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**Land North of Barrow Brook Business Park  
Ecology Report**

Final Report

May 2012

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## **Control sheet**

**Project No & Title:** BOW0017/104 Land North of Barrow Brook Business Park

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**Date of Issue:** May 2012 **Status:** Final

**Version No:** 1

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## **1. Introduction**

- 1.1. Bowland Ecology was commissioned by Caldecotte Consultants to undertake an extended Phase 1 habitat survey, Phase 2 vegetation survey and desk study of a site situated within Barrow, Lancashire (central grid reference SD740384) on behalf of the site owners; Admiral Taverns, in August 2009. The area covered during this survey is indicated by the red line boundary in Appendix 1 of this report.
- 1.2. In May 2012 Bowland Ecology were requested to revisit the site to assess whether the habitats on site had changed since the survey undertaken in 2009. The study area for the survey is indicated by the red line boundary within the plan presented in Appendix 1. However, at this stage a planning application is only being made for the area indicated by the blue line boundary in Appendix 1. Therefore, within this report the results will include all habitats within the red line boundary but analysis of impacts and recommendations will be focused upon the blue line boundary.
- 1.3. The study area is bound by Whalley Road to the west, the A59 to the east, Barrow Business Park and residential housing to the south and residential and agricultural land to the north.
- 1.4. The purpose of this report is to: present the results of the field survey and the desk study; identify if there are any ecological constraints to the proposed works; recommend mitigation measures if appropriate; and identify potential ecological enhancement measures.

## 2. Methodology

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### Desk Study

- 2.1. To determine whether the site is designated as or adjacent to a statutory designated nature conservation site (e.g. Sites of Special Scientific Interest SSSI) the Multi-Agency Geographic Information Centre (MAGIC – [www.magic.gov.uk](http://www.magic.gov.uk)) was consulted.
- 2.2. An internet search was undertaken to obtain any species records that may be available for the 10km square that the site is located in.
- 2.3. Nature on the Map (<http://www.natureonthemap.naturalengland.org.uk/>) was consulted to identify whether Natural England had identified any habitats on or within 1km of the site as Biodiversity Action Plan habitats.
- 2.4. The county records centre (Lancashire Ecological Records Network (LERN)) was contacted in 2009 to obtain any records that they may hold of protected species or species of nature conservation interest on site and within 1km of the site. They were also contacted to confirm if the site was designated as, or adjacent to, a Biological Heritage Site (BHS).

### Field Survey

#### *Phase 1 Habitat Survey*

- 2.5. The survey followed the standard Phase 1 habitat survey methodology (JNCC, 2007). This involves walking the whole site, mapping and describing different habitats (for example: woodland, grassland, scrub). A colour coded map of the habitats on site is produced, with corresponding target notes of ecologically interesting features.
- 2.6. The survey was extended such that evidence of fauna and faunal habitat was also recorded (for example potential bat roosts, specialist habitat such as ponds, animal tracks). The extended version of the Phase 1 survey is a modified approach to the Phase 1 survey and follows the approach recommended by the Guidelines for Baseline Ecological Assessment (IEA, 1995).
- 2.7. This survey was originally undertaken in July 2009. The update survey was completed on the 4<sup>th</sup> May 2012 by Lyndsey Husband MSc, BSc, MIEEM, CEnv. The survey was undertaken during suitable weather conditions (mild, drizzle, gentle breeze). The entire site was accessible for the survey and the survey was undertaken at an appropriate time of year. The results of the Phase 1 survey are discussed in paragraphs 3.5 to 3.13 (and in the Target Notes in Appendix 2) and illustrated on the Phase 1 Habitat Plan, which is shown in Appendix 1.

#### *Phase 2 Vegetation Survey*

- 2.8. In 2009 a Phase 2 vegetation survey was completed. The survey concentrated on the field in the north eastern corner of the site (Target Note 8). This field was considered to be more species rich than the rest of the survey site, and was therefore subject to more detailed investigation.

- 2.9 The Phase 2 vegetation survey was undertaken on the 15<sup>th</sup> September 2009 in fine weather. The survey was undertaken by Jeremy James MSc, BSc (Hons), CEnv, MIEEM.
- 2.10 The field survey was carried out using the National Vegetation Classification (NVC) system. To map the vegetation, the surveyor walked over the land in such a way as to see a reasonable sample of all habitats and vegetation communities present. The boundaries of NVC communities encountered were drawn onto large scale maps, making sure that each separate vegetation type or habitat was represented by a closed polygon.
- 2.11 Habitats of low ecological interest (already surveyed according to Phase 1 method) were not included in the Phase 2 survey.
- 2.12 Five 2x2m quadrats were recorded at the site (see Appendix 1 for approximate locations). All rooted vascular plants and bryophytes were recorded in each quadrat and given a Domin score of abundance. Additional species within the area surveyed but not recorded in quadrats were given a DAFOR score for abundance:

**Domin Scale**

**Score    Percentage Cover**

|    |                           |
|----|---------------------------|
| 1  | < 4%, few individuals     |
| 2  | < 4%, several individuals |
| 3  | < 4%, many individuals    |
| 4  | 4 – 10%                   |
| 5  | 11 – 25%                  |
| 6  | 26 – 33%                  |
| 7  | 34 – 50%                  |
| 8  | 51 – 75%                  |
| 9  | 76 – 90%                  |
| 10 | 91 – 100%                 |

**DAFOR Scale**

|    |   |             |
|----|---|-------------|
| D  | – | Dominant    |
| A  | – | Abundant    |
| F  | – | Frequent    |
| O  | – | Occasional  |
| R  | – | Rare        |
| L  | – | Locally     |
| CD | – | Co-dominant |

*Internal, External and Emergence Bat/Bird Survey*

- 2.13 The internal, external and emergency survey of the buildings (TN 9 & 10) on site was undertaken on the 15<sup>th</sup> February 2012. The survey was completed by Lyndsey Husband MSc, BSc (Hons), MIEEM, CEnv (Bat Licence Number 20120582) and Liz Higgs (Bat Licence Number 20114277).
- 2.14 The external survey involved the surveyors walking around the exterior of the buildings looking for structural features that would allow bats or birds to access the building to roost/nest. Signs of the presence of bats and birds, including

droppings, staining and scratches/wear were also sought using close focusing binoculars in the proximity of potential access points. Particular note was paid to features such as window ledges and windows where droppings often accumulate.

- 2.15 An internal inspection of the buildings was also completed. This involved the surveyors walking through the interior of the buildings looking for signs of bat activity including live or dead bats, droppings, urine staining and feeding remains (moth wings). In addition, the roof void of both buildings were fully accessed by the surveyors.
- 2.16 An emergence survey was undertaken on the evening of the 15<sup>th</sup> May 2012 which focused on the buildings indicated by Target Number 9 and 10 in Appendix 1 of this report. The two surveyors were positioned so that their combined view of the building covered all potential access/egress points for bats. The surveyors were on site half an hour before sunset (sunset 21:08) and remained on site for an hour and a half after sunset, when it was determined that all bat species would have emerged. Both of the bat surveyors had bat detectors (Batbox Duet) and recorded all bat activity during the survey. The weather conditions and timing of the emergence survey was considered optimal.
- 2.17 A bat tree inspection was also undertaken which involved the surveyors looking at all trees on site to assess if there were any features that bats could use as a roost (holes, cracks, loose bark or fissures). The trees were then classified using the criteria listed below:

| Roosting Habitat Value | Roosting Opportunities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Negligible             | Trees that have no features which could be used by bats for roosting.                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Low value              | One of two minor opportunities offered to individual bats.<br>Features associated with feeding or night time roosts, easily replaced elsewhere.<br>Features such as sparse ivy-cover, minor branch splits, small sections of loose or flaking bark<br>Features which may have been available for less than 10 years.                                                                                                                                                                                   |
| Moderate value         | Features which provide a more secure form of roost for small groups of bats and individuals, but may still be quite common types of feature such as dense ivy, significant branch splits, small cavities.<br>Features which may have been available for more than 10 years but less than 30 years.                                                                                                                                                                                                     |
| High value             | Features of particular significance, suitable for high priority roosts such as maternity roosts, used by large numbers of bats offering conditions that are rare or uncommon in the local area.<br>Features such as large cavities, extensive branch or trunk splits, also including multiple features in the same tree that offer diversity of opportunities.<br>Features which may have been available for more than 30 years and could therefore have been utilised by several generations of bats. |
| Confirmed roost        | Evidence found that indicate tree features are used by bats.<br>Droppings found at base of trees or below a cavity.<br>Bats heard chattering inside tree on warm day or at dusk.<br>Bats observed flying from a feature.                                                                                                                                                                                                                                                                               |

### **3. Results**

#### **Desk Study**

- 3.1. MAGIC confirmed that the proposed development site is not directly affected by any statutory nature conservation designations (e.g. Site of Special Scientific Interest) or adjacent to one of these sites. Nature on the Map indicated that no habitats on or adjacent to the site had been identified as Biodiversity Action Plan habitats.
- 3.2. Lancashire Ecological Records Centre (LERN) data search indicates that the following species could occur on site if the habitats on site were suitable.
  - Mammals – water vole and brown hare.
  - Amphibians – great crested newts (recorded 1.5km south-east of the site and separated from the site by the A59), common toad and frog.
  - Birds – lapwing, linnet, reed bunting, swallow and song thrush.
  - Plants – black poplar, mossy saxifrage, blue water-speedwell, fragrant orchid and bird's-eye primrose.
- 3.3. LERN confirmed that the site is not affected by or adjacent to any Biological Heritage Sites (BHS). The nearest BHS is 750m west of the development site and separated from the site by a road and a rail line. It is therefore considered that the development will not affect this BHS.
- 3.4. The internet search did not identify any species records which relate directly to the development site. It did identify the following species occur within the 10km square (SD73) that the site is situated in. Therefore, these species could occur on site if habitats were suitable.
  - Mammals – water vole and brown hare at Barrow Lodge (100m south – land between this feature and site has in part now been developed) and pipistrelle bats.
  - Amphibians – great crested newts have been recorded in a pond in Whalley (SD743368 1.5km south east of the site), common toad and frog.
  - Birds – common cuckoo, common grasshopper warbler, curlew, tree sparrow, greater scaup, grey partridge, house sparrow, lesser redpoll, lapwing, reed bunting, ring ouzel, spotter flycatcher, tree pipit, wood warbler and yellowhammer.
  - Plants – cornflower, lesser butterfly orchid and spreading hedge parsley.

#### **Field Survey**

##### *Phase 1 Habitat Survey*

- 3.5. The Phase 1 habitat survey covered the area indicated by the red line boundary on the plan in Appendix 1 of this report.
- 3.6. In summary, the habitats present on site include:
  - Species poor semi-improved grassland
  - Semi-improved grassland

- Dry ditches
- Tall ruderal herb
- Remnant hedgerows
- Scattered trees
- Introduced shrub – Japanese knotweed
- Buildings and hard standing.

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- 3.7. The majority of the site is comprised of five fields that are grazed by sheep. These fields are mainly species poor semi-improved grassland, but the field in the north-eastern corner of the site (refer to Target Number 8) was found to be more species rich than the others. This is in part due to the presence of a number of small wet areas and the field to the north of the study area was found to be more diverse than those within the study area.
- 3.8. Species present within the species poor semi-improved grassland included Yorkshire fog, creeping bent, creeping buttercup, creeping thistle, sweet vernal grass, cocks-foot, meadow foxtail and tufted hair grass.
- 3.9. In the north-eastern field of semi-improved grassland (Target Number 8), the species listed above are present, plus marsh foxtail, crested dog's-tail, soft brome, false oat grass, brown bent, great burnet, birds-foot trefoil, common sorrel, creeping cinquefoil, tormentil, willowherb sp. soft rush, hard rush, jointed rush and *Carex* sp. This area was subject to more detailed vegetation survey during September 2009. Quadrat data is presented in Table 1.
- 3.10. The vegetation sampled in detail at Target Note 8 is dominated by a mixture of mesotrophic grassland species, predominantly Yorkshire fog, creeping bent grass and crested dog's tail. The field was considered to be a single polygon of vegetation and it was not possible to separate out different NVC community polygons. The grassland exhibits shallow ridge and furrow. Areas of impeded drainage within the furrows are characterised by stands of soft rush and occasionally patches of tufted hair grass. In terms of the National Vegetation Classification (NVC), the grassland at Target Note 8 has elements of both MG10 *Holcus lanatus-Juncus effusus* rush pasture and MG9 *Holcus lanatus-Deschampsia cespitosa* grassland. Both of these grassland types occur frequently, the examples at the site are species poor and are likely to have become impoverished under agricultural improvement. Analysis of data using the Modular Analysis of Vegetation Information System (MAVIS, <http://www.ceh.ac.uk>) revealed the following coefficients of similarity between the Quadrat data and published NVC communities: Group 1: MG10a 59.94, MG10 55.12, MG6a 51.08, MG9a 50.87, MG10b 50.57, MG9 49.22. Similarity coefficients are not, in isolation, confirmation of NVC communities.
- 3.11. However, based upon the experience of the surveyor, the botanical characteristics of the site and the similarity coefficient data it is considered that Target Note 8 is predominantly MG10 with transitional (unmapped) areas of MG9. The vegetation was not particularly species rich and no BAP species or species of conservation interest were noted during the survey. Species recorded during the Phase 1 survey, such as great burnet and creeping cinquefoil were found rarely around the edges of the field in Target Note 8 and also around the edges of other fields within the application boundary. The field immediately adjacent to Target Note 8 and to the north appeared more species rich with abundant ribwort plantain and frequent autumn hawkbit in the sward. This area to the north is outside of the study area.

Table 1 Quadrat data from Target Note 8 grassland

| Species                          | Q1 | Q2 | Q3 | Q4 | Q5 | Constancy |
|----------------------------------|----|----|----|----|----|-----------|
| <i>Cynosurus cristatus</i>       | 15 | 30 | 25 | 15 | 10 | V         |
| <i>Agrostis stolonifera</i>      | 45 | 60 | 65 | 65 | 65 | V         |
| <i>Juncus effusus</i>            | 4  | ~  | 5  | 20 | 5  | IV        |
| <i>Holcus lanatus</i>            | 8  | 8  | 2  | 15 | 10 | V         |
| <i>Ranunculus repens</i>         | 2  | 4  | 3  | 2  | 4  | V         |
| <i>Taraxacum officinale</i> agg. | 1  | ~  | ~  | ~  | ~  | I         |
| <i>Juncus articulatus</i>        | 1  | ~  | ~  | 4  | ~  | II        |
| <i>Trifolium repens</i>          | 4  | 2  | 10 | 6  | 4  | V         |
| <i>Phleum pratense</i>           | 4  | ~  | ~  | ~  | ~  | I         |
| <i>Deschampsia cespitosa</i>     | 25 | ~  | 5  | ~  | 10 | III       |
| <i>Poa annua</i>                 | 1  | ~  | ~  | ~  | ~  | I         |
| <i>Calliergonella cuspidata</i>  | 4  | 2  | 4  | 4  | 2  | V         |
| <i>Lolium perenne</i>            | ~  | 5  | 4  | ~  | 2  | III       |
| <i>Ranunculus acris</i>          | ~  | 5  | ~  | ~  | ~  | I         |
| <i>Anthoxanthum odoratum</i>     | ~  | 5  | 2  | ~  | 2  | III       |
| <i>Festuca rubra</i>             | ~  | 4  | ~  | ~  | ~  | I         |
| <i>Alopecurus pratensis</i>      | ~  | 4  | ~  | ~  | ~  | I         |
| <i>Cardamine sp</i>              | ~  | 1  | ~  | ~  | ~  | I         |
| <i>Cerastium fontanum</i>        | ~  | ~  | 2  | ~  | ~  | I         |
| <i>Rumex obtusifolius</i>        | ~  | ~  | ~  | 1  | ~  | I         |
| <i>Salix sapling</i>             | ~  | ~  | ~  | ~  | ~  | I         |

Additional species (DAFOR); *Dactylis glomerata* R, *Carex hirsuta* R, *Arrhenatherum elatius* R, *Cirsium arvense* R, *Juncus inflexus* R, *Rumex acetosa* R, *Quercus robur* (S) O, *Potentilla reptans* R, *Plantago lanceolata* R, *Sanguisorba officinalis* R

- 3.12. The majority of the boundaries on site are fenced with remnant hawthorn bushes scattered along their line. Along the eastern boundary of the site, which backs onto the A59, a hawthorn hedgerow has been planted as screening. A single ash tree is present which is semi-mature. Situated along the southern boundary of the site there are two mature ash trees and two mature sessile oak trees (T1-4).
- 3.13. The western boundary of the site is bound by Whalley Road. A track leads from this road into an area of hardstanding/aggregate which is currently used for car parking. There are four buildings/structures within the development boundary adjacent to this car parking area, which include a disused pub/restaurant called La Tavema (refer to TN9), a residential cottage (refer to TN10 and two garages (refer to TN3 & 4).
- 3.14. These structures are described in detail in relation to birds and bats with the sections below. Japanese knotweed (8 x 5m stand growing through paving) is present with the yard of the cottage indicated by TN 10. The eastern boundary of the car park is demarked by stands of tall ruderal herb comprised of common nettle, rosebay willowherb and yellow loosestrife (Target Number 1) and by an outgrown hedgerow comprised of hawthorn and elder (Target Number 2).
- 3.15. Part of the northern perimeter of the site is defined by a public footpath. Along this footpath there is a dry ditch and the remnants of a hedgerow. Along this hedgerow there is a stand of Japanese knotweed, which is approximately 10mx3m (Target Number 6). The majority of the vegetation along the path is comprised of scattered hawthorn, reed canary grass, rosebay willowherb and common nettle.

Protected Species and/or Species of Nature Conservation Interest

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Bats

- 3.16. There are four mature trees (T1, T2, T3 & T4) along the southern boundary of the site. These are comprised of two ash trees and two oak trees (Target Number 7). These were assessed as to their potential to support bats. It was observed that the ash trees had a number of holes and cavities which have occurred due to the loss of limbs and rot and that potentially these could provide bat roosting sites. These trees were assessed to have high bat roost potential. The oak trees had fewer cavities for bats to roost but they were considered to provide some opportunities. Therefore they were considered to have medium bat roost potential.
- 3.17. All other trees on site were considered too young and/or did not possess the cavities that bats need for roosting.
- 3.18. In the car park there are two single storey garages. The garage nearest to the properties on Whalley Street (Target Number 4), is comprised of chipboard walls with a flat corrugated sheet roof. Access for bats was only available where the corrugated sheets met the top of the wall. These were inspected for signs of bats entering and exiting the building in 2009 and 2012. No droppings were found and cobwebs were present. The potential for bats in this building was considered to be low.
- 3.19. The walls of the second garage were constructed from concrete sheets (Target Number 3). The roof was flat and comprised of corrugated sheets. Along the sides and front of the garage there was a barge board that sits along the wall. There is a small gap between the barge board and the wall that bats could roost. However, flight lines are affected by dense vegetation. It was also observed that there were cobwebs. No signs of bats were found in 2009 or 2012. Therefore, this structure was considered to have low bat roost potential.
- 3.20. A terrace of properties runs along the western boundary of the site. The two southern properties within this row are within the planning application boundary. The building indicated by Target Number 9 has previously been run as an Italian Restaurant (La Taverna). This building is no longer in use. The main part of this building is two storey, constructed out of stone and rendered externally. The top of the wall is marked by a top stone. The roof of the building is hipped at the southern end and pitched east to west. The roof is covered in slates with a clay ridge. It was observed that mortar had been lost along the ridge of the building and a number of slates lifted. Therefore, creating potential opportunities for bats to roost.
- 3.21. At the rear of the restaurant are single storey extensions. These are either flat roofed and covered in felt or have a single pitch and covered in slates. These structures do have a barge board around their perimeter. These features did sit away from the wall, which would provide a cavity for bats to roost. However, these features were inspected and they were found to be covered in cobwebs, no bat droppings were found, these features are low to the ground and also these structures were shaded by surrounding vegetation therefore flight lines would be interrupted and natural heat would be limited.
- 3.22. Building 9 was inspected internally. All rooms including the cellar were inspected. No signs were found within any of the rooms or on the window ledges that would indicate that bats had been present. All of the windows of the building have been boarded up and the glass removed from the windows. It was observed that access to the cellar by bats was restricted to a fireplace/chimney as all other potential access routes (coal chute) had been sealed. No signs of bats were found.

- 3.23. The two roof voids of this building were accessed by the surveyors. The roof tiles have been backed within the roof void with plastic. It was observed that cobwebs extended across the whole roof void indicating that bats have not been flying within the roof void. No signs of bats were found internally within either of the two roof voids.
- 3.24. At the time of the survey no signs were found of birds nesting internally within this roof void, but it was observed that old bird nesting material was present at the top of the walls of this building.
- 3.25. The building indicated by Target Number 10 is a small stone cottage, which has been rendered externally. The roof is pitched and covered in slates with a clay ridge. Mortar was observed to have been lost at the ridge of the roof and it was observed that bats/birds could access this roof void via a gap between the top of the walls and the roof.
- 3.26. It was observed at the time of the survey that there are two active house sparrow nests at the rear of this property (eastern elevation). No signs of bats were observed externally.
- 3.27. The entire interior of this property, including the cellar was accessed and inspected for signs of bats. None were found. The roof void was accessed and internally inspected for signs of bats. No signs were found.
- 3.28. The cottage has two outbuildings which are constructed of stone with a single pitched roof covered in slates. These were inspected for signs of bats and none were found.
- 3.29. An emergence survey was undertaken on the 15<sup>th</sup> May 2012 which focused on the buildings indicated by Target Number 9 & 10. No bats were recorded emerging from either of the buildings. 45kHz and 55kHz pipistrelle bats were recorded soon after the peak time of emergence for these species (sunset and half an hour after sunset respectively), but bat activity within the vicinity of these buildings and the surrounding vegetation was very low. Full survey results are provided in Appendix 4 of this report.



Photo 1 La Tavema and Cottage

#### Nesting Birds

- 3.30. It is considered that the hedgerows and scattered hawthorn scrub on site would provide a range of common bird species with suitable nesting habitat. In addition, it was observed that house sparrow was nesting within the roof of the cottage on site.

#### Amphibians

- 3.31. It appeared from the maps of the area that there may be a pond to the north of the site (Target Number 12). This area was inspected in 2009 and it was found to be

dry even following a period of heavy rain. In addition, the species present (common nettle, creeping thistle and creeping bent) at the bottom of the depression indicated that it typically remains dry for most of the year.

- 3.32. There is a reservoir to the south of the site. This is a large reservoir, probably associated with the former printworks. Typically large waterbodies such as this do not provide good habitat for great crested newts as they are more likely to contain fish and support a large amount of waterfowl. It was observed that the reservoir is regularly used by fisherman suggesting a good population of fish.
- 3.33. To the east of the site there is a network of ponds and a large lake, which are in use as a fishery. The nature of these ponds means that they are unlikely to support great crested newts. In addition these features are separated from the development site by the A59 which as a dual carriageway would pose a significant obstacle to the migration of great crested newts.

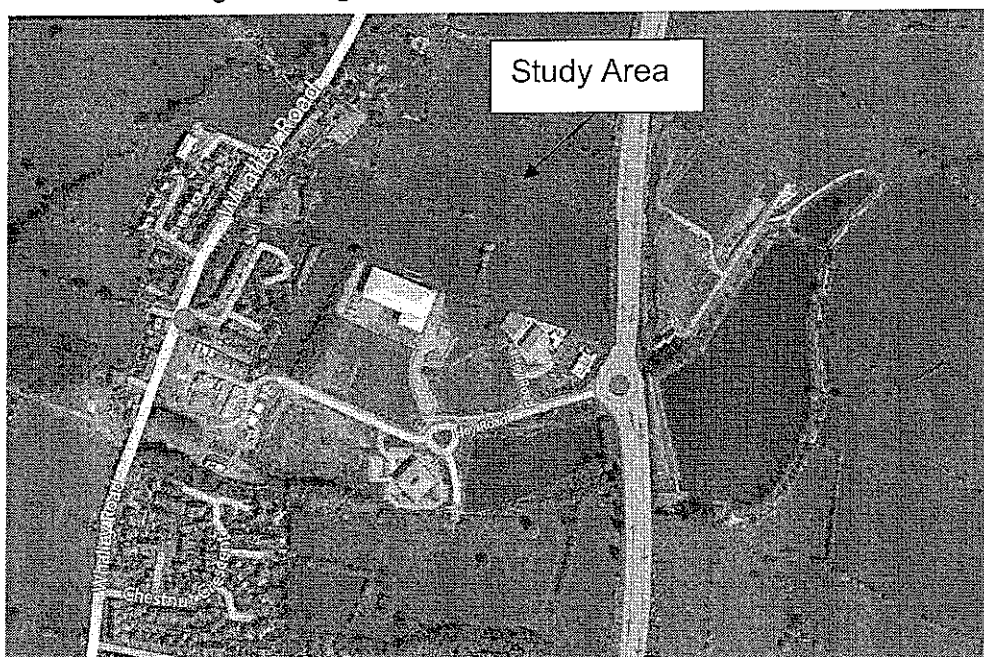


Photo 2 Illustrating location of fishing ponds in relation to study area

- 3.34. No further ponds were noted as being present within 250m of the development site following a review of plans, and walk over of the surrounding area. The nearest ponds that could be found on plan (not seen during the survey) are 300m from the site boundary to the west toward Clitheroe Golf Course.
- 3.35. It is considered that the majority of the site would not be suitable terrestrial habitat for amphibians as the study area is dominated by grazed pasture and hardstanding. The only potentially suitable terrestrial habitat for amphibians on site would be the tall ruderal herb and hedgerow at Target Number 5 and along the northern boundary of the site (Target Number 6). However, due to the absence of ponds locally it is considered that the potential for amphibians of site would be low.

#### Water Voles

- 3.36. There are historical records (record from 1977) of water vole on Barrow Lodge which is 100m south of the site. However, the ditches on site were found to be dry even after a period of prolonged rain in 2009 and 2012. This removes the water voles main defence mechanisms against predators reducing significantly the likelihood of their occurrence. No signs of water vole activity were found within the ditches upon completion of a spot check.

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Badgers

- 3.37. No signs of badger activity were identified on site or within 30m of the boundary of the site. The area is heavily used by dog walkers, which may deter many wild animals from using this area.

## 4. Recommendations

- 4.1. At this time a planning application is only being made for the area indicated by the blue line boundary in Appendix 1 and 3. This area of parking, hedgerows and species poor grassland will be developed into residential properties, landscape planting and associated infrastructure.

### Habitats

- 4.2. The proposed development site (refer to blue line boundary) is dominated by species poor grazed pasture, hedgerows and hardstanding. This habitat is considered to be of low ecological value on site. Small areas of tall ruderal herb and hedgerow are present on site. These habitats are not botanically diverse but they do provide habitat diversity and are considered to be of value to species such as birds, bats, small mammals and bats.
- 4.3. Four mature trees are present along the southern boundary of the site T1-4. These are considered to be of high ecological value and should be retained in their current condition.

### Recommendations

- It is recommended that the proposed housing estate includes areas of native tree planting or tree/shrub planting of species that would attract fauna onto site e.g. plant species that produce pollen, seed or berries. Consideration should be given to the potential of planting dense stands of native species that would provide birds with suitable nesting habitat.
- It is recommended that a species rich hedgerow is planted around the perimeter of the development. This will provide screening between the residential development and surrounding industrial development and roads. This habitat will also compensate for the loss of hedgerows and scattered scrub within the centre of the site which will provide birds, bats, small mammals and invertebrates with suitable habitat.
- Fencing should be erected prior to works commencing on site at the edge of the root protection zone which surrounds the four mature trees along the southern boundary of the site. This fencing should remain in place until all works are complete on site.
- To enhance habitat diversity on site it should be considered where areas of grassland on site could be managed as species rich grasslands. Two potential mixes are provided below. Other species mixes are available and a mix should be obtained that will suit the soil conditions on site and light levels. The management of each grassland can differ:

#### Flowering lawn mixture – which can tolerate regular cutting.

| Percentage of Mix | Latin Name                  | Common Name       |
|-------------------|-----------------------------|-------------------|
| Herbs/Wildflowers |                             |                   |
| 2                 | <i>Galium verum</i>         | Lady's Bedstraw   |
| 1                 | <i>Leontodon hispidus</i>   | Rough Hawkbit     |
| 1                 | <i>Leucanthemum vulgare</i> | Oxeye Daisy       |
| 4                 | <i>Lotus corniculatus</i>   | Birdsfoot Trefoil |
| 4                 | <i>Primula veris</i>        | Cowslip           |
| 3                 | <i>Prunella vulgaris</i>    | Selfheal          |

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|         |                            |                             |
|---------|----------------------------|-----------------------------|
| 2       | <i>Ranunculus acris</i>    | Meadow Buttercup            |
| 2       | <i>Rumex acetosa</i>       | Common Sorrel               |
| 1       | <i>Trifolium pratense</i>  | Wild Red Clover             |
| Grasses |                            |                             |
| 8       | <i>Agrostis capillaris</i> | Common Bent                 |
| 40      | <i>Cynosurus cristatus</i> | Crested Dogtail             |
| 28      | <i>Festuca rubra</i>       | Slender-creeping Red-fescue |
| 4       | <i>Phleum bertolonii</i>   | Smaller Cat's-tail          |

Soil should not be enriched (i.e. soil should be infertile/low levels of soil fertility), sowing should occur spring or autumn and grassland will take 12-18 months to establish. Undertake one cut in the first year to take the top off weeds. Once the grassland is established mow regularly as a lawn but not too short (25-40mm). To permit flowering mowing should be relaxed from late June. Cut again when the sward gets untidy (after 4-8 weeks). Mowing may be suspended earlier in the year to allow cowslips to flower. Cuttings should be collected and removed from site.

#### Meadow mix:

| Percentage of Mix | Latin Name                                                    | Common Name                 |
|-------------------|---------------------------------------------------------------|-----------------------------|
| Herbs/Wildflowers |                                                               |                             |
| 0.5               | <i>Achillea millefolium</i>                                   | Yarrow                      |
| 2                 | <i>Centaurea nigra</i>                                        | Common Knapweed             |
| 1                 | <i>Daucus carota</i>                                          | Wild Carrot                 |
| 2                 | <i>Galium verum</i>                                           | Lady's Bedstraw             |
| 2                 | <i>Leucanthemum vulgare</i>                                   | Oxeye Daisy                 |
| 3                 | <i>Poterium sanguisorba</i> -<br>( <i>Sanguisorba minor</i> ) | Salad Burnet                |
| 2.5               | <i>Prunella vulgaris</i>                                      | Selfheal                    |
| 3                 | <i>Ranunculus acris</i>                                       | Meadow Buttercup            |
| 0.5               | <i>Rumex acetosa</i>                                          | Common Sorrel               |
| 2.5               | <i>Silene dioica</i>                                          | Red Campion                 |
| 1                 | <i>Silene vulgaris</i>                                        | Bladder Campion             |
| Grasses           |                                                               |                             |
| 8                 | <i>Agrostis capillaris</i>                                    | Common Bent                 |
| 40                | <i>Cynosurus cristatus</i>                                    | Crested Dogtail             |
| 28                | <i>Festuca rubra</i>                                          | Slender-creeping Red-fescue |
| 4                 | <i>Phleum bertolonii</i>                                      | Smaller Cat's-tail          |

Soil should not be enriched, sowing should occur spring or autumn. Undertake one cut in the first year to take the top off weeds. After flowering in July or August take a cut to 50mm. Leave the cuttings to dry on site and shed seed for 1-7 days then remove from site. Mow the re-growth through to late autumn/winter to c 50mm and again in spring if needed.

- An enhancement measure that could be installed is a pond. This would provide habitat diversity upon the site. This habitat feature would be of use to a range of species including amphibians, bats and birds.

#### Bats

- 4.4. It is considered that the four trees (T1, T2, T3 & T4) along the southern boundary of the site have bat roost potential. These trees will not be directly impacted by the proposed works therefore no further survey is recommended at this time. The bat

surveys did not find any evidence that the buildings indicated by Target Number 9 and 10 have been or are being used as a bat roosting site. Therefore, no further bat surveys are recommended and no further mitigation is recommended.

#### Recommendations

- It is recommended that measures are adopted during the development of the site to ensure the long term health of the trees that line the southern boundary of the site. This includes ensuring that no structures (inc. hardstanding) are constructed over the roots of these trees and that no ground disturbance occurs within the root protection zone during development. In addition, street lighting on site should be positioned so that it does not light the area surrounding these trees.
- The planting of a diverse range of trees, shrubs and grasslands on site will ensure that invertebrate levels remain high and will encourage bats onto and across the site upon development.
- All lighting on site should be focused on site and away from surrounding vegetation to encourage the on going use of this habitat by bats for foraging.
- To enhance the development site it is recommended that four 2F Schwegler bat boxes are erected within the four trees along the southern boundary of the site. These boxes must be erected more than 5m above the ground and should face in a south-west or south-easterly direction.

#### Nesting Birds

- 4.5. It is considered likely that birds will nest within the shrubs and trees on site. In addition, it was observed that house sparrow is nesting within the roof void of the building indicated by Target Number 10.

#### Recommendations

- If vegetation requires removal or the building at Target Note 10 requires demolition then these works should occur outside of the bird nesting season which extends from mid-March to end- August inclusive. All birds nests are protected under by the Wildlife and Countryside Act 1981.
- If these works must be undertaken during the bird nesting season then a nesting bird survey will need to be undertaken by a suitably qualified ecologist to assess if nests are present. If nests were to be found works would need to stop in the vicinity of the nest until the young have fledged the nest.

#### Japanese Knotweed

- 4.6. Japanese knotweed is a notifiable weed under Schedule 9, Section 14 of the Wildlife & Countryside Act 1981 and therefore to plant or otherwise cause Japanese knotweed to grow in the wild is an offence under the legislation.
- 4.7. Under The Environmental Protection Act 1990. Japanese Knotweed is classed as 'controlled waste' and as such must be disposed of safely at a licensed landfill site according to the Environmental Protection Act (Duty of Care) Regulations 1991. Soil containing knotweed roots would be regarded as contaminated and, if taken off a site, must be disposed of at a suitably licensed landfill site and buried to a depth of at least 5m.

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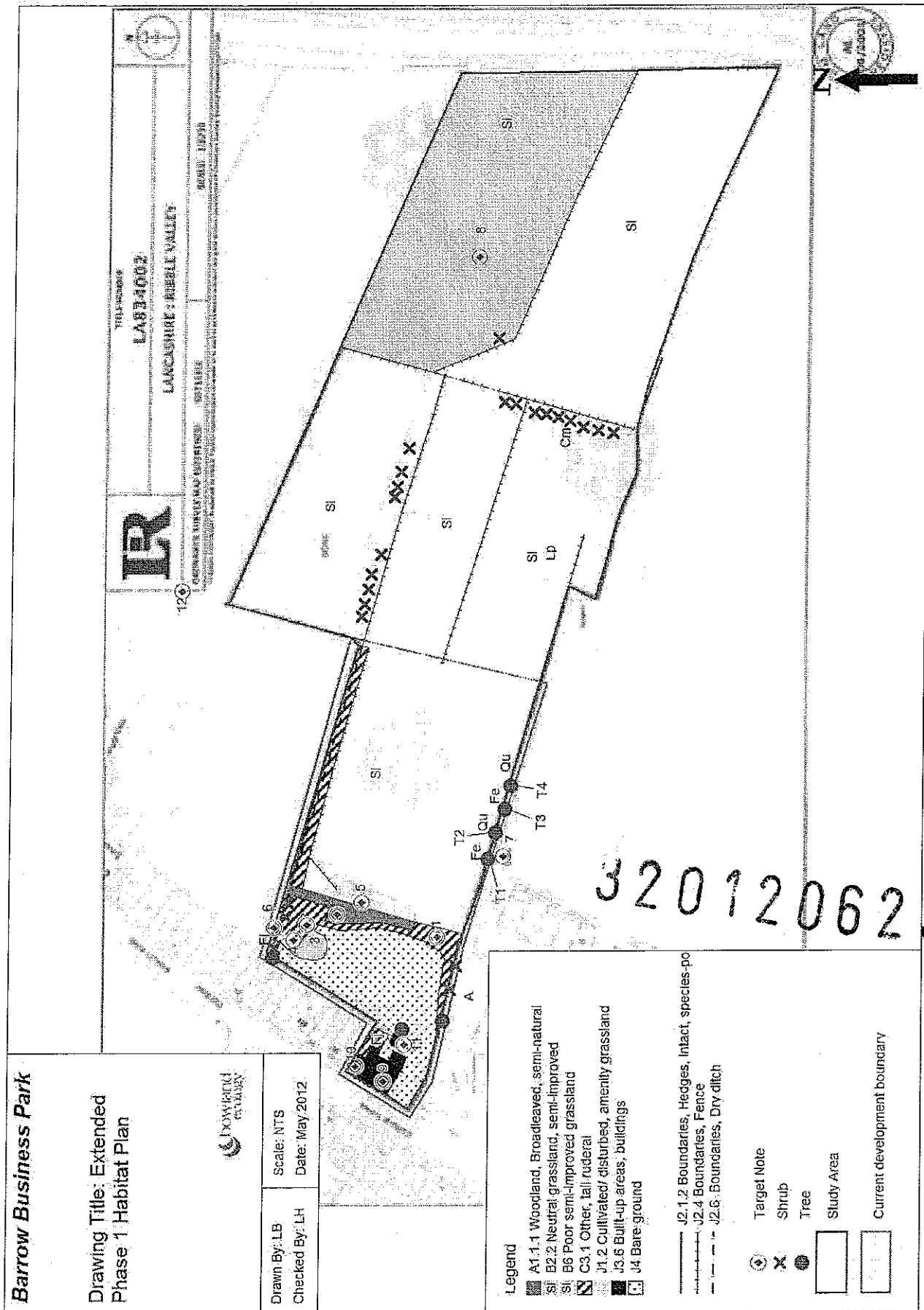
## **References**

- Bat Conservation Trust. (2012). *Bat Surveys Good Practice Guidelines 2<sup>nd</sup> Edition*.  
IEA. 1995. *Guidelines for Baseline Ecological Assessment*. Chapman and Hall  
Nature Conservation Committee (1990). *Handbook for Phase 1 Habitat Survey: A technique for environmental audit*. JNCC

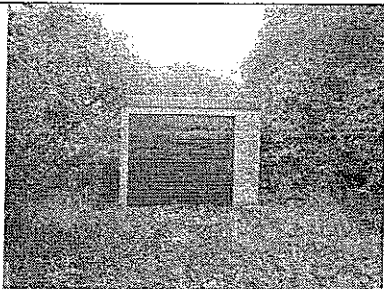
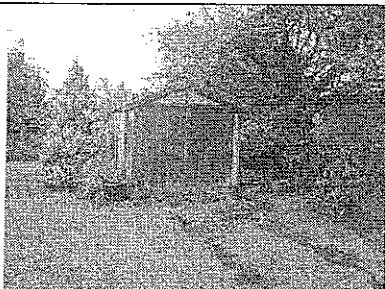
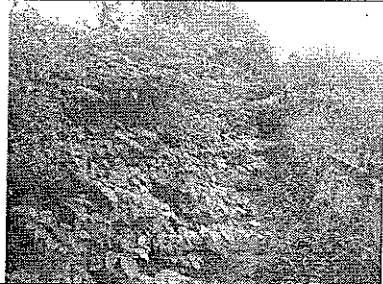
## **Appendices**

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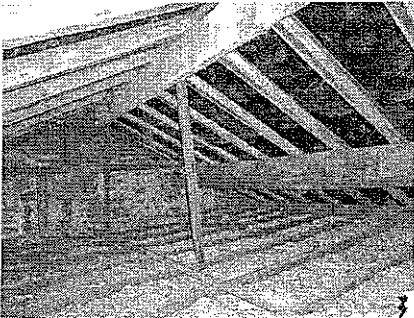
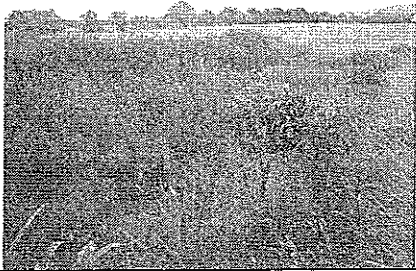
## **Appendix 1 Phase 1 Habitat Plan**



## **Appendix 2 Phase 1 Target Notes**

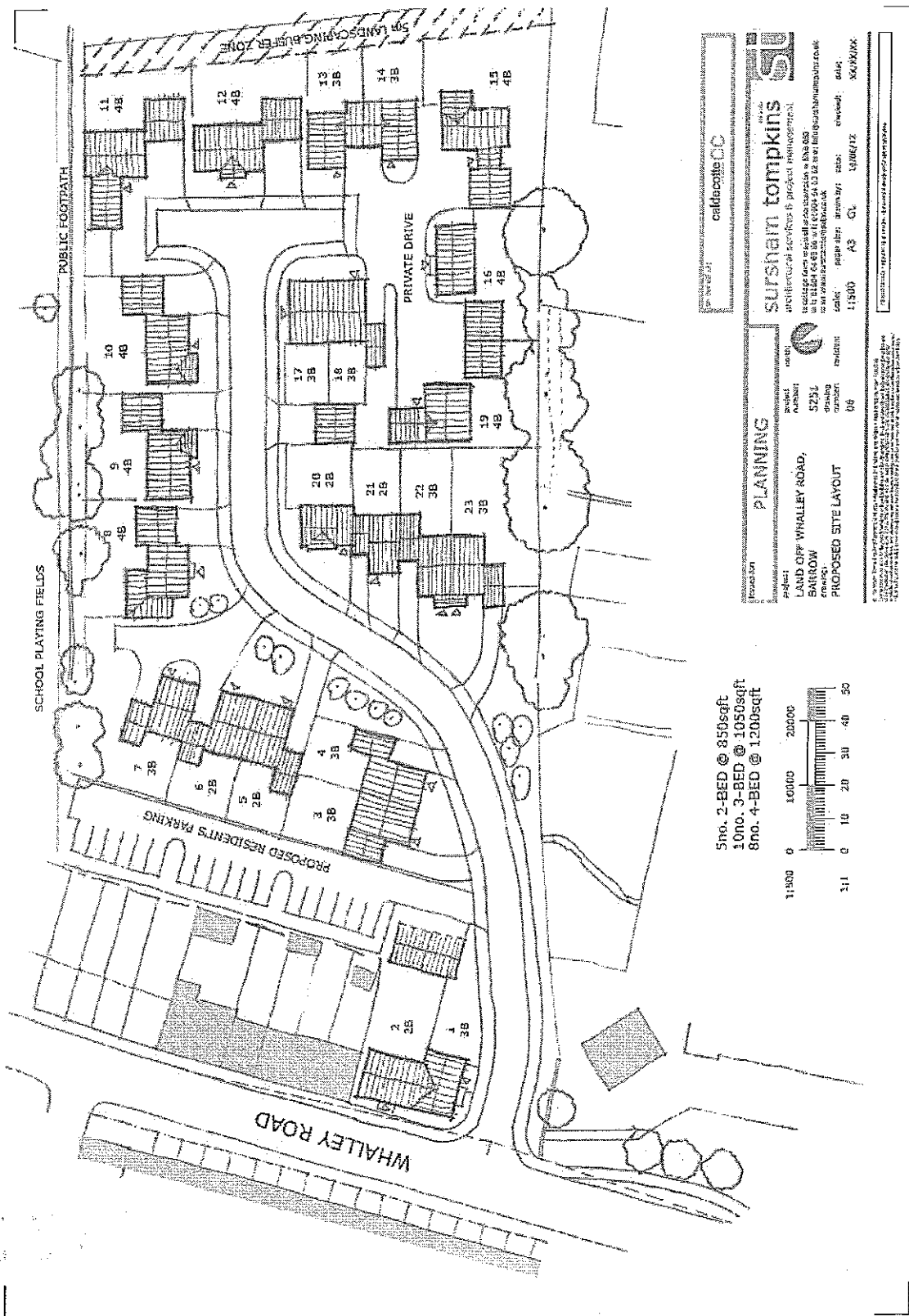
| Target Number | Photo                                                                               | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1             | No photo                                                                            | Tall ruderal vegetation comprising rosebay willowherb, yellow loosestrife and common nettle.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 2             | No photo                                                                            | Outgrown hedgerow comprised of hawthorn and elder with an understory of enchanters nightshade, common nettle, hedge woundwort and oak saplings. There is a network of trails through this area, but it is considered that they are human rather than badger.                                                                                                                                                                                                                                                                                 |
| 3             |    | Single storey garage, with walls constructed out of concrete sheets. Flat roof comprised of corrugated sheets. The barge board around the exterior of the building has a small space which bats could use as a roosting site. However, vegetation around the building is dense on two sides restricting flight lines to the building and in addition it was observed that there were cobwebs along the barge board and no droppings, suggesting that bats have not accessed this building. It is considered to have low bat roost potential. |
| 4             |   | Single storey garage, with a pitched roof. Side comprised of chip board and the roof of corrugated sheets. Access for bats only available at the bottom of the corrugated sheets of the roof. No bat droppings were found and cobwebs were present over the end holes suggesting that bats had not accessed the building. The garage was considered to have low bat roost potential.                                                                                                                                                         |
| 5             | No photo                                                                            | This building has been demolished.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 6             |  | Stand of Japanese knotweed measuring approximately 10x3m.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 7             |  | Four mature trees on the edge of the site, considered to have medium to high bat roost potential.                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 8             | No photo                                                                            | Species rich semi improved grassland containing Yorkshire fog, creeping bent, creeping buttercup, creeping thistle, sweet vernal grass, cocks-foot, meadow foxtail, tufted hair grass, marsh foxtail, crested dog's-tail, soft brome, false oat grass, brown                                                                                                                                                                                                                                                                                 |

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| Target Number | Photo                                                                                                                                                                | Description                                                                                                                                                                                                                                                                  |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               |                                                                                                                                                                      | bent, great burnet, birds-foot trefoil, common sorrel, creeping cinquefoil, tormentil, willowherb, soft rush, hard rush, jointed rush, <i>Carex</i> sp.                                                                                                                      |
| 9             |   | <p>Main building two storey, rendered with a pitched, hipped roof. Potential gaps for bats and birds present along the ridge or via lifted tiles. No signs of bats or birds recorded externally.</p> <p>Internally roof is lined with plastic. No signs of bat observed.</p> |
| 10            | <p>See above for exterior of building</p>                                         | <p>Small cottage rendered externally, two storeys with pitched roof covered in slats with a clay ridge.</p> <p>No signs of bats found internally.</p> <p>House sparrow recorded to be nesting at the rear of this property.</p>                                              |
| 11            | No photo                                                                                                                                                             | <p>Outbuildings, constructed out of stone/brick with a single pitch roof, covered in slates.</p> <p>No signs of bats or birds found internally.</p>                                                                                                                          |
| 12            |                                                                                   | <p>Dry pond, not considered to hold water even in spring due to the presence of creeping thistle, common nettle and creeping bent at the base of the pond. Not considered to have potential for great crested newts.</p>                                                     |

## **Appendix 3 Proposed Site Layout**

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## **Appendix 4 Bat Emergence Survey Results**

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|                   |                                                                                                             |
|-------------------|-------------------------------------------------------------------------------------------------------------|
| <b>Surveyor 1</b> | <b>Lyndsey Husband</b>                                                                                      |
| <b>Date</b>       | <b>15<sup>th</sup> May 2011 – located at rear of building 10 with view of both buildings</b>                |
| <b>Sunset</b>     | <b>21:08</b>                                                                                                |
| <b>Survey</b>     | <b>20:40 – 22:40</b>                                                                                        |
| <b>Time</b>       | <b>Species and Activity</b>                                                                                 |
| 21.27             | Pipistrelle commuting over the roof of the cottage from Whalley Road.                                       |
| 21.32             | Pipistrelle commuting south to north along vegetation at rear of buildings being surveyed.                  |
| 21.38             | 2x 55kHz pipistrelle in social flight to the south of La Taverna.                                           |
| 21.46             | 45kHz pipistrelle foraging at the rear of La Taverna briefly.                                               |
| <b>Surveyor 2</b> | <b>Liz Higgs</b>                                                                                            |
|                   | <b>Located on Whalley Road with a view of both buildings</b>                                                |
| <b>Time</b>       | <b>Species and Activity</b>                                                                                 |
| 21.27             | Pipistrelle potentially emerged from the Bay Horse Pub north of site and flew over the roof of the cottage. |
| 21.36             | Unseen 45kHz pipistrelle unseen.                                                                            |
| 21.37             | Pipistrelle commuting from west to east over Whalley Road.                                                  |
| 21.38             | 2x 55kHz pipistrelle from west to east over Whalley Road                                                    |
| 21.58             | 45kHz unseen two passes.                                                                                    |