

Wombwell Lane, Barnsley
Ecological Appraisal

Swift Property Management & Consultancy Ltd

Report prepared by:
Ecus Ltd.
Brook Holt
3 Blackburn Road
Sheffield
S61 2DW
0114 266 9292

September 2015

Ecus Ltd

Report to: 3-5 Bradford Road
Cleckheaton
West Yorkshire
BD19 5AG

Report Title: Wombwell Lane, Barnsley – Ecological Appraisal

Revision: Final

Issue Date: September 2015

Report Ref: 6852

Originated By: 
Sarah Unsworth
Graduate Ecologist Date: September 2015

Reviewed By: 
Elizabeth Richell
Senior Ecologist Date: September 2015

Approved By: 
Stuart Silver
Principal Ecologist Date: September 2015

Prepared by:
Ecus Ltd.
Brook Holt
3 Blackburn Road
Sheffield
S61 2DW
0114 2669292

The report and the site assessments carried out by Ecus on behalf of the client in accordance with the agreed terms of contract and/or written agreement form the agreed Services. The Services were performed by Ecus with the skill and care ordinarily exercised by a reasonable Environmental Consultant at the time the Services were performed. Further, and in particular, the Services were performed by Ecus taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between Ecus and the client.

Other than that expressly contained in the paragraph above, Ecus provides no other representation or warranty whether express or implied, in relation to the services.

This report is produced exclusively for the purposes of the client. Ecus is not aware of any interest of or reliance by any party other than the client in or on the services. Unless expressly provided in writing, Ecus does not authorise, consent or condone any party other than the client relying upon the services provided. Any reliance on the services or any part of the services by any party other than the client is made wholly at that party's own and sole risk and Ecus disclaims any liability to such parties.

This report is based on site conditions, regulatory or other legal provisions, technology or economic conditions at the time of the Service provision. These conditions can change with time and reliance on the findings of the Services under changing conditions should be reviewed.

Ecus accepts no responsibility for the accuracy of third party data used in this report.

CONTENTS

SUMMARY.....	1
1. INTRODUCTION.....	3
2. METHODOLOGY	4
2.1 DESK STUDY AND DATA CONSULTATION	4
2.2 EXTENDED PHASE 1 HABITAT SURVEY	4
2.3 PROTECTED AND KEY SPECIES SURVEY	4
2.4 INVASIVE SPECIES	7
2.5 SURVEY LIMITATIONS.....	7
3. SURVEY FINDINGS.....	8
3.1 GENERAL SITE DESCRIPTION	8
3.2 DESIGNATED SITES.....	8
3.3 HABITATS.....	9
3.4 SPECIES	11
3.5 INVASIVE SPECIES	15
4. ECOLOGICAL ASSESSMENT & MITIGATION	16
4.1 PROPOSED DEVELOPMENT	16
4.2 SITES OF NATURE CONSERVATION IMPORTANCE	16
4.3 HABITATS.....	16
4.4 SPECIES	17
4.5 INVASIVE SPECIES	20
5. REFERENCES.....	21
FIGURE 1. SURVEY FINDINGS PLAN.....	22
FIGURE 2. POND MAP.....	23
APPENDIX 1. SITE PHOTOGRAPHS.....	24
APPENDIX 2. SPECIES LISTS.....	25
APPENDIX 3. TARGET NOTES	27

Summary

Ecus Ltd was commissioned by Swift Property Management and Consulting in September 2015 to undertake an ecological appraisal of an area of land located near Wombwell Lane, in the Stairfoot area of Barnsley (central national grid reference: SE 37647 04903). The survey was required ahead of a planning application in relation to the construction of two trade and warehouse units on the site.

The purpose of the survey work at the Wombwell Lane site was to carry out an extended Phase 1 habitat survey and to review its potential to contain, or be used by, species protected under both UK and European nature conservation legislation, namely the Wildlife & Countryside Act 1981 (as amended) and the Habitat Regulations 2010 (as amended). Any impacts upon these habitats or species likely to result from the proposed development were then assessed.

The majority of site habitats are considered to be of importance for nature conservation within the zone of immediate influence only, with the exception of Dob Sike, a small stream that runs through the north of the site, which is considered to be of up to local importance.

Care should be taken throughout works to prevent potential direct and indirect adverse impacts to Dob Sike stream, which flows along the site's northern boundary. The Environment Agency best practice guidelines for *Works and maintenance in or near water: PPG5* (Environment Agency 2007) should be adhered to, to include measures such as a minimum 10 m stand off from the stream throughout the works to prevent unnecessary disturbance from machinery.

Vegetation clearance should be undertaken outside of the bird nesting season, which runs from March-August inclusive. Should this not be possible, a check for nesting birds should be undertaken by an experienced ecologist immediately prior to removal.

Common amphibians and reptiles have potential to be found on site. In accordance with best practice, a precautionary approach to works is therefore recommended. An Ecological Clerk of Works (ECoW) should attend site during the site strip to supervise clearance of site habitats, to ensure that any reptiles or amphibians present are carefully moved off site to a place of safety; such as along the line of the defunct canal. The site should be stripped directionally from north to south to allow reptiles and amphibians to move into other safe areas of habitat of their own accord.

While no badger setts were identified during the survey, the site contains suitable habitat to support badger setts. An update badger survey should therefore be undertaken prior to commencement of site works to ensure that no badger setts have been created on site in the intervening period. Furthermore, all deep excavations should be covered overnight unless completely fenced off and any unfenced/uncovered shallow excavations should have a scaffold board or equivalent placed in them to one side to act as an escape ramp should badgers or small mammals fall in.

Hedgehogs have potential to be found on site. If encountered they should be carefully picked up in gloved hands and moved to a safe area outside the footprint of works.

Works in areas where the species Indian balsam is present can inadvertently result in an offence through spread of seeds *via* people or machinery and disposal of

contaminated waste material from a site. As an initial measure, the areas of Indian balsam should have a suitable exclusion zone fenced off as soon as possible and contractors/site operators be made aware of its presence to prevent spread and ensure it is dealt with appropriately and responsibly. It is recommended that an ecologically sensitive landscaping plan is developed for the proposed scheme with new tree and shrub planting to include a variety of native species, where feasible.

No other protected species constraints have been identified at the current time.

Recommendations for the enhancement of site biodiversity are provided in Section 4.

1. Introduction

- 1.1.1 Ecus Ltd was commissioned by Swift Property Management and Consulting to undertake an ecological appraisal of a 0.6 ha area of land located on the edge of Wombwell Retail Park, on Wombwell Lane, Barnsley (central national grid reference: SE 37647 04903). The survey was required ahead of a planning application in relation to the construction of two trade and warehouse units on the site.
- 1.1.2 The site is located to the east of Barnsley, on the edge of the Stairfoot area. It lies between the existing Wombwell Retail Park and neighbouring agricultural land. The site has been derelict for a number of years and a mosaic of tall ruderal vegetation, scrub and semi-improved grassland has colonised the site since it was cleared. A stream, Dob Sike, is present on site, flowing along the northern boundary before turning south where it enters a short culvert, briefly flowing outwith but alongside the eastern boundary of the site before entering another short culvert section. A disused canal and towpath border the site to the south.
- 1.1.3 An ecological walkover survey and assessment has been undertaken to review the habitats on site and the potential for the site to contain, or be used by, species protected under both UK and European nature conservation legislation, namely the Wildlife & Countryside Act 1981 (as amended) and the Habitat Regulations 2010 (as amended).
- 1.1.4 This report details the findings of the ecological investigations. The methods of ecological assessment are described, including site surveys and evaluation. Recommended mitigation measures and the need for any further survey work are included as appropriate.

2. Methodology

2.1 Desk Study and Data Consultation

- 2.1.1 Data consultation was undertaken with Barnsley Biological Records Centre (BBRC) in September 2015 as part of the ecological appraisal process to determine whether any sites, habitats or species of note have previously been recorded within 1 km of the site. Records were requested for species protected under UK and European legislation including, but not limited to, amphibians, badger, bats, birds and reptiles.
- 2.1.2 The Multi-Agency Geographical Information for the Countryside (MAGIC) website (www.magic.gov.uk) was consulted in July 2015 for information on statutory designated sites of nature conservation interest within 2 km of the site.
- 2.1.3 Information obtained from BBRC and MAGIC is included within the report as appropriate.

2.2 Extended Phase 1 Habitat Survey

- 2.2.1 The site was surveyed by Ecus ecologist Sarah Unsworth on 4th September 2015.
- 2.2.2 The survey visits followed extended Phase 1 habitat survey methodology (JNCC, 2010). The habitats and vegetation types present were recorded and have been mapped accordingly (Figure 1). This survey method aims to characterise habitats and communities present and is not intended to provide a complete list of all species occurring across the site.
- 2.2.3 Notable, rare or scarce plant species were highlighted if present. Evidence of protected species or species of nature conservation importance was recorded where present at the time of survey. Species recorded are included within the report as appropriate. Information is presented in Figure 1, using Target Notes (TN) to identify particular features of interest, where appropriate.
- 2.2.4 Habitats and species of principal importance listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 and habitats and species listed on the local Biodiversity Action Plan (LBAP) for Barnsley, were noted where present.
- 2.2.5 The value and sensitivity of ecological features present were determined based on the guidance given in 'Guidelines on Ecological Impact Assessment' (IEEM, 2006). Individual ecological receptors within the zone of influence (habitats and species that could be affected by the development) were assigned levels of importance for nature conservation, with highest importance occurring at an international level, moving down through UK, national, county, district, local to lastly, zone of immediate influence only.

2.3 Protected and Key Species Survey

- 2.3.1 Any evidence of protected species or groups encountered during the survey was recorded. This included observations of field signs and an assessment of the suitability of the habitats present to support protected species. For full details of legislation relating to all habitats and species discussed within this report visit <http://www.legislation.gov.uk>.

Amphibians

- 2.3.2 Waterbodies within 500 m of the survey area, which are not separated from the site by a major barrier, were searched for using an Ordnance Survey (OS) map. Four waterbodies were identified to the south of the site. Each waterbody 1- 4 (Figure 2) is a remnant of the now disused canal.

Badger

- 2.3.3 Signs of badger (*Meles meles*) activity were searched for as part of the extended Phase 1 survey. Survey followed standard methodology detailed in Surveying Badgers (Harris *et al.*, 1989). This included survey for badger setts, along with survey of linear features and boundaries for signs of badger activity including dung pits, foraging marks, feeding signs and pathways.

Bats

- 2.3.4 There are no buildings on site. Trees within the survey area were assessed for their potential to support roosting bats as part of the extended Phase 1 habitat survey.
- 2.3.5 Trees may have several features of potential interest to roosting bats associated with it. It is not always possible to confirm usage of a feature by bats, as often the animals may be present on one day and no evidence of occupation may be found on the next. Consequently it is customary when undertaking such surveys to assign each feature to a defined category of roosting potential, taking into consideration the criteria outlined in Table 1 below. Such criteria have been developed in accordance with current best practice guidelines (Hundt, 2012).
- 2.3.6 Habitats within and adjacent to the survey area were also assessed for their potential to be used by foraging and commuting bats.

Table 1. Categories for assessing trees for bat roosting potential

Table 2: Categories for assessing trees for bat roosting potential				
Negligible	Low	Medium	High	Confirmed
Newly planted or very small tree	Vigorous tree in good health	Semi-mature tree likely to be approaching maturity	Mature or over mature tree with significant proportion of deadwood	Bats emerging at dusk and returning at dawn (in summer)
Tree lacks any evidence of hollowing or fungal attack		Some areas of hollowing or fungal rot	Hollow trunk or extensive fungal decay	Audible squeaking from within a hole, especially on hot days or at dusk
No Potential Roost Features (PRFs) recorded from tree	Low number of PRFs recorded from sub-optimal locations	A low number of PRFs, one or more in optimal tree location	A range of PRFs in optimal locations on tree	Droppings within tree or concentration of droppings on outside or beneath tree
Located within areas of poor quality bat foraging habitat	Area offering limited suitable habitat features	Connectivity to medium quality habitats	Tree in high quality habitat	Records of bats roosting within tree in the last 5 years
Heavily disturbed or brightly lit	Potential roost features with minor disturbance	Potential roost features suffer little or no disturbance	Tree in remote area and largely undisturbed	
Potential Roost Features (PRFs) surveyed for include: wood pecker holes, knot-holes, flush cuts, tear outs, double leaders, wounds and cankers, butt rot, hazard-beams, frost-cracks, lifted bark, unions, ivy and bat/birds boxes.				

Birds

- 2.3.7 Formal bird survey was not undertaken as part of this assessment, however during the survey the opportunity was taken to record all species of birds encountered and to assess the suitability of the habitats present to support nesting and foraging birds.

Reptiles

- 2.3.8 The habitats present on site were assessed for their suitability to support basking, foraging and hibernating reptiles, with reference to their connectivity with other suitable habitat in the surrounding area.

Riparian mammals and white-clawed crayfish

- 2.3.9 Ecus Ltd typically search for watercourses located within 30 m of the survey area, which are not separated from the site by a major barrier, using an Ordnance Survey (OS) map. Dob Sike, a small stream, flows within the northern boundary and partially outwith the adjacent eastern boundary of the site. Dob Sike was assessed for its suitability to support riparian mammals and white-clawed crayfish.

Other protected and key species

- 2.3.10 The opportunity was taken whilst on the site to assess habitats for their potential to support any other nationally or locally scarce or otherwise notable

species, or any species protected under national or international nature conservation law.

2.4 Invasive species

- 2.4.1 The opportunity was taken during the extended Phase 1 habitat survey to record the presence of any invasive plant or animal species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), where present.

2.5 Survey Limitations

- 2.5.1 Dense hawthorn (*Crataegus monogyna*) and bramble (*Rubus fruticosus* agg.) scrub limited access to some parts of the site. It is therefore possible that mammal burrows could be present on site but not identified as they were obscured by dense vegetation. However the site is small and it was possible to survey the majority of the area and the immediate surroundings for other mammal signs, such as tracks, foraging marks, hairs etc. that would otherwise indicate the presence of mammal burrows.
- 2.5.2 Survey was undertaken within the optimal botanical survey season and it is considered that a robust evaluation of habitat types and the overall site character has been made.

3. Survey Findings

3.1 General Site Description

- 3.1.1 The approximately 0.6 ha site is located on the outskirts of the Stairfoot area of Barnsley, adjacent to the Wombwell Lane Retail Park. The site appears to have previously been developed and buildings subsequently demolished. Historical aerial imagery shows that the site was in use as a bare earth car park in 2002 and 2003. The next available image dates from 2008, which shows that the site was no longer in use as a car park, and a large amount of rubble/spoil had been placed on site from adjacent developments. The rubble piles had begun to be colonised by vegetation.
- 3.1.2 At the time of the September 2015 survey site habitats were dominated by dense bramble scrub, tall ruderal vegetation and semi-improved grassland. Scattered tree saplings were present across the site, with a small number of young trees present. Several mature trees are outwith but immediately adjacent to the site's southern boundary, on the steep bank that leads up to the defunct canal's towpath.
- 3.1.3 There are large rubble piles present across the site which have largely been covered with vegetation, however some areas of bare rubble are still present, along with areas of fly-tipping and rubbish piles. Due to ground compaction caused by heavy machinery there were several small ephemeral pools present at the time of the survey. Two larger depressions had been colonised by marginal vegetation, and although no water was present at the time of the survey it suggests they may hold small amounts of water at times of high rainfall.

3.2 Designated Sites

- 3.2.1 Stairfoot Brickworks Site of Special Scientific Interest (SSSI) lies 390 m to the east of the site. The site is designated as a SSSI for its earth heritage value. This is the only statutorily designated site within 1 km of the site.
- 3.2.2 The site is also located within the Dearne Valley Green Heart Nature Improvement Area, which aims to help restore and enhance the ecological networks of the River Dearne, its floodplain and its link to habitats on surrounding slopes and hills.
- 3.2.3 A single local wildlife site (LWS) and one candidate LWS within 1 km were identified by BBRC, these are listed in Table 2 below.

Table 2. Sites of conservation concern within 2 km

Site	Description	Approximate distance and direction from site
Statutory		
Stairfoot Brickworks SSSI	Earth heritage	390 m east
Non-Statutory LWS		
Stairfoot Disused Railway LWS	Disused railway line with broadleaved woodland lining old track	790 m north-west
Swaithe Flood Meadows	Flood meadow	340 m south-west

Site	Description	Approximate distance and direction from site
(Candidate Site)		

- 3.2.4 Stairfoot Brickworks is considered to be of importance to nature conservation at a national level, whilst the non-statutory sites are considered to be of local importance.

3.3 Habitats

- 3.3.1 Site habitats are discussed in order of dominance below. As a whole, the majority of site habitats may be considered to fall within the “Open Mosaics on Previously Developed Land” habitat as listed on the Barnsley LBAP. A consideration of site habitats in relation to this category follows the habitat descriptions below.

Open Mosaics on Previously Developed Land

Scattered ephemeral and perennials

- 3.3.2 Site habitats are dominated by ephemeral and perennial vegetation that has colonised the bare ground remaining after the site was abandoned. While scattered in places, this habitat is well developed across the majority of the site, forming a thick, herb dominated sward, which would likely develop into grassland and scrub if left unmanaged.
- 3.3.3 Species recorded in the grassland include black medick (*Medicago lupulina*), barren strawberry (*Potentilla sterilis*), creeping cinquefoil (*Potentilla reptans*), white clover (*Trifolium repens*), creeping buttercup (*Ranunculus repens*), ribwort plantain (*Plantago lanceolata*), common mouse ear (*Cerastium fontanum*), perforate St John’s wort (*Hypericum perforatum*), yarrow (*Achillea millefolium*) and common centaury (*Centaureum erythraea*), with scattered grass species including creeping bent (*Agrostis stolonifera*), false oat grass (*Arrhenatherum elatius*), Yorkshire fog (*Holcus lanatus*) and tufted hair grass (*Deschampsia cespitosa*).
- 3.3.4 Where the ground has been compacted additional species recorded include hard rush (*Juncus inflexus*), soft rush (*J. effusus*), gypsywort (*Lycopus europaeus*), brooklime (*Veronica beccabunga*), pointed spear moss (*Calliergonella cuspidata*) and springy turf moss (*Rhytidiadelphus squarrosus*).

Tall ruderal vegetation

- 3.3.5 Tall ruderal vegetation is present across many of the rubble mounds. Species recorded include common nettle (*Urtica dioica*), bramble (*Rubus fruticosus* agg.), creeping thistle (*Cirsium arvense*), rosebay willowherb (*Chamerion angustifolium*), broadleaved willowherb (*Epilobium montanum*), weld (*Reseda luteola*) and sycamore (*Acer pseudoplatanus*), silver birch (*Betula pendula*) and ash (*Fraxinus excelsior*) saplings.
- 3.3.6 Within the two larger depressions that appear to hold water at times of greater rainfall (TN1 and TN2), common reed (*Phragmites australis*), bullrush (*Typha latifolia*), goat willow (*Salix caprea*) and ash saplings (*Fraxinus excelsior*) were also recorded.

Dense and scattered scrub

- 3.3.7 Towards site boundaries and in the west of the site, the vegetation grades into scattered or dense scrub. Species found here include elder (*Sambucus nigra*), silver birch saplings, sycamore saplings, goat willow sapling, bramble, dog rose (*Rosa canina*), butterfly bush (*Buddleja davidii*), rosebay willowherb, hawthorn (*Crataegus monogyna*), wych elm saplings (*Ulmus glabra*), common nettle and greater willowherb (*Epilobium hirsutum*).
- 3.3.8 The habitat around the banks of the stream also comprise a line of scattered trees and scrub, including hazel (*Corylus avellana*) and hawthorn stools, scattered silver birch and bramble. Ground flora is sparse and includes ivy (*Hedera helix*) and male fern (*Dryopteris felix-mas*). A path also runs alongside the stream and there are small amounts of bare ground scattered underneath the tree canopy.
- 3.3.9 This habitat is limited in its extent, being limited to within 1-2 m of the stream banks and site boundaries. Tree and shrub diversity is limited and trees are young to early mature with a species-poor groundflora, limited to commonly occurring species that are abundant in the local area.

Evaluation

- 3.3.10 Whilst the site comprises formerly developed land that has naturally vegetated, the species recorded are commonly occurring and found on similar sites in the wider area, including along the line of the now disused canal which is likely to provide a similar and more extensive habitat resource in the local area.
- 3.3.11 Given that the site is limited in extent, supporting common habitats and no notable flora, site habitats are considered to be of importance to nature conservation within their zone of immediate influence only. Whilst currently comprising an open mosaic of habitats, ruderal and dense scrub habitats are beginning to encroach from the site boundaries, which will eventually lead to increased homogenisation of site over time, reducing its overall ecological value. As the site has been identified as future development land for the adjacent business park, the site is expected to remain unmanaged.

Stream: Dob Sike

- 3.3.12 A small local stream, "Dob Sike" flows within the northern boundary of the site. The stream flows onto site from a culvert at the western side of the site that route the stream underneath the canal towpath. The stream then flows eastwards through the site, before turning south, outwith the eastern boundary of the site where it enters a further culvert. The stream was devoid of marginal or submerged aquatic vegetation at the time of the survey, with a typical water depth of up to 50 mm. The stream is open with very shallow soil dominated banks with a silt and gravel dominated substrate.
- 3.3.13 Streams and Rivers are listed on the Barnsley LBAP and under Section 41 of the NERC Act 2006. There are no other streams in the local area and while culverted in the immediate vicinity of the site, the channel is open in the surrounding areas providing habitat connectivity with the wider area. Dob Sike is therefore considered to be of importance at up to a local level.

3.4 Species

Amphibians

- 3.4.1 Barnsley Biological Records Centre did not identify any amphibian records within 1 km of the site.
- 3.4.2 There are no ponds on site but vegetation composition suggests the two depressions that appear to occasionally hold water (TN1 and TN2) but are considered to be highly ephemeral in nature and unlikely to support breeding amphibians.
- 3.4.3 Four ponds were identified from OS mapping (P1-4, Figure 2); which appear to be remnant sections of the defunct canal. Approximate distances from site are as follows:
- P1 – 140 m north-west
 - P2 – 20 m south-east
 - P3 – 190 m south-east
 - P4 – 290 m south-east
- 3.4.4 Upon inspection all four ponds were found to no longer be existent. P1 and P2 had been present within the line of the former canal, but the full length of the canal was dry and fully vegetated. No marginal vegetation was present within the line of the canal, with vegetation dominated by common nettle, rosebay willowherb, greater willowherb, hawthorn saplings and bramble. P3 shown on OS mapping is a former slurry pit of a piggery that was infilled by the new owner of the land where it was sited. The landowner, present at the time of the survey reported no knowledge of P4 shown immediately adjacent to his property and the pond is no longer considered to exist.
- 3.4.5 There are no records of amphibians (including great crested newts) within 1 km of the site and no suitable breeding ponds on site or within 500 m of the site. The presence of great crested newt on site is therefore considered highly unlikely.
- 3.4.6 Given the small size of the site, lack of permanent ponds and presence of similar habitat to the south and east of the site, site habitats are not considered to be of importance to common amphibians outwith the zone of immediate influence.

Badger

- 3.4.7 Two badger records were provided by BBRC. They are both located 965 m south-west of the site, near to a disused railway and the River Dove. There are no roads or other barriers between the record locations and the site; the intervening land being dominated by agriculture.
- 3.4.8 No evidence of badgers was found on site at the time of the survey. Site habitats have some potential for sett creation, with dense scrub providing cover, and more open areas offering foraging potential. Several small scrape marks were found across the site (TN3 and TN4), indicating foraging activity, but these were considered to be made by rabbit.

- 3.4.9 A single redundant burrow was identified at the north-western corner of the site. The entrance hole was too small for badger, and no other badger signs, such as latrines, hair or bedding were recorded on or near the site. It is assessed that the mammal holes recorded belong to rabbit.
- 3.4.10 Several small mammal holes were also noted within the bank top of the tow path which runs outwith but adjacent to the site boundary, however these were considered to have been made by rats and rabbits.
- 3.4.11 It should be noted that the dense scrub limited access and visibility in places, but a search in and around these areas did not reveal any mammal paths leading into the areas.
- 3.4.12 Given the availability of suitable habitat on site and connectivity with other areas of suitable habitat, it is possible that badger may cross the site from time to time as part of a wider foraging territory, or move onto the site to create new setts. Given the small size of the site and the abundance of similar habitat in the area to the south site habitats are not considered to be of importance to foraging badgers outwith the zone of immediate influence.

Bats

- 3.4.13 Seven bat records were supplied by BBRC, all comprising records of common pipistrelle (*Pipistrellus pipistrellus*). The closest roost record to site is located in a house 400 m south of the site and is of a common pipistrelle.
- 3.4.14 There are no buildings on site. All trees were assessed as having negligible potential to support roosting bats due to their young age and lack of appropriate features.
- 3.4.15 The mosaic of ephemerals, perennials, tall ruderal vegetation and dense scrub provide suitable foraging habitat for any bats that are resident in the local area. The tree line that runs outwith but immediately adjacent to the southern boundary of the site, along the route of the disused canal, provides a connecting commuting and foraging route between other areas of habitat.
- 3.4.16 Large areas of suitable habitat exist in the wider area surrounding the site in the form of farmland, and the old canal corridor to the south of the site. Whilst site habitats are likely to contribute to the available foraging resource within the area, they are not considered to be of importance to foraging bats outwith the zone of immediate influence.

Birds

- 3.4.17 In 2009, a re-assessment of Birds of Conservation Concern (BoCC) was published by Eaton *et al.* (2009), which defined rare and threatened bird species on two lists (Red and Amber) describing the level of threat to each species of concern.
- 3.4.18 "Red" is the highest conservation priority, with species needing urgent action due to either a historical decline in breeding population, severe (>50%) decline in breeding or non-breeding population, or severe decline in breeding range over 50 years or more. "Amber" is the next most critical group, with species qualifying for this status as a result of either recovery from red list criterion, being classed as rare breeders in the UK, moderate (>25%) decline in breeding or non-breeding population or moderate decline in breeding range

over 25 years or more. These categories are followed by Green, indicating that the species are relatively unthreatened.

- 3.4.19 Bird records of species of conservation concern supplied by BBRC are shown below in Table 3. They comprise 10 Schedule 1 birds, 17 Red list species and 22 Amber list species and two species listed on the LBAP. As indicated within Table 3, several species are considered likely to utilise site habitats either as a foraging resource within a larger territory or as a nesting resource..

Table 3. Birds recorded within 1 km of the site provided by BBRC

Common name	Latin name	BoCC Conservation status	Likely to use site habitats (Y/N)
Fieldfare	<i>Turdus pilaris</i>	Schedule 1, Red	N
Redwing	<i>Turdus iliacus</i>	Schedule 1, Red	N
Barn Owl	<i>Tyto alba</i>	Schedule 1, Amber	N
Black Redstart	<i>Phoenicurus ochruros</i>	Schedule 1, Amber	N
Green Sandpiper	<i>Tringa ochropus</i>	Schedule 1, Amber	N
Kingfisher	<i>Alcedo atthis</i>	Schedule 1, Amber	N
Merlin	<i>Falco columbarius</i>	Schedule 1, Amber	N
Brambling	<i>Fringilla montifringilla</i>	Schedule 1	N
Greenshank	<i>Tringa nebularia</i>	Schedule 1	N
Little Ringed Plover	<i>Charadrius dubius</i>	Schedule 1	N
Corn Bunting	<i>Miliaria calandra</i>	Red	N
Cuckoo	<i>Cuculus canorus</i>	Red	N
Dunlin	<i>Calidris alpina</i>	Red	N
Grey Partridge	<i>Perdix perdix</i>	Red	N
Herring Gull	<i>Larus argentatus</i>	Red	N
House Sparrow	<i>Passer domesticus</i>	Red	Y
Lapwing	<i>Vanellus vanellus</i>	Red	N
Linnet	<i>Carduelis cannabina</i>	Red	N
Skylark	<i>Alauda arvensis</i>	Red	N
Song Thrush	<i>Turdus philomelos</i>	Red	Y
Starling	<i>Sturnus vulgaris</i>	Red	Y
Tree Sparrow	<i>Passer montanus</i>	Red	Y
Turtle Dove	<i>Streptopelia turtur</i>	Red	N
Willow Tit	<i>Parus montanus</i>	Red	N
Willow Warbler	<i>Phylloscopus trochilus</i>	Red	N
Yellow Wagtail	<i>Motacilla flava subsp. flavissima</i>	Red	Y
Yellowhammer	<i>Emberiza citrinella</i>	Red	N
Blackbird	<i>Turdus merula</i>	Amber	Y
Bullfinch	<i>Pyrrhula pyrrhula</i>	Amber	Y
Common Gull	<i>Larus canus</i>	Amber	N
Dunnock	<i>Prunella modularis</i>	Amber	Y
Golden Plover	<i>Pluvialis apricaria</i>	Amber	N
Green Woodpecker	<i>Picus viridis</i>	Amber	N

Common name	Latin name	BoCC Conservation status	Likely to use site habitats (Y/N)
House Martin	<i>Delichon urbica</i>	Amber	N
Jack Snipe	<i>Limnocyrtus minimus</i>	Amber	N
Kestrel	<i>Falco tinnunculus</i>	Amber	N
Meadow Pipit	<i>Anthus pratensis</i>	Amber	N
Mistle Thrush	<i>Turdus viscivorus</i>	Amber	Y
Pink-Footed Goose	<i>Anser brachyrhynchus</i>	Amber	N
Redshank	<i>Tringa totanus</i>	Amber	N
Redstart	<i>Phoenicurus phoenicurus</i>	Amber	Y
Reed Bunting	<i>Emberiza schoeniclus</i>	Amber	N
Ringed Plover	<i>Charadrius hiaticula</i>	Amber	N
Sand Martin	<i>Riparia riparia</i>	Amber	N
Shelduck	<i>Tadorna tadorna</i>	Amber	N
Snipe	<i>Gallinago gallinago</i>	Amber	N
Stock Dove	<i>Columba oenas</i>	Amber	Y
Swallow	<i>Hirundo rustica</i>	Amber	N
Teal	<i>Anas crecca</i>	Amber	N
Goldcrest	<i>Regulus regulus</i>	Local BAP	N
Goldfinch	<i>Carduelis carduelis</i>	Local BAP	Y

3.4.20 Blackbird (*Turdus merula*), wood pigeon (*Columba palumbus*), chaffinch (*Fringilla coelebs*), wren (*Troglodytes troglodytes*) and long-tailed tit (*Aegithalos caudatus*) were all recorded on site during the ecological walkover. All of these species are Green listed species.

3.4.21 The habitats on site, including scattered ephemerals and perennials, tall ruderal vegetation and dense scrub, provide some foraging and nesting opportunity for urban and garden bird species. Whilst site habitats contribute to the available nesting and foraging resource within the area, the site is limited in extent and large areas of optimal habitat or equal or greater quality exist within the wider landscape, particularly down the canal corridor, in adjacent farmland and woodland to the south. As such, site habitats are not considered to be of importance to birds, outwith their zone of immediate influence.

Reptiles

3.4.22 No reptile records were provided by BBRC within 2 km of the site.

3.4.23 Site habitats appear suitable for reptile species, with large rubble piles providing an assortment of potential refugia and open areas of vegetation and bare ground offering basking potential. There is direct connectivity with other areas of suitable habitat to the south of the site with the disused canal acting a habitat corridor.

3.4.24 Site habitats have potential to support reptile species, but given the lack of existing records, the small size of the site and close proximity to an existing

retail park limiting connectivity to the north, the site is not considered to be of importance to reptiles outwith the zone of immediate influence.

Riparian mammals and white-clawed crayfish

- 3.4.25 The stream bed is a mix of mud and small gravel, with no larger stones or pebbles to act as refugia for white clawed crayfish. The species is therefore not considered to be a receptor for the proposed development and is not considered further within this report.
- 3.4.26 The banks of the stream are shallow, with no vegetation present. There was no evidence of water voles along the course of the stream (burrows, feeding stations, latrines etc.) and the stream is considered unsuitable for the species, lacking cover and available food plants. The stream is small (~1 m bank to bank) and lacks connectivity with larger water bodies. Otter and water vole are therefore not considered to be a receptor for the proposed development and are not considered further within this report.

Other protected and key species

- 3.4.27 No hedgehog (*Erinaceus europaeus*) records were provided by BBRC. The habitats on site have potential to be utilised by hedgehogs as part of a wider foraging resource which is likely to focus along the line of the defunct canal. Given the widely available habitat which is of similar quality to the south of the site, the site habitats are considered to be important to hedgehog conservation within the zone of immediate influence only.
- 3.4.28 No evidence of other protected or key species was recorded during the ecological walkover survey.

3.5 Invasive species

- 3.5.1 Indian balsam (*Impatiens glandulifera*) which is listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) was recorded from several locations on site (TN6). It was recorded in areas along both the southern and northern boundaries and several small shoots were recorded on one of the rubble piles. The section of Dob Sike that runs outwith the east of the site was choked with Indian balsam, as was the bed of the disused canal.

4. Ecological Assessment & Mitigation

4.1 Proposed Development

- 4.1.1 The following assessment is based on the Units 7 and 8 Site Plan (Dwg No. WL – 100 - 01). Landtake of the majority of site habitats will be required to accommodate the proposed development, with the stream retained and no impacts anticipated to the adjacent disused canal.

4.2 Sites of Nature Conservation Importance

- 4.2.1 Stairfoot Brickworks SSSI is primarily designated for its geological interest. None of the features the site is designated for are found on site and the proposed development is not considered likely to impact upon the SSSI.
- 4.2.2 Given the distance and separation from site, no impacts to the two non-statutorily designated sites of nature conservation present within 1 km of the site are anticipated to result from the proposed development.

4.3 Habitats

Open Mosaics on Previously Developed Land

Scattered ephemeral and perennials, tall ruderal vegetation, scrub and young woodland

- 4.3.1 Total landtake of the mosaic of scattered ephemeral and perennials, tall ruderal, dense scrub and trees will be required to accommodate the proposed development.
- 4.3.2 While this habitat is listed on the Barnsley LBAP, the site is small in size (~0.6 ha), species found there are commonly found in other habitats present in the wider area and lack of management is leading to the site being increasingly encroached by scrub. The two ephemeral pools are not considered to hold water for any length of time and are limited in their ecological value. As such landtake of this habitat is not considered to be of importance to nature conservation outwith the zone of immediate effect.
- 4.3.3 Trees bordering the site and along Dob Sike should be protected during construction through the implementation of Root Protection Areas (RPAs) in accordance with British Standard BS5837: 2012.
- 4.3.4 It is recommended that an ecologically sensitive planting scheme should be produced for the proposed development, incorporating native species where practicable or flowering and fruiting species of value to wildlife. Planting should aim to improve the diversity around the site and along the open section of Dob Sike running through the site. This would comprise a benefit to site biodiversity in accordance with the National Planning Policy Framework (NPPF, 2012).

Stream: Dob Sike

- 4.3.5 The stream, Dob Sike, will be retained within the proposed development and should not be directly affected by the proposed development.
- 4.3.6 Care should be taken throughout works to prevent potential direct and indirect adverse impacts to water courses. Best practice guidelines (Environmental

Alliance, 2012; 2007) should be adhered to, to include measures such as a minimum 10 m stand off from the stream throughout the works to prevent unnecessary disturbance from machinery. Materials, fuel and machinery should not be stored within close proximity to the watercourse to prevent pollution and litter from entering the stream. Contingency plans should be put in place to deal with accidental spillages and rubbish or spoil piles should not be formed within the stand off zone.

- 4.3.7 Provided the measures above are adhered to then there should be no impact upon the stream.

4.4 Species

Amphibians

- 4.4.1 Common frog, common toad and smooth newt are protected under the Wildlife and Countryside Act 1981 (as amended) against sale, barter or exchange of captive animals only. Common toad is also listed as a priority species under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.
- 4.4.2 While there are no records of amphibians within 1 km of the site these species have potential to be found on site given the presence of seasonal pools, a stream, and connectivity with other areas of suitable habitat. The site is small however, and there is similar habitat available in the wider area. Site habitats are therefore not considered to be important to amphibians outwith the zone of immediate influence.
- 4.4.3 A supervised removal of rubble piles should be undertaken ahead of the main site clearance to check for the presence of amphibians which should be moved to a place of safety along the canal corridor by an ecologist. The main site strip should be undertaken from north to south to allow any amphibians present to move into other areas of their own accord, or be placed in safe areas by an Ecological Clerk of Works (ECoW).

Badger

- 4.4.4 Badgers and their setts are protected under the Protection of Badgers Act 1992. It is an offence under the act to kill, injure or take a badger. It is also an offence to destroy, damage or obstruct a currently active badger sett, or to disturb animals within the sett.
- 4.4.5 Badgers are not currently considered resident on site or within 50 m of it, however it cannot be ruled out that they move onto site in the future, or move across site while foraging. Alternative foraging habitat is available within the wider local area along the corridor of the defunct canal and in farmland to the south. As such, landtake associated with the proposed development is not considered to be of importance to badger outwith the zone of immediate effect.
- 4.4.6 Given that there is suitable habitat for sett creation on and around site, a pre-commencement badger survey is recommended prior to the start of site works to determine if any badgers have moved into the area. Additionally, as there is potential for badgers to access the site from the surrounding area, a best practice approach to works is recommended. The site should be securely fenced to ground level to prevent badgers entering the works area.

As a further precaution, all deep excavations should be covered overnight unless completely fenced off and any unfenced/uncovered shallow excavations should have a scaffold board or equivalent placed in them to one side act as an escape ramp should badgers or small mammals fall in.

- 4.4.7 Should any large mammal holes be discovered during clearance of dense scrub, works should cease immediately and an ecologist should be contacted for advice.

Bats

- 4.4.8 All species of bat occurring within the UK are included in Schedule 2 of the Conservation of Habitats and Species Regulations 2010 (as amended). Under regulation 41 bats are protected from deliberate capture, injury or killing, from deliberate disturbance and from deliberate damage or destruction of a breeding site or resting place (roost).
- 4.4.9 All UK bats are also included on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). However, their protection is limited to certain offences. Under the 1981 Act (as amended) it is an offence to intentionally or recklessly disturb bats while they are occupying a structure or place used for shelter or protection, or to obstruct access to any such place.
- 4.4.10 *Barbastelle* (*Barbastella barbastellus*), Bechstein's (*Myotis bechsteinii*), brown long-eared (*Plecotus auritus*), greater horseshoe (*Rhinolophus ferrumequinum*), lesser horseshoe (*Rhinolophus hipposideros*), noctule (*Nyctalus noctula*) and soprano pipistrelle (*Pipistrellus pygmaeus*) bats are included as priority species under Section 41 of the NERC Act 2006.
- 4.4.11 The development as proposed will result in landtake of site habitats including areas of ephemeral and perennial vegetation, tall ruderal vegetation and scrub. Whilst the habitats on site may provide some foraging opportunity for any bats resident in the wider area, there is an abundance of similar habitat along the line of the defunct canal. As such, landtake of habitats on site is not considered to be of importance to foraging bats outwith the immediate zone of effect.
- 4.4.12 Whilst roosting bats are not currently considered a receptor for the proposed development, following a best practice approach, consideration could be given to providing bat roosting provision within the proposed development schemes. It is recommended that Schwegler-style bat boxes are either incorporated into the fabric of new buildings to provide a benefit to nature conservation. Suitable boxes may include the Schwegler 1FR bat tubes or the 2F box with double front panel. The final choice of provision and positioning should be discussed with an ecologist, should this be feasible within the scheme, and would be well placed facing south onto the tree corridor along the line of the defunct canal. A sensitive lighting scheme should also be developed for the proposed development, to avoid unnecessary light spill onto the trees along the canal and Sob Dyke corridors.
- 4.4.13 The planting scheme for the development should utilise native species of UK provenance, where practicable, or other flowering and fruiting species to enhance foraging opportunity for any bats in the local area. Tree planting would also be beneficial to foraging bats and should be incorporated within the landscape scheme, where appropriate

Birds

- 4.4.14 All nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended) against destruction of the nest during the bird nesting season, which falls between March and August, inclusive.
- 4.4.15 The development will result in the landtake of habitats which are likely to provide some nesting and foraging opportunity for local bird species, notably in areas of dense scrub and young woodland around the stream. However, much of the site has an open structure, with a short or medium sward, making such areas unsuitable for many bird species to nest. There is abundant suitable nesting habitat present in the wider area to the south of the site, particularly along the line of the defunct canal. As such, landtake of site habitats is not considered to be of importance to nesting and foraging birds outwith the zone of immediate effect.
- 4.4.16 In accordance with best practice, it is recommended that any landtake of scrub or tree removal should be undertaken outside of the bird breeding season, i.e. undertaken between September to February inclusive. If it is not possible to schedule clearance works for these months, a nesting bird check should be undertaken by a suitably qualified ecologist, no more than two days prior to clearance, to check for the presence of active bird nests.
- 4.4.17 Consideration could be given to incorporating bird nesting provision within the development, such as general purpose nest boxes or sparrow terraces. The general purpose boxes should be attached at a minimum of 3 m from the ground, avoiding directly north or south-facing aspects. The sparrow terrace should be attached at eaves level, also avoiding directly north or south-facing aspects. The final choice of provision and positioning should be discussed with an ecologist, should this be feasible within the scheme.

Reptiles

- 4.4.18 Grass snakes, slow worm and common lizard are reptiles included on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), although their protection extends only to certain parts of section 9. Under the Act (1981) common reptiles are protected from intentional killing and injuring, and the Act makes it an offence to possess, sell, transport for sale or advertise for sale any of these reptiles. All of the British reptile species are included as species of principal importance on the list produced under section 41 of the NERC Act 2006.
- 4.4.19 Whilst no records were provided for the area, given the availability of suitable habitat on the site, and connectivity with other areas of suitable habitat, it is possible that reptiles might be present on site. Given the small size of the site however, and the abundance of other areas of suitable habitat to the south of the site, site habitats are not considered to be of importance to reptile conservation outwith the zone of immediate effect.
- 4.4.20 In accordance with best practice, a precautionary approach to works is recommended. An Ecological Clerk of Works (ECoW) should attend site during the site strip to oversee vegetation clearance works and the removal of rubble piles and provide advice as appropriate in the unlikely event that reptiles are encountered. An ECoW should supervise clearance of site habitats, to ensure that any reptiles present are carefully moved off site to a place of safety; such as along the line of the defunct canal. The site should be

stripped directionally from north to south to allow reptiles to move into other safe areas of habitat of their own accord.

Other protected/notable species

4.4.21 Hedgehogs may be found on site. If encountered during site clearance works then they should be carefully picked up in gloved hands and moved to a safe place outwith the footprint of works.

4.4.22 No mitigation is considered necessary for other protected/notable species.

4.5 Invasive species

4.5.1 Indian balsam was recorded on site. This species is listed on Schedule 9 Part II of the Wildlife and Countryside Act 1981 (as amended) and whilst the presence of this species does not constitute an offence in itself, causing it to spread in the wild does.

4.5.2 It is recommended that the presence of Indian balsam is addressed prior to works on site. Works in areas where the species is present can inadvertently result in an offence through spread of seeds *via* people or machinery and disposal of contaminated waste material from a site. As an initial measure, the areas of Indian balsam should have a suitable exclusion zone fenced off as soon as possible and contractors should be made aware of its presence to ensure they can develop a plan to effectively and safely remove the material from site for disposal at an approved facility.

4.5.3 The species can be controlled chemically or non-chemically. Non-chemical control methods include cutting to ground level before flowering season begins in June, and repeating annually, or pulling and burning or composting the stem (as long as seeds are not present). Chemical control includes treating plants with glyphosate, or 2,4-D amine but appropriate advice should be sought if using chemicals adjacent to a watercourse. Chemical controls are best put in place in springtime.

4.5.4 It is recommended that any new landscape planting should incorporate native species, where practicable, and avoid any species listed on Schedule 9.

5. References

British Standards Institution (2012) BS5837: 2012. *Trees in Relation to Design, Demolition and Construction*.

Eaton MA, Brown AF, Noble DG, Musgrove AJ, Hearn R, Aebischer NJ, Gibbons DW, Evans A and Gregory RD. (2009) *Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man*. British Birds, 102, 296–341.

Harris, S., Cresswell, P. and Jefferies, D. (1989) *Surveying Badgers*. Mammal Society (Occasional Publication No 9).

Hundt, L. (2012) *Bat Surveys – Good Practice Guidelines Version 2*. Bat Conservation Trust, London.

IEEM (2006) *Guidelines for Ecological Impact Assessment in the United Kingdom*. IEEM, Winchester, UK.

JNCC (2010) *Handbook for Phase 1 habitat survey – A technique for environmental audit*. ISBN 0 86139 636 7.

Great Britain. Department for Communities and Local Government (2012) *National Planning Policy Framework*. London: Department for Communities and Local Government.

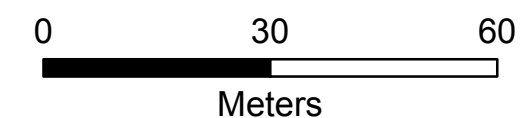
.

Figure 1. Survey Findings Plan



Legend

- Site boundary
- Fence
- ⊗ Target note
- Tree
- × Scattered scrub
- Stream
- Tall ruderal
- Dense scrub
- Scattered ephemerals and perennials



Swift Property Management and Consulting
Wombwell Lane, Barnsley

Figure 1
Survey findings

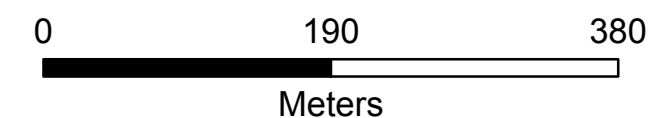
Brook Holt 3 Blackburn Road Sheffield S61 2DW
T: 0114 2669292 www.ecusltd.co.uk

Figure 2. Pond Map



Legend

-  Site boundary
-  500 m buffer
-  Location of ponds identified on OS maps that were found to be dry or non-existent during survey



Swift Property Management and Consulting
Wombwell Lane, Barnsley

Figure 2
Pond map

Brook Holt 3 Blackburn Road Sheffield S61 2DW
T: 0114 2669292 www.ecusltd.co.uk

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Appendix 1. Site Photographs



Legend

Plate 1. Scattered ephemerals and perennials habitat.

Plate 2. Scattered ephemerals and perennials grading into scrub on rubble mounds

Plate 3. Rubble mound with tall ruderal vegetation.

Plate 4. Dense scrub on rubble mound

Plate 5. Area of rubble with well developed ephemeral and perennial vegetation

Plate 6. Larger rubble block with crevice beneath



Swift Property Management and Consulting

Wombwell Lane, Barnsley
Ecological Appraisal

Appendix 1

Site Images

Brook Holt 3 Blackburn Road Sheffield S61 2DW
T: 0114 2669292 www.ecusltd.co.uk



Legend

Plate 7. Area to north-east of site where vegetation is shorter and rubble piles are more bare of vegetation

Plate 8. Dense scrub with sycamore saplings starting to dominate the habitat in this area

Plate 9. From top of rubble mound looking down onto areas of more open, short sward vegetation

Plate 10. Area of marginal vegetation in a depression (TN1, Fig. 1)

Plate 11. View of the site from outwith the southern boundary, on the old canal towpath

Plate 12. Mature trees outwith but immediately adjacent to the site's southern boundary



Swift Property Management and Consulting

Wombwell Lane, Barnsley
Ecological Appraisal

Appendix 1

Site Images

Brook Holt 3 Blackburn Road Sheffield S61 2DW
T: 0114 2669292 www.ecusltd.co.uk



13



14



15



16



17



18



19

Legend

Plate 13. Dob sike stream, which flows along the northern boundary of the site

Plate 14. Dob sike stream, which flows along the northern boundary of the site: banks are muddy, shallow and there is no vegetation within the stream channel.

Plate 15. Bank leading up to defunct canal towpath outwith site's southern boundary. Several small mammal burrows present, all of which were too small to be used by badger

Plate 16. Indian balsam (TN6, Fig.1) along southern boundary of site

Plate 17. Scrape caused by mammal foraging (TN3, Fig. 1)

Plate 18. Dob Sike as it passes outwith the site boundary. It is choked with Indian balsam

Plate 19. Vegetated section of disused canal where OS mapping showed P2 to be present. The full length of the disused canal was similarly vegetated



Swift Property Management and Consulting

Wombwell Lane, Barnsley
Ecological Appraisal

Appendix 1

Site Images

Brook Holt 3 Blackburn Road Sheffield S61 2DW
T: 0114 2669292 www.ecusltd.co.uk

Appendix 2. Species Lists

Table A2.1. Species list

Common name	Scientific name	DAFOR
Scattered ephemeral and perennial vegetation		
Black medick	<i>Medicago lupulina</i>	D
Common mouse ear	<i>Cerastium fontanum</i>	D
Creeping cinquefoil	<i>Potentilla reptans</i>	D
Pointed spear moss	<i>Calliergonella cuspidata</i>	LD
Springy turf moss	<i>Rhytidiadelphus squarrosus</i>	LD
Common centaury	<i>Centaureum erythraea</i>	LF
Hard rush	<i>Juncus inflexus</i>	LF
Soft rush	<i>Juncus effusus</i>	LF
Barren strawberry	<i>Potentilla sterilis</i>	F
Common nettle	<i>Urtica dioica</i>	F
Autumn hawkbit	<i>Leontodon autumnalis</i>	O
Common sorrel	<i>Rumex acetosa</i>	O
Common bent	<i>Agrostis capillaris</i>	O
Common ragwort	<i>Jacobaea vulgaris</i>	O
Creeping bent	<i>Agrostis stolonifera</i>	O
Creeping buttercup	<i>Ranunculus repens</i>	O
Dandelion	<i>Taraxacum officinale</i> agg.	O
Evening primrose sp.	<i>Oenothera</i> sp.	O
False oat grass	<i>Arrhenatherum elatius</i>	O
Greater plantain	<i>Plantago major</i>	O
Ribwort plantain	<i>Plantago lanceolata</i>	O
Scentless mayweed	<i>Tripleurospermum inodorum</i>	O
Selfheal	<i>Prunella vulgaris</i>	O
Tufted hair grass	<i>Deschampsia cespitosa</i>	O
White clover	<i>Trifolium repens</i>	O
Yarrow	<i>Achillea millefolium</i>	O
Yorkshire fog	<i>Holcus lanatus</i>	O
Annual meadow grass	<i>Poa annua</i>	R
Brooklime	<i>Veronica beccabunga</i>	R
Common fumitory	<i>Fumaria officinalis</i>	R
Common vetch	<i>Vicia sativa</i>	R
Gypsywort	<i>Lycopus europaeus</i>	R
Hairy St John's wort	<i>Hypericum hirsutum</i>	R
Perforate St John's wort	<i>Hypericum perforatum</i>	R
Redshank	<i>Polygonum persicaria</i>	R
White melilot	<i>Melilotus albus</i>	R
Herb robert	<i>Geranium robertianum</i>	R
Tall ruderal vegetation and scrub		
Bramble	<i>Rubus fruticosus</i> agg.	D
Common nettle	<i>Urtica dioica</i>	D

Common name	Scientific name	DAFOR
Broad leaved willowherb	<i>Epilobium montanum</i>	F
Creeping thistle	<i>Cirsium arvense</i>	F
Bulrush	<i>Typha latifolia</i>	LD
Common reed	<i>Phragmites australis</i>	LD
Rosebay willowherb	<i>Chamerion angustifolium</i>	LD
Broad leaved dock	<i>Rumex obtusifolius</i>	O
Dog rose	<i>Rosa canina</i>	O
Goat willow saplings	<i>Salix caprea</i>	O
Sycamore saplings	<i>Acer pseudoplatanus</i>	O
Weld	<i>Reseda luteola</i>	O
Lesser burdock	<i>Arctium minus</i>	R
Prickly sow thistle	<i>Sonchus asper</i>	R
Spear thistle	<i>Cirsium vulgare</i>	R
Wild teasel	<i>Dipsacus fullonum</i>	R
Dense boundary scrub		
Bramble	<i>Rubus fruticosus</i> agg.	D
Dog rose	<i>Rosa canina</i>	F
Sycamore	<i>Acer pseudoplatanus</i>	F
Butterfly bush	<i>Buddleja davidii</i>	O
Elder	<i>Sambucus nigra</i>	O
Goat willow	<i>Salix caprea</i>	O
Hawthorn	<i>Crataegus monogyna</i>	O
Rosebay willowherb	<i>Chamerion angustifolium</i>	O
Ash	<i>Fraxinus excelsior</i>	R
Silver birch	<i>Betula pendula</i>	R
Wych elm	<i>Ulmus glabra</i>	R
Scattered scrub and trees		
Bramble	<i>Rubus fruticosus</i> agg.	F
Hazel	<i>Corylus avellana</i>	F
Hawthorn	<i>Crataegus monogyna</i>	F
Silver birch	<i>Betula pendula</i>	O
Male fern	<i>Dryopteris felix-mas</i>	O

Appendix 3. Target notes

TN1 – Small depression (~1 m x 2 m) that appears to function as small ephemeral pool. Dominated by bulrush (*Typha latifolia*) with few areas where open water could be present. Dry at time of survey

TN2 – Larger depression (~4 m x 7 m) that also appears to act as a seasonal pond. Dominated by common reed (*Phragmites australis*)

TN3 – Small scrape caused by mammal foraging

TN4 - Small scrape caused by mammal foraging

TN5 – Burrow entrance with small side entrance located nearby. Appears to be either a rabbit or fox burrow

TN6 – Indian balsam