activity survey was late September/ October. The results of the single autumn survey were as would be expected for a site of this habitat quality. It was therefore considered that a reasonable assessment could be made on this basis.
- 3.49 The breeding bird survey provided an indication of the breeding bird assemblage of the Site. Whilst some species might otherwise not be observed the survey was considered to provide a good indication of the likely impacts.
- 3.50 Whilst some of the reptile surveys were undertaken outside of the optimal survey period, these were undertaken during suitable conditions. Considering the absence of reptile records from consultees, a reasonable amount of confidence of the absence of these species can be gained from the five surveys that were undertaken.
- 3.51 From the data that has been collected regarding foraging and commuting bats, breeding birds and reptiles and given the nature of the proposals, the impacts upon these important ecological features are likely to be limited. The Framework Plan indicates that the habitats of higher ecological value to these species' groups will be retained and buffered by greenspace. This includes the hedgerows, mature trees, semi-improved neutral grassland, wet ditch and adjacent Pendleton Brook.

4.0 RESULTS

Desk Study

- 4.1 A summary of the relevant information is provided below; original data provided by the consultees has not been included within this report. Locations non-statutory designated sites referred to in the following section are illustrated on Figure 1.

Statutory Designated Sites

- 4.2 No designated sites of international nature conservation importance were located within 10km of the Site.

- 4.3 No designated sites of national/regional nature conservation importance were located within 2km of the Site.
- 4.4 No designated sites of local importance were located within 1km of the Site.

Non-Statutory Designated Sites

- 4.5 There are three non-statutory sites within 1km of the Site. The details of these sites are provided in Table 6 below and mapped on Figure 1.

Table 6: Non-Statutory Designated Sites

Site Name	Designation	Proximity to site (approximate)	Description
River Ribble	Biological Heritage Site (BHS)	70 m northwest	The river and its associated habitats support a rich assemblage of plants and animals. The river is important for salmon <i>Salmo salar</i> , sea trout <i>Salmo trutta trutta</i> , otter <i>Lutra lutra</i> and water vole <i>Arvicola amphibius</i> . Much of the land associated with the river provides nesting habitat for bird species such as; sand martin <i>Riparia riparia</i> , kingfisher <i>Alcedo atthis</i> , oystercatcher <i>Haematopus ostralegus</i> , common sandpiper <i>Actitis hypoleucos</i> , little ringed-plover <i>Charadrius dubius</i> and goosander <i>Mergus merganser</i> .
Barrow Clough Wood	Biological Heritage Site (BHS)	550 m southeast	The site comprises of clough woodland to the south of Clitheroe that is included in the Lancashire Inventory of Ancient Woodland (Provisional), (English Nature, 1994). The canopy consists of locally abundant Ash with Oak <i>Quercus</i> sp., Sycamore <i>Acer pseudoplatanus</i> , Beech <i>Fagus sylvatica</i> , Birch <i>Betula</i> sp. and occasional Horse-chestnut <i>Aesculus hippocastanum</i> . Alder <i>Alnus glutinosa</i> is frequent along the course of the brook. The ground flora includes Bluebell <i>Hyacinthoides non-scripta</i> , Tufted Hair-Grass <i>Deschampsia caespitosa</i> and Sweet Vernal-grass <i>Anthoxanthum odoratum</i> .
Primrose Lodge	Biological Heritage Site (BHS)	565 m east	The site comprises the lodge for the former Primrose Print Works, created by the damming of Mearley Brook, and adjacent semi-natural broadleaved woodland. The site supports the largest known colony of Green Figwort <i>Scrophularia umbrosa</i> , in the Ribble Valley which is a nationally scarce species.

Protected Species

- 4.6 Records of protected and notable faunal species derived from the desk study consultees are provided in Table 7 below. Species records have been filtered to comprise protected and / or notable species within 1km of the Site from the last 20 years. The locations of the pertinent species records are mapped on Figure 1.

- 4.7 No notable / protected birds are recorded within the survey boundary. There were 73 records within 1km, associated with the housing to the north of the application boundary.

Table 7: Protected and Notable Species

Species	Conservation Status	Total Number of Records within 1km	Location / Minimum distance of records from site.
Amphibians			
Common Frog <i>Rana temporaria</i>	WCA, Sch5, LBAP	1	A single record from 2018, 210 m N of site and near to the residential area of Clitheroe.
Mammals			
Common Pipistrelle <i>Pipistrellus pipistrellus</i>	Regs, WCA, Sch5 LBAP	6	Records of bats in flight and bat roosts ranging from 2005-2017, the closest being a roost located 175 m SE.
Pipistrelle Bat Species <i>Pipistrellus</i> sp.	Regs, WCA, Sch5 LBAP	2	Two roost records from 2004 and 2018, the closest being a maternity roost record 795m NE within Primrose Lodge BHS.
European Otter <i>Lutra lutra</i>	Regs, WCA, Sch5, SPI, LBAP	4	Four records from 2015 to 2019 within 1km of the site, one being 680 m N on the River Ribble.
Badger <i>Meles meles</i>	-	1	CONFIDENTIAL
Birds			
Black-headed Gull <i>Chroicocephalus ridibundus</i>	BoCC Amber, LBAP	2	Records from 2015 recorded at Primrose Lodge.
Bullfinch <i>Pyrrhula pyrrhula</i>	BoCC Amber, LBAP	1	A single record from 2017.
Dunnock <i>Prunella modularis</i>	BoCC Amber, LBAP	9	Records ranging from 1999 - 2009
Grey Wagtail <i>Motacilla cinerea</i>	BoCC Red	1	A single record from 2008.
House Sparrow <i>Passer domesticus</i>	SPI, BoCC Red, LBAP	29	Records ranging from 1999-2018.
Peregrine <i>Falco peregrinus</i>	WCA, Sch1,	1	A single record from 2018 recorded within recreational ground in the residential area of Clitheroe, 860 m N.
Song Thrush <i>Turdus philomelos</i>	SPI, BoCC Red, LBAP	3	Records from 1999 and 2009.
Starling <i>Sturnus vulgaris</i>	SPI, BoCC Red, LBAP	24	Records ranging from 2008-2009.
Swift <i>Apus apus</i>	BoCC Amber, LBAP	1	A single record from 2011.
Willow warbler <i>Phylloscopus trochilus</i>	BoCC Amber, LBAP	1	A single record from 2004.

Species	Conservation Status	Total Number of Records within 1km	Location / Minimum distance of records from site.
Inverts			
Wall butterfly	WCA, Sch5, SPI, LBAP	1	A single record 500m S from 2008.
White-letter Hair streak butterfly	WCA, Sch5, SPI, LBAP	1	A single record 500m S from 2010.

Status Key: Regs = The Conservation of Habitats and Species Regulations 2017. WCA = Wildlife and Countryside Act 1981 (as amended). Sch5 = Schedule 5 of WCA. SPI = Species of Principal Importance listed in Section 41, Natural Environment and Rural Communities Act (2006). BoCC Red = Birds of Conservation Concern Red List. BoCC Amber = Birds of conservation concern Amber List, LBAP = Lancashire Biodiversity Action Plan.

Field Survey - Habitats

- 4.8 The habitats described below correspond to those mapped on Figure 2. Botanical species lists for each habitat are provided in Appendix A.

Broad-leaved scattered trees

- 4.9 A line of trees including sycamore *Acer pseudoplatanus*, lime *Tilia x europaea*, horse-chestnut *Aesculus hippocastanum*, cherry laurel *Prunus laurocerasus* and garden privet *Ligustrum ovale* were found along the north western field boundary of the separate north western field. Scattered trees, including occasional mature hawthorn *Crataegus monogyna*, alder *Alnus glutinosa* and blackthorn *Prunus spinosa*, were found along the bank of Pendleton Brook. Occasional hedgerow trees were also found to the east of the southern field near the union of hedgerows (H1 and H2). Also two pedunculate oaks *Quercus robur* were present within this field (Figure 2).

Dense Scrub

- 4.10 There is a small patch of abundant blackthorn *Prunus spinosa* in the north-western corner of the southern field.

Scattered Scrub

- 4.11 Scattered scrub comprising occasional hawthorn is found to the east of the Site at the southern end of hedgerow H1.

Improved Grassland

- 4.12 The majority of the Site comprised improved grassland. The field compartments were cut as hay-meadows in late June and then grazed by sheep (Photograph 1). The field compartment north of Henthorn Road comprised abundant perennial ryegrass *Lolium perenne* with frequent Yorkshire fog *Holcus lanatus*. Perennial ryegrass *Lolium perenne* was the most abundant species within the sward, with frequent Yorkshire fog and white clover *Trifolium repens*. Occasional species included meadow foxtail *Alopecurus pratensis* and red clover *Trifolium pratense*. Soft-brome *Bromus*

hordeaceus, meadow buttercup *Ranunculus acris* and common mallow *Malva sylvestris* were rare species present.

Photograph 1: Northern field compartment, improved grassland, freshly cut for hay, facing south



Neutral Grassland

- 4.13 The southern field compartment had small areas of moderately species rich neutral grassland, associated with the wet ditch and adjacent to Pendleton Brook. The sward comprised abundant crested-dog's tail *Cynosurus cristatus* with frequent ribwort plantain *Plantago lanceolata*, quaking grass *Briza media* and rough hawkbit *Leontodon hispidus*. Yellow oat-grass *Trisetum flavescens*, false oat-grass *Arrhenatherum elatius* and mouse-ear hawkweed *Pilosella officinarum* were locally frequent. Occasional species included common sorrel *Rumex acetosa*, red fescue *Festuca rubra* and yarrow *Achillea millefolium*, with rarely occurring tormentil *Potentilla erecta*, silverweed *Potentilla anserina* and selfheal *Prunella vulgaris*.
- 4.14 This community is broadly analogous with NVC community (MG4) *Alopecurus pratensis*-*Sanguisorba officinalis* grassland and therefore has the potential to be representative of Lowland Meadows Habitat of Principal Importance under the NERC Act 2006.

Photograph 2: Pendleton Brook with neutral grassland, facing north



Poor Semi-improved Grassland

- 4.15 A small area of poor semi-improved grassland was situated along the bank of Pendleton Brook. Yorkshire fog was the most abundant species within the sward, with frequent cock's-foot *Dactylis glomerata* and creeping buttercup *Ranunculus repens*. Bittersweet *Solanum dulcamara*, silverweed and meadow fescue *Schedonorus pratensis* were locally frequent. Rare species included, barren strawberry *Potentilla sterilis*, water forget-me-not *Myosotis scorpioides* and cuckooflower *Cardamine pratensis*.

Poor semi-improved grassland / Tall ruderal mosaic

- 4.16 This habitat mosaic is found along the banks of the wet ditch in the southern field. False oat-grass and Yorkshire-fog are frequent grasses, whilst common nettle *Urtica dioica* and bittersweet are locally frequent. This is mapped as TN1 on Figure 2.
- 4.17 Several other discrete areas of tall ruderal habitat were present within the eastern field, these predominantly comprised stands of common nettle *Urtica dioica*.

Photograph 3: Wet ditch with tall ruderal/ poor semi-improved (TN1) grassland along margins, facing northeast. Southern improved grassland compartment recently cut for hay.



Marginal vegetation

- 4.18 Semi-aquatic plants such as water figwort *Scrophularia auriculata*, great willowherb *Epilobium hirsutum*, yellow iris *Iris pseudacorus* and reed canary-grass *Phalaris aurundinacea* are found along Pendleton Brook.

Running Water

- 4.19 Pendleton Brook forms part of the southern boundary of the Site. The banks were approximately 1-2m in height and separated by a 5m channel. The Brook flowed from east to west and had a rocky substrate. The northern bank was steep and vegetated with occasional trees including mature hawthorn, alder and blackthorn. A wet ditch runs through the southern field, draining into Pendleton Brook. This was approximately 0.5m wide with 0.5m high banks.

Invasive species

- 4.20 Indian balsam *Impatiens glandulifera* was occasionally found along the banks of Pendleton Brook. Denser stands were noted offsite further upriver.

Hedgerows

- 4.21 Severn hedgerows were recorded bordering the Site. All hedgerows supported at least 80% native canopy species and therefore meet the criteria as a Habitat of Principal Importance under the NERC Act 2006. Hedgerows H1, H2, H4 and H6 were also assessed as being of moderately high to high conservation value (Grades 1- 2) using HEGS methodology and therefore are considered a priority for nature conservation. One hedgerow (H6) was assessed as being 'Important' under the Hedgerow Regulations.
- 4.22 Hawthorn *Crataegus monogyna* was a dominant component of the hedges with other species such as blackthorn *Prunus spinosa*, elder *Sambucus nigra*, bramble *Rubus fruticosus agg.*, dog-rose *Rosa canina*, and guelder-rose *Viburnum opulus* present. Tree standards such as ash *Fraxinus excelsior*, sycamore *Acer pseudoplatanus* and horse chestnut *Aesculus hippocastanum* were interspersed within the hedge system.
- 4.23 Further information regarding the quality and ecological value of the hedgerows is provided below in Table 8.

Table 8: Hedgerow Survey Summary

Ref	Canopy (from most abundant to least abundant)	Sp. most to least abundant	Height / Width (m)	Length (m)	Sp. per Av. 30m†	Notes	HEGS Grade	Important Hedgerow
H1	<i>Cm, Fe, Ap, Ps, Rf, Ia, Rc, Ah, Ca</i>		2-4 / 2-3	171	3.5	Unmanaged, 30-10% gaps, fourteen standards, two end connections.	-1	No
H2	<i>Cm, Ps, Cq, Fe, Rf, Qr, Rc, Sn, Ap, Vo</i>		2-4 / 2-3	199	3.5	Unmanaged, <10% gaps, three end connections, six tree standards.	-1	No
H3	<i>Ps, Cm, Rc, Sn.</i>		>4 / 2-3	42	3	<10% gaps, three end connections.	3+	No
H4	<i>Cm, Ps, Ca, Fe, Rc, Ug</i>		1-2 / 1-2	213	3.6	<10% gaps, two end connections.	-2	No
H5	<i>Cm, Ca, Fe, Ap</i>		2-4 / 1-2	71	2	No gaps, two end connections, one tree standard	3+	No
H6	<i>Ps, Cm, Sci, Rc, Ca, Fe, Rf, Sn</i>		2-4 / 2-3	167	5.5	No gaps, three end connections	2+	Yes
H7	<i>Cm, Ps, Rc, Qr, Sn, Ca, Ia</i>		2-4 / 2-3	95	4	<10% gaps, two end connections, one tree standard.	3	No

Species Key: *Ah Aesculus hippocastanum* horse-chestnut, *Ap Acer pseudoplatanus* – sycamore, *Ca Corylus avellana* – hazel, *Cm Crataegus monogyna* – hawthorn, *Fe Fraxinus excelsior* – ash, *Ia Ilex aquifolium* – holly, *Psp. Prunus spp.* – cherry species, *Ps – Prunus spinosa* – blackthorn, *Qr Quercus robur* – pedunculate oak, *Rc Rosa canina* – dog-rose, *Rf Rubus fruticosus agg.* – bramble, *Sc Salix cinerea* – grey willow, *Sn Sambucus nigra* – elder, *Ug Ulmus glabra* – wych elm, *Vo Viburnum opulus* – guelder-rose.

Field Survey - Fauna

Badgers

- 4.24 Whilst it was considered that the grassland and hedgerows may provide suitable foraging habitat for this species, during the survey no signs attributable to badgers such as setts, latrines, hairs or footprints were recorded within the Site or its immediate surrounds (where accessible).

Bats

Habitats

- 4.25 Due to its species-poor nature, the improved grassland habitat recorded across the majority of Site is unlikely to support a high abundance of invertebrate species and therefore is less likely to provide a significant foraging resource for local bat populations. However, the neutral semi-improved grassland, hedgerows, mature trees, running water and scrub would provide suitable foraging and commuting habitat and linkages into the wider area.

Ground Level Assessment of Trees

- 4.26 All mature trees present within the Site were assessed for their potential to support roosting bats. The preliminary ground level assessment identified six trees as potentially providing moderate or high bat roosting potential (see Figure 2).

Detailed Potential Roosting Feature (PRF) Inspection Survey in Trees (Aerial Inspection)

- 4.27 Of these six trees, T1 and T6 are likely to be impacted by the proposals and were therefore fully inspected using aerial techniques. No evidence of roosting bats was observed at the time of survey and the bat roost potential categories for both trees were revised to **Low** following the detailed this inspection. Table 9 below details the results of the assessment.

Table 9: Trees with Bat Potential

Tree Ref	Description	Bat Roost Potential Category
T1	English oak <i>Quercus robur</i> with two PRFs; 1) A branch tear-out with exposed and rotting heartwood, 6m high on NW aspect. Two access points at the top and bottom of the feature, approximately 6cm in diameter. Internal cavity 50cm in length, extended upwards but was very wet inside. Negligible bat roosting potential. 2) Natural knot hole 4m high on SE aspect. Large cavity, approximately 10cm x 30cm. Internally the cavity extended approximately 60cm upwards. No evidence of roosting bats and limited potential as it was very wet inside. Low bat roosting potential.	Low

Tree Ref	Description	Bat Roost Potential Category
T6	English oak with two PRFs; 1) Large split with exposed heartwood along a branch 5m high on S aspect. Cracks and cavities in heartwood only extended a few centimetres and were open and exposed to rain as they were wet inside. Low bat roosting potential. 2) Split along another branch 4m high on NW aspect. The crack was wide and exposed and the cavity created did not extend further into limb. Low bat roosting potential.	Low

Bat Activity Survey

Autumn Static Detector Survey

- 4.28 A single static detector was deployed on 13th – 18th September 2019. The unit was attached to tree T1. The unit recorded seven species of bat. Common pipistrelle was the most commonly occurring species with over 56% of the total registrations over the survey period, with a nightly peak of 88 registrations on the night of 14th/15th September. There was a nightly peak of 61 registrations for soprano pipistrelle, 6 for noctule, 3 for Nyctalus species, 4 for Myotis species and a nightly peak of 1 registration for both brown long-eared (BLE) and a pipistrelle species.

Table 10: Autumn Static Detector Results Summary

Location	Avg. registrations per hour	Total registrations	Most recorded species (total number of registrations)	Other species recorded (total number of registrations)
Attached to T1	5.307	328	Common pipistrelle (184)	Soprano pipistrelle (101), noctule (14), Nyctalus sp. (12), Myotis sp. (12), pipistrelle sp. (3) and BLE (2)

- 4.29 Relative usage of the Site per species, as shown by percentage of all bat registrations recorded over the duration of the static monitoring period is shown in Table 11, below.

Table 11: Static Detector Percentage Species Abundance

Species Recorded	Percentage (%)
Common Pipistrelle	56
Soprano Pipistrelle	30.8
Noctule	4.3
Nyctalus Species	3.7
Myotis Species	3.7
Pipistrelle Species	0.9
Brown Long-eared	0.6

Autumn Transect Survey

- 4.30 The survey started at 19:16 and finished at 21:17. Sunset was at 19:17. With reference to Figure 3, the route began and ended at the access gate into the southern fields off Henthorn Road. The route looped around the Site, incorporating hedgerows and trees of potential interest to commuting and foraging bats. The first bat recorded was a soprano pipistrelle foraging along the mature tree line along the north-western survey boundary at 19:33. A further 34 bat contacts were recorded during the survey both commuting and foraging. Species recorded also included common pipistrelle and noctule. All bats recorded comprised individuals. Overall the level of bat activity was considered to be unexceptional, with activity concentrated along hedgerows.

Birds

- 4.31 A total of twenty-one bird species were recorded during the breeding bird survey in June 2019. Of the species observed, four were Species of Principal Importance (Section 41, NERC 2006), three appear on the BoCC (2015) as Red-listed and eight are Amber-listed, and as such are considered 'notable' (some species may have multiple designations), notable species are detailed in Table 12. Thirteen species are Green-listed or unlisted (not of conservation concern).
- 4.32 Four species were confirmed as breeding. Five species were considered probable breeders, whilst eight species were considered possible breeders. The notable species lesser black-backed gull *Larus fuscus* (Amber), swift *Apus apus* (Amber), house martin *Delichon urbicum* (Amber) and starling *Sturnus vulgaris* (Red, NERC) were flyovers only. All the recorded notable species are common to abundant breeding residents or summer visitors to Lancashire.

Table 12: SPI, BoCC Red- and Amber-Listed Bird Species Recorded at Henthorn Road, Clitheroe during the Breeding Bird Survey in 2019 and their Recent Status within Lancashire.

Species	Conservation Status	Number recorded	Breeding Status	Recent Status within Lancashire ¹
Oystercatcher <i>Haematopus ostralegus</i>	Amber	2	Possible	Abundant winter and breeding bird
Stock dove <i>Columba oenas</i>	Amber	1	Possible	Common breeding resident.
Kestrel <i>Falco tinnunculus</i>	Amber	1	Possible	Common breeding resident.
Willow warbler <i>Phylloscopus trochilus</i>	Amber	3	Probable	Abundant breeding bird and double passage migrant.
Song thrush <i>Turdus philomelos</i>	SPI; Red; LBAP	3	Confirmed	Common breeding resident.

Species	Conservation Status	Number recorded	Breeding Status	Recent Status within Lancashire ¹
House sparrow <i>Passer domesticus</i>	SPI; Red	2	Probable	Abundant but decreasing resident.
Bullfinch <i>Pyrrhula pyrrhula</i>	SPI; Amber	2	Probable	Uncommon breeding resident.

¹. *The Lancashire Bird Report 2014* (Lancashire and Cheshire Fauna Society (LCFS))

Habitat Usage

- 4.33 The grassland habitats were sparsely utilised by birds, notable absentees being meadow pipit *Anthus pratensis* and skylark *Alauda arvensis*. Oystercatchers *Haematopus ostralegus* may possibly breed in the local area. Kestrel *Falco tinnunculus* foraged over the open fields.
- 4.34 These habitats supported common farmland birds, such as wren *Troglodytes troglodytes*, blackbird *Turdus merula*, and robin *Erithacus rubecula*. Notable birds included stock dove *Columba oenas*, song thrush *Turdus philomelos*, house sparrow *Passer domesticus*, bullfinch *Pyrrhula pyrrhula* and willow warbler *Phylloscopus trochiloides*.
- 4.35 There is a moderately low diversity and abundance of breeding birds on the Site, which would be considered typical for the habitats present.

Breeding Bird Assemblage Value

- 4.36 The Site was assessed against the published criteria for birds, set out in the “BHS Guidelines for Site Selection May 2018” to assess the Site against the thresholds for county value. There are nine guidelines; none were currently relevant for the Site’s breeding birds, based on the bird species recorded during the single survey.
- 4.37 The Site is presently considered to have a nature conservation value of local importance, judged by the population status and numbers of farmland / urban fringe species such as song thrush, house sparrow and bullfinch.
- 4.38 The diversity of bird species on Site is fairly low (21), as would be expected from a pastoral Site in this location.

Barn Owl

- 4.39 No evidence of barn owl was found in association with the trees on Site. The suitability of the Site is limited to foraging rather than for rest and shelter.

Great-crested newt

- 4.40 Five ponds were located within 500m of the survey boundary (see Figure 4). Ponds P1-P4, located to the north of Site, were previously surveyed by FPCR in 2018 to support Phase 1 of the project (Ecological Appraisal, FPCR, August 2018). During this survey ponds P1 and P4 were dry and ponds P2 and P3 were subject to aquatic surveys. These were undertaken on four occasions

during May 2018, three of which were within the peak survey period (mid-April to mid-May¹⁷). Great crested newts were not recorded within any of the ponds surveyed.

- 4.41 Pond P5, located 50m to the south of Site was subject to eDNA sampling in June 2019, the results of which were negative for GCN (see Appendix B).

Otter

Habitat Assessment

- 4.42 Pendleton Brook borders the Site along the southern survey boundary. The banks were approximately 1-2m in height and separated by a 5m channel. The Brook flowed from east to west and had a rocky substrate. The northern bank was steep and vegetated with occasional trees including mature hawthorn, alder and blackthorn, with exposed tree roots providing some potential for places of rest or shelter for otter. The southern bank was mainly hard engineered with concrete blocks and had more limited potential to support otter (Photograph 4). At the time of survey, the water levels were approximately 0.5m high and the water was brisk to fast flowing.

Photograph 4: Hard engineered southern bank of Pendleton Brook



- 4.43 The onsite wet ditch was approximately 0.5m wide with 0.5m high banks. The banks were heavily grazed by sheep and bankside vegetation was limited, with no trees or scrub for places of rest or shelter for otter. This habitat had limited suitability for otter.

Presence / Likely Absence Survey

- 4.44 During the survey a potential otter holt was recorded in association with a potential slide / haul out along Pendleton Brook (Photograph 5). No other otter field signs were recorded during the survey along Pendleton Brook or the wet ditch.

¹⁷ English Nature (2001) Great Crested Newt Mitigation Guidelines. English Nature, Peterborough

Photograph 5: Potential otter holt

Reptiles

Habitat Assessment

- 4.45 The grassland recorded across the majority of the Site was not considered suitable to support reptile species due to the short sward, which lacks habitat ecotones. However, the areas of tall herb vegetation adjacent to bare ground near the margins of the tree belts and hedgerows and the wet ditch and brook habitats could provide enough structural diversity and connective habitat required to support individuals from a local reptile population, particularly that of grass snake *Natrix helvetica*.

Presence / likely absence surveys

- 4.46 Presence / likely absence surveys were undertaken on five occasions in 2019 as shown in Table 11 below. All survey visits were conducted under suitable weather conditions, in either the morning or early evening. During these surveys, no evidence of any reptile species was recorded.

Table 11: Results of Reptile Surveys

Survey Occasion	Date	Reptile Sightings
1	20/09/19	None
2	03/10/19	None
3	04/10/19	None
4	08/10/19	None
5	17/10/19	None

Water voleHabitat Assessment

- 4.47 Pendleton Brook provided limited suitable habitat for water vole. The hard-engineered banks to the south were unsuitable for burrowing. The steep bank profiles to the north provided a more suitable substrate for burrows, however these were heavily grazed at the time of survey and provided limited foraging opportunities or cover.
- 4.48 The suitability of the wet ditch for water voles changed between survey occasions and depended largely on the management of the improved field compartments in which it was located. During the Phase 1 habitat survey in June, the ditch had a good cover of marginal vegetation and provided opportunities for foraging water vole. This survey was undertaken when the improved field compartments were being harvested for a silage crop. However, the aftermath grazing regime meant that the vegetation surrounding the ditch was very short during the October otter and water vole survey, as a result the ditch provided very limited foraging opportunities for water vole during this period.

Presence / likely absence Surveys

- 4.49 No water vole field signs were identified during the survey associated with Pendleton Brook or the wet ditch.

5.0 DISCUSSION & RECOMMENDATIONS**Statutory Designated Sites**

- 5.1 The degree to which designated sites receive consideration under the planning system and legislative protection depends on the designation itself and its level of importance and value. This ranges from sites of international importance protected by UK legislation that transposes European directives, to protection under UK legislation or national and local planning policy.
- 5.2 No designated sites of international nature conservation importance are located within 10km and no designated sites of national nature conservation importance within 2km of the survey site.

Non-statutory Sites

- 5.3 Whilst not necessarily protected in law, non-statutory designated sites do generally receive policy protection (as “Locally Designated Sites”), as reflected in the National Planning Policy Framework (NPPF)¹⁸. NPPF suggests that Locally Designated Sites can have a fundamental role to play in meeting overall national biodiversity targets and that appropriate weight should be attached to designated sites when making planning decisions.
- 5.4 Three non-statutory Biological Heritage Sites (BHSs) were located within 1km of the Site; the River Ribble, Primrose Lodge and Barrow Clough Wood.

¹⁸ Department for Communities and Local Government. (2018). National Planning Policy Framework. Available from: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>

- 5.5 The River Ribble BHS is located 70m north-east of the Site and is designated for the range of flora and fauna it supports. The proposals would likely result in an increase in recreational usage of the existing riverside footpath which could lead to an increased in recreational usage. However, given the proximity to existing development and the existing recreational usage of this footpath, it is not considered that the associated impacts would be detrimentally significant.
- 5.6 Also due to the nature of the proposals, The River Ribble BHS could be at risk from pollution during works as a result of soil/silt-laden runoff or accidental spillages, with adverse impacts on dependent flora and fauna associated with the watercourse. Adoption of sound site management principles and adherence to current best practice guidelines for working near water should help to prevent negative impacts on the associated wetland habitats from pollution events during construction, as will good working practice to prevent contamination in the event of, for example, a fuel spill.
- 5.7 Both Primrose Lodge and Barrow Clough Wood BHS don't have any formal public access arrangements and so negative impacts are not anticipated as a result of the proposals.

Habitats

- 5.8 The degree to which habitats receive consideration within the planning system relies on a number of mechanisms, including:
- Inclusion within specific policy (e.g. veteran & ancient trees and ancient woodland in NPPF, or non-statutory site designation),
 - Identification as a Habitat of Principal Importance for biodiversity under Natural Environment and Rural Communities Act (NERC) 2006 and consequently identification as a Priority Habitat within the local Biodiversity Action Plan (LBAP) and a Priority Habitat for England under Biodiversity 2020.
- 5.9 Under the NPPF, development should seek to provide a measurable net gain in biodiversity with an emphasis on improving ecological networks and linkages where possible.
- 5.10 The vast majority of the Site is dominated by improved grassland, which together with the areas of tall ruderal vegetation, are considered to be of negligible nature conservation value.

Scattered broadleaved trees and scrub

- 5.11 The trees recorded across the Site comprised mature oaks, lime and other native trees. All provided structural diversity and continuity and potential habitats for invertebrates, nesting birds and other local wildlife and should be retained wherever possible.
- 5.12 Retained trees should be suitably protected throughout the construction works i.e. working methods will adhere to standard best practice guidance including BS5837 Trees in Relation to Construction – Recommendations: 2012 for trees and hedgerows.
- 5.13 Where it is not possible to retain mature trees safely within the proposals, suitable replacement planting should be undertaken. It is recommended that these are locally occurring native tree species and/or flower/fruit/seed bearing species of known wildlife value in order to enhance the value of the study area for foraging wildlife.
- 5.14 Scrub areas provide structural diversity and continuity and potential habitats for invertebrates and nesting birds. The development is to retain these habitats within the proposed green infrastructure.

Grassland Habitats

Neutral Grassland

- 5.15 The neutral grassland recorded across the Site was moderately species rich. Although the neutral grassland habitats were not surveyed to NVC level, it was considered that they were representative of MG4 grassland. As such, these grasslands were considered to be of importance at a local level. During construction these areas will be protected from development activity and grassland will be retained within the green infrastructure with appropriate future management secured through an habitat management plan.

Poor Semi-improved Grassland

- 5.16 The areas of grassland identified as poor semi-improved are dominated by grass species with few forbs, of which only a small number occur in any abundance. These grasslands are not considered to be representative of any grassland community of conservation value and as such these grasslands are not considered important ecological features.

Hedgerows

- 5.17 All of the hedgerows within and bordering the Site are greater than 20m in length and comprised native species. As a result, all hedgerows within the Site qualify as a Habitat of Principal Importance under the NERC Act 2006. Hedgerows H1, H2, H4 and H6 were also assessed as being of moderately high to high conservation value (Grades 1- 2) using HEGS methodology and therefore are considered a priority for nature conservation. One hedgerow (H6) was assessed as being 'Important' under the Hedgerow Regulations.
- 5.18 The hedgerows recorded within the Site were assessed as being species rich (containing 4 or more woody species per 30m sample point) and provided connectivity through the Site and with the wider landscape. As a result, the hedgerows recorded on Site would be considered to be of value at least at a local scale.
- 5.19 The proposals have sought to retain all hedgerows within the Site, with the exception of a single gap created within H7 to allow for Site access. This small loss will be more than compensated for through the planting of additional hedgerows within the Site, namely along both sides of the wet ditch.
- 5.20 Retained hedgerows should, be protected from adverse impacts from development via retention of a minimum 5m buffer zone along the length (or larger if dictated by arboricultural survey data and the root protection areas of any hedgerow trees).

Schedule 9 Plants

- 5.21 The invasive plant Indian balsam was noted along Pendleton Brook. Under Section 14, Schedule 9 of the Wildlife and Countryside Act 1981 it is an offence to plant or otherwise cause Indian balsam to grow in the wild. A strategy is included below which, contains a proposed management plan for the control of this species prior to, during and after development. It is likely that plants upstream provide a seedbank for further colonisation of the Site and one option would be to address this to prevent further recruitment onsite, if this is not feasible then ongoing control and management of regrowth on Site would need to be undertaken.

Indian Balsam Management Strategy

- 5.22 Annual monitoring for the presence of Indian balsam will be required. It is recommended that the affected areas should be monitored annually for any regrowth each spring (between April and mid-May).
- 5.23 Indian balsam can be controlled by spraying or by mechanical methods, the best choice of methods used, depends on the time of year and how established the stand is. Providing annual monitoring is undertaken at the correct time of year mechanical treatment will ordinarily be the most appropriate method, particularly in the vicinity of a water course.
- 5.24 If small stands are identified prior to the formation of seed pods (usually late May) then the plants can be 'pulled'. This method will prevent the spread of seeds and interrupt the reproductive cycle of the species. Pulled plants can be bagged and disposed of as controlled waste. However, as the pulled plants are effectively sterile it is possible to either leave them to rot naturally or compost them.
- 5.25 It may be necessary to repeat this process in subsequent growing seasons if seeds have become established.
- 5.26 If seed heads have developed then, a bag should be placed over the plant beforehand pulling is undertaken in order to catch any seeds from the explosive seed pods. If this is undertaken then the bagged plants must be disposed of at a waste facility licensed to dispose of this type of controlled waste.
- 5.27 If larger stands establish then it may be more appropriate to treat this chemically. The plants should be sprayed in the spring before flowering but late enough to ensure that germinating seedlings have grown up sufficiently to be adequately covered by the spray. It is likely that this method will need repeating in subsequent years.
- 5.28 Environment Protection Act 1980, Section 80 Water Resources Act 1991 states care needs to be taken when spraying or treating invasive species in the presence of a watercourse (whether occasionally dry or otherwise). Due to the proximity of the stands to Pendleton Brook, any herbicides used should be agreed by the Environment Agency before use.

Protected / Notable Species

- 5.29 Principal pieces of legislation protecting wild species are Part 1 of the Wildlife and Countryside Act 1981 (as amended) (WCA) and the Conservation of Habitats and Species Regulations 2017 (as amended). Some species, for example badgers, also have their own protective legislation (Protection of Badger Act 1992).
- 5.30 In addition to protected species, there are those that are otherwise of conservation merit, such as species of principal importance for the purpose of conserving biodiversity under the Natural Environment and Rural Communities (NERC) Act 2006. These are recognised in the National Planning Policy Framework (NPPF), which advises that when determining planning applications, LPA's 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;*
 - *Development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around*

developments should be encouraged, especially where this can secure measurable net gains for biodiversity.

- 5.31 The implications that various identified species may have for developmental design, planning and programming considerations are outlined below.

Badgers

- 5.32 Badgers and their active setts are protected under the Protection of Badgers Act 1992, making it an offence to kill, injure or take badgers or to damage or obstruct access into a badger sett. The Act also prohibits disturbance of a badger whilst it is occupying a sett.
- 5.33 No evidence of the presence of badger was recorded within the Site during the survey and subsequently badgers are not considered to pose a constraint to development of the Site.

Bats

- 5.34 All species of bats and their roosts are listed on the Conservation of Habitats and Species Regulations 2017 making it illegal to deliberately disturb any such animal or damage / destroy a breeding site or roosting place of any such animal. Bats are also afforded full legal protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Under this legislation it is illegal to recklessly or intentionally kill, injure or take a species of bat or recklessly or intentionally damage or obstruct access to or destroy any place of shelter or protection or disturb any animal whilst they are occupying such a place of shelter or protection. Some bat species are SPI under the NERC Act and a number of bat species are also priority species within the Lancashire BAP.
- 5.35 Eight records of common pipistrelle and a pipistrelle species were returned from within the search area, including several records of roosts, the closest being a common pipistrelle roost located 175m south-east of the Site.

Bat Roosts in Trees

- 5.36 Two trees with bat roosting potential (T1 and T6) were to be lost to facilitate the proposals and were therefore fully inspected using aerial techniques. The Framework Plan has since been updated and only tree T1 will now be removed. No evidence of roosting bats was observed at the time of survey and the bat roosting potential categories for trees T1 and T6 were revised to **Low** following the detailed PRF inspection.
- 5.37 As bat tree roosts can be transient features and new roosts can develop in a relatively short period of time, a pre-commencement assessment of T1 will be undertaken. Potential roosting features (PRFs) will be checked by a licenced bat ecologist before the tree is felled to ensure the continued absence of roosting bats. If roosting bats are found, a derogation licence from Natural England (NE) will be required to enable the works. Any further mitigation required under this licence would be subject to NE approval.
- 5.38 Five other mature trees recorded on Site (T2-T6) had features that could potentially be used by roosting bats, (Figure 2). Current proposals indicate that these trees and the neighbouring connective habitats, are to be retained within areas of public open space and buffered from development and therefore negative impacts on any potential roosts are likely to be avoided.
- 5.39 Should the proposals change and these trees are affected by proposals either directly (i.e. removal or arboricultural remediation works to facilitate proposals), indirectly (i.e. isolation through removal

of connecting hedgerows) or if it was to be subject to direct lighting, then the presence or likely absence of roosting bats should first be ascertained via either detailed climbing inspection to internally view all cavities, or if not possible, using nocturnal roost surveys. Inspection survey can be carried out at any time of year and emergence/return to roost survey would need to be carried out in the optimal bat active season from May to September, inclusive. If bats or evidence of previous presence of bats is found within the tree's features, impacts to the roost would need to be avoided, or a licence would need to be obtained from Natural England to disturb the bats or remove the roosting feature. This would involve the inclusion of appropriate mitigation and potentially compensation measures.

Bat Activity

- 5.40 During the autumn transect survey, bat activity was recorded across all areas of the Site, albeit from small numbers of bats and with small numbers of registrations. Peak activity was associated with the hedgerows and mature trees. The species assemblage recorded during the transect within the Site comprised in order of decreasing abundance; soprano pipistrelle (c. 51%), common pipistrelle (c. 34% of total activity), an unidentified pipistrelle species (c. 11%) and noctule (c. 3%).
- 5.41 Up to seven species of bat were recorded during the static detector surveys of the Site: comprising common pipistrelle, soprano pipistrelle, noctule, a Myotis species, a Nyctalus species, a pipistrelle species and BLE.
- 5.42 The species and composition of bats recorded on static detectors are broadly similar to those recorded during the transect surveys with common and soprano pipistrelle the most frequently recorded species. Common and soprano pipistrelle are both common and widespread species that are frequently associated with the habitat types within the application Site and surrounding landscape. The levels of activity associated with these species, and also Myotis species, Nyctalus species, noctule and BLE are consistent with their known abundance at a regional and national scale and is not considered to be significant.
- 5.43 Based on the initial bat activity survey, the bat assemblage on Site appears unexceptional and comprises common and widespread species within their expected range. Habitat usage is largely associated more structured vegetation on the periphery of the Site such as hedgerows and mature trees.
- 5.44 Proposals suggest that residential elements of the scheme will be confined to the improved grassland areas. This habitat is considered to provide suboptimal value for foraging bats and its loss is considered unlikely to have a negative impact upon the Favourable Conservation Status of local bat populations. To minimise potential impacts of development, the Framework Plan has sought to retain all areas of higher value habitat resources such as hedgerows and mature trees and has included a green buffer around all existing field boundaries. This will maintain connectivity for bats through the development and into the wider countryside. Additional hedgerow and tree planting are proposed within the areas of greenspace, focused around the riparian habitats. Three seasonally wet attenuation areas are also proposed, which will increase the abundance of invertebrate prey.
- 5.45 Creating dark corridors along retained boundary features and in areas of greenspace will be important to maintaining and enhancing value for bats as sources for invertebrate prey and commuting and dispersal routes through the landscape. The hedgerow network and mature trees

will be retained and enhanced to provide a key habitat resource for local bat populations and care should be taken to avoid artificially lighting these habitats.

- 5.46 It is recommended that as a further enhancement, the roosting opportunities provided within the scheme are increased and bat boxes are placed on suitable retained trees or within new buildings on the periphery of developed areas. The bat boxes should be a variety of designs to encourage different environmental conditions. However, all the boxes should be suitable for both common pipistrelle but also a wide range of British species, both common and uncommon. There are a wide range of suitable bat boxes available, these should ideally be made from a cement and wood-based material. Suppliers include; Schwegler, Vivara Pro and Ibstock.
- 5.47 With the implementation of the mitigation and enhancements proposed above, residual effects on the local population of bats are likely to be positive.

Breeding Birds

- 5.48 All wild bird species are protected while nesting by the Wildlife and Countryside Act (WCA) 1981 (as amended). This legislation protects wild birds and their eggs from intentional harm, and makes it illegal to intentionally take, damage, or destroy a wild bird nest while it is in use or being built. Species listed under Schedule 1 of the WCA 1981 (as amended) have additional protection and makes it is an offence to intentionally or recklessly disturb the species, on or near an 'active' nest.
- 5.49 Where removal of woody vegetation is required, it is recommended that this is carried out outside of the nesting season (March – August inclusive). If removal outside the nesting season is not feasible, all vegetation to be removed should be checked by an experienced ecologist for the presence of active nests. Should active nests be discovered, detailed advice would be provided by the supervising ecologist. Advice is likely to include a buffer zone around any located nests until all young have fledged.
- 5.50 Multiple records of notable bird species were provided from within 1km of the survey boundary.
- 5.51 The single survey carried out so far revealed that seven notable species utilised the Site (excluding flyover species), and four of these were confirmed or probable breeders.
- 5.52 The hedgerows recorded bordering the Site provide potential nesting habitat for a range of common farmland and urban fringe bird species. Depending on timing of the cutting regime, the grassland habitats recorded onsite could also provide potential habitat for species of ground nesting farmland birds.

Barn Owl

- 5.53 Barn owls are listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and therefore the birds, their nests, eggs and young are fully protected. It is an offence to intentionally or recklessly disturb barn owls at an active nest site with eggs or young or before eggs are laid, or to disturb the dependent young.
- 5.54 No sign of barn owl was recorded during the various surveys, including the night time bat transect. It is therefore considered unlikely that barn owl utilise the Site to any extent and should therefore not pose a constraint to development.

Kingfisher

- 5.55 Kingfishers are listed under Schedule 1 of the WCA (1981) (as amended) which extends its protection to cover them against disturbance to both adults and their dependent young at all times whilst they are breeding. Kingfishers nest in deep tubular tunnels with their eggs laid between May and July. Trees or bushes with branches overhanging the river provide important fishing perches. They rely on sight to hunt for minnows and sticklebacks as such their ability to hunt can be severely affected by an increase in pollution and sediment.
- 5.56 Kingfishers were observed on a number of occasions hunting along Pendleton Brook while surveyors were undertaking other ecology surveys. However, no potential kingfisher nest tunnels were observed along the bank adjacent to the survey boundary.
- 5.57 It is recommended that vegetation along the banks is retained where feasible. Any works along the banks for the purposes of the construction phase or subsequent landscaping should be checked immediately prior to commencement to ensure that the area is absent of nest tunnels.

Great crested newts

- 5.58 Great crested newts are afforded legal protection by Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and under the Conservation of Habitats and Species Regulations 2017. Great crested newts are also listed as a Species of Principal Importance under the NERC Act.
- 5.59 The hedgerows / field margins were considered to be suitable terrestrial habitat for GCN foraging, commuting and as a resting place / shelter habitat. The grassland habitats were likely to represent a suitable foraging and commuting resource only, with limited features suitable for resting / shelter.
- 5.60 Five ponds were located within 500m of the survey boundary. Ponds P1-P4, located to the north of Site, were previously surveyed by FPCR in 2018 to support Phase 1 of the project. Ponds P1 and P4 were dry and ponds P2 and P3 were subject to aquatic surveys; great crested newts were not recorded within any of the ponds surveyed.
- 5.61 Given this and the negative eDNA result for pond P5, GCN are not considered to be a constraint to proposals.

Otter

- 5.62 Otter are afforded legal protection by Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) under which it is an offence to intentionally kill, injure or take an otter (or attempt to), possess or control any live or dead specimen or anything derived from an otter, intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter, intentionally or recklessly disturb this species while it is occupying a structure or place which it uses for that purpose. Otter is also a European Protected Species, and under the Conservation of Habitats and Species Regulations 2017 (as amended) it is an offence to deliberately capture or kill, deliberately disturb or take an otter, or damage or destroy a breeding site or resting place. Otter are also listed as a species of principal importance under the NERC Act and a priority species under the Lancashire BAP.
- 5.63 Desk study consultations returned four records of otter within the 1km search area, including two records within Pendleton Brook, 900m up stream of Site. In addition, anecdotal accounts of otter being observed within Pendleton Brook along the southern boundary, as well as an otter road traffic accident on Henthorn Road, were received from a member of the public.

- 5.64 A potential otter holt and potential slide were recorded on the northern bank of Pendleton Brook, along the application boundary. Due to the absence of other field signs in the vicinity of the potential holt, this is unlikely to be frequently used. However, this could also indicate that this is a natal holt; natal holts are inconspicuous and show little evidence of the presence of otters. Spraints, which are conspicuous at other holts are not visible at natal holts²⁰. Therefore, further monitoring surveys will be required in order to confirm the status of the potential holt site to ensure an otter breeding site is not disturbed as a result of the proposals.
- 5.65 In order to limit any impacts, the Framework Plan has included a 10m exclusion zone around the potential holt site where no construction work or landscaping earthworks will be undertaken. The rest of Pendleton Brook is buffered from the development by approximately 30m of greenspace. In addition, the Framework Plan has retained and buffered the wet ditch, with the exception of a small break to the north to facilitate the access road.
- 5.66 Due to the presence of otter within Pendleton Brook, it is recommended that a fenced buffer zone 10m from the water's edge is installed to deter otters from accessing the Site / construction area.
- 5.67 Should any works be required in proximity of the Brook, e.g. for a drainage outfall, precautionary measures are recommended to avoid impacts on otters during the construction phase. Precautionary measures should comprise the following:
- An updated Site visit immediately prior to commencement of works to establish whether there is any evidence of increased otter activity along the banks;
 - A toolbox talk to all contractors to ensure they understand otters and their ecology.
- 5.68 During Site operation, the area to the north of Pendleton Brook will be utilised as greenspace. As such this may result in potential disturbance to otter. The Framework Plan shows proposed tree and hedgerow planting along its length, this should comprise a range of thorny species which would provide a 'soft barrier' to recreational impacts. It would also be prudent to include a stockproof fence during the short/medium term whilst this newly planted vegetation establishes to prevent access by people and dogs. Ideally this fence would be set a number of metres back from the bank top.

Reptiles

- 5.69 All British reptiles are protected from killing and injury under the Wildlife and Countryside Act 1981 (as amended) and are listed as species of principal importance for the conservation of biodiversity under the NERC Act, indicating that public bodies, such as the Local Planning Authority, have a duty to have regard to the conservation of these species.
- 5.70 Consultation with LERN returned no records of reptiles from within 1km of the Site. Localised areas associated with the margins of the hedgerows and riparian habitats could provide the structural diversity required to support reptiles. Presence / likely absence surveys are ongoing. No reptiles have been found so far and no reptile records were received from consultees. This suggests that the presence of reptiles is unlikely.

²⁰ Chanin P (2003). Ecology of the European Otter. Conserving Natura 2000 Rivers Ecology Series No. 10. English Nature, Peterborough.

Water vole

- 5.71 Water vole are listed under Schedule 5 of the WCA 1981 (as amended). Water vole are also a Species of Principal Importance under the NERC Act (2006).
- 5.72 Consultation with LERN returned no records of water vole from within 1km of the Site, although the citation for The River Ribble BHS does list this species. The results of the field survey confirmed that habitats along Pendleton Brook and the onsite wet ditch provided limited opportunities for water vole. No evidence of water vole was recorded during the survey and as such, water vole are considered unlikely to be currently present within the Site. As a result, water vole are not considered to present a constraint to the scheme at this time. Due to the presence of this species further down the catchment, precautionary checks should be undertaken prior to any works to river banks.

General enhancements

- 5.73 The Lawton report²¹ published in 2010 and the government white paper²², which followed from it, established the need for a great focus on producing more resilient ecological networks. As such, significant biodiversity enhancements are possible through the strengthening of wildlife corridors onsite as part of development proposals. The following recommendations would enhance the functionality of these wildlife corridors and result in a significant biodiversity gain:
- The hedgerow network and associated mature tree resource are an important ecological network, proposals should seek to implement:
 - Selective planting of native locally produced woody species to reduce the number of gaps within the network;
 - A management plan, as part of proposals with a view to creating tall wide hedgerows that provide a continuous supply of fruit, berries and nectar to local wildlife.
 - Any new habitats created as part of the green infrastructure of the Site should aim to increase the diversity of habitats present and provide structural diversity, with scrub and grassland areas and should be designed in a way to have connectivity with each other and existing habitats on site.
- 5.74 In addition to the recommendations with respect to individual species and habitats outlined above, opportunities may exist within the scheme for general biodiversity enhancements to be undertaken. As such, the following are recommended for this Site:
- Areas of informal grassland should seek to use a herb-rich mix suitable for the local area, with any more formal areas using a flowering lawn mix as an alternative to a standard rye grass mix. Any garden planting proposed at the outset should also use native species of value to wildlife. Suitable small tree species for inclusion in garden planting schemes include field maple, silver birch and holly. All informal areas of planting should use native species and be subject to sympathetic management and a management plan to promote their conservation value.

²¹ J. Lawton et al. (2010) Making Space for Nature: a Review of England's Wildlife Sites and Ecological Network. Report to Defra. London: Department for Environment, Food and Rural Affairs.

²² DEFRA (2011) Government response to the Making Space for Nature review. Department for Environment, Food and Rural Affairs

- Soft landscaping using native and ecologically valuable species would enhance the Site, avoid using non-native species with overly complex flower structure or those of an invasive nature such as cotoneasters.
- An ecological management plan should be devised and adhered to for all retained and created habitats in order for them to maintain existing value and/or realise enhanced value, making sure that management is appropriate and ongoing for the life of the development.
- Small gaps could be left under or in the corners of garden fences to permit access for wildlife such as hedgehog.
- Deadwood piles could be created in areas of retained open space to provide a habitat niche for amphibians and small mammals as well as deadwood for invertebrates such as saproxylic beetles.
- The attenuation area should be designed to provide optimal habitat for wildlife as well as serving drainage functions, for example a storage pond designed to hold water all year round, or else a scrape planted with meadow mixture for wetlands.

APPENDIX A: BOTANICAL SPECIES LIST

Common Name	Scientific Name	Abundance (DAFOR)
Scattered broad-leaved trees		
Sycamore	<i>Acer pseudoplatanus</i>	O
Lime	<i>Tilia x europaea</i>	O
Cherry laurel	<i>Prunus laurocerasus</i>	O
Copper beech	<i>Fagus sylvatica</i>	O
Horse-chestnut	<i>Aesculus hippocastanum</i>	O
Garden privet	<i>Ligustrum ovalifolium</i>	O
Pedunculate oak	<i>Quercus robur</i>	O
Ash	<i>Fraxinus excelsior</i>	O
Hawthorn	<i>Crataegus monogyna</i>	O
Blackthorn	<i>Prunus spinosa</i>	O
Alder	<i>Alnus glutinosa</i>	O
Dense scrub		
Blackthorn	<i>Prunus spinosa</i>	A
Dog-rose	<i>Rosa canina</i>	O
Hedge bindweed	<i>Calystegia sepium</i>	O
Scattered scrub		
Hawthorn	<i>Crataegus monogyna</i>	O
Improved grassland		
Perennial rye-grass	<i>Lolium perenne</i>	A
Yorkshire-fog	<i>Holcus lanatus</i>	F
White clover	<i>Trifolium repens</i>	F
Meadow foxtail	<i>Alopecurus pratensis</i>	O
Cock's-foot	<i>Dactylis glomerata</i>	O
Red clover	<i>Trifolium pratense</i>	O
Red fescue	<i>Festuca rubra</i>	O
Sweet vernal-grass	<i>Anthoxanthum odoratum</i>	O
Timothy	<i>Phleum pratense</i>	O
Rough meadow-grass	<i>Poa trivialis</i>	O
Hairy sedge	<i>Carex hirta</i>	O
Common sorrel	<i>Rumex acetosa</i>	R
Common mouse-ear	<i>Cerastium fontanum</i>	R

Common Name	Scientific Name	Abundance (DAFOR)
Common nettle	<i>Urtica dioica</i>	R
Yarrow	<i>Achillea millefolium</i>	R
Meadow buttercup	<i>Ranunculus acris</i>	R
Broad-leaved dock	<i>Rumex obtusifolius</i>	R
Germander speedwell	<i>Veronica chamaedrys</i>	R
Common bird's-foot-trefoil	<i>Lotus corniculatus</i>	R
Crested dog's-tail	<i>Cynosurus cristatus</i>	R
Common bent	<i>Agrostis capillaris</i>	R
Hard rush	<i>Juncus inflexus</i>	R
Ribwort plantain	<i>Plantago lanceolata</i>	R
Common mallow	<i>Malva sylvestris</i>	R
False oat-grass	<i>Arrhenatherum elatius</i>	R
Creeping thistle	<i>Cirsium arvense</i>	R
Compact rush	<i>Juncus conglomeratus</i>	R
Meadow vetchling	<i>Lathyrus pratensis</i>	R
Field horsetail	<i>Equisetum arvense</i>	R
Soft-brome	<i>Bromus hordeaceus</i>	R
Neutral grassland		
Crested dog's-tail	<i>Cynosurus cristatus</i>	A
Ribwort plantain	<i>Plantago lanceolata</i>	F
Quaking-grass	<i>Briza media</i>	F
Rough hawkbit	<i>Leontodon hispidus</i>	F
Yellow oat-grass	<i>Trisetum flavescens</i>	LF
Mouse-ear-hawkweed	<i>Pilosella officinarum</i>	LF
False oat-grass	<i>Arrhenatherum elatius</i>	LF/R
Red clover	<i>Trifolium pratense</i>	O
Rough meadow-grass	<i>Poa trivialis</i>	O
Red fescue	<i>Festuca rubra</i>	O
Yorkshire-fog	<i>Holcus lanatus</i>	O
Common sorrel	<i>Rumex acetosa</i>	O
Yarrow	<i>Achillea millefolium</i>	O
Common bird's-foot-trefoil	<i>Lotus corniculatus</i>	O
Common bent	<i>Agrostis capillaris</i>	O

Common Name	Scientific Name	Abundance (DAFOR)
Sweet vernal-grass	<i>Anthoxanthum odoratum</i>	O
Barren strawberry	<i>Potentilla sterilis</i>	O
Meadow fescue	<i>Schedonorus pratensis</i>	O
Field wood-rush	<i>Luzula campestris</i>	O
Perennial rye-grass	<i>Lolium perenne</i>	R
Cock's-foot	<i>Dactylis glomerata</i>	R
White clover	<i>Trifolium repens</i>	R
Meadow buttercup	<i>Ranunculus acris</i>	R
Dandelion	<i>Taraxacum officinale</i> agg.	R
Thyme-leaved speedwell	<i>Veronica serpyllifolia</i>	R
Daisy	<i>Bellis perennis</i>	R
Common mallow	<i>Malva sylvestris</i>	R
Bush vetch	<i>Vicia sepium</i>	R
Selfheal	<i>Prunella vulgaris</i>	R
Creeping thistle	<i>Cirsium arvense</i>	R
Bulbous buttercup	<i>Ranunculus bulbosus</i>	R
Spear thistle	<i>Cirsium vulgare</i>	R
Silverweed	<i>Potentilla anserina</i>	R
Tormentil	<i>Potentilla erecta</i>	R
Poor semi-improved grassland		
Yorkshire-fog	<i>Holcus lanatus</i>	A
Cock's-foot	<i>Dactylis glomerata</i>	F
Creeping buttercup	<i>Ranunculus repens</i>	F
Bittersweet	<i>Solanum dulcamara</i>	LF
Silverweed	<i>Potentilla anserina</i>	LF
Meadow fescue	<i>Schedonorus pratensis</i>	LF/O
Common nettle	<i>Urtica dioica</i>	LF/R
Meadowsweet	<i>Filipendula ulmaria</i>	LF/R
Creeping bent	<i>Agrostis stolonifera</i>	O
Common sorrel	<i>Rumex acetosa</i>	O
False oat-grass	<i>Arrhenatherum elatius</i>	O
Rough meadow-grass	<i>Poa trivialis</i>	O
Yarrow	<i>Achillea millefolium</i>	O

Common Name	Scientific Name	Abundance (DAFOR)
Creeping thistle	<i>Cirsium arvense</i>	O
Common ragwort	<i>Jacobaea vulgaris</i>	O
Himalayan balsam	<i>Impatiens glandulifera</i>	O
Rough meadow-grass	<i>Poa trivialis</i>	O
Common mouse-ear	<i>Cerastium fontanum</i>	O
Meadowsweet	<i>Filipendula ulmaria</i>	O
Rosebay willowherb	<i>Chamaenerion angustifolium</i>	R
Sweet vernal-grass	<i>Anthoxanthum odoratum</i>	R
Male-fern	<i>Dryopteris filix-mas</i>	R
Prickly sow-thistle	<i>Sonchus asper</i>	R
Bush vetch	<i>Vicia sepium</i>	R
Creeping cinquefoil	<i>Potentilla reptans</i>	R
Perennial rye-grass	<i>Lolium perenne</i>	R
Common hogweed	<i>Heracleum sphondylium</i>	R
Hard rush	<i>Juncus inflexus</i>	R
Water forget-me-not	<i>Myosotis scorpioides</i>	R
Cleavers	<i>Galium aparine</i>	R
Crosswort	<i>Cruciata laevipes</i>	R
Barren strawberry	<i>Potentilla sterilis</i>	R
Red campion	<i>Silene dioica</i>	R
Great willowherb	<i>Epilobium hirsutum</i>	R
Upright hedge-parsley	<i>Torilis japonica</i>	R
Cuckooflower	<i>Cardamine pratensis</i>	R
Herb-Robert	<i>Geranium robertianum</i>	R
Ribwort plantain	<i>Plantago lanceolata</i>	R
White clover	<i>Trifolium repens</i>	R
Spear thistle	<i>Cirsium vulgare</i>	R
Greater bird's-foot-trefoil	<i>Lotus pedunculatus</i>	R
Cow parsley	<i>Anthriscus sylvestris</i>	R
Common hogweed	<i>Heracleum sphondylium</i>	R
Poor semi-improved grassland/tall ruderal mosaic		
False oat-grass	<i>Arrhenatherum elatius</i>	F
Yorkshire-fog	<i>Holcus lanatus</i>	F

Common Name	Scientific Name	Abundance (DAFOR)
Common nettle	<i>Urtica dioica</i>	LF
Bittersweet	<i>Solanum dulcamara</i>	LF
Branched bur-reed	<i>Sparganium erectum</i>	LF
Water figwort	<i>Scrophularia auriculata</i>	O
Plicate sweet-grass	<i>Glyceria notata</i>	O
Brooklime	<i>Veronica beccabunga</i>	O
Marsh foxtail	<i>Alopecurus geniculatus</i>	R
Common mouse-ear	<i>Cerastium fontanum</i>	R
Spear thistle	<i>Cirsium vulgare</i>	R
Reed canary-grass	<i>Phalaris arundinacea</i>	R
Great willowherb	<i>Epilobium hirsutum</i>	R
Meadow foxtail	<i>Alopecurus pratensis</i>	R
Hard rush	<i>Juncus inflexus</i>	R
White clover	<i>Trifolium repens</i>	R
Creeping buttercup	<i>Ranunculus repens</i>	F
Cleavers	<i>Galium aparine</i>	O
Marginal vegetation		
Water figwort	<i>Scrophularia auriculata</i>	O
Great willowherb	<i>Epilobium hirsutum</i>	R
Wintercress	<i>Barbarea vulgaris</i>	R
Wood dock	<i>Rumex sanguineus</i>	R
Reed canary-grass	<i>Phalaris arundinacea</i>	R
Yellow iris	<i>Iris pseudacorus</i>	R
Lesser burdock	<i>Arctium minus</i>	R

APPENDIX B: ENVIRONMENTAL DNA ANALYSIS REPORT

DNA Analysis Report - Commercial in Confidence



Customer: FPCR Environment & Design Ltd
Address: Sand Hutton
 York
 York
 YO41 1LZ
Contact: [REDACTED]
Email: [REDACTED]
Tel: [REDACTED]
Report date: 10-Jul-2019
Order Number: GCN19-1190
Samples: Pond Water
Analysis requested: Detection of Great Crested Newt eDNA from pond water.

Thank you for submitting your samples for analysis with the Fera eDNA testing service. The details of the analysis are as follows:

Method:

The method detects pond occupancy from great crested newts (GCN) using traces of DNA shed into the pond environment (eDNA). The detection of GCN eDNA is carried out using real time PCR to amplify part of the cytochrome 1 gene found in mitochondrial DNA. The method followed is detailed in Biggs J., et al, (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford.

The limits of this method are as follows: 1) the results are based on analyses of the samples supplied by the client and as received by the laboratory, 2) any variation between the characteristics of this sample and a batch will depend on the sampling procedure used. 3) the method is qualitative and therefore the levels given in the score are for information only, they do not constitute the quantification of GCN DNA against a calibration curve, 4) a 'not detected' result does not exclude presence at levels below the limit of detection.

The results are defined as follows:

Positive: DNA from the species was detected.
eDNA Score: Number of positive replicates from a series of twelve.
Negative: DNA from the species was not detected; in the case of negative samples the DNA extract is further tested for PCR inhibitors and degradation of the sample.
Inconclusive: Controls indicate degradation or inhibition of the sample, therefore the lack of detection of GCN DNA is not conclusive evidence for determining the absence of the species in the sample provided.

page 1 of 2

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DNA Analysis Report - Commercial in Confidence



CustomerReference	Fera Reference	GCN Detection	eDNA Score	Inhibition	Degradation
FPCR-8439-P1	S19-017371	Negative	0	No	No

The results indicate that eDNA for great crested newts was not detected in the sample submitted. Analysis was conducted in the presence of the following controls: 1) extraction blank, 2) appropriate positive and negative PCR controls for each of the TaqMan assays (GCN, Inhibition, and Degradation). All controls performed as expected.

This test procedure was developed using research funded by the Department of Environment, Food and Rural Affairs.

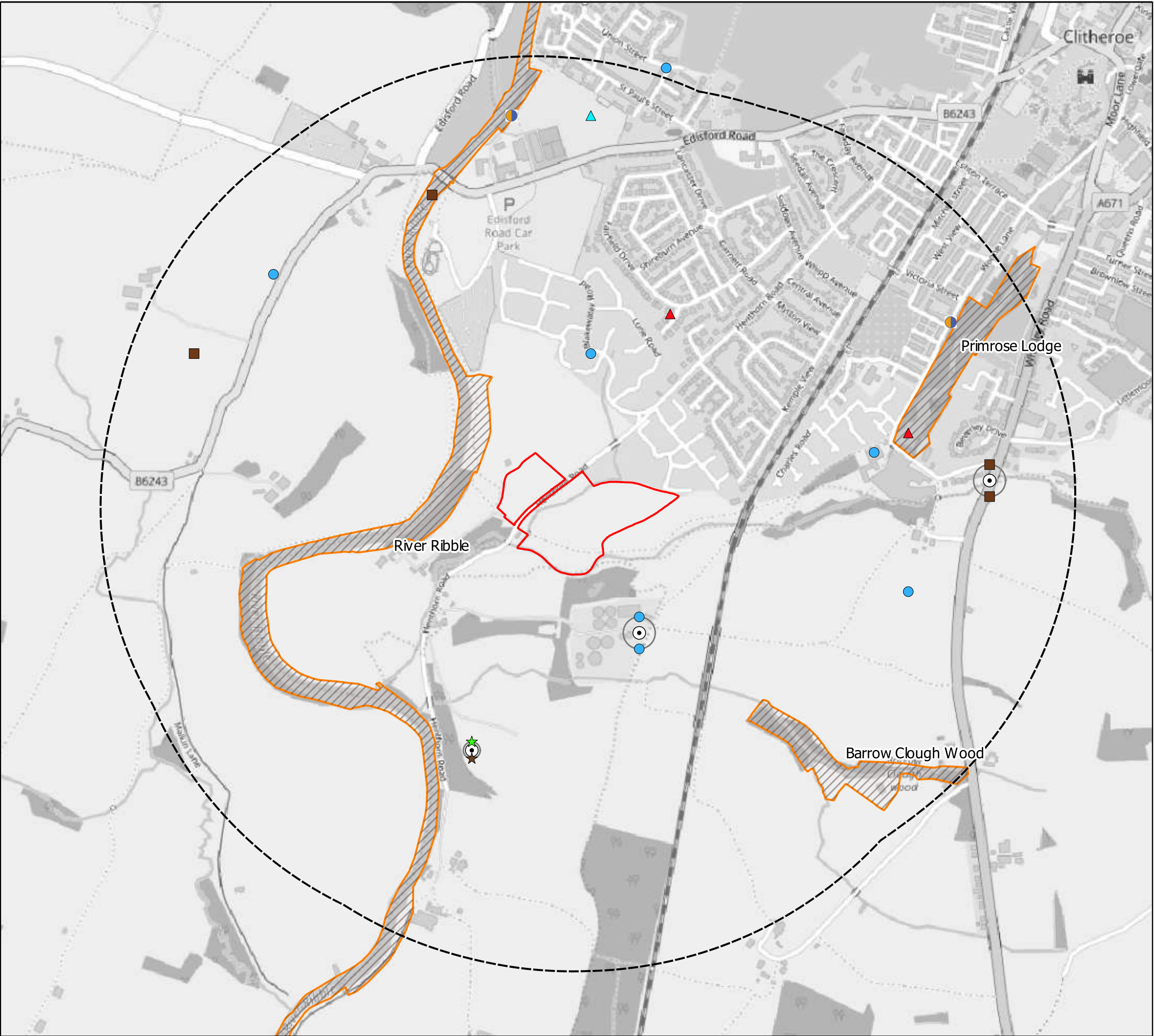
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page 2 of 2

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APPENDIX C: STATIC BAT DETECTOR RESULTS

Recording Period	Unit No.	Start Date	End Date	Survey Hours	Total Av. per hour	Total Registrations	Common Pipistrelle			Soprano Pipistrelle			Noctule			Nyctalus Species			Myotis Species			Pipistrelle Species			Brown Long-eared		
							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	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour	Period Total	Peak Count	Av. Per Hour
Autumn	4	13/09/19	18/09/19	61:48:08	5.307	328	184	88	2.977	101	61	1.634	144	66	0.227	123	34	0.194	124	44	0.194	33	19	0.049	22	11	0.032
Totals				61:48:08	5.307	328	184	88	2.977	101	61	1.634	144	66	0.227	123	34	0.194	124	44	0.194	33	19	0.049	22	11	0.032



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Key

- Survey Boundary
- 1km buffer
- Biological Heritage Sites (BHS)

Invertebrate Species

- Wall butterfly
- White-letter Hairstreak butterfly

Mammal Species

- European Otter
- Common Pipistrelle
- Pipistrelle Bat species

Bird Species

- Notable Bird records (see Ecological Appraisal)
- Peregrine

Key

 Survey Boundary

Phase 1 Habitats

 Built Environment: hardstanding

 Improved grassland

 Neutral grassland - semi-improved

 Semi-improved grassland / tall ruderal mosaic

 Other tall herb and fern - ruderal

 Poor semi-improved grassland

 Scrub - dense/continuous

 Broadleaved trees

 Running water

 Intact hedge - native species-rich

 Hedge with trees - species-poor

 Hedge with trees - native species-rich

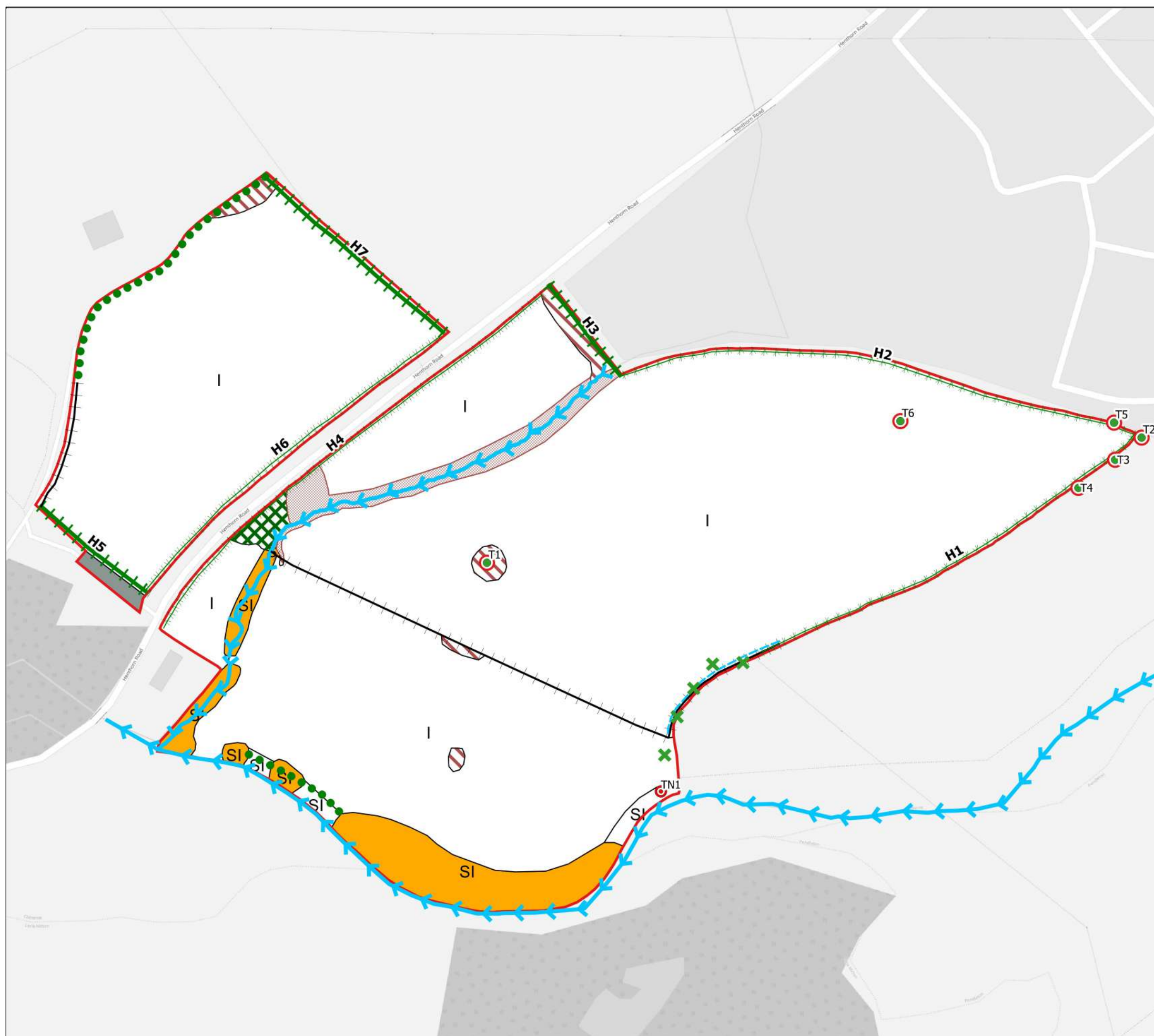
 Fence

 Dry ditch

 Scrub - scattered

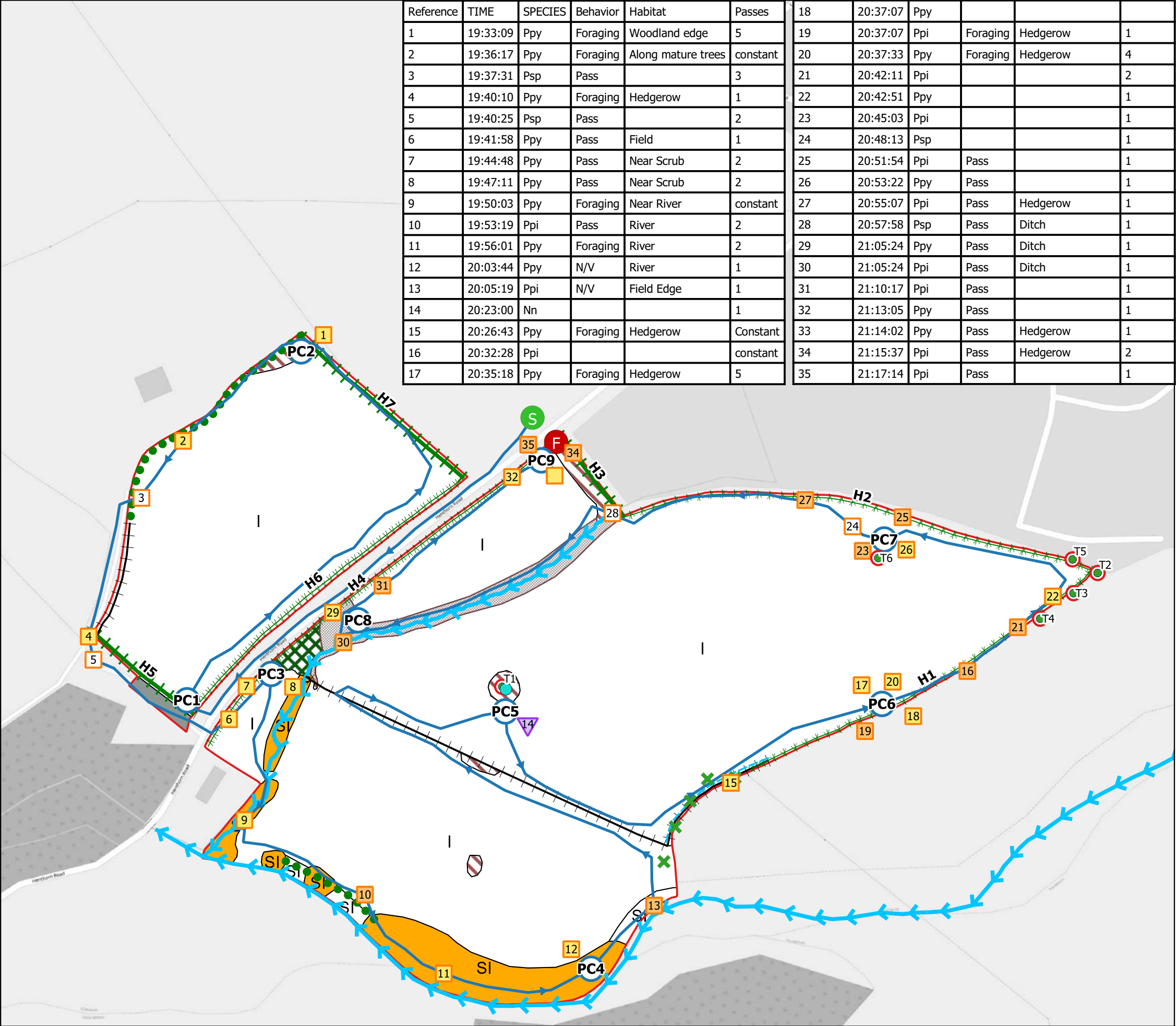
 Target note (with ref.)

 Tree with Bat Potential (with ref.)



client: Gladman
project: Phase 2 Henthorn Road, Clitheroe
drawing title: PHASE 1 HABITAT PLAN

scale: NTS @ A3
drawing / figure number: Figure 2
drawn: JS / KH / MB
issue: 30/10/2019
rev: -



Reference	TIME	SPECIES	Behavior	Habitat	Passes
1	19:33:09	Ppy	Foraging	Woodland edge	5
2	19:36:17	Ppy	Foraging	Along mature trees	constant
3	19:37:31	Psp	Pass		3
4	19:40:10	Ppy	Foraging	Hedgerow	1
5	19:40:25	Psp	Pass		2
6	19:41:58	Ppy	Pass	Field	1
7	19:44:48	Ppy	Pass	Near Scrub	2
8	19:47:11	Ppy	Pass	Near Scrub	2
9	19:50:03	Ppy	Foraging	Near River	constant
10	19:53:19	Ppi	Pass	River	2
11	19:56:01	Ppy	Foraging	River	2
12	20:03:44	Ppy	N/V	River	1
13	20:05:19	Ppi	N/V	Field Edge	1
14	20:23:00	Nn			1
15	20:26:43	Ppy	Foraging	Hedgerow	Constant
16	20:32:28	Ppi			constant
17	20:35:18	Ppy	Foraging	Hedgerow	5

18	20:37:07	Ppy			
19	20:37:07	Ppi	Foraging	Hedgerow	1
20	20:37:33	Ppy	Foraging	Hedgerow	4
21	20:42:11	Ppi			2
22	20:42:51	Ppy			1
23	20:45:03	Ppi			1
24	20:48:13	Psp			1
25	20:51:54	Ppi	Pass		1
26	20:53:22	Ppy	Pass		1
27	20:55:07	Ppi	Pass	Hedgerow	1
28	20:57:58	Psp	Pass	Ditch	1
29	21:05:24	Ppy	Pass	Ditch	1
30	21:05:24	Ppi	Pass	Ditch	1
31	21:10:17	Ppi	Pass		1
32	21:13:05	Ppy	Pass		1
33	21:14:02	Ppy	Pass	Hedgerow	1
34	21:15:37	Ppi	Pass	Hedgerow	2
35	21:17:14	Ppi	Pass		1

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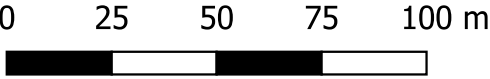
Key:

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

Bat Contacts

- Common Pipistrelle - Ppi
- Soprano Pipistrelle - Ppy
- Pipistrelle Species - Psp
- Noctule - Nn

For habitat symbology see Phase 1 Habitat Plan



client
Gladman

project
Phase 2 Henthorn Road,
Clitheroe

drawing title
AUTUMN BAT ACTIVITY PLAN

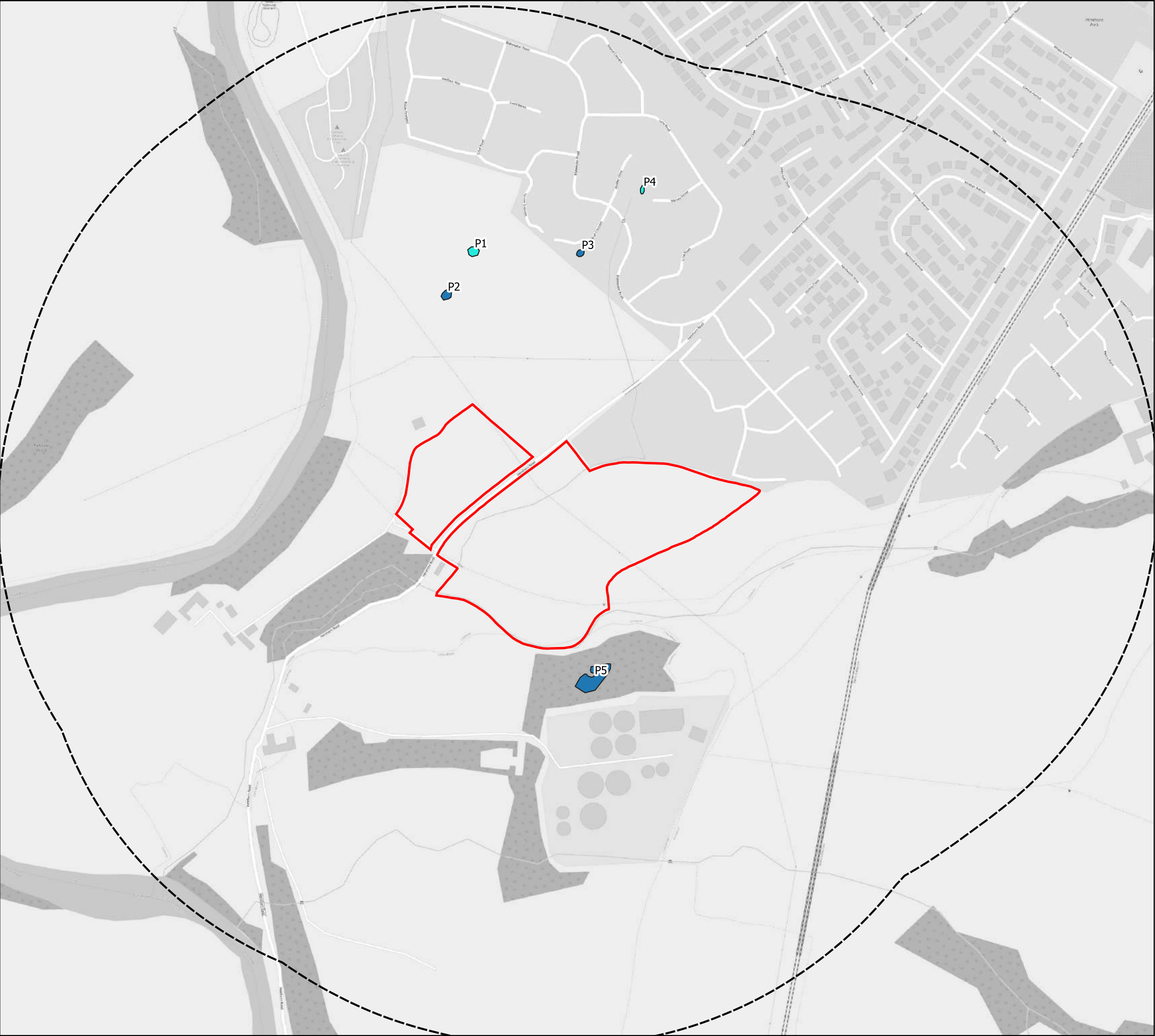
scale @ A3
NTS @ A3

drawn
SH / KH

issue
30/10/2019

drawing / figure number
Figure 3

rev
-



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Key

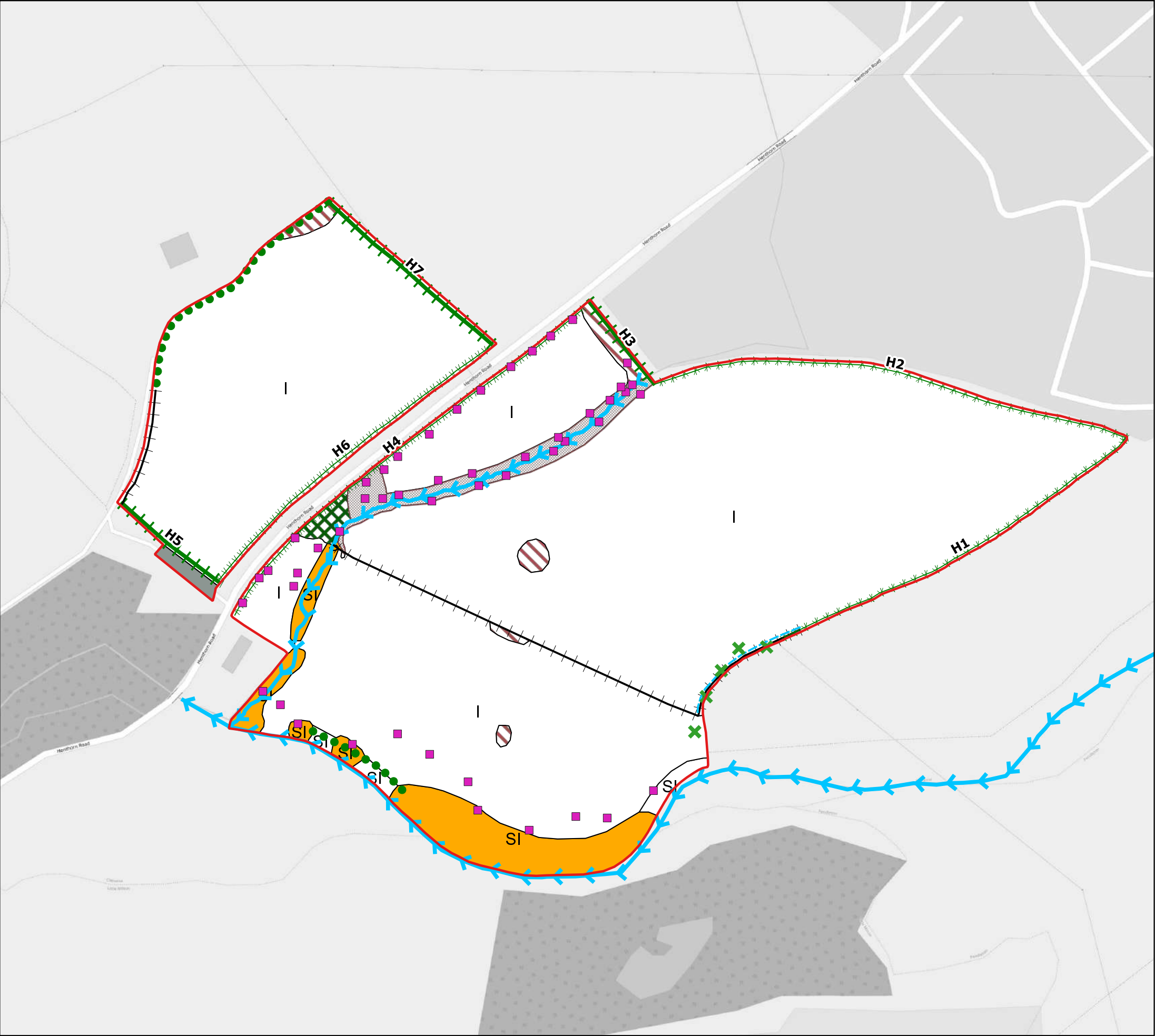
 Survey Boundary

 500m Buffer

Waterbody (with ref.)

 Normal

 Dry



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Key

- Survey Boundary
- Reptile refugia location

For habitat symbology, see Phase 1 Habitat Plan