

Moorend: Land off Chatburn Old Road, Chatburn, Lancashire BB7 4AB

ECOLOGICAL SURVEY AND ASSESSMENT

March 2022

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Document Control

Survey Type:	Surveyors ¹	Survey Date(s)
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Reporting	Personnel	Date
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SUMMARY

- i. This ecological survey and assessment presents the ecological, biodiversity and nature conservation status of Moorend, off Chatburn Old Road, Chatburn, Lancashire BB7 4AB. The assessment was requested in connection with proposals to develop the site to housing.
- ii. This report presents the results of a desktop study, data search and extended Phase 1 Habitat Survey carried out in December 2021. The scope of survey undertaken is appropriate to identify potential ecological constraints, the remit of mitigation required and opportunities for biodiversity associated with the development proposals.
- iii. The site comprises an area of unmanaged formerly sheep-grazed grassland which has been partially re-seeded (where the ground has been previously cleared during the construction of the residential development to the immediate north of the site, and over an area of imported topsoil). Areas of bare ground (associated with the former construction site) support areas of colonising vegetation, and a public footpath with vegetation planted and colonising the footpath verge are also present. Two mature trees are present at the eastern end of the site.
- iv. The proposals will have no adverse effect on statutory or non-statutory designated sites for nature conservation.
- v. A small 1m² area of plant species indicative of calcareous conditions is present (i.e. Salad Burnet) beyond the north-eastern boundary of the site. It is recommended that this area is protected during the construction phase of the proposed development. Measures for the protection of the grassland are presented at **Section 5.2**. It is recommended that, in the long term, this area is translocated to form part of the 900m² area of calcareous grassland proposed to the south-west of the site.
- vi. Only common and widespread plant species were found. None of the habitats present are representative of semi-natural habitat. No Priority Habitats are present within the site. In terms of each habitat's importance in a geographical context, the mature trees are considered to be of 'site' importance. The areas of bare ground and colonising vegetation and the grassland habitats are not considered to be of importance in terms of a geographical context.
- vii. Both trees will be retained by the proposed development; measures to protect the trees during the construction phase of the proposals are presented at **Section 5.2**.
- viii. No invasive plant species listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended) were detected within the site.
- ix. The mature trees are suitable for use by nesting birds and are of moderate suitability for use by roosting bats; the proposals will retained both trees. Measures for the protection of nesting birds during works and to ensure that nocturnal wildlife are not impacted by lighting as a consequence of the proposals are presented at **Section 5.2**. Measures to ensure the protection of bats if works are proposed to the trees overhanging the south-western end of the site (of 'low' suitability for use by roosting bats due to the presence of Ivy) are presented at **Section 5.2**, with further measures for the protection of other wildlife, including hedgehog (a Priority Species) during works. Badger activity has been noted within the wider area; the proposals will not impact upon any badger setts or areas of core or important habitat for badger however. Measures to ensure the protection of badger during the construction phase of the proposed development are presented at **Section 5.2**. No other protected species have been detected.
- x. The recommendations in **Section 5.0** outline all the mandatory measures and additional actions to be applied to ensure compliance with wildlife legislation, the National Planning Policy Framework (NPPF) and best practice.
- xi. The proposals will secure an opportunity to implement beneficial measures such as habitat creation that will safeguard habitats for wildlife such as birds and bats, with the aim of providing a net gain in biodiversity

in accordance with the principles of the NPPF. Recommendations for ecological enhancements are presented at **Sections 5.3** and **5.4**.

- xii. It is concluded that the proposals are feasible and acceptable in accordance with ecological considerations and relevant planning policy. Development at the site will provide an opportunity to secure ecological enhancement for wildlife associated with residential development.

1.0 INTRODUCTION

1.1 Background and Rationale

1.1.1 ERAP (Consultant Ecologists) Ltd was commissioned by JJ Construction NW Ltd to carry out an ecological assessment of Moorend: land off Chatburn Old Road, Chatburn, Lancashire BB7 4AB (hereafter referred to as the 'site'). The Ordnance Survey (OS) grid reference at the centre of the site is SD 76583 43967. An aerial image of the site and its surrounding habitats is appended at **Figure 1** (source image: ESRI World Imagery).

1.1.2 The assessment was requested in connection with a planning application to develop the site to housing.

1.2 Scope of Works

1.2.1 The scope of ecological works undertaken in December 2021 comprised:

- a. A desktop study and data search for known ecological information at the site and the local area;
- b. An Extended Phase 1 Habitat Survey and assessment;
- c. Assessment of the ecological value of the habitats within the site with the use of the National Vegetation Classification (NVC) and the Ratcliffe criteria, as presented in *A Nature Conservation Review* (Ratcliffe, 1977);
- d. Survey and assessment of all habitats for relevant statutorily protected species¹ and other wildlife including badger (*Meles meles*), bird species and reptiles;
- e. A daylight bat survey of the trees;
- f. The identification of any potential ecological constraints on the proposals and the specification of the scope of mitigation and ecological enhancement required in accordance with wildlife legislation, planning policy guidance and other relevant guidance; and
- g. The identification of any further surveys or precautionary actions that may be required to inform the progression of the site through the planning process ,and/or prior to the commencement of any construction activities.

2.0 METHOD OF SURVEY

2.1 Desktop Study and Data Search

2.1.1 The following sources of information and ecological records were consulted:

- a. MAGiC: A web-based interactive map which brings together geographic information on key environmental schemes and designations, including details of statutory nature conservation sites;
- b. Lancashire Environment Record Network (LERN);
- c. Lancashire Badger Group; and
- d. Lancashire Biodiversity Action Plan (BAP); and
- e. Previous ecological studies completed at the site and its immediate surroundings, namely:

¹ In accordance with *Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and Their Impact on the Planning System* (Ministry of Housing, Communities & Local Government, 2005) developers should not be required to undertake surveys for protected species unless there is reasonable likelihood of the species being present and affected by the development. In this instance (for example) there are no ditches or watercourses within or in proximity to the site; there has therefore been no requirement to consider water vole (*Arvicola amphibius*) or otter (*Lutra lutra*) as part of this assessment.

- 2010-175 *Land at Chatburn Old Road, Clitheroe: Ecological Survey and Assessment* (ERAP Ltd, 2010);
- 2014-119 *Land at Chatburn Old Road, Clitheroe: Ecological Survey and Assessment* (ERAP Ltd, 2014)
- 2017-432 *Letter in Relation to LCC/2017/0087 Ecology Response Dated 28th November 2017, Land off Old Road, Chatburn, BB7 4AB* (ERAP (Consultant Ecologists) Ltd, 2017); and
- 2019-133 *Land off Chatburn Old road, Chatburn, Lancashire BB7 4AB: Ecological Survey and Assessment* (ERAP (Consultant Ecologists) Ltd, 2019) hereafter the '2010, 2014, 2017 and 2019 ecology reports'

2.1.2 Note that none of the 2010, 2014, 2017 and 2019 ecology reports covered the same site boundary as the site however.

2.2 Vegetation and Habitats

2.2.1 An Extended Phase 1 Habitat Survey of the site was carried out by Brian Robinson on 14th December 2021. The weather was dry and overcast, with a light air (Beaufort scale 1) and an air temperature of 7°C at midday.

2.2.2 A habitat and vegetation map was produced for the site and the immediate surrounding area at a scale of 1:1000 (refer to **Figure 2**). The mapping is based on the Joint Nature Conservation Committee Phase 1 Habitat Survey methodology (JNCC, 2010) with minor adjustments to illustrate and examine the habitats with greater precision.

2.2.3 On site habitat mapping was assisted via use of GPS technology and QField on-site mapping software, using *Moorend: Proposed Site Plan* (Stanton Andrews Architects, 2020) and *ESRI World Imagery* as base plans.

2.2.4 The plant species within the site boundary were determined with estimates of the distribution, ground cover, abundance and constancy of individual species. The estimation of abundance was based on the DAFOR system, where D = Dominant, A = Abundant, F = Frequent, O = Occasional and R = Rare, this being a widely used and accepted system employed by ecological surveyors. The terms L = Locally and V = Very were additionally used to describe the plant species distributions with greater precision.

2.2.5 Stands of vegetation and habitats were described and evaluated using the National Vegetation Classification (NVC). The NVC provides a systematic and comprehensive analysis of British vegetation and is a reliable framework for nature conservation and land-use planning.

2.2.6 Habitats within the site were assessed in accordance with the UK Habitats Classification / UKHab (Butcher, et al., 2020). The UKHab has been designed to function at two scales: fine scale (25m² or 5 metres length) and large scale (400m² or 20 metres length). It has been considered for the purposes of this survey that the fine scale of 25m² or 5 metres length is appropriate.

2.2.7 Searches were made for uncommon, rare and statutorily protected plant species, those species listed as protected in the *Wildlife and Countryside Act 1981* (as amended) and species which are indicators of important and uncommon plant communities. Plant nomenclature follows *New Flora of the British Isles 3rd Edition* (Stace, 2010).

2.2.8 Searches were carried out for the presence of invasive species, including those listed on Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended), including Japanese Knotweed (*Fallopia japonica*), Indian Balsam (*Impatiens glandulifera*) and Giant Hogweed (*Heracleum mantegazzianum*).

2.3 Animal Life

Badger

- 2.3.1 The survey area for badger covered the site (as annotated on **Figure 2**) and extended to accessible land within a radius of 50 metres from the site boundary. Private gardens / land were excluded from the survey.
- 2.3.2 The survey was conducted in accordance with guidance presented within *Badgers and Development* (Natural England, 2007) and *Badgers: surveys and mitigation for development projects* (Natural England, 2015).
- 2.3.3 The following signs of badger activity were searched for:
- Sett entrances, e.g. entrances that are normally 25 to 35cm in diameter and shaped like a 'D' on its side;
 - Large spoil heaps outside sett entrances;
 - Bedding outside sett entrances;
 - Badger footprints;
 - Badger paths;
 - Latrines;
 - Badger hairs on fences or bushes;
 - Scratching posts; and
 - Signs of digging for food.
- 2.3.4 Habitats within and surrounding the site were assessed in terms of their suitability for use by foraging and sheltering badger in accordance with their known habitat preferences as detailed in current guidance and *Badger* (Roper, 2010).

Bat Species

Daylight Survey

- 2.3.5 The site was assessed for its suitability to support roosting bats by Brian Robinson, Natural England Class Survey Licence WML CL18 (Bat Survey Level 2), Registration Number 2015-13161-CLS-CLS.
- 2.3.6 The surveyor's qualifications and experience meet the criteria as defined in the *Technical Guidance Series Competencies for Species Survey: Bats* (CIEEM, 2013).
- 2.3.7 A list of equipment used is detailed at **Table 2.1**, below:

Table 2.1: Survey Equipment used during Daylight Bat Survey

Ladders
LED Lenser P14 torch
Canon Ixus digital camera
8x20 binoculars
Ridgid Micro Inspection Camera Borescope CA-100

- 2.3.8 A preliminary assessment of the trees within the site was conducted to assess their suitability for use by roosting bats, and to inform whether further surveys or precautionary measures were required.
- 2.3.9 Trees were assessed from the ground using binoculars and a high-powered torch. Each tree was searched for the presence of the following features:

Woodpecker holes, rot holes, hazard beams, other vertical or horizontal cracks or splits in stems and branches, partially decayed platey bark, knot holes, man-made holes, tear-outs, cankers in which cavities have developed, other hollows or cavities, including butt-rots, double-leaders forming compression forks with included bark, gaps between overlapping stems or branches, partially detached Ivy (*Hedera helix*) with stem diameters in excess of 50mm and bat, bird or dormouse (*Muscardinus avellanarius*) boxes.

- 2.3.10 Terms used to describe any features present follow (where possible) those outlined and described in *Bat Tree Habitat Key, 2nd Edition* (Andrews, H (ed), 2013) and *Bat Roosts in Trees: A Guide to Identification and Assessment for Tree-care and Ecology Professionals* (BTHK, 2018).

Habitat Assessment for Commuting / Foraging Bats

- 2.3.11 Habitats within and adjacent to the site were assessed for their value and suitability for commuting and foraging bats in accordance with Table 4.1 of *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*, (Collins, J. (ed), 2016). Reference has been made to the categories and descriptions / examples, presented at **Table 2.2**, below.

Table 2.2: Consideration of Suitability of Foraging and Commuting Habitat for Bats

Suitability	Commuting Habitat	Foraging Habitat
Negligible	Negligible habitat features on site likely to be used by commuting bats.	Negligible habitat features on site likely to be used by foraging bats.
Low	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.	Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree or patch of scrub.
Moderate	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 linked to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	Continuous, high-quality habitat that is well connected to the wider landscape and is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. Habitats close to and connected to known roosts.	High-quality habitat that is well-connected to the wider landscape and is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Habitats close to and connected to known roosts.

Bird Species

- 2.3.12 Bird species observed and heard during the survey were recorded.
- 2.3.13 Habitats throughout the site and in the immediate surrounding area were assessed for their value to roosting, feeding and nesting birds, as indicated by the amount of shelter, feeding value, woody vegetation structure and species diversity of tree and shrub species in the site.

Great Crested Newt

Desktop Search for Ponds

- 2.3.14 In accordance with *Great crested newts: advice for local planning authorities* (Natural England, 2020) all ponds within an unobstructed 500 metres of a site should be considered for their suitability to support breeding great crested newts. The potential of the proposed development to impact upon any great crested newt population(s) whose breeding ponds are within 500 metres must be considered.
- 2.3.15 The search of habitats in the wider area up to a distance of 500 metres from the site boundary revealed the presence of a pond (Pond 1), located 60 metres to the south of the site (at SD 76621 43865) within Chatburn Wildlife Garden. The small (approx. 20m²) plastic lined pond (refer to the appended **Photo 11**) is not shown

on any Ordnance Survey map and is likely to have been created to increase the biodiversity at the woodland area within Chatburn Wildlife Garden.

Consideration of Requirement for Further Survey

- 2.3.16 The requirement for further survey at the pond was then assessed using the following criteria:
- Presence of dispersal barriers to great crested newt movements between ponds and the site, as detected during the walkover survey;
 - Distance of ponds from the site, and the potential influence of the proposed development of the site on any populations of great crested newt (if present at ponds), using the Natural England rapid risk assessment tool; and
 - Presence of other ponds which may form metapopulations and / or alter the influence of the site on ponds at greater distances.

Presence of Dispersal Barriers

- 2.3.17 A mortared wall lies on the southern site boundary, between the majority of the site and the pond. The wall does not extend along the full length of the southern site boundary and ends to the west. Although the wall will present a dispersal barrier between the site and the pond, amphibian dispersal from the pond to the site may be possible.

Consideration of Distance of Ponds from Site and Relative Size of Site

- 2.3.18 To inform the requirement for further surveys, the Natural England Rapid Risk Assessment tool from *GCN Method Statement WML-A14-2 (Version April 2020)* (Natural England, 2020) has been completed, as presented at **Table 2.3**, below.
- 2.3.19 The tool has been completed based on the distances of the ponds from the site, and the size of the development site (0.9 hectares or 'Ha'). The rapid risk assessment tool assumes that great crested newt are present.

Table 2.3: Rapid Risk Assessment Result

Component	Likely Effect	Notional Offence Probability Score
Great crested newt breeding pond(s)	No effect	0
Land within 100m of any breeding pond(s)	0.5 – 1 ha lost or damaged	0.70
Land 100-250m from any breeding pond(s)	0.5 – 1 ha lost or damaged	0.30
Land >250m from any breeding pond(s)	0.5 – 1 ha lost or damaged	0.03
Individual great crested newts	No effect	0
	Maximum:	0.70
Rapid risk assessment result:	Red: Offence Highly Likely	

- 2.3.20 Due to the proximity of Pond 1 to the site it has been considered necessary to further consider its suitability for use by breeding great crested newt.

Habitat Suitability Index Assessment

- 2.3.21 The pond was assessed using the Habitat Suitability Index (HSI) (Oldham, et al., 2000) by Brian Robinson. The pond was examined with reference to the ten HSI scoring criteria, which are: **SI₁**: Geographical location; **SI₂**: Pond area; **SI₃**: Pond drying; **SI₄**: Water quality (as indicated by the diversity of aquatic plants and invertebrates); **SI₅**: Shade; **SI₆**: Waterfowl; **SI₇**: Fish; **SI₈**: Abundance of other ponds within a one kilometre radius; **SI₉**: Quality of terrestrial habitat; and **SI₁₀**: Macrophyte cover (i.e. aquatic and emergent plants). The survey was conducted in accordance with *ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. Amphibian and Reptile Groups of the United Kingdom* (ARG UK, 2010).

2.3.22 The assessment followed guidance in relation to interpreting HSI scores, following the categorical scale shown at **Table 2.4**, below.

Table 2.4: Pond Habitat Suitability Index Categories

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

Assessment of Terrestrial Habitat

2.3.23 An assessment of the terrestrial habitat within the site for great crested newts was conducted, as informed by the *Great Crested Newt Mitigation Guidelines* (English Nature / Natural England, 2001) and the *Great Crested Newt Conservation Handbook* (Langton, et al., 2001).

2.3.24 Habitats present within the site were assessed for their value to support foraging, sheltering and hibernating great crested newt. Favourable habitats can comprise rough grassland, scrubland, woodland and sites with underground crevices or cracks, such as mammal holes, voids in tree stumps or banks, and refugia such as rock piles or dead wood.

Reptile Species

2.3.25 The site and its surroundings were assessed in terms of their suitability for use by reptile species using the important characteristics for reptiles outlined in the draft document '*Reptile Mitigation Guidelines*' (Natural England, 2011), and the *Reptile Habitat Management Handbook* (Edgar, et al., 2010). These habitat characteristics are outlined in **Table 2.5**, below.

Table 2.5: Important Habitat Characteristics for Reptiles

1. Location (in relation to species range)	7. Connectivity to nearby good quality habitat
2. Vegetation Structure	8. Prey abundance
3. Insolation	9. Refuge opportunity
4. Aspect	10. Hibernation habitat potential
5. Topography	11. Disturbance regime
6. Surface geology	12. Egg-laying site potential

Other Wildlife

2.3.26 Evidence of other wildlife (including Priority Species) observed whilst on site (but for which specific surveys were not made) was recorded and has been included in this report where it is considered of relevance to the planning application.

2.4 Survey and Reporting Limitations

2.4.1 The survey was completed December, when many plant species are in a state of senescence; the surveyor is experienced in identifying plant species from their vegetative characteristics however, and it is considered that a reliable assessment of the habitats present was possible.

2.4.2 Conditions (i.e. the timing of the survey) was unsuitable to obtain an indication of the water quality via sampling the aquatic invertebrate diversity. It has therefore been assumed that the pond supports a 'good' water quality, based on the likely inputs of water to the pond (the pond appears rain-water fed with no obvious sign of pollution).

2.4.3 All measurements within this report are approximate only, and have been either measured (using QField) or estimated whilst on site or calculated using mapping software (QGIS) or internet-based mapping services such as MAGiC and Google Earth.

2.5 Evaluation Methods

- 2.5.1 The habitats, vegetation and animal life were evaluated with reference to standard nature conservation criteria as described in *A Nature Conservation Review* (Ratcliffe, 1977) and *Guidelines for the Selection of Biological SSSIs* (Bainbridge, et al., 2013). These are size (extent), diversity, naturalness, rarity, fragility, typicality, recorded history, position in an ecological or geographical unit, potential value and intrinsic appeal.
- 2.5.2 Habitats have been assessed to determine whether they meet those described in *UK Biodiversity Action Plan: Priority Habitat Descriptions* (Maddock, A (ed), 2008); these lists are used to help draw up the statutory lists of Priority Habitats, as required under Section 41 of the *Natural Environment and Rural Communities (NERC) Act 2006*. Where suitable, the ecological value of the habitats present has been assessed using the terms outlined in *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (CIEEM, 2018).
- 2.5.3 Government advice on wildlife, as set out in the *National Planning Policy Framework* (Ministry of Housing, Communities and Local Government, 2021) and associated government circulars has been taken into consideration. Legislation relating to protected species, such as those listed under Schedules 1, 5, 6 and 8 of the *Wildlife and Countryside Act 1981* (as amended) and *The Conservation of Habitats and Species Regulations 2017*, is referenced where applicable, and any impacts to protected species are evaluated in accordance with current guidance.
- 2.5.4 The presence of any Priority Species, as listed under Section 41 of the *Natural Environment and Rural Communities (NERC) Act 2006* is noted, and habitats are assessed in terms of their suitability and value for these species. The presence of habitats and/or species listed by the Lancashire BAP Provisional Long List has been taken into account in the evaluation of the site.

3.0 SURVEY RESULTS

3.1 Desktop Study and Data Search

Designated Sites for Nature Conservation

Statutory Designated Sites for Nature Conservation and SSSI Impact Risk Zones

- 3.1.1 The site is not and does not form part of any statutory designated site for nature conservation.
- 3.1.2 The site lies within a Site of Special Scientific Interest (SSSI) Impact Risk Zone for Little Mearley Clough SSSI, located 2.8 kilometres to the south-east of the site and designated for its geological interest. The SSSI Impact Risk Zone requires the Local Planning Authority to consult with Natural England on likely risks from the following development categories (Ordnance Survey, 2022):
- Planning applications for quarries, including: new proposals, Review of Minerals Permissions, extensions, variations to conditions etc. Oil and gas exploration / extraction.
 - Livestock and poultry units with a floorspace greater than 500m², slurry lagoons and digestate stores greater than 4000m².
 - General combustion processes greater than 50 megawatts energy input including energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis / gasification, anaerobic digestion, sewage treatment works and other incineration / combustion.
- 3.1.3 The proposals do not match any of the development categories which would require further consultation with Natural England.

Non-statutory Designated Sites for Nature Conservation

- 3.1.4 The site is not and does not form part of any non-designated site for nature conservation.

3.1.5 13 non-statutory designated sites for nature conservation (called Biological Heritage Sites, or BHS within Lancashire) are present within 2 kilometres of the site; these are summarised at **Table 3.1** below.

Table 3.1: BHS Within 2 Kilometres of the Site

BHS Name	Distance and Direction from Site	Reason for Designation
A59 Road Cutting, Worston to Chatburn	0.52 kilometres to the east	The BHS description is incomplete, however it is noted that the BHS has been selected for its artificial habitats (Ar2) and its flowering plants and ferns (Ff4b).
Bellman Farm Marsh	0.55 kilometres to the south-west	The site comprises the land adjoining Pimlico Brook from near Pimlico Link Road to the wet fields associated with Bellman Farm. The site also includes the area around the old kiln and the adjacent embankment. The wet fields have an underlying peaty soil, indicative of a historical wetland habitat. Their situation between slightly elevated limestone formations to the north west and south east indicates a former valley mire. Formerly managed as meadowland, their vegetation is essentially fen meadow.
Worsaw Hill, Warren Hill, Crow Hill and The Ridge	0.6 kilometres to the south-east	The site comprises a cluster of limestone knolls between Worston and Downham and includes Crow Hill, The Ridge, Warren Hill and Worsaw Hill. The cluster of limestone knolls is also notified as a Geological Site of Special Scientific Interest. The site is of particular importance for its species-rich limestone grassland.
Bean Hill Wood and Grassland	0.66 kilometres to the north	The site comprises a north and northeast facing bluff slope to the south of the River Ribble between Ribble Lane and Chatburn Brook. The habitats on the site comprise two blocks of deciduous woodland separated by field slope of species-rich grassland.
River Ribble from London Road Bridge Preston, in West, to County Boundary, in East	0.7 kilometres to the south-west	The site comprises the River Ribble and associated semi-natural habitats from the county boundary at Paythorne (SD856836) downstream to London Road Bridge, Walton-le-Dale, Preston (SD553287). The Ribble rises high in the Pennines at Newby Head Moss at an altitude of 422m and is one of the largest rivers in North West England. Collectively, the river and its associated habitats support a rich assemblage of plants and animals. Throughout the length of the River Ribble the General Quality Assessment is Very Good and Good (A and B) with a localised section with the Fairly Good (C) classification.
Bellman Park Quarry	1.01 kilometres to the south	Bellman Park Quarry is cut into one of a series of limestone hills, and is a link in a chain of calcareous habitats and features between Clitheroe and Downham. To the west are Clitheroe Castle knoll and Salthill and to the east Crow hill, Worsaw Hill and the A59(T) road cutting. It forms part of the Salthill and Bellmanpark geological SSSI.
Worston Common	1.23 kilometres to the south	The site comprises species-rich grassland situated on the edge of the village of Worston. Two species occurring at the site, namely Green Figwort (<i>Scrophularia umbrosa</i>) and Melancholy Thistle (<i>Cirsium heterophyllum</i>), are included in the <i>Provisional Lancashire Red Data List of Vascular Plants</i> .
Salthill Quarry	1.27 kilometres to the south-west	The site comprises of a mosaic of habitats including limestone grassland, scrub and developing woodland surrounding a former limestone quarry which has been developed as an industrial estate. The main areas of interest are the exposed outcrops and stony ground which have been colonised by a diverse flora.
Swanside Beck and Smithies Brook Valley	1.3 kilometres to the north-east	The site comprises a mosaic of semi-natural habitats along the valley of Swanside Beck and Smithies Brook. It extends for approximately 2.5 km upstream from the confluence of Smithies Brook with the river Ribble near Smithies Bridge, Chatburn. Within the site are a complex of habitats including woodland, scrub, grassland, flushes, marsh, riverbank and running water. The site is noted for the occurrence of the freshwater crayfish, a species listed

BHS Name	Distance and Direction from Site	Reason for Designation
		in Schedule 5 of the <i>Wildlife and Countryside Act 1981</i> , and as a spawning ground for salmon and brown trout.
Coplow Quarry and Pimlico Road Grasslands	1.34 kilometres to the south-west	The site comprises of areas of species-rich, semi-natural calcareous grassland and developing scrub at Coplow Quarry. The site includes Coplow Quarry geological SSSI.
West Clough Wood	1.59 kilometres to the north-west	The site comprises ancient, semi-natural woodland occupying the steep sides of West Clough Brook, located between the villages of West Bradford and Grindleton. The woodland is listed in the Lancashire Inventory of Ancient Woodland (Provisional), (English Nature, 1994).
Town End Croft Wood	1.72 kilometres to the east	The site comprises a block of woodland situated near the junction of Chatburn Road and Green Lane on a ridge immediately to the north west of Downham. The woodland supports a diversity of species characteristic of semi-natural woodland.
Cross Hill Quarry	1.83 kilometres to the west	The site comprises the disused Cross Hill limestone quarries and the adjoining Brungerley Park and supports a mosaic of semi-natural habitats including limestone grassland, scrub and woodland. The site includes Cross Hill Quarry Local Nature Reserve. The main quarry supports a diversity flora.

3.1.6 The presence of the BHS is considered further at **Section 4.2** below.

Priority Habitats Inventory and Soilscape Information

3.1.7 The Priority Habitats Inventory² was checked via MAGiC map. No Priority Habitats are reported for the site.

3.1.8 In accordance with *Soilscape (England)* as presented on MAGiC Map (National Soil Resources Institute, 2005), the site supports '*freely draining slightly acid loamy soils*', and the characteristic semi-natural habitats associated with the soils comprise '*base-rich pastures and deciduous woodlands*'.

Protected and Notable Species

3.1.9 LERN hold no records of protected and notable species for the site.

3.1.10 Records of protected and notable species for a 2 kilometre radius of the site are summarised at **Table 3.2** below.

Table 3.2: Records of Protected Species Within a 2 Kilometre Radius of the Site

Taxon Group	Species Name and Designations ¹ and Notes
Amphibians	Common toad (<i>Bufo bufo</i>): PS & LBAP. 1 record, 1865 metres to the west of the site, and from 2019.
	Common frog (<i>Rana temporaria</i>): LBAP. A total of 13 records, dated between 1970 and 2010, the closest of which is 745 metres to the south-west of the site, and from 1992.
	Palmate newt (<i>Lissotriton helveticus</i>): A total of 5 records, dated between 1881 and 2010, the closest of which is 1220 metres to the south of the site, and from 1995.
	Smooth newt (<i>Lissotriton vulgaris</i>): 2 records, dated 1992 and 1995; the closest record is 1220 metres to the south of the site, and from 1995.
Birds – WCAs¹ Species	Peregrine (<i>Falco peregrinus</i>): WCAs1 & LBAP. A total of 3 records, dated between 1978 and 1999, the closest of which is 745 metres to the south-west of the site, and from 1978.
	Fieldfare (<i>Turdus pilaris</i>): WCAs1. 1 record, 745 metres to the south-west of the site, and from 1978.
	Kingfisher (<i>Alcedo atthis</i>): WCAs1. A total of 4 records, dated between 1998 and 1999, the closest of which is 1035 metres to the north-east of the site, and from 1999.
	Redwing (<i>Turdus iliacus</i>): WCAs1. 2 records, dated 1978 and 1992; the closest record is 745 metres to the south-west of the site, and from 1978.

² A spatial dataset that describes the geographic extent and location of Natural Environment and Rural Communities Act (2006) Section 41 habitats of principal importance.

Taxon Group	Species Name and Designations ¹ and Notes
Birds – Priority and Species LBAP	PS & LBAP Cuckoo (<i>Cuculus canorus</i>), curlew (<i>Numenius arquata</i>), grey partridge (<i>Perdix perdix</i>), house sparrow (<i>Passer domesticus</i>), lapwing (<i>Vanellus vanellus</i>), reed bunting (<i>Emberiza schoeniclus</i>), skylark (<i>Alauda arvensis</i>), spotted flycatcher (<i>Muscicapa striata</i>), tree pipit (<i>Anthus trivialis</i>), tree sparrow (<i>Passer montanus</i>), bullfinch (<i>Pyrrhula pyrrhula</i>), duncock (<i>Prunella modularis</i>), herring gull (<i>Larus argentatus</i>), song thrush (<i>Turdus philomelos</i>) and starling (<i>Sturnus vulgaris</i>). PS Only Lesser redpoll (<i>Acanthis cabaret</i>). LBAP Only Black-headed gull (<i>Chroicocephalus ridibundus</i>), common sandpiper (<i>Actitis hypoleucos</i>), grey heron (<i>Ardea cinerea</i>), kestrel (<i>Falco tinnunculus</i>), long-eared owl (<i>Asio otus</i>), meadow pipit (<i>Anthus pratensis</i>), northern golden plover (<i>Pluvialis apricaria</i> subsp. <i>albifrons</i>), oystercatcher (<i>Haematopus ostralegus</i>), raven (<i>Corvus corax</i>), redshank (<i>Tringa totanus</i>), snipe (<i>Gallinago gallinago</i>), swift (<i>Apus apus</i>), teal (<i>Anas crecca</i>) and willow warbler (<i>Phylloscopus trochilus</i>).
Bony Fish	PS & LBAP Atlantic salmon (<i>Salmo salar</i>), brown / sea trout (<i>Salmo trutta</i>) and European eel (<i>Anguilla anguilla</i>). LBAP Only Bullhead (<i>Cottus gobio</i>).
Crustaceans	White-clawed freshwater crayfish (<i>Austropotamobius pallipes</i>): WCAs5, PS & LBAP. 2 records, both from 2012; the closest record is 1645 metres to the north-east of the site
Flowering Plants	PS & LBAP Field Gentian (<i>Gentianella campestris</i>). PS Only Darnel (<i>Lolium temulentum</i>), Field Eryngo (<i>Eryngium campestre</i>) and Thorow-wax (<i>Bupleurum rotundifolium</i>). LBAP Only Autumn Gentian (<i>Gentianella amarella</i>), Barberry (<i>Berberis vulgaris</i>), Bird's-eye Primrose (<i>Primula farinosa</i>), Blue Moor-grass (<i>Sesleria caerulea</i>), Blue Water-speedwell (<i>Veronica anagallis-aquatica</i>), Buckthorn (<i>Rhamnus cathartica</i>), Cloudberry (<i>Rubus chamaemorus</i>), Common Gromwell (<i>Lithospermum officinale</i>), Common Rock-rose (<i>Helianthemum nummularium</i>), Cowberry (<i>Vaccinium vitis-idaea</i>), Field Mouse-ear (<i>Cerastium arvense</i>), Field Pepperwort (<i>Lepidium campestre</i>), Fragrant Orchid (<i>Gymnadenia conopsea</i>), Globeflower (<i>Trollius europaeus</i>), Grass-of-Parnassus (<i>Parnassia palustris</i>), Greater Pond-sedge (<i>Carex riparia</i>), Green Hellebore (<i>Helleborus viridis</i>), Hairy Violet (<i>Viola hirta</i>), Heath Dog-violet (<i>Viola canina</i>), Heath Spotted-orchid (<i>Dactylorhiza maculata</i> subsp. <i>ericetorum</i>), Henbane (<i>Hyoscyamus niger</i>), Herb-paris (<i>Paris quadrifolia</i>), Knotted Clover (<i>Trifolium striatum</i>), Lesser Twayblade (<i>Neottia cordata</i>), Lily-of-the-valley (<i>Convallaria majalis</i>), Limestone Bedstraw (<i>Galium stemei</i>), Marsh Fragrant-orchid (<i>Gymnadenia densiflora</i>), Mountain Everlasting (<i>Antennaria dioica</i>), Narrow-leaved Bitter-cress (<i>Cardamine impatiens</i>), Northern Spike-rush (<i>Eleocharis mamillata</i> subsp. <i>austriaca</i>), Northern Yellow-cress (<i>Rorippa islandica</i>), Opposite-leaved Pondweed (<i>Groenlandia densa</i>), Red Pondweed (<i>Potamogeton alpinus</i>), Round-leaved Dog-rose (<i>Rosa obtusifolia</i>), Round-leaved Wintergreen (<i>Pyrola rotundifolia</i>), Shepherd's Cress (<i>Teesdalia nudicaulis</i>), Shining Pondweed (<i>Potamogeton lucens</i>), Slender Tufted-sedge (<i>Carex acuta</i>), Small Scabious (<i>Scabiosa columbaria</i>), Stinking Hellebore (<i>Helleborus foetidus</i>), Thread-leaved Water-crowfoot (<i>Ranunculus trichophyllus</i>), White Bryony (<i>Bryonia dioica</i>), Wild Service-tree (<i>Sorbus torminalis</i>), Wintergreen (<i>Pyrola rotundifolia</i> subsp. <i>maritima</i>) and Wood Crane's-bill (<i>Geranium sylvaticum</i>).
Invertebrates – butterflies	PS & LBAP White-letter hairstreak (<i>Satyrrium w-album</i>), small heath (<i>Coenonympha pamphilus</i>) and wall (<i>Lasiommata megera</i>). LBAP Only Ringlet (<i>Aphantopus hyperantus</i>).
Invertebrates – moths	PS & LBAP August thorn (<i>Ennomos quercinaria</i>), double dart (<i>Graphiphora augur</i>), garden tiger (<i>Arctia caja</i>) and v-moth (<i>Macaria wauaria</i>). PS Only Anomalous (<i>Stilbia anomala</i>), autumnal rustic (<i>Eugnorisma glareosa</i>), brindled ochre (<i>Dasytopia templi</i>), centre-barred sallow (<i>Atethmia centrago</i>), cinnabar (<i>Tyria jacobaeae</i>),

Taxon Group	Species Name and Designations ¹ and Notes
	<p>dark-barred twin-spot carpet (<i>Xanthorhoe ferrugata</i>), ghost moth (<i>Hepialus humuli</i>), Haworth's minor (<i>Celaena haworthii</i>), heath rustic (<i>Xestia agathina</i>), knot grass (<i>Acronicta rumicis</i>), latticed heath (<i>Chiasmia clathrata</i>), mottled rustic (<i>Caradrina morpheus</i>), mouse moth (<i>Amphipyra tragopoginis</i>), neglected rustic (<i>Xestia castanea</i>), red carpet (<i>Xanthorhoe decoloraria</i>), rosy rustic (<i>Hydraecia micacea</i>), shaded broad-bar (<i>Scotopteryx chenopodiata</i>), small phoenix (<i>Ecliptopera silaceata</i>), small square-spot (<i>Diarsia rubi</i>) and white ermine (<i>Spilosoma lubricipeda</i>).</p> <p>LBAP Only Dusky-lemon sallow (<i>Cirrhia gilvago</i>), brown rustic (<i>Rusina ferruginea</i>), butterbur (<i>Hydraecia petasitis</i>), chimney sweeper (<i>Odezia atrata</i>), golden-rod brindle (<i>Xylena solidaginis</i>), lunar hornet moth (<i>Sesia bembeciformis</i>), northern drab (<i>Orthosia opima</i>), northern rustic (<i>Standfussiana lucerneae</i>), puss moth (<i>Cerura vinula</i>) and wood tiger (<i>Parasemia plantaginis</i>).</p>
Jawless Fish	<p>PS & LBAP River lamprey (<i>Lampetra fluviatilis</i>).</p> <p>LBAP Only Brook lamprey (<i>Lampetra planeri</i>).</p>
Reptiles	<p>Adder (<i>Vipera berus</i>): WCAs5, PS & LBAP. 2 records, dated 1956 and 1968; the closest record is 1765 metres to the north-west of the site, and from 1968.</p> <p>Common lizard (<i>Zootoca vivipara</i>): WCAs5, PS & LBAP. 1 record, 1765 metres to the north-west of the site, and from 1974.</p> <p>Grass snake (<i>Natrix helvetica</i>): LBAP. 2 records, dated 1956 and 1968; the closest record is 1765 metres to the north-west of the site, and from 1968.</p>
Spiders (Araneae)	<p>Labyrinth spider (<i>Agelena labyrinthica</i>): LBAP. 1 record, 1485 metres to the south-west of the site, and from 1989.</p>
Terrestrial mammals	<p>Bats (Order <i>Chiroptera</i>): EPS, WCAs5 & LBAP. A total of 6 records, dated between 1994 and 2006, the closest of which is 520 metres to the east of the site, and from 2003.</p> <p>Noctule bat (<i>Nyctalus noctula</i>): EPS, WCAs5, PS & LBAP. 1 record, 55 metres to the north-east of the site, and from 2019.</p> <p>Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>): EPS, WCAs5, PS & LBAP. A total of 7 records, all from 2019, the closest of which is 55 metres to the north-east of the site.</p> <p>Unidentified Myotis bat (<i>Myotis</i> sp.): EPS, WCAs5 & LBAP. 2 records, dated 2010 and 2015; the closest record is 1890 metres to the north of the site, and from 2015.</p> <p>Daubenton's bat (<i>Myotis daubentonii</i>): EPS, WCAs5 & LBAP. A total of 4 records, all from 2006, the closest of which is 1665 metres to the west of the site.</p> <p>Common pipistrelle (<i>Pipistrellus pipistrellus</i>): EPS, WCAs5 & LBAP. A total of 15 records, dated between 1986 and 2019, the closest of which is 55 metres to the north-east of the site, and from 2019.</p> <p>Whiskered bat (<i>Myotis mystacinus</i>): EPS, WCAs5 & LBAP. A total of 3 records, dated between 2010 and 2019, the closest of which is 825 metres to the south-west of the site, and from 2019.</p> <p>Eurasian red squirrel (<i>Sciurus vulgaris</i>): WCAs5, PS & LBAP. A total of 3 records, dated between 1945 and 1959, the closest of which is 1765 metres to the north-west of the site, and from 1959.</p> <p>European water vole (<i>Arvicola amphibius</i>): WCAs5, PS & LBAP. A total of 3 records, dated between 1909 and 1964, the closest of which is 1765 metres to the north-west of the site, and from 1964.</p> <p>Brown hare (<i>Lepus europaeus</i>): PS & LBAP. A total of 13 records, dated between 1996 and 2020, the closest of which is 960 metres to the south-east of the site, and from 2005.</p> <p>Polecat (<i>Mustela putorius</i>): PS & LBAP. 2 records, both from 2020; the closest record is 1635 metres to the north-east of the site</p> <p>West European hedgehog (<i>Erinaceus europaeus</i>): PS & LBAP. A total of 3 records, dated between 2015 and 2019, the closest of which is 1400 metres to the south-west of the site, and from 2016.</p> <p>Eurasian badger (<i>Meles meles</i>): PBA. A total of 5 records, dated between 1969 and 2017, the closest of which over 500 metres from the site.</p>
<p>¹Key to Designation Codes: EPS = European Protected Species under the <i>Conservation of Habitats and Species Regulations 2017</i>. WCAs1 = Species receives full protection under Schedule 1 of the <i>Wildlife and Countryside Act 1981</i> (as amended). WCAs5 = Species receives full protection under Schedule 5 of the <i>Wildlife and Countryside Act 1981</i> (as amended). PBA = Protection of Badger Act 1992 PS = Priority Species listed under Section 41 of the NERC Act 2006 LBAP = Species listed on the Lancashire Biodiversity Action Plan Provisional Long List</p>	

- 3.1.11 Lancashire Badger Group hold no records of badger for the site. Records are held for five badger setts within 2 kilometres of the site; all are between 1 and 1.4 kilometres from the site boundary.
- 3.1.12 The presence of these protected and notable species within the wider area has been taken into account throughout this report.

Previous Ecology Reports

- 3.1.13 The 2010, 2014, 2017 and 2019 ecology reports did not cover the same area as this application; a portion of this area has now been developed as residential dwellings and another is in use as a temporary works area, and the 2019 report relates to an area to the north-east of the site.
- 3.1.14 Areas of the wider site (in 2010 and 2014) were detected to support calcareous grassland; this had been removed in 2017 due to construction on the site and due to infilling with soil at the housing site's margins. On 21st December 2017 (the date of the 2017 survey) no areas of remaining calcareous grassland could be detected.
- 3.1.15 It is understood that all matters relating to the removal and any compensation for the removal of the calcareous grassland prior to this report will be dealt with separately to this application; the site has been evaluated in this report in terms of the habitats currently present.
- 3.1.16 A single plant of Salad Burnet (*Sanguisorba minor*) was detected beyond the north-eastern corner of the site in the 2019 ecology report, with locally frequent Springy Turf-moss (*Rhytidiadelphus squarrosus*), Red Fescue (*Festuca rubra*) and Hawkweed species (*Hieracium* sp.). It is considered this 1m² area, which remains present in 2022, is a remnant of the former larger area of calcareous grassland detected at the site.
- 3.1.17 The presence of this area is considered further at **Section 4.3** below.

3.2 Vegetation and Habitats

General Description

- 3.2.1 The approximately 0.9 hectare site is located on the suburban fringe with a recent residential development to the immediate north, suburban housing to the east, a quarry to the west and woodland to the north (across Chatburn Old Road) and south.
- 3.2.2 The site comprises an area of unmanaged formerly sheep-grazed grassland (which has been partially re-seeded where the ground has previously cleared during the construction of the residential development to the immediate north of the site, and following the importation of topsoil at the north-eastern end of the site). Areas of bare ground (associated with the former construction site) with areas of colonising vegetation and a public footpath and vegetation planted and colonising on the footpath verge are also present. Two mature trees are present at the eastern end of the site.
- 3.2.3 The northern site boundary is defined by fencing beyond which lies the rear gardens of the recent residential development. The eastern site boundary is defined by garden fencing. The southern site boundary is defined by garden fencing at its eastern end, and a stone wall at its western end (beyond which lies an area of broad-leaved woodland) The western site boundary lies within an area of cleared ground (associated with eh yard for the recently construction residential dwellings).
- 3.2.4 A Phase 1 Habitat Survey map is appended at **Figure 2**, and can be referred to for all habitat descriptions. Photographs are appended at **Section 8.2**.

Grassland Area

- 3.2.5 Refer to **Photos 1 to 3**. The grassland (at the time of survey) appeared unmanaged although it is known that it has been previously sheep grazed. The grassland is somewhat variable across its sward, with areas

to the north-east of the site more recently established on imported top soils, and areas towards the south-western end re-established on previously cleared ground.

- 3.2.6 The vegetation is characterised by constant, frequent and locally abundant Cock's-foot (*Dactylis glomerata*) and Yorkshire-fog (*Holcus lanatus*) and occasional and locally frequent Red Fescue (*Festuca rubra*), Timothy (*Phleum pratense*), Creeping Buttercup (*Ranunculus repens*), False Oat-grass (*Arrhenatherum elatius*), Perennial Rye-grass (*Lolium perenne*), Creeping Bent (*Agrostis stolonifera*), Dandelion (*Taraxacum officinale* agg.) and Hogweed (*Heracleum sphondylium*). Other species within the sward include occasional and very locally frequent Creeping Thistle (*Cirsium arvense*), occasional Broad-leaved Dock (*Rumex obtusifolius*), Common Bent (*Agrostis capillaris*), Common Ragwort (*Senecio jacobaea*), Common Sorrel (*Rumex acetosa*), Common Vetch (*Vicia sativa*), Soft-rush (*Juncus effusus*), Spear Thistle (*Cirsium vulgare*) and Tufted Hair-grass (*Deschampsia cespitosa*). A plant species list is appended at **Table 8.1**.
- 3.2.7 The semi-improved neutral grassland is not typical of any NVC community, although it is considered with a continued absence of management it will succeed towards and *MG1 False Oat-grass* grassland (Rodwell, 1992) of the NVC. The grassland is described by the UKHab as g3c other neutral grassland with the following secondary codes: 10 scattered scrub, 14 scattered rushes, 77 neglected (unmanaged for 3 to 10 years) and 60 sheep grazed.

Footpath with Colonising and Planted Vegetation on its Verge

- 3.2.8 Refer to **Photos 4 and 5**. The footpath is devoid of vegetation. Vegetation planted on and colonising the earth bunded verge at the footpath's eastern and northern edges is characterised by occasional and locally frequent Butterfly-bush (*Buddleja davidii*), Dog-rose (*Rosa canina*), Honeysuckle (*Lonicera periclymenum*), Mugwort (*Artemisia vulgaris*), Blackthorn (*Prunus spinosa*), Creeping Buttercup (*Ranunculus repens*), Perennial Rye-grass, Yorkshire-fog, Common Nettle, Creeping Thistle (*Cirsium arvense*) and Tufted Hair-grass, occasional Alder (*Alnus glutinosa*), Field Maple (*Acer campestre*), Cherry species (*Prunus* sp.), and locally frequent Hawthorn (*Crataegus monogyna*). A plant species list is appended at **Table 8.2**.
- 3.2.9 The vegetation is not typical of any NVC community. The habitat is described by the UKHab as u1c artificial unvegetated; unsealed surface with the following secondary codes: 11 scattered trees, 10 scattered scrub, 17 ruderal / ephemeral and 16 tall herb.

Bare Ground with Colonising Vegetation

- 3.2.10 Refer to **Photo 6**. The bare ground with colonising vegetation is composed of compacted stone and cleared earth, and includes a mound of earth and rubble at the approximately centre of the site.
- 3.2.11 The vegetation is characterised by occasional and locally frequent Perennial Rye-grass and Creeping Buttercup, occasional Broad-leaved Dock, Broad-leaved Willowherb (*Epilobium montanum*), Common Ragwort and Great Willowherb (*Epilobium hirsutum*) and locally frequent Common Nettle (*Urtica dioica*), Creeping Bent, Common Mouse-ear (*Cerastium fontanum*), Smooth Sow-thistle (*Sonchus oleraceus*) and Yorkshire-fog. A plant species list is appended at **Table 8.3**.
- 3.2.12 The habitat is not typical of any NVC community, and is described by the UKHab as u1c artificial unvegetated; unsealed surface with the following secondary codes: 11 scattered trees, 10 scattered scrub, 17 ruderal / ephemeral and 16 tall herb.

Invasive Plant Species

- 3.2.13 No invasive plant species listed under Schedule 9 of the *Wildlife and Countryside Act 1981* (as amended) were detected within the site.

3.3 Animal Life

Badger

- 3.3.1 Badger tracks were noted in the woodland to the south of the site and to the west of the site (along the eastern edge of the quarry to the west of the site). ERAP (Consultant Ecologists) Ltd is aware that badger have been noted feeding within gardens to the east of the site (via communication between the neighbouring householders and the client).
- 3.3.2 No signs of foraging badger or pit latrines were noted within the site during the survey. No badger setts were noted within the site or within 50 metres of the site.
- 3.3.3 The grassland habitats within the site are suitable for foraging badger although is unlikely to provide core or important foraging habitat; similar (and better quality) habitats are present throughout the wider area, and the site is small in size.
- 3.3.4 Impacts to badger as a consequence of development and during the construction phase of the proposed development are considered further at **Section 4.4** below.

Bat Species

Trees

- 3.3.5 The two mature trees within the site (**Photo 7**) were both noted to support features suitable for use by roosting bats. Fagsyl1, a mature Beech (*Fagus sylvatica*) supports a weld at 10m on its southern face (**Photo 8**) and a knot hole at 5 metres on its northern face; as viewed from the ground it was considered that the knot hole appears 'blind' (i.e. does not extend into a cavity suitable for use by roosting bats).
- 3.3.6 Tilsp1, a mature Lime species (*Tilia* sp.), supports a knot hole on the southern face of a side branch, approximately 4 metres from the ground.
- 3.3.7 Both trees are assessed to be of 'moderate' suitability for use by roosting bats; further inspections will be required if works are proposed to the trees. This is considered further at **Section 4.4** below.
- 3.3.8 Refer to **Photo 10**. Mature trees overhang the site at its south-western corner, and support dense Ivy, which may obscure further features suitable for use by roosting bats³. These trees are considered to be of 'low' suitability for use by roosting bats, and are considered further at **Section 4.4**.

Habitat Assessment for Commuting and Foraging Bats

- 3.3.9 The trees and scrub within the site and at site margins are suitable for use by foraging bats and will provide habitat connectivity across the site. The grassland within the site is unlikely to provide an abundance or diversity of invertebrate prey, and is therefore considered to be of low suitability for use by foraging bats.
- 3.3.10 The habitats present are suitable for and are likely to contribute to the wider foraging area of low numbers of common species of edge-feeding foraging bats, such as common pipistrelle (*Pipistrellus pipistrellus*), and also low numbers of species known to forage over open habitats and over wide areas, such as noctule (*Nyctalus noctula*).
- 3.3.11 A diverse range of species and / or a large number of bats are considered unlikely at the site owing to the absence of habitats such as woodland or tree-lined watercourses within the site.

³ It is recognised that Ivy is anecdotally thought to provide potential roosting habitat for low numbers / individual crevice dwelling bat species, however in accordance with *Bat Roosts in Trees - A Guide to Identification and Assessment for Tree-Care and Ecology Professionals* (BTHK, 2018) actual evidence of bat roosting behind Ivy is rare, with only two confirmed roosts known in the UK and suggests Ivy is not typically used by roosting bats.

Bird Species

3.3.12 Birds detected in the site in December 2021 are listed in **Table 3.3**, below.

Table 3.3: Bird species Detected on 14th December 2021

Scientific Name	Common Name	BOCC Status ¹
<i>Aegithalos caudatus</i>	Long-tailed tit	Green
<i>Columba livia</i>	Feral pigeon	Green
<i>Columba palumbus</i>	Wood pigeon	Green
<i>Corvus monedula</i>	Jackdaw	Green
<i>Erithacus rubecula</i>	Robin	Green
<i>Fringilla coelebs</i>	Chaffinch	Green
<i>Passer domesticus</i>	House sparrow	Red
<i>Phasianus colchicus</i>	Pheasant	Green
<i>Turdus merula</i>	Blackbird	Green

¹BOCC: Birds of Conservation Concern (Stanbury, et al., 2021).
Priority Species are presented in **bold**.

3.3.13 The trees and shrubs are all suitable for use by nesting passerine (i.e. perching) species, including those detected within the site during the survey. This is considered further at **Section 4.4**, below.

Great Crested Newt

3.3.14 The grassland and scrub habitats within the site are suitable for use by foraging and sheltering amphibian species including great crested newt. The areas of bare and cleared ground are of poor suitability for amphibian species.

3.3.15 Pond 1 (refer to **Photo 11**) is 60 metres to the south of the site and connected terrestrially to the site via the railway bridge to the north-west corner of the site. A Habitat Suitability Index (HSI) assessment of the pond was conducted and the results are given at **Table 3.4**, below.

Table 3.4: Habitat Suitability Index Assessment for Pond 1

Criteria	Description	Pond 1	Score ¹
SI ₁	Location	Optimal	1.00
SI ₂	Pond Area	20m ²	0.50
SI ₃	Permanence	Never dries	0.90
SI ₄	Water Quality	Good	1.00
SI ₅	Shade	70%	0.80
SI ₆	Waterfowl	Absent	1.00
SI ₇	Fish	Absent	1.00
SI ₈	Pond count ²	None	0.10
SI ₉	Terrestrial habitat	Good	1.00
SI ₁₀	Macrophyte cover	100%	0.80
Assessment Result:		Below average	0.56

¹Calculated by (SI₁ x SI₂ x SI₃ x SI₄ x SI₅ x SI₆ x SI₇ x SI₈ x SI₉ x SI₁₀)^{1/10}
²Ponds within an unobstructed 1 kilometre radius

3.3.16 The assessment of Pond 1 is 'below average'; the score is most affected by the size of the pond and the absence of other, connected ponds within a 1 kilometre radius.

3.3.17 Overall the presence of great crested newt at the pond is considered reasonably unlikely at Pond 1 however for the following reasons:

- The pond has been created to increase the diversity of habitats within the woodland, but is not a long-standing pond. It is therefore not considered that an existing population of great crested newt will have been associated with the pond in the long term;
- There are no ponds marked on Ordnance Survey maps within an unobstructed 1 kilometre radius of the pond from which great crested newt could have colonised the pond subsequent to its creation; and

c. There are no records of great crested newt within a 2 kilometre radius of the site.

3.3.18 Therefore the presence of great crested newt at the site is reasonably discounted. It is not considered that further surveys are required to determine the presence or absence of great crested newt at Pond 1.

3.3.19 The potential for other amphibian species to use the pond for breeding is considered further at 'other wildlife' below.

Reptiles

3.3.20 Debris suitable for sheltering and basking reptiles was examined during the survey; no reptile species were detected.

3.3.21 Large areas of the site have been regularly disturbed and the site provides poor quality habitat for sheltering, basking and hibernating reptiles. The site is not adjacent or linked to any areas of favourable habitat for reptile species, and there are no records of reptile for the site. Records held for the wider area are distant from the site, and old (the most recent is from 1974). The presence of reptiles within the site is reasonably discounted.

Other Wildlife

3.3.22 The site supports suitable habitat for foraging hedgehog (*Erinaceus europaeus*), a Priority Species; the site is considered to be too small to provide core or important habitat for this species.

3.3.23 Pond 1, located 60 metres to the south of the site, may be suitable for use by other breeding amphibian species such as common frog (*Rana temporaria*), a Lancashire BAP species, or common toad (*Bufo bufo*), a Priority and Lancashire BAP Species. Both species are known to disperse over wider areas from breeding ponds than great crested newt, and therefore the potential for these species to have colonised the pond must be considered. The wall at the southern end of the site will remain a partial barrier to amphibian dispersal, however it is possible that common frog and common toad may be present within the site. It is considered that the site is reasonably unlikely to provide 'core' or 'important' habitat for foraging or sheltering amphibian species however. The site provides habitat of poorer quality than that of the woodland surrounding the pond, and is not extensive in terms of the terrestrial habitat it provides.

3.3.24 The potential presence of hedgehog, common frog and common toad at the site is considered further at **Section 4.4**.

4.0 EVALUATION AND ASSESSMENT

4.1 Introduction and Description of Proposals

4.1.1 In accordance with (Stanton Andrews Architects, 2020) it is proposed to develop the site to residential dwellings with associated access road and gardens.

4.1.2 **Section 4.2** provides an assessment of any impacts of the proposed development on the designated sites for nature conservation present in the wider area. The ecological value of habitats within the site is evaluated at **Section 4.3**, and protected and notable species are considered at **Section 4.4**.

4.2 Designated Sites for Nature Conservation

4.2.1 It is considered that the site is sufficiently small and distant from all designated sites for nature conservation that the proposed development will have no impact upon them.

4.3 Vegetation and Habitats

- 4.3.1 Only common and widespread plant species were found. None of the habitats present are representative of semi-natural habitat. No Priority Habitats are present within the site.
- 4.3.2 A 1m² area of grassland which supports Sala Burnet is located beyond the north-eastern site boundary. Although this area lies outside the site boundary there is the potential for it to be damaged during the construction phase of the proposed development. Measures to ensure the protection of this area during the construction phase of the proposed development are presented at **Section 5.2**. It is recommended that, in the long term, this area is translocated to the 900m² area of calcareous grassland proposed to the south-west of the site in order that it forms part of a wider coherent habitat unit and does not degrade through lack of regular management to (for example) Bramble scrub.
- 4.3.3 In terms of each habitat's importance in a geographical context⁴, the mature trees are considered to be of 'site' importance. The areas of bare ground and colonising vegetation and the grassland habitats are not considered to be of importance in terms of a geographical context.
- 4.3.4 Both trees will be retained by the proposed development; measures to protect the trees during the construction phase of the proposals are presented at **Section 5.2**.

4.4 Protected Species and Other Wildlife

- 4.4.1 Trees Fagsyl1 and Tilsp1 are of moderate suitability for use by roosting bats; both trees will be retained and protected during works. Recommendations relating to the retention of features suitable for use by foraging and commuting bats (including the provision of suitable lighting) are presented at **Section 5.2**.
- 4.4.2 Trees to the south-west of the site are considered to be of 'low' suitability for use by roosting bats; if the proposals require works to these trees then measures to ensure the protection of bats will be required. These measures are presented at **Section 5.2**.
- 4.4.3 Recommended features to include within the proposals to enhance habitats for roosting bats at the site are presented at **Section 5.3**.
- 4.4.4 The trees and shrubs provide suitable foraging and nesting habitat for the species of birds detected within the site and the wider area via the records search (including house sparrow, a Priority Species). Recommendations for the protection of birds during works are presented at **Section 5.2**. Recommendations for enhancements for nesting birds to include within the site design are presented at **Section 5.3**.
- 4.4.5 Badger are known to be present in the wider area and forage in gardens to the east of the site. Pond 1 supports suitable habitat for breeding common frog and common toad. It is considered that the proposed development will not remove any core or important foraging or sheltering habitat for these species, and that no badger setts will be impacted by the works. The proposals have the potential to harm wildlife during the construction phase of the proposed development however; recommendations for the protection of hedgehog, badger, common frog, common toad and other wildlife during works are presented at **Section 5.2**.
- 4.4.6 Measures to ensure that hedgehog can access to the proposed garden habitats (and to ensure habitat connectivity is maintained across the site) are presented at **Section 5.3**.

⁴ Using the terms presented at Section 4.7 of *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (CIEEM, 2018), i.e. International and European, National, Regional, Local Authority-wide area, River Basin District, Estuarine system / Coastal cell or Local. The term 'site' value is additionally used to highlight ecological features considered to be of importance in the context of the wider site habitats, but which are of negligible value in the context of the local area.

5.0 RECOMMENDATIONS AND ECOLOGICAL ENHANCEMENT

5.1 Introduction

5.1.1 These recommendations aim to ensure that the development is implemented in accordance with relevant wildlife legislation, Natural England guidance, the principles of the National Planning Policy Framework (NPPF), local planning policy and best practice.

5.1.2 In accordance with Chapter 15, paragraph 180(d) of the NPPF:

'opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate'.

5.1.3 Where possible, opportunities to enhance the ecological interest and habitat connectivity and seek biodiversity gain through appropriate landscape planting and habitat creation have been identified.

5.1.4 All recommendations are appropriate to the geographical area, the habitats in the wider area, the wildlife present in the local area (and likely to use the site post-construction) and take into consideration the end use of the site as a residential development.

5.2 Protection of Vegetation and Wildlife

Protection of Trees, Shrubs and Calcareous Grassland

5.2.1 During the construction phase, temporary protective demarcation fencing will be used to protect the trees, and shrubs to be retained and the area of calcareous grassland located outside the site boundary. The fencing must extend outside the canopy of the retained trees and must remain in position until all areas have been developed to ensure protection is provided throughout the construction phase.

5.2.2 The fencing will be in accordance with BS5837:2012 *Trees in Relation to Design, Demolition and Construction: Recommendations* (BSI, 2012).

5.2.3 It is recommended that, in the long term, the 1m² area supporting Salad Burnet is translocated to the 900m² area of calcareous grassland proposed to the south-west of the site in order that it forms part of a wider coherent habitat unit and does not degrade through lack of regular management to (for example) Bramble scrub. This should be undertaken once the soils for the compensatory area have been fully prepared in accordance with Table 5.1 of *2019-133b Land off Chatburn Old road, Chatburn Lancashire BB7 4AB: Calcareous Grassland Establishment and Management Plan* (ERAP (Consultant Ecologists) Ltd, 2019).

5.2.4 The turf supporting the Salad Burnet and all adjacent plants should be carefully excavated by hand to a depth of at least 0.3 metres (or to the depth of the soils above the bedrock) and moved directly to the calcareous grassland area. If the area cannot form turfs, the top soil will be scraped off (including roots and vegetation) and transported directly to the receptor site. The soil will be re-spread to the same depth and extent as the donor site.

5.2.5 The translocation will be undertaken in spring or early autumn, when it is relatively warm and damp. The translocation works will avoid periods of heavy rain, to avoid waterlogged conditions or cold weather when the soil may be frozen.

Protection of Bats

Lighting

5.2.6 Paragraph 185(c) in Chapter 15 (conserving and enhancing the natural environment) of the NPPF states that development should:

'limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.'

- 5.2.7 The lighting scheme to be implemented at the developed site must involve the use of appropriate products and screening, where necessary, to ensure no excessive artificial lighting shines over the retained trees, woodland to the south and north of the site, areas of ecological enhancement and any landscape planting, as lighting overspill may deter use by wildlife such as foraging bats.
- 5.2.8 The lighting scheme will be designed with reference to current guidance, namely:
- Guidance Note 8: Bats and Artificial Lighting in the UK* (Institution of Lighting Professionals & Bat Conservation Trust, 2018); and
 - Bats and lighting: Overview of current evidence and mitigation guidance* (Stone, 2014).

Reasonable Avoidance Measures to be Observed During Any Works to Trees Overhanging the Site

- 5.2.9 It is recommended that the following measures are adopted if the proposed development requires any works to the Ivy-clad trees overhanging the site. In accordance with *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)* (Collins, J. (ed), 2016) it is essential that the following actions are applied during any works to the trees listed below:
- The optimal time for tree removal is between September and late February inclusive;
 - Overhanging limbs must be section / soft felled under the supervision of a licensed bat surveyor, with Ivy removed first prior to the removal of any limb;
 - The sectioning must avoid cutting through or close to any cavities. This is likely to involve climbing the tree;
 - Cut sections will be lowered to the ground with the use of ropes;
 - Once on the ground the limb will be inspected by the licensed bat surveyor and guidance issued; and,
 - All felled sections will be left to lie on the ground for 24 hours before snedding (removing side branches).
- 5.2.10 If at any time during the works a bat is discovered or suspected all contractors must withdraw from the area and ERAP Ltd (01772 750502) or Natural England must be contacted for further guidance.
- 5.2.11 Further survey will be required if any works are proposed to the trees within the site.

Protection of Birds During Works

- 5.2.12 All wild birds are protected under the *Wildlife and Countryside Act 1981* (as amended) while they are breeding. It is advised that any works such as vegetation clearance that will affect habitats suitable for use by nesting birds are scheduled to commence outside the bird nesting season. Commencement of works in the nesting season must be informed by a pre-works nesting bird survey, carried out by a suitably experienced ecologist. The bird breeding season typically extends between March to August inclusive (Natural England, 2015).
- 5.2.13 If breeding birds are detected the ecologist will issue guidance in relation to the protection of the nesting birds in conjunction with the scheduled works. This may involve cordoning off an area of the site until the young birds have fledged.

Protection of Other Wildlife During Works

- 5.2.14 It is recommended that the following Reasonable Avoidance Measures (RAMs) are adopted during the construction phase of the proposed development:
- All site personnel must be made aware of this RAMs;

- b. Prior to any soil strip, vegetation will be strimmed to a height of no less than 0.15 metre and all arising removed;
- c. During construction, any holes, trenches or other pits which wildlife could fall into will be covered overnight, or have sloped banks or ramps top allow escape;
- d. All pipes will be covered overnight to prevent access by wildlife (such as badger);
- e. The use of chemicals (such as fertilisers and herbicides) harmful to amphibians should be avoided wherever possible; and
- f. If any wildlife species is detected within the site (such as a hedgehog or common toad), it must be carefully picked up, placed in a clean bucket and moved to an area of suitable habitat beyond the development area.

5.3 Enhancements for Wildlife to Include within the Proposed Development

Enhancing Habitats for Roosting Bats

- 5.3.1 It is recommended that the development incorporates the installation of three bat access panels at the new buildings.
- 5.3.2 The bat access panels should be sited at least four metres above ground level, ideally facing or close to areas of landscape planting or existing linear features. The access panels should not be positioned over windows or doorways where bat droppings may become a nuisance. Once the development layout has been finalised, an ecologist should advise on appropriate positions for the bat access panels. Suitable bat access panels are available from NHBS Ecology (www.nhbs.com) or Wild Care (www.wildcare.co.uk) and are presented at **Insert 1**, below:



Insert 1: Examples of integrated bat access panels and an externally mounted box⁵

- 5.3.3 It is recommended that 2 bat boxes are erected onto suitable retained mature trees within the site. An ecologist will advise on the siting of the bat boxes whilst on site. Note that the boxes illustrated above and below are suggested models only; other makes of bat box will be considered appropriate provided they are suitably designed and intended to provide long-lasting features for roosting bats.
- 5.3.4 Suitable bat boxes are the Schwegler 1FF, Greenwood Ecohabitat's single or double cavity boxes and Schwegler 1FD, see **Insert 2**, below. Other long-lasting boxes of similar design will also be suitable to provide enhancements at the site.

⁵ Left to right: IBstock Enclosed Bat Box 'c' (left); Habitat Bat Access Panels (centre left and centre right) and Greenwood's Ecohabitat's two crevice bat box (right). Products with a brick face are illustrated, however the Habitat bat access panels can be supplied unfaced to enable the addition of matching material.



Insert 2: Schwegler 1FF, Greenwood Ecohabitat’s single cavity and Schwegler 1FD bat boxes

5.3.5 Bat boxes should be installed to the following guidelines (Bat Conservation Trust, 2016):

- a. At least 4 metres above the ground (where safe installation is possible);
- b. Sheltered from strong winds and exposed to the sun for part of the day (usually south or south-west);
- c. Located close to unlit linear features, such as lines of trees or hedgerows; and
- d. Installed where the bat box entrance is not cluttered or impeded by branches, or accessible to predators (such as cats) by large branches underneath them.

Enhancing Habitats for Nesting Birds

House Sparrow

5.3.6 House sparrows are associated with suburban areas. Monitoring suggests a severe decline in the UK house sparrow population, estimated as halving in rural areas, and dropping by 60% in towns and cities since the mid-1970’s (RSPB, 2018).

5.3.7 The installation of 2 house sparrow terrace nest boxes is recommended at the proposed new housing. The boxes will not be positioned over windows or doorways where droppings may become a nuisance. RSPB advice states that boxes should ideally be sited facing north to east, to avoid exposure to direct sunlight, which may cause overheating of chicks in the nest. An example of a suitable house sparrow bird box is given below at **Insert 3**:



Insert 3: Schwegler 1SP House Sparrow Nesting Terrace

5.3.8 Such bird boxes are available from the NHBS (www.nhbs.com) or Wild Care (www.wildcare.co.uk). ERAP (Consultant Ecologists) Ltd will advise on the siting of bird boxes.

5.3.9 Note that the box illustrated is a suggested model only; other makes of house sparrow terrace will be considered appropriate provided they are suitably designed and intended to provide long-lasting features for nesting birds.

Swift

- 5.3.10 The swift (*Apus apus*) has recently been added to The Birds of Conservation Concern Red list (Stanbury, et al., 2021) owing to the recorded recent declines and its identified status as a high conservation priority.
- 5.3.11 The construction of the residential properties provides an opportunity for the installation of two additional nesting opportunities for swift to assist their conservation. Suitable swift nest boxes are illustrated at **Insert 4** below.



Insert 4: Examples of swift nest boxes⁶

Maintenance of Habitat Connectivity Throughout the Developed Site

- 5.3.12 To ensure habitat connectivity is maintained as part of the development proposals, gaps within the proposed fencing (see **Insert 5**, below, as reproduced from *Hedgehogs and Development* (British Hedgehog Preservation Society / PTES, 2019)) to allow access by other wildlife (including hedgehog) should be incorporated across the site. It is recommended that suitable wildlife gaps (at least 0.1 metre tall and 0.15 metre wide) are installed at suitable intervals around the base of the proposed fencing.



Insert 5: Showing wildlife access gap within fencing

5.4 Landscape Planting

- 5.4.1 It is recommended that the landscape planting within the residential site is composed from native species and species known to be of value for the attraction of wildlife.
- 5.4.2 It is recommended that trees which support blossom and fruit which will attract insects are incorporated into the landscape planting. Suitable species are presented at **Table 5.1**, below.

⁶ From left to right No. 17A Schwegler Swift Nest Box (Triple Cavity) as installation (left), Manthorpe Swift Nesting Box (centre) and Ibstock Eco-habitat for Swift (right), all available from www.NHBS.com

Table 5.1: Suitable Native Species for Tree and Shrub Planting

Scientific Name	Common Name	Scientific Name	Common Name
<i>Acer campestre</i>	Field Maple	<i>Prunus spinosa</i>	Blackthorn
<i>Corylus avellana</i>	Hazel	<i>Rosa arvensis</i>	Field Rose
<i>Crataegus monogyna</i>	Hawthorn	<i>Rosa canina</i>	Dog-rose
<i>Ilex aquifolium</i>	Holly	<i>Sambucus nigra</i>	Elder
<i>Malus sylvestris</i>	Crab Apple	<i>Sorbus aucuparia</i>	Rowan
<i>Prunus avium</i>	Wild Cherry	<i>Ulmus glabra</i>	Wych Elm
<i>Prunus padus</i>	Bird Cherry	<i>Viburnum opulus</i>	Guelder Rose

- 5.4.3 The understorey and ground cover planting design should be prepared to optimise the attraction of invertebrates such as feeding bumblebees and butterflies. Where possible the use of native species should be maximised but where necessary non-native species known to be attractive to invertebrates should be used.
- 5.4.4 Planting schemes that include flowering species such as *Viburnum*, *Ceanothus*, *Hebe*, *Lavandula*, *Lonicera*, *Potentilla*, *Rosmarinus* and *Vinca* can maximise opportunities for feeding invertebrates and for the attraction of foraging bats and birds.
- 5.4.5 For further plants suitable for the attraction of pollinators please refer to the *Perfect for Pollinators Plant List* (Royal Horticultural Society, 2012). It is recommended that the selection of plant species at the site ensures that a variety of flowering species are available throughout the year.

6.0 CONCLUSION

- 6.1 This ecological assessment has demonstrated that a residential development at the site is feasible and acceptable in accordance with ecological considerations and the National Planning Policy Framework.
- 6.2 It is possible to implement reasonable actions for the protection and long-term conservation of fauna such as nesting birds and commuting / foraging bats associated with the site.
- 6.3 Measures to conserve the habitat connectivity through the site are entirely feasible.
- 6.4 Development at the site will provide an opportunity to secure ecological enhancement for fauna typically associated with residential areas such as breeding birds and roosting bats.

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8.0 APPENDIX: TABLES, PHOTOGRAPHS AND FIGURES

8.1 Plant Species Lists

Table 8.1: Plant Species List for Grassland

Scientific Name	Common Name	DAFOR ¹	% Cover
Woody Species			
<i>Crataegus monogyna</i>	Hawthorn	VLF	1%
<i>Fagus sylvatica</i>	Beech	LA	<1%
<i>Fraxinus excelsior</i>	Ash	R	<1%
<i>Ilex aquifolium</i>	Holly	R	<1%
<i>Rosa canina</i>	Dog-rose	R	<1%
<i>Tilia</i> sp.	Lime species	LA	<1%
Herb Species			
<i>Agrostis capillaris</i>	Common Bent	O	<1%
<i>Agrostis stolonifera</i>	Creeping Bent	O/LF	<1%
<i>Alopecurus pratensis</i>	Meadow Foxtail	O	<1%
<i>Arrhenatherum elatius</i>	False Oat-grass	O/LF	10%
<i>Brassica napus</i>	Rape	R	<1%
<i>Cirsium arvense</i>	Creeping Thistle	O/MLF	<1%
<i>Cirsium vulgare</i>	Spear Thistle	O	<1%
<i>Dactylis glomerata</i>	Cock's-foot	F/LA*	40%
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	O	<1%
<i>Dryopteris dilatata</i>	Broad Buckler-fern	R	<1%
<i>Festuca rubra</i>	Red Fescue	O/LF	5%
<i>Geranium robertianum</i>	Herb-Robert	R	<1%
<i>Geum urbanum</i>	Wood Avens	R	<1%
<i>Hedera helix</i>	Ivy	R	<1%
<i>Heracleum sphondylium</i>	Hogweed	O/LF	<1%
<i>Holcus lanatus</i>	Yorkshire-fog	F/LA*	40%
<i>Juncus effusus</i>	Soft-rush	O	<1%
<i>Juncus inflexus</i>	Hard Rush	VLF	<1%
<i>Lolium perenne</i>	Perennial Rye-grass	O/LF	20%
<i>Phalaris arundinacea</i>	Reed Canary-grass	R	<1%
<i>Phleum pratense</i>	Timothy	O/LF	5%
<i>Plantago lanceolata</i>	Ribwort Plantain	VLF	<1%
<i>Ranunculus repens</i>	Creeping Buttercup	O/LF	10%
<i>Rumex acetosa</i>	Common Sorrel	O	<1%
<i>Rumex obtusifolius</i>	Broad-leaved Dock	O	<1%
<i>Senecio jacobaea</i>	Common Ragwort	O	<1%
<i>Taraxacum officinale</i> agg.	Dandelion	O/LF	<1%
<i>Tussilago farfara</i>	Colt's-foot	R	<1%
<i>Urtica dioica</i>	Common Nettle	LF	10%
<i>Vicia sativa</i>	Common Vetch	O	<1%

¹**Key to DAFOR:** D=Dominant, A=Abundant, F=Frequent, O=Occasional, R=Rare, V=Very, L=Local and *denotes a constant species

Table 8.2: Plant Species List for Footpath Verge

Scientific Name	Common Name	DAFOR ¹	% Cover
Woody Species			
<i>Acer campestre</i>	Field Maple	O	5%
<i>Alnus glutinosa</i>	Alder	O	5%
<i>Betula pendula</i>	Silver Birch	VLF	<1%
<i>Buddleja davidii</i>	Butterfly-bush	O/LF	1%
<i>Crataegus monogyna</i>	Hawthorn	LF	5%
<i>Lonicera periclymenum</i>	Honeysuckle	O/LF	5%
<i>Malus sylvestris</i>	Crab Apple	R	<1%
<i>Prunus</i> sp.	Cherry species	O	<1%
<i>Prunus spinosa</i>	Blackthorn	O/LF	10%

Scientific Name	Common Name	DAFOR ¹	% Cover
<i>Rosa canina</i>	Dog-rose	O/LF	5%
Herb Species			
<i>Aphanes arvensis</i>	Parsley-piert	R	<1%
<i>Arrhenatherum elatius</i>	False Oat-grass	O	<1%
<i>Artemisia vulgaris</i>	Mugwort	O/LF	5%
<i>Brassica napus</i>	Rape	R	<1%
<i>Cardamine flexuosa</i>	Wavy Bitter-cress	O	<1%
<i>Carex hirta</i>	Hairy Sedge	R	<1%
<i>Chamerion angustifolium</i>	Rosebay Willowherb	R	<1%
<i>Cirsium arvense</i>	Creeping Thistle	O/LF	<1%
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	O/LF	<1%
<i>Dipsacus fullonum</i>	Wild Teasel	R	<1%
<i>Epilobium hirsutum</i>	Great Willowherb	O	<1%
<i>Holcus lanatus</i>	Yorkshire-fog	O/LF	10%
<i>Juncus effusus</i>	Soft-rush	O	<1%
<i>Lolium perenne</i>	Perennial Rye-grass	O/LF	10%
<i>Melilotus officinalis</i>	Ribbed Melilot	VLF	<1%
<i>Phalaris arundinacea</i>	Reed Canary-grass	O	<1%
<i>Plantago lanceolata</i>	Ribwort Plantain	R	<1%
<i>Plantago major</i>	Greater Plantain	R	<1%
<i>Poa annua</i>	Annual Meadow-grass	LF	<1%
<i>Ranunculus repens</i>	Creeping Buttercup	O/LF	10%
<i>Rubus fruticosus</i> agg.	Bramble	VLF	<1%
<i>Rumex acetosa</i>	Common Sorrel	O	<1%
<i>Rumex obtusifolius</i>	Broad-leaved Dock	O	<1%
<i>Sisymbrium officinale</i>	Hedge Mustard	LF	<1%
<i>Sonchus oleraceus</i>	Smooth Sow-thistle	VLF	<1%
<i>Tussilago farfara</i>	Colt's-foot	VLF	<1%
<i>Urtica dioica</i>	Common Nettle	O/LF	<1%
<i>Vicia cracca</i>	Tufted Vetch	R	<1%

¹**Key to DAFOR:** D=Dominant, A=Abundant, F=Frequent, O=Occasional, R=Rare, V=Very, L=Local and *denotes a constant species

Table 8.3: Plant Species List for Bare Ground with Colonising Vegetation

Scientific Name	Common Name	DAFOR ¹	% Cover
<i>Agrostis stolonifera</i>	Creeping Bent	LF	5%
<i>Brassica napus</i>	Rape	R	<1%
<i>Cerastium fontanum</i>	Common Mouse-ear	LF	<1%
<i>Cirsium arvense</i>	Creeping Thistle	R	<1%
<i>Cirsium vulgare</i>	Spear Thistle	O/LF	<1%
<i>Epilobium hirsutum</i>	Great Willowherb	O	<1%
<i>Epilobium montanum</i>	Broad-leaved Willowherb	O	<1%
<i>Holcus lanatus</i>	Yorkshire-fog	LF	<1%
<i>Lolium perenne</i>	Perennial Rye-grass	O/LF	5%
<i>Phleum pratense</i>	Timothy	R	<1%
<i>Ranunculus repens</i>	Creeping Buttercup	O/LF	<1%
<i>Rumex obtusifolius</i>	Broad-leaved Dock	O	<1%
<i>Senecio jacobaea</i>	Common Ragwort	O	<1%
<i>Senecio vulgaris</i>	Groundsel	R	<1%
<i>Sonchus oleraceus</i>	Smooth Sow-thistle	LF	<1%
<i>Tripleurospermum inodorum</i>	Scentless Mayweed	R	<1%
<i>Urtica dioica</i>	Common Nettle	LF	5%
<i>Veronica chamaedrys</i>	Germander Speedwell	R	<1%

¹**Key to DAFOR:** D=Dominant, A=Abundant, F=Frequent, O=Occasional, R=Rare, V=Very, L=Local and *denotes a constant species

8.2 Photographs



Photo 1: Grassland within site



Photo 2: Grassland within site



Photo 3: Grassland within site



Photo 4: Footpath with vegetation on verge



Photo 5: Footpath with vegetation on verge



Photo 6: Bare ground with colonising vegetation



Photo 7: Mature trees at eastern end of the site



Photo 8: Weld at Fagsyl1



Photo 9: Knot-hole at Tilsp1



Photo 10: Dense Ivy on mature tree overhanging the site at its south-western boundary



Photo 11: Pond 1

8.3 Figures

Figure 1: Aerial Image of the Site and its Surroundings

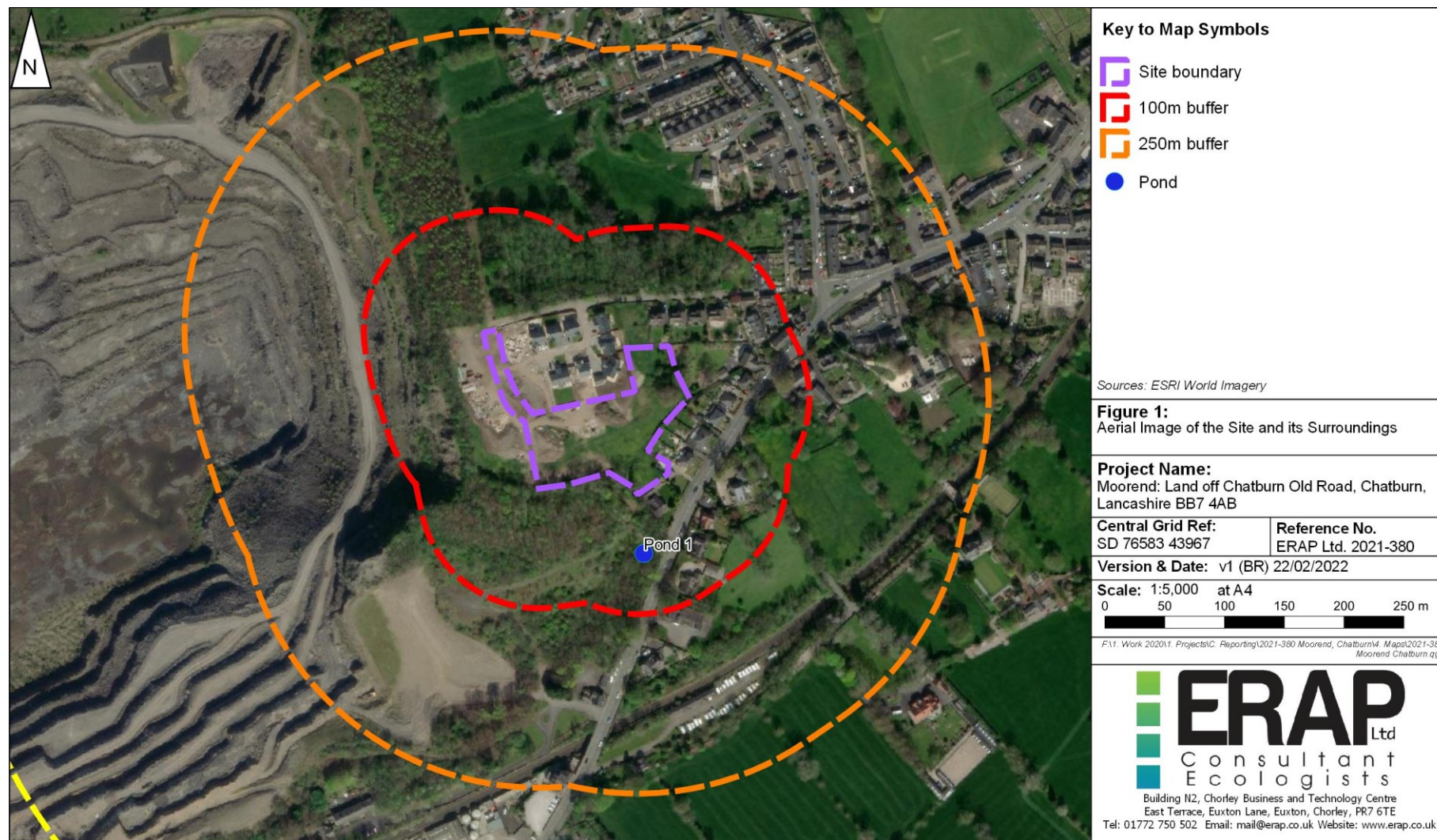


Figure 2: Phase 1 Habitat and Vegetation Map

