






Land off Clitheroe Rd, Barrow, Phase 2

Ecological Appraisal

March 2016

Control sheet

 <p>2 York Street, Clitheroe, Lancashire BB7 2DL</p> <p>Tel: 01200 446777 www.bowlandecology.co.uk</p>	
Job number:	BOW17_670
Title:	Ecological Appraisal
Client:	PWA Planning
Prepared by:	Laura Bennett, <i>Ecologist</i>
Checked by:	Ellen Milner, <i>Senior Ecologist</i>
Date of Issue:	March 2016
Version:	1
Revisions:	0
Status:	Final
<p>This report is prepared by Bowland Ecology Ltd for the sole and exclusive use of PWA Planning in response to their particular instructions. No liability is accepted for any costs, claims or losses arising from the use of this report or any part thereof for any purpose other than that for which it was specifically prepared or by any party other than PWA Planning.</p> <p>This report has been prepared by an environmental specialist and does not purport to provide legal advice. You may wish to take separate legal advice.</p> <p>The information which we have prepared and provided is true, and has been prepared and provided in accordance with the BS42020 and Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.</p> <div style="display: flex; justify-content: space-between; align-items: flex-end;"> <div style="text-align: center;"> <p>Signed (Author)</p>  </div> <div style="text-align: center;"> <p>Signed (QA)</p>  </div> </div>	

Contents

1. Introduction	1
2. Methodology	2
3. Results	4
4. Evaluation of Habitats and Assessment of Potential Impacts	9
5. Mitigation and Enhancement	10
6. References	14
Legal Information	15
Appendix A - Target Notes	19
Appendix B - Phase 1 Plan	21
Appendix C - LERN Data Search Results	22
Appendix D – Site Proposals	23

1. Introduction

- 1.1 Bowland Ecology Ltd was commissioned by PWA Planning to undertake an ecological appraisal of an area of land (0.7 ha) off Clitheroe Road, Barrow, near Clitheroe (NGR: SD 73537 437859). This report is submitted in support of a planning application for phase two of a residential development comprising nine properties.
- 1.2 The site currently comprises an undeveloped area of land adjacent to Clitheroe Rd. The habitats present include semi-improved grasslands, tall ruderal vegetation, hedgerows, scrub and trees. A small stream runs adjacent to the site boundary. The surrounding habitats are predominantly rural comprising fields and associated boundaries, hard standing (roads) residential properties, and pockets of broadleaved woodland.
- 1.3 The purpose of the survey was to: 1) identify and map all habitats occurring within the survey area, 2) identify the presence of (or potential for) wildlife interests with particular reference to the need for further surveys and legal requirements, and 3) provide an ecological appraisal, identify potential impacts and provide recommendations pertaining to the proposed development.
- 1.4 This report includes a description of survey methods and results; provides recommendations for further survey; and outlines proposals to provide protection, mitigation and enhancements for biodiversity and protected species.
- 1.5 The locations of target notes as listed in Appendix A are shown on the Extended Phase 1 Habitat Plan (Appendix B). This report should be read in conjunction with the Phase 1 Habitat Plan.

2. Methodology

- 2.1 The desk study, extended Phase 1 habitat survey and ecological appraisal follow the Guidelines for Preliminary Ecological Appraisal (GPEA) (CIEEM, 2012) and are in line with the British Standard 'Biodiversity – Code of practice for planning and development' (BS42020:2013).

Desk Study

- 2.2 The aim of the desk study was to identify the presence of statutory and non-statutory wildlife sites within the area as well as legally protected species and Habitats and Species of Principal Importance (SPI's and HPI's) (NERC Act 2006 Section 41).
- 2.3 The Multi-Agency Geographic Information for the Countryside (MAGIC) website (<http://magic.gov.uk>) was reviewed for information on locally, nationally and internationally designated sites of nature conservation importance (statutory sites only) on or within 2 km of the site boundary. Natural Environment and Rural Communities (NERC) Act Section 41 lists of Habitats and Species of Principal Importance for the Conservation of Biodiversity were also consulted.
- 2.4 Local records on and within 2 km of the site were obtained following a data search with the local records centre, Lancashire Environment Record Network (LERN). Online resources were also searched for records of protected species.
- 2.5 Ordnance survey maps and aerial photographs (<http://maps.google.co.uk/maps>) were reviewed to help identify any waterbodies, continuous habitat and any other notable habitats within the surrounding area.

Extended Phase 1 Habitat Survey

- 2.6 An extended Phase 1 Habitat survey was undertaken, following standard methodology (JNCC, 2010, and CIEEM, 2012). All features of ecological significance were target noted (see Appendix A) and their locations mapped on a colour coded figure (Appendix B). The survey was carried out by Laura Bennett MSc, MA, ACIEEM on the 19th February 2016. The weather was cool and sunny and provided no constraint to survey.
- 2.7 The extended Phase 1 Habitat survey methodology records information on the habitats together with any evidence of and potential for legally protected and notable fauna, in particular:
- potential roosting sites for bats within buildings and trees (identification of suitable cracks and crevices – survey undertaken externally and from ground only). Assessment of tree suitability is assessed according the BCT Good Practice Guidelines 3rd Edition (2016);

Table 1: Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape (Collins, 2016).

Suitability	Description of Roosting Habitat	Commuting & Foraging Habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated i.e. not very well connected to the surrounding landscape by other habitat.

	and/or suitable surrounding habitats to be used on a regular basis or by a larger number of bats (i.e. unlikely to be suitable maternity or hibernation). A tree of sufficient size and age to contain potential roosting features but with none seen from the ground, or feature seen with only very limited roosting potential.	Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions, and surrounding habitat but unlikely to support a roost of high conservation status.	Continuous habitat connected to the wider landscape that could be used by bats for commuting, such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging, such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis, and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Continuous high quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats, such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close and connected to known roosts.

- assessing the suitability of habitats for other notable and protected species such as nesting birds (including any active or disused nests), reptiles, water vole (*Arvicola amphibius*), otter (*Lutra lutra*), white-clawed crayfish (*Austropotamobius pallipes*), badger (*Meles meles*) and invertebrates;
- checking for the most common invasive plant species subject to strict legal control including; Japanese knotweed (*Fallopia japonica*), giant knotweed (*Fallopia sachalinensis*), hybrid knotweed, giant hogweed (*Heracleum mantegazzianum*), rhododendron (*Rhododendron* sp) and Himalayan balsam (*Impatiens glandulifera*); and,
- assessing the suitability of the habitat for amphibians and for the protected great crested newts (*Triturus cristatus*). Ponds on site and within 0.25 km (access permitting) will be subject to a habitat suitability index (HSI) (Oldham *et al.* 2000) assessment for great crested newt. A 0.25 km search radius was considered appropriate in this instance due to the small scale and localised nature of the effects of the scheme. An HSI is a numerical index, between 0 and 1. Values close to 0 indicate unsuitable habitat, 1 represents optimal habitat. The HSI for the great crested newt incorporates ten suitability indices, all of which are factors known to affect this species. The HSI for great crested newts is a measure of habitat suitability - it is not a substitute for newt surveys.

Survey Limitations

- 2.8 Ecological surveys are limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour. The timing of the survey was

outside the optimum period and has therefore not produced a complete list of plants and animals on site. However the conditions were suitable and the whole of the site was accessible. As a result, a valid assessment of the habitats present and their potential to support legally protected species was undertaken.

- 2.9 The list of invasive plant species included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) is extensive and these plants are found in a range of different habitats, including aquatic habitats. The extended Phase 1 habitat survey checked, in particular, for the presence of Japanese knotweed, giant knotweed, hybrid knotweed, giant hogweed, rhododendron and Himalayan balsam. There may be other invasive plant species present on the site which were not recorded, but it is considered that this survey is sufficient to identify any significant constraints posed by invasive plants.
- 2.10 The results of this ecological survey have allowed an evaluation of the likely use of the site by protected and controlled species, the need for any additional survey work and the requirement for any mitigation works.
- 2.11 An assessment of effects on ecological features has been made using the available design and survey information and the professional judgement of the ecologist. This includes a consideration of the relevant legislation and planning guidance. If there are changes to the proposals, such as a change to the proposed development design or to the construction method and programme, the assessment would need to be reviewed.

3. Results

Statutory and Non-Statutory Wildlife Sites

- 3.1 There is one statutory designated site within 2 km of the site (Appendix C).
- Light Clough Site of Special Scientific Interest (SSSI) located approximately 1.4 km to the east of the site. The SSSI is designated for its geological interest.
- 3.2 There are nine non-statutory designated sites within 2 km of the proposed area (Appendix C):
- Barrow Brook Field Biological Heritage Site (BHS) is just over 450 m from the planning application boundary and is 1.3 ha in size. The BHS comprises a triangular field south of Barrow Brook and alongside the railway line which runs from Clitheroe to Whalley. It supports damp, species-rich, semi-natural, neutral grassland and is designated for such;
 - Hard Hill Common BHS is located on the other side of the railway line approximately 600 m from the planning application site. The common is 27 ha and is designated for its swamp and fen habitats including purple moor grass/rush pasture and flushes;
 - Calderstones Hospital Woodland/Railway Line BHS comprises of an area of alder-willow carr woodland with adjoining swamp and grassland. It is 4.2 ha in size and is designated for its artificial habitats. It lies approximately 750 m from the planning application area;
 - Spring Wood BHS is located approximately 1.25 km to the south east of the site and is designated for its woodland and scrub;

- Calder bank/Broken Row BHS is located approximately 1.7 km to the south east of the planning application area. The BHS comprises a steep banking situated along the north side of the River Calder and is designated for its flowering plants and ferns;
- Small Field BHS is located approximately 1.7 km to the north west of the planning application area. The BHS comprises a small field of semi natural neutral grassland and is designated for its grassland, flowering plants and ferns;
- St Johns Wood and Lords Park Wood BHS is located approximately 1.8 km to the south east of the planning application area and is designated for its woodland and scrub;
- The River Ribble (from London Road Bridge Preston, in West, to County Boundary, in East) BHS is located approximately 1.8 km to the north west of the planning application area. The BHS comprises the River Ribble and associated semi-natural habitats and is important for salmon, sea trout, otter and water vole;
- Mitton Wood BHS is located approximately 1.9km to the west of the planning application area. The BHS comprises a large, semi-natural woodland and is designated for its woodland and scrub, flowering plants and ferns and molluscs.

3.3 LERN provided records of Lancashire Key Species including legally protected and NERC Act 2006 Section 41 Species of Principal Importance (SPI) on or within 2 km of the site, therefore these species may be present if suitable habitats are found on site:

- birds: bullfinch, common sandpiper, cuckoo, curlew, dunnoek, grey heron, grey partridge, greylag goose, house martin, house sparrow, kestrel, lapwing, lesser redpoll, linnet, marsh tit, meadow pipit, oystercatcher, reed bunting, sand martin, skylark, snipe, song thrush, spotted flycatcher, starling, swallow, swift and willow warbler;
- mammals: bats, brown hare, badger, otter, water vole, pipistrelle and soprano pipistrelle;
- amphibians: common frog, common toad, great crested newt, palmate newt and smooth newt;
- plants: barberry, black poplar, bluebell, Canadian waterweed, common meadow-rue, cornflower, fragrant orchid, giant hogweed, green-winged orchid, Himalayan balsam, Japanese knotweed, lesser butterfly-orchid, mossy saxifrage, northern yellow-cress, Pyrenean scurvygrass, rhododendron, thin-spiked wood-sedge, white bryony, horsetail and rough horsetail;
- fungus: purple spindles;
- mosses and liverworts: floating crystalwort, blunt-leaved bog-moss, bog moss, cow-horn bog-moss, dotted thyme-moss, fringed bog-moss, large white-moss, papillose bog-moss, sickle-leaved hook-moss, slender stubble-moss, sphagnum palustre var. palustre, sphagnum recurvum, spiky bog-moss and spreading earth-moss;
- invertebrates: *Ilybius guttiger* beetle, cinnabar, lunar hornet, small phoenix and small square-spot moths;
- bony fish: bullhead and European eel.

3.4 The search of the Multi Agency Geographical Information Centre (www.magic.gov.uk) identified several areas classified as Habitats of Principal Importance (HPI) under the 2006 NERC Act within 2 km of the site:

- One traditional orchard located approximately 1.7 km to the south of the site;
- Numerous areas of deciduous woodland, the closest of which is located approximately 500 m north of the site;
- Three areas of semi natural ancient woodland, the closest of which is approximately 1.2 km to the south east of the site;
- One area of lowland fen approximately 600 m to the west of the site;
- One area of good quality semi improved grassland approximately 1.7 km north west of the site;
- One area of lowland calcareous grassland approximately 500 m to the north west of the site;
- One area of upland calcareous grassland approximately 1.7 km to the east of the site.

- 3.5 Based on a review of aerial photographs and OS maps there are no ponds on or within 250 m of the site boundary.

Extended Phase 1 Habitat Survey

- 3.6 Target notes summarising key interest features for wildlife recorded during the extended Phase 1 Habitat survey are included in Appendix A. The Phase 1 habitat plan for the study site is presented in Appendix B, which includes the habitats present on site and the locations of target notes.

Habitats

Species poor semi improved grassland

- 3.7 The most abundant habitat on site is a species poor semi improved grassland field (TN1). Species present include cock's foot (*Dactylis glomerata*), Yorkshire fog (*Holcus lanatus*), red fescue (*Festuca rubra*), creeping buttercup (*Ranunculus repens*), lesser celandine (*Ranunculus ficaria*), meadow buttercup (*Ranunculus acris*), dandelion (*Taraxacum officinale*) and broad-leaved dock (*Rumex obtusifolius*).

Moderately species rich semi improved grassland

- 3.8 A more species rich area of grassland is present to the western margin of the site and along the road verge (TN2). Additional species present include common knapweed (*Centaurea nigra*), red fescue (*Festuca rubra*), self-heal (*Prunella vulgaris*), ribwort plantain (*Plantago lanceolata*), red clover (*Trifolium repens*), glaucous sedge (*Carex flacca*) and springy turf moss (*Rhytidiadelphus squarrosus*).

Running water

- 3.9 A shallow stream (TN3) runs along part of the southern and eastern boundaries of the site. The stream is approximately 0.5 m wide and 15cm deep with a gravel/pebble substrate. The banks are dominated by tall ruderal and scrub and the watercourse is somewhat shaded by the adjacent woodland to the south of the site. It is thought likely to dry up on occasion.

Tall ruderal vegetation

- 3.10 Along the edge of the stream is an area of tall ruderal vegetation (TN4) dominated by nettle (*Urtica dioica*), common hogweed (*Heracleum sphondylium*), lesser celandine, creeping buttercup, hairy brome (*Bromopsis ramosa*) and bryophytes including pointed spear moss (*Calliergonella cuspidata*) and hart's-tongue thyme moss (*Plagiomnium undulatum*).

Scrub and trees

- 3.11 Around the eastern and northern boundaries of the site are grown out species rich hedgerows now better described as scrub areas with trees (TN5). Species present include hazel (*Corylus avellana*), ash (*Fraxinus excelsior*), alder (*Alnus glutinosa*), oak (*Quercus robur*), elder (*Sambucus nigra*), ivy (*Hedera helix*), hawthorn (*Crataegus monogyna*), soft shield fern (*Polystichum setiferum*), common hogweed, nettle, jack by the hedge (*Alliaria petiolata*), herb Robert (*Geranium robertianum*) and bramble (*Rubus fruticosus* agg). The north eastern corner is dominated by blackthorn (*Prunus spinosa*).
- 3.12 There are a number of mature poplar (*Populus* sp.) trees growing just outside the boundary and an area of woodland to the east of the site. Some of the branches overhang the site from these areas.

Hedgerows

- 3.13 Along the western boundary of the site is a short section of species poor native hedgerow (TN6) dominated by hawthorn and ash with bramble and ivy. Ground flora species include lords and ladies (*Arum maculatum*), and dog's mercury (*Mercurialis perennis*).
- 3.14 To the north western corner of the site is a hedgerow (TN8) comprising introduced species cherry laurel (*Prunus laurocerasus*) and leylandii (*Cupressus x leylandii*).





Other habitat

- 3.15 Towards the entrance of the site is an existing compound area made up of bare ground and hard standing (TN7). Just to the east of this are several piles of stored soils, some of which are bare, some vegetated with poor semi-improved grassland similar to the surrounding habitat.

*Faunal Considerations*Bats

- 3.1 There are a number of hedgerows, scrub areas and trees on site and just outside the boundary, and a small area of semi mature broadleaved woodland adjacent to the southern margin. Whilst this woodland, the grassland habitats and the linear features, including the hedgerows around the site, are considered to provide moderate foraging and commuting opportunities for a range of bat species there is no shortage of similar habitat in the surrounding landscape. A number of records for bats within 2 km of the site were returned by the data search including pipistrelle, Daubenton's and Natterer's bats. The closest record is for a pipistrelle bat approximately 160m to the east of the site boundary recorded in 2009.
- 3.2 There are four mature trees along the scrub corridor at TN5 with features that provide potential for roosting bats, an alder, two ash trees and an oak (T1-4). Descriptions of the trees are provided in table 2. All other trees were considered to have negligible potential for bat roosting and are given no further consideration.

Table 2: Trees with bat roost potential

Tree No	Description	Photo
T1	A mature alder with some ivy cover and a trunk cavity. The tree provides some potential for roosting bats, however this is limited as the cavity is open to the elements from above and likely to be damp. No signs of bats were identified during the ground level survey – LOW SUITABILITY	
T2	A mature ash tree with several cracks and rot holes in the bark. The tree provides potential for roosting bats, however the cavities appear to be quite damp so the potential is somewhat limited. No signs of bats were identified during the ground level survey – MODERATE SUITABILITY	
T3	A mature ash tree with flaky bark and a limb cavity. The tree provides potential for roosting bats. No signs of bats were identified during the ground level survey – MODERATE SUITABILITY	
T4	A mature oak tree with very flaky bark rot holes and broken limbs. The tree provides potential for roosting bats. No signs of bats were identified during the ground level survey – MODERATE SUITABILITY	

Birds

- 3.3 The shrubs, scrub, hedgerows and trees around the margins of the site provide habitat for foraging and nesting birds. Bird species recorded during the survey include nuthatch (*Sitta europaea*), robin (*Erithacus rubecula*), magpie (*Pica pica*), blue tit (*Cyanistes caeruleus*), jackdaw (*Corvus monedula*) and long tailed tit (*Aegithalos caudatus*).

Mammals

- 3.4 The grassland and hedgerows provide opportunities for small mammals such as mice, field voles and shrews. No badger setts or field signs were observed to be present at the time of survey. Records for water vole and otter were returned by the data search, however these records are over 1 km from the site boundary. The stream is not considered to be suitable for water vole due to its shallow depth, muddy/scrub banks, and its location adjacent to residential properties. The stream provides potentially suitable habitat for foraging/commuting otter however presence is thought to be unlikely due to the shallow nature of the stream and its location adjacent to residential properties. The stream also appears to be culverted in several places along its length,

fragmenting the habitat and further reducing its suitability to provide habitat for protected species.

Amphibians and reptiles

- 3.5 Records for great crested newts were returned by the data search, however there are no ponds on or within 250 m and it is therefore considered highly unlikely that great crested newt would be present onsite.
- 3.6 However the site, particularly the piles of spoil and soil on site may provide refugia habitat for common amphibians such as common frog, common toad and smooth and palmate newts, records of which were returned by the data search.
- 3.7 The site and spoil mounds may also provide suitable habitat for reptiles, however the risk is considered to be low given the uniform topography of the site and the lack of records.

Fish

- 3.8 Records for bullhead and European eel were returned by the data search the closest of which is approximately 400 m from the site. These species could therefore be present within the stream, although given the shallow depth of the stream and the presence of a number of culverts along the length the habitat is considered to be sub-optimal.

Other species

- 3.9 No evidence of suitable habitat for any other protected species was identified at the time of survey.

4. Evaluation of Habitats and Assessment of Potential Impacts

Scheme Proposal

- 4.1 It is proposed that the site would be a suitable location for a small residential development comprising nine properties (Appendix D).

Designated sites

- 4.2 Due to the small footprint of the works (0.7 ha) and their distance from designated sites it is considered that there will be no impacts to any statutory or non-statutory designated sites from the proposed development.
- 4.3 The development site is within the impact risk zone for the Light Clough SSSI but the development does not fall into a risk category as the development comprises less than 100 houses.

Habitats

- 4.4 The development will result in the loss of 0.54 ha of poor semi-improved grasslands and tall ruderal vegetation (TN's 1 and 4). These habitats are locally common and of limited ecological value therefore mitigation for the loss of these habitats in terms of botanical value is not required.
- 4.5 0.08 ha of more species rich semi improved neutral grassland (TN2) will be lost as a result of the development. The majority of the scrub and trees around the margins of the site are to be retained as part of the development however, 20 m of species poor native hedgerow at TN6 is to be removed to facilitate the new entrance. Loss of these habitats may impact upon the botanical and wildlife interest of the site.

- 4.6 Due to the small footprint of the works and their distance from site it is considered that there will be no impacts from the proposed development to any HPI's identified during the data search.

Bats

- 4.7 The habitats on site are considered to provide moderate foraging and commuting habitat for bats. The majority of these features are to be retained with the exception of the species poor hedgerow at TN6. Additional planting of trees and shrubs is proposed for the landscaping areas within the residential development. It is therefore considered that with careful design of the development, including the lighting scheme and retention of habitats it is considered that the risk of impacts to commuting and foraging bats is low and no further survey is necessary.

- 4.8 There are four mature trees along the scrub corridor on along the eastern and northern boundaries of the site. The trees have flaky bark, rot holes and cavities which provide potential for roosting bats (an alder, two ash trees and an oak (T1-4)). Should the trees be affected by the development impacts to roosting bats could occur if the works are carried out without due care and attention which would constitute an offence (see legal information).

Birds

- 4.9 The majority of nesting bird habitat around the margins of the site is to be retained as part of the development. However where hedgerows, trees, scrub and other potential bird nesting habitat, are removed as a result of the proposed works impacts to nesting birds could occur if works are undertaken without due care and attention which would constitute an offence (see legal information).

Amphibians and reptiles

- 4.10 Presence of great crested newt on the site is considered to be very unlikely. However common amphibians and reptiles may utilise the refugia habitat provided by the spoil and soil mounds. The development of the site therefore has the potential to impact upon amphibians such as common frog and common toad, and reptiles such as slow worm and common lizard if present, through construction related activities.

Spring/watercourse

- 4.11 The stream is not thought to be suitable for water vole or otter due to its shallow nature, lack of vegetation on the banks and location adjacent to residential properties. The stream provides potential habitat for bullhead and European eel which have been recorded in the area. Works within the vicinity of the stream could therefore lead to impacts upon these species and on the water quality of the stream if undertaken without due care and attention.

5. Mitigation and Enhancement

- 5.1 This section provides the required measures to mitigate the impacts of the proposed development. A key element of the National Planning Policy Framework is to minimise impacts to biodiversity and provide enhancements. Paragraph 109 states that '*The planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and providing net gains in biodiversity where possible*'. It also states in Paragraph 118 that '*when determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by encouraging opportunities to incorporate biodiversity in and around developments*'. This section also therefore includes suggested enhancement measures.

Habitats

- 5.2 The majority of habitats that will be lost as a result of the development (poor semi improved grassland and small amounts of tall ruderal vegetation) are considered to be commonly occurring and of limited ecological significance.
- 5.3 Suitable mitigation for the loss of any of the species poor hedgerow at TN6 should be implemented within the proposed site. Specifically, the replanting of new hedgerow of at least equivalent length to that lost, comprising native species of local provenance to offset the loss of this ecological feature. Planting of additional native trees or hedgerows will enhance ecological connectivity within the wider landscape and benefit many species of wildlife including bats. Within the residential development plans each plot has been afforded a garden and trees are to be planted across the site.
- 5.4 Species should be native, appropriate to the locality and should be sourced locally where possible. Planting should be undertaken at an appropriate time of year (Oct – Feb, when there is no ground frost) and specimens protected from grazing by rabbits and deer.
- 5.5 In order to mitigate for the loss of moderately species rich grassland (TN1) it is recommended that soils from these areas are retained and used to encourage the development of species rich grasslands within the proposed garden/landscaping areas. It is recommended that any amenity areas within the new development are seeded with a native grassland species mix.

Bats

- 5.6 Impacts to bats as a result of the loss of foraging habitat onsite is considered to be low. The addition of new garden areas and trees to the site will provide new foraging and commuting habitat for bats. The new housing development will also provide new opportunities for roosting bats, particularly crevice dwelling bats such as pipistrelles.
- 5.7 The scrub and tree corridor in which the bat risk trees are located is considered to provide a wildlife corridor within the wider landscape. The feature, including the trees is currently to be retained as part of the development. However if during the works it becomes necessary to remove any of these trees, further survey for bats will be necessary.
- 5.8 Although there is no known bat roost present within the trees, a procedure should be in place should bats be found or suspected at any time during construction activities. If bats are found or suspected, as a legal requirement, work in that area should cease immediately until further advice has been sought from Natural England and/or the scheme ecologist. The scheme ecologist, Natural England or their agents in the Lancashire area will be able to locate a licensed bat worker to remove any bats present which might be harmed during the works. If bats are exposed during the works and are vulnerable to harm, gloves or a container should be used to move them to a dark and quiet area, until a bat worker has been contacted.
- 5.2 Any new lighting schemes should be designed in accordance with the appropriate guidance (BCT & ILE 2008) to minimise the impacts on foraging bats likely to be utilising the habitats. This document includes (but not limited to) measures such as;
- use of low pressure sodium lamps or high pressure sodium instead of mercury or metal halide lamps;
 - lighting should be directed to where it is needed and light spillage avoided in particular along the site boundaries.

Birds

- 5.9 The majority of nesting bird habitat on site is to be retained. However any required vegetation removal works should take place outside the breeding bird season which runs from late February until September, in order to prevent any impacts upon breeding birds.
- 5.10 Any vegetation clearance work that must be carried out within the bird breeding season will be subject to a pre-clearance bird survey carried out by a suitably experienced ecologist. No vegetation clearance will be carried out within 5 m of an identified nest until the young have fledged and are no longer returning to the nest site. Vegetation will only be cleared once a scheme ecologist has declared the nest to be no longer in use.
- 5.11 Mitigation for the loss of breeding bird habitat should include the planting of native species of trees and shrubs (as described above) and the provision of alternative nesting in the form of two nest boxes located along the scrub and tree corridor to the east of the site .

Amphibians

- 5.12 Prior to the commencement of works it is recommended that the semi-improved neutral grassland and the tall ruderal vegetation be regularly mown and the sward length kept very short to deter amphibians and reptiles from inhabiting the site. It is also recommended that the spoil/soil mounds are dismantled carefully and any reptiles/amphibians encountered moved to a safe location off site. There is abundant more suitable habitat for reptiles and amphibians in the surrounding area.

Pollution prevention

- 5.13 The stream is to be retained and avoided by the works. It is advised that implementation of appropriate pollution prevention measures to protect the watercourse from leakages of fuels or lubricants from vehicles and equipment and from siltation and run off be undertaken. The Environment Agency's Pollution Prevention Guidance series is currently under review and at this time is not classed as 'good practice' however, in lieu of any other interim advice or guidance these documents are still considered to provide useful advice on avoiding or minimising the risk of pollution events.

Enhancement measures

- 5.14 As designs for the site develop an ecologist can provide site specific advice on ways to provide enhancements, in addition to mitigation, to improve the wildlife value of the final development and contribute towards a net gain in biodiversity. Simple examples of enhancement measures which could be considered and designed into the proposals include (but are not limited to):

- Installation of additional wildlife boxes (bird and bat) across the site;
- Bat friendly features can also be incorporated into new building designs. Incorporation of roosting opportunities within the proposed development should be achievable, and can be designed to meet with planning requirements and building regulations. It is recommended that one of the following is incorporated into each building with south or west aspects;
 - Access gaps between soffits and walls (15-20mm);
 - Access points to the roof void via bat tiles incorporated into the roof structure or bat tubes built into gaps in the masonry or into wall surfaces (Tubes such as the Schwegler 2FR Bat Tube would be suitable).
 - Access points over top of cavity walls by specifically constructed gaps;
 - External bat bricks installed at a height of 3m (or close to the roof line), in the south or west facing elevation (Schwegler 1FR Bat Tube would be suitable).

- The integration of bat roosting habitat will not cause disturbance to users of the development, nor create aesthetic problems. Bats will not nibble or gnaw at wood, wires or insulation. Bat droppings do not smell strongly, there are no known health risks associated with them. The droppings are dry and do not putrify, but crumble away to dust, or are washed away by rain.
- Any plantings within the new development would provide foraging habitat for bats, and therefore have the potential to increase the value of the site. Nectar rich plants that attract insects would be recommended as they would enhance foraging opportunities for bats in the local area.

Re-survey of the Site

- 5.15 If no works are undertaken on site within 12 months of this survey or if any changes to the proposals are made, a further ecological survey may be necessary (because of the mobility of animals and the potential for colonisation of the site).

6. References

BCT & ILE (2008) *Bats and lighting in the UK*. Bat Conservation Trust
http://www.bats.org.uk/pages/bats_and_lighting.html

BSI (2013). *BS 42020 Biodiversity. Code of practice for planning and development*.

CIEEM, 2012. Guidelines for Preliminary Ecological Appraisal. Chartered Institute of Ecology and Environmental Management.

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

Department for Communities and Local Government (2012); *National Planning Policy Framework*.

JNCC, 1993 revised 2010. Handbook for Phase 1 Habitat Survey: A technique for environmental audit (reprint). Joint Nature Conservation Committee, Peterborough.

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

Natural England, 2001. *Great Crested Newt Mitigation Guidelines*.

Legal Information ¹

Species	Legislation	Offences	Notes on licensing procedures and further advice
Species that are protected by European and national legislation			
Bats <i>European protected species</i>	Conservation of Habitats and Species Regulations 2010 Reg 41	<ul style="list-style-type: none"> Deliberately¹ capture, injure or kill a bat; Deliberate disturbance² of bats; Damage or destroy a breeding site or resting place used by a bat. <p>The protection of bat roosts is considered to apply regardless of whether bats are present.</p>	<p>An NE licence in respect of development is required in England.</p> <p>https://www.gov.uk/bats-protection-surveys-and-licences</p> <p><i>European Protected Species: Mitigation Licensing- How to get a licence</i> (NE 2010)</p> <p><i>Bat Mitigation Guidelines</i> (English Nature 2004)</p> <p><i>Bat Workers Manual</i> (JNCC 2004)</p> <p><i>BS8596:2015 Surveying for bats in trees and woodland</i> (BSI, 2015)</p>
	Wildlife and Countryside Act 1981 (as amended) ⁴ S.9	Intentionally or recklessly ³ obstruct access to any structure or place used for shelter or protection or disturb a bat in such a place.	Licence from NE is required for surveys (scientific purposes) that would involve disturbance of bats or entering a known or suspected roost site.
Otter <i>European protected species</i>	Conservation of Habitats and Species Regulations 2010 Reg 41	<ul style="list-style-type: none"> Deliberately¹ capture, injure or kill an otter; Deliberate disturbance² of otters; Damage or destroy a breeding site or resting place used by an otter. 	<p>Licences issued for development by NE.</p> <p>https://www.gov.uk/otters-protection-surveys-and-licences</p> <p><i>European Protected Species: Mitigation Licensing- How to get a licence</i> (NE 2010)</p>
	Wildlife and Countryside Act 1981 (as amended) ⁴ S.9	Intentionally or recklessly ³ obstruct access to any structure or place used for shelter or protection or disturb an otter in such a place.	No licence is required for survey in England. However, a licence would be required if the survey methodology involved disturbance.

¹ This report provides guidance of potential offences as part of the impact assessment. This report does not provide detailed legal advice and for full details of potential offences against protected species the relevant acts should be consulted in their original forms i.e. The Wildlife and Countryside Act, 1981, as amended, The Countryside and Rights of Way Act 2000, The Natural Environment and Rural Communities Act, 2006 and The Conservation of Habitats and Species Regulations 2010.

Species	Legislation	Offences	Notes on licensing procedures and further advice
	Wildlife and Countryside Act 1981 (as amended) ⁴ S.1	<ul style="list-style-type: none"> Intentionally kill, injure or take any wild bird; Intentionally take, damage or destroy the nest of any wild bird while that nest is in use or being built; Intentionally take or destroy the nest or eggs of any wild bird. <p>Schedule 1 species</p> <p>Special penalties are liable for these offences involving birds on Schedule 1 (e.g. most birds of prey, kingfisher, barn owl, black redstart, little ringed plover).</p> <p>Intentionally or recklessly³ disturb a Schedule 1 species while it is building a nest or is in, on or near a nest containing eggs or young; intentionally or recklessly disturb dependent young of such a species.</p>	<p>No licences are available to disturb any birds in regard to development.</p> <p>Licences are available in certain circumstances to damage or destroy nests, but these only apply to the list of licensable activities in the Act and do not cover development.</p> <p>General licences are available in respect of 'pest species' but only for certain very specific purposes e.g. public health, public safety, air safety.</p> <p>https://www.gov.uk/wild-birds-protection-surveys-and-licences https://www.gov.uk/prevent-wild-birds-damaging-your-land-farm-or-business</p>

¹Deliberate capture or killing is taken to include "accepting the possibility" of such capture or killing

²Deliberate disturbance of animals includes in particular any disturbance which is likely a) to impair their ability (i) to survive, to breed or reproduce, or to rear or nurture their young, or (ii) in the case of animals of hibernating or migratory species, to hibernate or migrate; or b) to affect significantly the local distribution or abundance of the species to which they belong. Lower levels of disturbance not covered by the Conservation of Habitats and Species Regulations 2010 remain an offence under the Wildlife and Countryside Act 1981 although a defence is available where such actions are the incidental result of a lawful activity that could not reasonably be avoided. Thus deliberate disturbance that does not result in either (a) or (b) above would be classed as a lower level of disturbance.






³The term 'reckless' is defined by the case of Regina versus Caldwell 1982. The prosecution has to show that a person deliberately took an unacceptable risk, or failed to notice or consider an obvious risk.





⁴The Wildlife and Countryside Act (1981) has been updated by various amendments, including the Countryside and Rights of Way Act 2000 and the Natural Environment and Rural Communities Act 2006. A full list of amendments can be found at <http://jncc.defra.gov.uk/page-1377>.

Site Designation	Legislation	Protection	Guidance
Site of Special Scientific Interest (SSSI)	Wildlife and Countryside Act 1981 (as amended)	<p>It is an offence to carry out or permit to be carried out any potentially damaging operation.</p> <p>SSSIs are given protection through policies in the Local Development Plan.</p>	<p>Owners, occupiers, public bodies and statutory undertakers must give notice and obtain the appropriate consent under S.28 before undertaking operations likely to damage a SSSI.</p> <p>S.28G places a duty on all public bodies to further the conservation and enhancement of SSSIs.</p> <p>Further guidance can be found in the National Planning Policy Framework and the accompanying joint Circular (ODPM Circular 6/2005 & Defra Circular 01/2005) to PPS9 for England, which is still valid.</p>
Local Sites	There is no statutory designation for Local Sites.	Local Sites are given protection through policies in the Local Development Plan.	<p>Development proposals that would potentially affect a Local Site would need to provide a detailed justification for the work, an assessment of likely impacts, together with proposals for mitigation and restoration of habitats lost or damaged.</p> <p>Further guidance can be found in the National Planning Policy Framework and the accompanying joint Circular (ODPM Circular 6/2005 & Defra Circular 01/2005) to PPS9 for England, which is still valid.</p>

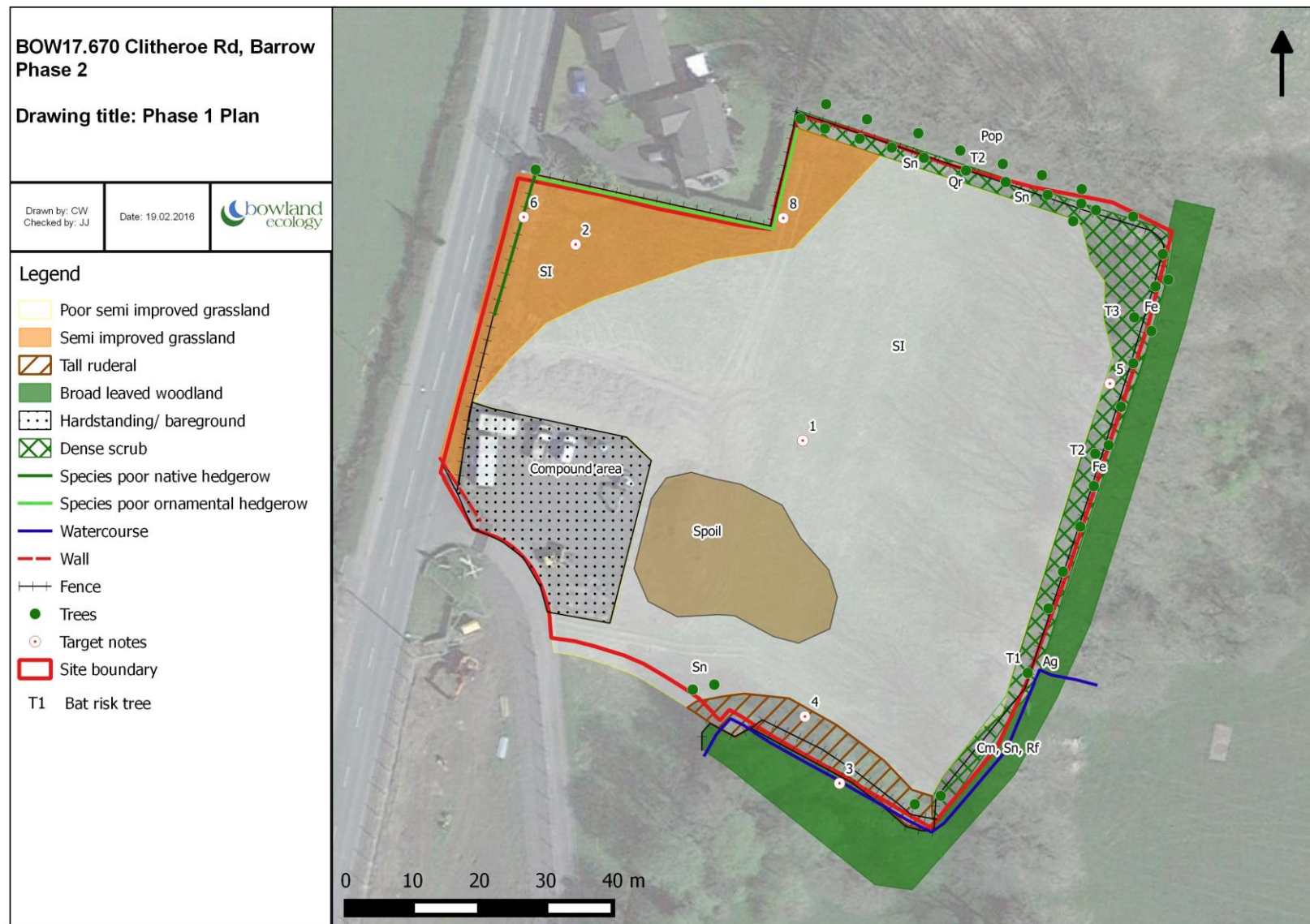
Habitats & Species	Legislation	Guidance
Species and Habitats of Principal Importance for the Conservation of Biodiversity	Natural Environment & Rural Communities Act 2006 S.40 (which superseded S.74 of the Countryside & Rights of Way Act 2000).	<p>S.40 of the NERC Act 2006 sets out the duty for public authorities to conserve biodiversity in England.</p> <p>Habitats and species of principal importance for the conservation of biodiversity are identified by the Secretary of State in consultation with NE, are referred to in S.41 of the NERC Act for England. The list of habitats and species was updated in 2008:</p> <p>http://webarchive.nationalarchives.gov.uk/20140605090108/http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx</p> <p>The habitats and species listed are not necessarily of higher biodiversity value, but they may be in decline. Habitat Action Plans and Species Action Plans are written for them or are in preparation, to guide their conservation.</p> <p>Ecological impact assessments should include an assessment of the likely impacts to these habitats and species.</p>
Biodiversity Action Plan (BAP) Habitats & Species	No specific legislation, unless it is also a species or habitat of principal importance as described above.	<p>The UK Post 2010 Biodiversity Framework published in July 2012 succeeds the UK BAP. Following devolution in 1998, each of the four countries of the UK have developed their own Biodiversity Strategies. In England the current strategy is <i>Biodiversity 2020: A strategy for England's wildlife and ecosystem services</i> (2011), which also reflects a change in strategic thinking following the Convention for Biological Diversity's (CBD) Strategic Plan for Biodiversity 2011-2020 and the launch of the new EU Biodiversity Strategy. The UK Post 2010 Biodiversity Framework demonstrates how the work of the four countries and the UK contributes to the Aichi Biodiversity Targets in the CBD's Strategic Plan for Biodiversity 2011-2020.</p> <p>The original UK BAP list of species and habitats, prepared over 10 years ago, was used to compile the lists of species and habitats of principal importance under section 41 of the NERC Act 2006 which now forms the focus of England's Biodiversity Strategy.</p> <p>In addition to the England Biodiversity Strategy, there are also many BAPs at the regional and local level which feed into the delivery at the country level and also identify biodiversity priorities at the more local level.</p>

Appendix A - Target Notes

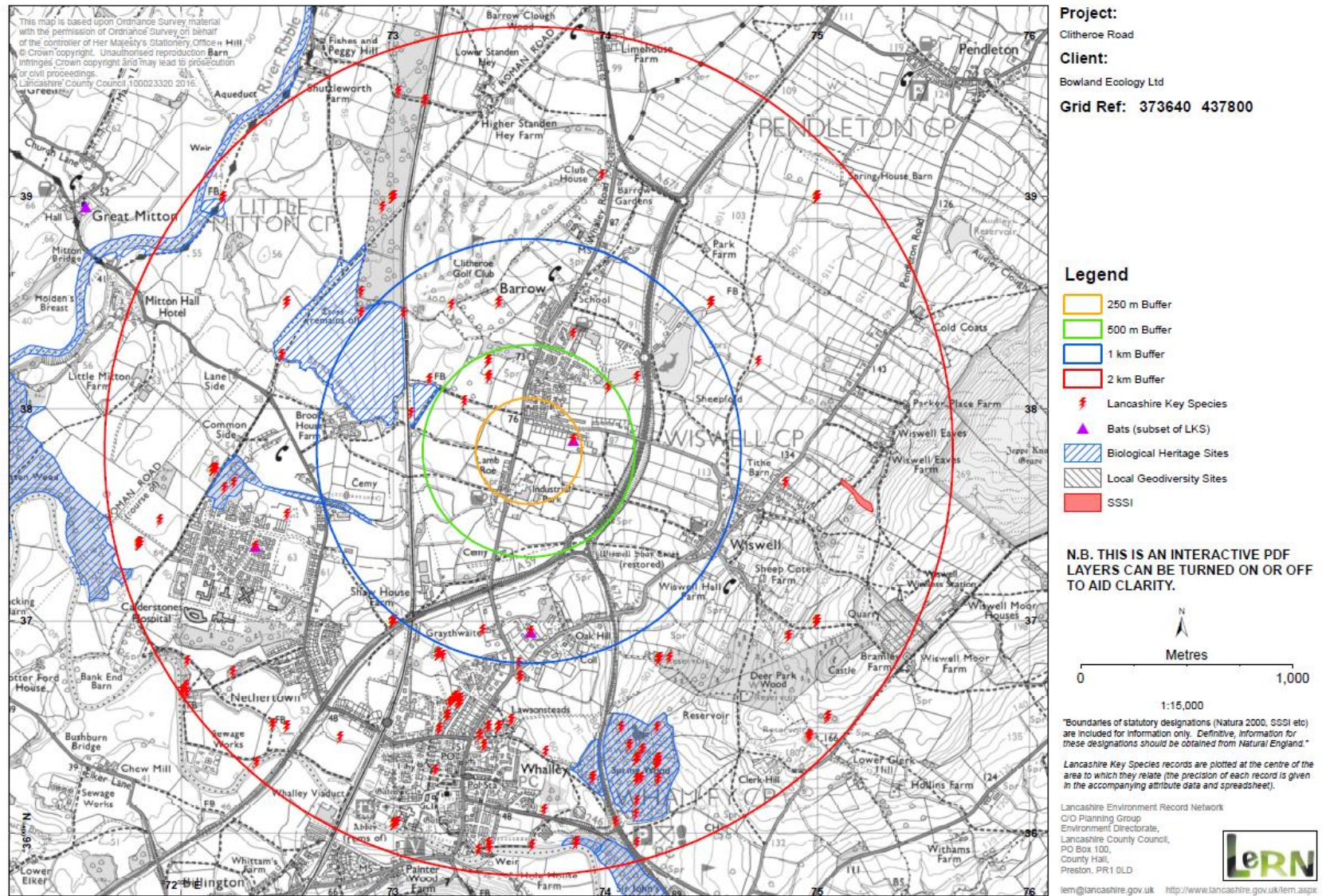
TN/ No.	Description	Photo
1	The most abundant habitat within the site boundary is poor semi improved neutral grassland. Species present include Yorkshire fog, common mouse ear, creeping buttercup, common chickweed, dandelion and common sorrel. There are also scattered tall ruderal species including nettle and broad leaved dock.	
2	There is an area of more species rich semi improved grassland within the north western corner of the site and along the road verge. Additional species include knapweed, lesser celandine, red fescue, self-heal, ribwort plantain, red clover, glaucous sedge and springy turf moss.	
3	A shallow stream runs along part of the southern and eastern boundaries of the site. The stream is approximately 0.5 m wide and 15cm deep with a gravel/pebble substrate. The banks are dominated by tall ruderal and scrub and the watercourse is somewhat shaded by the adjacent woodland to the south of the site. It is thought likely to dry up on occasion and has no potential for water vole given the shallow depth and shaded scrubby nature of the banks. Otter could migrate along its length though this is considered unlikely due to the proximity to roads and residential properties.	
4	Along the edge of the stream is an area of tall ruderal vegetation dominated by nettle, common hogweed, lesser celandine, creeping buttercup, hairy brome and bryophytes including pointed spear moss and hart's tongue thyme moss.	
5	Around the eastern and northern boundaries of the site are grown out hedgerows now better described as scrub areas with trees. Species present include hazel, ash, alder, elder, ivy, hawthorn, soft shield fern, common hogweed, nettle and bramble. The north eastern corner is dominated by blackthorn. There are four mature trees along this scrub corridor with cavities and potential for roosting bats (an alder, two ash trees and an oak (T1-4). The scrub itself provides habitat for nesting birds, foraging bats and constitutes a wildlife corridor within the wider landscape. There are a number of mature poplar trees growing just outside the boundary, some of the branches over hang the site, but none were identified to	

	have bat roosting potential.	
6	Along the western boundary of the site is a short section of species poor native hedgerow dominated by hawthorn and ash with bramble and ivy. Ground flora species include lords and ladies, and dog's mercury. The hedgerow will provide habitat for nesting birds and foraging bats.	
7	Towards the entrance of the site is an existing compound area made up of bare ground and hard standing. Just to the east of this are several piles of stored soils, some of which are bare, some vegetated with poor semi improved grassland similar to the surrounding habitat.	 
8	TN8 denotes an introduced species hedgerow made up of cherry laurel and leylandii. The hedge provides habitat for nesting birds and foraging bats.	

Appendix B - Phase 1 Plan



Appendix C - LERN Data Search Results



Appendix D – Site Proposals

