7. Ecology and Nature Conservation

Introduction

7.1 This chapter assesses the effects of the Proposed Development on ecology and nature conservation. In particular it considers effects that may arise as a result of the Proposed Development on ecological features. This assessment is based upon the development as proposed in the Parameters Plans (Chapter 5: The Proposed Development, **Figures 5.1** to **Figure 5.6**).

7.2 Within this chapter "the Site" refers to land that falls within the application boundaries A and B as identified in the Site Location Plans (Chapter 5: The Proposed Development, **Figure 1.1** and **Figure 1.2**).

7.3 The chapter describes the methods used to assess the likely significant effects, the baseline conditions currently existing at the Site and surroundings, the potential direct and indirect effects of the development arising from site clearance, construction and occupation of the Site, the mitigation measures required to prevent, reduce, or offset the identified significant effects and the residual effects. It has been written by TEP.

Planning Policy Context

National Planning Policy

National Planning Policy Framework

7.4 The National Planning Policy Framework (NPPF) (Ref 7-1) identifies the importance the Government places on development enhancing the natural environment by protecting and enhancing valued landscapes, geological conservation interests and soils. It recognises the wider benefits of ecosystems beyond their inherent value to wildlife. The NPPF emphasises the hierarchy of designations, the mitigation hierarchy and the principle that new development should result in net gain for biodiversity.

Any Other Relevant National Planning or Development Strategies

7.5 Other national policy which supports the NPPF include: Circular 06/2005: Biodiversity and Geological Conservation (Ref 7-2); Making Space for Nature (Ref 7-3); The Natural Environment White Paper (Ref 7-4) and Biodiversity 2020: A strategy for England's wildlife and ecosystem services (Ref 7-5).

Local Planning Policy

Central Lancashire Core Strategy (adopted in July 2012)

7.6 The Proposed Development should conserve, protect and seek opportunities to enhance and manage the biological assets of the area in line with Policy 22 Biodiversity and Geodiversity of the Core Strategy (Ref 7-6).

Adopted South Ribble Local Plan (adopted in July 2015)

7.7 The following policies within the Local Plan (Ref 7-7) are relevant to the Proposed Development:

- Policy G8 – Green Infrastructure and Networks – Future Provision;
- Policy G13 – Trees, Woodlands and Development;
- Policy G16 – Biodiversity and Nature Conservation; and
- Policy G17 – Design Criteria for New Development.

Penwortham Town Neighbourhood Development Plan 2016 – 2026

7.8 The Neighbourhood Development Plan (Ref 7-8) will only support developments that conform to the environmental policy in the Local Plan, G16 Biodiversity and Nature Conservation and Core Strategy Policy 22.

Other Relevant Policy, Standards and Guidance

7.9 Other national policy and legislation which may be relevant to the Proposed Development include:

- A Green Future: Our 25 Year Plan to Improve the Environment (Ref 7-9);
- Policy Paper: Nature for people, climate and wildlife – includes England Trees Action Plan (Ref 7-10);
- The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (Ref 7-11);
- Wildlife and Countryside Act 1981 (as amended) (WCA) (Ref 7-12);
- Natural Environment and Rural Communities Act 2006 (NERC) (Ref 7-13);
- Hedgerow Regulations 1997 (Ref 7-14); and
- Protection of Badgers Act 1992 (Ref 7-15).

7.10 Additional guidance on habitats and species to be considered within the assessment is provided by:

- Lancashire Biodiversity Action Plan (Ref 7-16) which is delivered through the Lancashire Biodiversity Partnership. This focuses on aspects of the local ecology which are in need of protection or conservation.
- The Birds of Conservation Concern (BoCC) (Ref 7-17) report splits UK birds into three categories of conservation importance – red, amber and green. Red is the highest conservation priority, and includes species that are globally threatened, or have experienced historical UK population decline, a severe decline in UK breeding population, or a severe contraction of UK breeding range. Amber is the next most critical group, followed by green.

Assessment Methodology and Significance Criteria

7.11 The ecological assessment has been carried out with due consideration for the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment (EcIA) (Ref 7-18). The guidelines

provide a robust framework for EcIA, which is then informed by the interpretation of contextual information and professional judgement.

Baseline Surveys

7.12 The following baseline ecology surveys were undertaken on land under the control of the Applicants as well as third party owned land to establish the existing ecological features on the Site.

Desktop Study

7.13 A search of existing information relating to protected species, habitats of conservation priority and designated sites was undertaken in 2019. Sources included Lancashire Environment Records Network, Natural England and MAGIC Map websites. The search extended 2km from the Site boundary for non-statutory designated sites, protected species and priority species and habitats. Information regarding statutory protected sites within the wider area (up to 10km) was also collected. Relevant local planning policies were also identified to inform the assessment.

7.14 The full methodology for the desk-based ecology assessment (DBA) is included within the technical report in **Appendix 7.1**.

Limitations

7.15 No limitations were encountered during the DBA.

Extended Phase 1 Habitat Survey

7.16 An extended Phase 1 habitat survey of the Site was carried out by TEP botanists in April and May 2018. This was updated in April 2021, this was a walkover update to ensure the baseline conditions had not changed since the original assessment, along with additional parcels of land which were now accessible. The 2018 and 2021 surveys were carried out in accordance with the Phase 1 habitat assessment method (Ref 7-19) and Guidelines for Preliminary Ecological Appraisal (Ref 7-20). The method records the habitat types present in and immediately surrounding the Site, based on the descriptions within the Phase 1 habitat assessment method. Plant species were identified in accordance with Stace (Ref 7-21) and recorded as target notes using the DAFOR (Dominant, Abundant, Frequent, Occasional, Rare) scale of abundance.

7.17 The 2018 and 2021 site surveys included an extended assessment of the habitats present for their potential to support species of conservation concern, particularly statutorily protected species or species listed under S41. Any signs indicating the presence of these species were recorded.

7.18 The full methodology for the extended Phase 1 habitat survey is included within the technical report in **Appendix 7.2**.

Limitations

7.19 The Phase 1 habitat surveys were undertaken during the recommended seasonal window (April to October) and therefore no seasonal constraints were encountered. No limitations were encountered where access was possible, although some small areas remain unsurveyed due to lack of access, predominantly in private landownership and residential gardens. However, a high level assessment of the habitats in unsurveyed areas has been possible from review of aerial imagery and therefore there are no limitations to the overall assessment of habitats within the Site.

Tree Survey

7.20 A survey of trees on the Site was carried out by TEP arboriculturists in May 2018. The survey was by means of inspection from ground level in accordance with BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations (Ref 7-22). The Standard provides a categorisation method to "*identify the quality and value (in a non-fiscal sense) of the existing tree stock, to allow informed decisions to be made concerning which trees should be removed or retained in the event of development occurring*". The method places trees and groups of trees into one of four quality categories and provides guidance on the integration and protection of trees during construction.

7.21 The presence of Tree Preservation Orders, Conservation Areas, Ancient Woodland and Veteran Trees has also been ascertained.

7.22 The full methodology for the arboriculture survey is included within the technical report in **Appendix 7.4**.

Limitations

7.23 Inspection of trees was restricted in some cases by dense vegetation. Therefore a "worst-case scenario" was used for the assessment.

Hedgerow Assessment

7.24 A hedgerow assessment of the Site was carried out by TEP botanists in April and May 2018. Additional parcels of land which were now accessible were surveyed in April 2021. Native hedgerows on site were subject to a detailed sampling survey in accordance with the wildlife and landscape criteria set out in the Hedgerow Regulations for determining "important" hedgerows. This entailed recording the number of woody species (as listed on Schedule 3 of the Hedgerow Regulations) within 30m sample sections as well as any features within 2m associated with the hedge. These features include the presence of any bank or wall, ditch, standard trees and ground flora species (as listed on Schedule 2 of the Hedgerow Regulations). Also, the number of connections with adjacent hedgerows was recorded. Hedgerow target notes were made on standard data recording forms. For each hedgerow this included a description of the hedge and detailed plant species list.

7.25 For clarity, the scope of the survey and assessment focuses on ecology and does not cover the archaeology and history criteria set out in the Hedgerow Regulations nor on landscape value.

7.26 The full methodology for the hedgerow assessment is included within the technical report in **Appendix 7.3**.

Limitations

7.27 The hedgerow assessment was undertaken during the recommended seasonal window (April to May) and therefore no seasonal restrictions were encountered. No limitations were encountered during the survey.

Badger Survey

7.28 A badger *Meles meles* survey of the Site, and surrounding 30m buffer where accessible, was undertaken by TEP ecologists in March 2018. An updated survey was undertaken in July 2019 and April 2021. This survey was undertaken in line with the standard approach detailed in Surveying Badgers (Ref 7-23) and used during the National Badger Survey (Ref 7-24).

7.29 The survey involved surveying potentially suitable habitat and looking for evidence of badger activity such as setts, badger trails/pathways, snuffle holes (or foraging pits), latrines and badger hairs. Any badger setts and associated entrance holes were recorded and assigned a category of badger sett type.

7.30 The full methodology for the badger survey is included within the technical report in **Appendix 7.5.**

Limitations

7.31 Some limitations to access to third party land within the 30m buffer was encountered. These areas were surveyed insofar as was possible from accessible parts of the Site and from the public highway. This, along with the information gathered from the DBA, is considered sufficient to allow a robust assessment of the Proposed Development, using a "worst-case scenario" where appropriate.

Barn Owl Survey

7.32 Five buildings within the Site, which are to be demolished, were externally assessed in late 2018 for suitability as a nesting site for barn owl and, where possible, the interior was viewed through windows and doorways. The interior of one building (Building B2) could also be viewed through a large gap in the brickwork on the east elevation. This survey was updated in 2021 for a total of seven buildings identified for demolition. Field signs for barn owl, if present, were recorded including:

- Droppings - white vertical streaks on roof beams and large white splashes on floors.
- Pellets - Barn owls generally swallow their prey whole and regurgitate the indigestible parts (bones, fur etc.) as pellets. The colour and condition of pellets can give an indication as to when a site was last used by barn owls.
- Feathers - Barn owl nestlings begin their initial moult at 11 months. Adult barn owls tend to shed their primary and secondary wing feathers before and after breeding.
- Nest debris - barn owls do not build nests but nesting areas may contain nestling fluff and pellet debris.

- Potential entrance points - the minimum entrance hole size required for barn owls to gain access to a building is 7 cm x 7 cm.
- Suitable nesting platforms - Barn owls need a level area to lay eggs usually over 3 m in length and over 3 m off the ground. Typical nesting places include tops of walls, between bales and on attic floors.

7.33 The full methodology for the barn owl survey is included within the technical report in **Appendix 7.6**.

Limitations

7.34 No internal access to the buildings was possible during the survey and therefore field signs or suitable nesting platforms may not have been visible from the external vantage points. However, given the construction of the buildings and the absence of potential entrance points, the survey information obtained was considered sufficient to allow a robust assessment of the Proposed Development, using a "worst-case scenario" where appropriate.

Bat Roost Survey - Buildings

7.35 Seven buildings within the Site, which are to be demolished, were assessed in line with the Bat Conservation Trust (BCT) Guidelines (Ref 7-25) for their potential to support roosting bats. The survey was undertaken by TEP bat licensed ecologists in March 2018 and updated in 2021.

7.36 The buildings were subject to a daytime external assessment for bat roost suitability, where accessible, to identify any suitable potential roost features (PRF's) for use by bats such as crevices, cracks, holes and any other potential access points into the structures. PRF's were inspected to assess their suitability for use by bats using a torch and binoculars. Inspection of features included determining presence of any signs of bats roosting within the buildings including; droppings, feeding remains and other indicative marks. The buildings were then categorised in accordance with the criteria set out in the BCT Guidelines.

7.37 The full methodology for the bat roost survey is included within the technical report in **Appendix 7.7** and **Appendix 7.13**.

Limitations

7.38 No internal access to the buildings was possible during the surveys and therefore field signs of roosting bats may have been missed. However, given the construction of the buildings and the absence of potential entrance points, the survey information obtained was considered sufficient to allow a robust assessment of the Proposed Development, using a "worst-case scenario" where appropriate.

Bat Roost Survey – Trees

Ground Based Assessment

7.39 Trees within the Site were assessed in line with the BCT Guidelines for their potential to support roosting bats. The survey was undertaken by licensed bat ecologists in March 2018. A further ground-based assessment of trees in previously unsurveyed areas and of trees identified for felling was undertaken in April 2021.

7.40 The ground-based assessment of the trees involved the surveyor searching from the ground for any PRF's which may be used by bats, using binoculars. The trees were then categorised in accordance with the criteria set out in the BCT Guidelines.

Aerial and back-tracking surveys 2019

7.41 Following the ground-based assessment, trees categorised as moderate or high were subject to aerial inspection. The survey was undertaken by tree climbers and a licensed bat ecologist in July and August 2018. PRF's were searched for evidence and/or suitability for roosting bats with the aid of high-powered torch and endoscope. The trees were then categorised in accordance with the criteria set out in the BCT Guidelines.

7.42 Following the aerial inspection, trees categorised as moderate or high were subject to back tracking surveys. Trees within the Site were grouped into six survey "zones". Zones that contained trees with high suitability were subject to three back tracking surveys. Zones that contained trees with moderate suitability only were subject to two back tracking surveys. The surveys were undertaken in August and September 2018 and were led by bat surveyors and the number of surveyors (one or two per zone) was determined based on the number of trees, size of area and accessibility.

7.43 Surveyors were positioned along potential bat commuting features within each zone and moved in the same direction with an aim to identify bats re-entering roosts at dawn or moved in the opposite direction with an aim to identify bats emerging from roosts at dusk. The back-tracking surveys were carried out in line with the BCT Guidelines. Dusk surveys commenced 15 minutes prior to sunset and finished 90 minutes after sunset. Dawn surveys commenced 90 minutes prior to sunrise and finished 15 minutes after sunrise. Surveyors used heterodyne detectors (Petterson D230) and frequency division (Anabat SD2 and Express) detectors to record bat calls. Sonogram analysis was undertaken by ecologists, trained to Advanced Level 3 Analook Analysis and kaleidoscope.

Limitations

7.44 The backtracking surveys were undertaken during the recommended seasonal window (May to September) and therefore no seasonal restrictions were encountered.

7.45 Aerial tree inspections and nocturnal roost surveys of trees could not be undertaken within one area of the Site ("Zone 2" in the west of the Site, as shown in the technical report in **Appendix 7.7**) due to health and safety concerns relating to cattle. However this assessment has been undertaken based on the worst case following review of the results of the ground level tree inspection and bat activity surveys in the Site and this is considered to be sufficient to allow a robust assessment of the Proposed Development.

Nocturnal Emergence/ Re-entry Surveys of Buildings and Trees 2021

7.46 Eight trees with moderate or high roost habitat suitability were identified which will be lost as a result of the development proposals for the Site. Of the seven buildings identified for demolition, one with high roost suitability was identified.

7.47 These trees and the building have been subject to nocturnal roost surveys undertaken within the appropriate season (May to September inclusive) in 2021. Dusk surveys commenced 15 minutes prior to sunset and finished 90 minutes after sunset. Dawn surveys commenced 90 minutes prior to sunrise and finished 15 minutes after sunrise. Surveyors used heterodyne detectors (Petterson D230) and frequency division (Anabat SD2 and Express) detectors to record bat calls. Sonogram analysis was undertaken by ecologists, trained to Advanced Level 3 Analook Analysis and kaleidoscope.

7.48 The full methodology for the nocturnal emergence/ re-entry surveys is included within the technical report in **Appendix 7.7** and **Appendix 7.13**.

Limitations

7.49 The nocturnal emergence/re-entry surveys were undertaken during the recommended seasonal window (May to September) and therefore no seasonal restrictions were encountered.

Bat Activity Survey

7.50 Five bat activity surveys were carried out at the Site between August 2017 and June 2018, in accordance with BCT guidance. Two pre-determined transect routes, to cover all features likely to be of value to foraging and commuting bats, were surveyed to sample bat activity during the peak active season.

7.51 A pair of bat surveyors walked each transect route using heterodyne (Pettersson D230) and frequency division (Anabat) detectors. The surveys commenced at sunset and continued for at least 120 minutes after sunset. Number of bat passes, species, behaviour and flight direction were noted at each pre-determined four-minute stop and the intervening walks. Standardised methods of measuring and recording weather parameters were used e.g. cloud cover (oktas) and wind (Beaufort scale).

7.52 To accompany the transect surveys, static monitoring was undertaken. Eight Anabat Express and SM2 static detectors were placed close to features of valuable foraging/commuting habitat within the Site and were set to record for five consecutive nights during favourable weather conditions to monitor bat activity.

7.53 Recorded sonograms were analysed using Analook W4.2d software by bat ecologists trained to Analook Analysis Advanced Level 3 and kaleidoscope.

7.54 The full methodology for the bat activity survey is included within the technical report in **Appendix 7.8**.

Limitations

7.55 Some species, such a brown long-eared bat *Plecotus auritus* can be relatively difficult to detect due to the low amplitude (i.e. quiet) calls. Presence of brown long-eared was recorded on site but the activity of this species may be underestimated. The conclusions and interpretation in this report takes this into consideration.

7.56 Bats vary their calls dependent on the habitats they fly in and on their activity (commuting, foraging, social interaction, etc). It is not always possible to identify bat calls to species level owing to the overlap of call parameters between some species and/or poor-quality recordings (e.g. brief and distant passes). In these cases, it is accepted that species are identified to genus level or group level (e.g. *Myotis*, *Myotis/Plecotus* and *Nyctalus/Eptesicus*) (Ref 7-26). Where call parameters are inconclusive the species has been labelled as 'unknown'. This ensures the dataset is interpreted accurately and transparently.

7.57 The bat activity surveys were undertaken during the recommended seasonal window (April to October) and therefore no seasonal constraints were encountered.

7.58 Some limitations with regard to sub-optimal weather conditions (i.e. precipitation) and survey equipment malfunction were encountered during the surveys. However, given the overall level of survey effort these were not considered to be significant constraints.

Breeding Bird Survey

7.59 A breeding bird survey (BBS) was carried out of the Site, using methods based on the standard breeding bird survey and common bird census methods developed by the British Trust for Ornithology (BTO) (Ref 7-27).

7.60 Three survey visits were carried out in the morning period, starting at least half an hour after dawn. Each survey visit was carried out approximately 4 weeks apart, over the period April to June 2018, by TEP ornithologists. Bird species and activity patterns were recorded and mapped using standard BTO symbology. Three survey visits were undertaken using pre-determined transect routes to cover the entire site. Bird species within the 100m surrounding the Site boundary were also recorded during the survey, as a proportion of the bird's foraging or nesting habitat is likely to be within the Site.

7.61 The full methodology for the BBS is included within the technical report in **Appendix 7.9**.

Limitations

7.62 The BBS was undertaken during the recommended seasonal window (April to June) and therefore no seasonal restrictions were encountered. No limitations were encountered during the survey.

Wintering Bird Survey

7.63 A winter bird survey, comprising nine visits between September 2017 and February 2018, was undertaken at the Site. October to March forms the winter period where species of potential interest for this site associated with nearby European protected sites (e.g. Ribble and Alt Estuaries Special Protection Area (SPA)/ Ramsar and Martin Mere SPA/ Ramsar located 6.79km west and 15km south west of the Site respectively) are present in significant numbers in the wider area. The bird migration season also includes September and April.

7.64 During each survey visit a transect route was walked throughout the Proposed Development site and surrounding area (up to 500m away). The transect surveys lasted for between four and six hours. The surveys were undertaken by TEP ornithologists.

7.65 Birds recorded during the transect survey included: all wader, wildfowl and raptor species; BoCC Amber or Red List species; priority species listed under Section 41 of the NERC Act; and protected species listed on Schedule 1 of the WCA. Observations were recorded directly onto the survey map.

7.66 The full methodology for the wintering bird survey is included within the technical report in **Appendix 7.10**.

Limitations

7.67 The wintering bird surveys were undertaken during the recommended seasonal window (September to March) and therefore no seasonal constraints were encountered. No limitations were encountered during the survey.

Great Crested Newt Survey

7.68 Ponds were identified to lie within 500m of the Site during a review of aerial and OS imagery. Ponds which were found to hold water, where access was granted, were subject to environment DNA (eDNA) sampling to determine the presence or absence of great crested newts *Triturus cristatus* (GCN). eDNA sampling was undertaken by licensed surveyors in June 2017 and in June 2019 in line with the guidance outlined below.

7.69 On 28th March 2014, DEFRA published a report (Ref 7-28) into the effectiveness of environmental DNA testing to detect GCN presence from samples of pond water. Shortly after publication of this report, Natural England European protected species (EPS) licensing department confirmed that they would accept quantitative Polymerase Chain Reaction (qPCR) analysis of eDNA from water samples as proof of presence or absence of GCN in a pond. Natural England also stated that sampling must take place between the 15th April and the 30th June and be undertaken by a licensed GCN surveyor.

7.70 The full methodology for the great crested newt survey is included within the technical report in **Appendix 7.11**.

Limitations

7.71 The eDNA surveys were undertaken during the recommended seasonal window (mid-April to June) and therefore no seasonal constraints were encountered. Access was not granted to one pond (Pond P3) which lies outside the Site and is under third party ownership. It is understood, from liaison with the landowner, that amphibian surveys have been completed of the pond in connection with another planning application, but the survey information was not publicly available at the time of producing this assessment. The pond was not visible from adjacent land and therefore an assessment of its suitability for great crested newts could not be made. However, given the confirmed absence of great crested newts in the surrounding ponds (as detailed later in this Chapter) and the lack of records in the DBA it has been concluded that great crested newts are unlikely to be present within Pond P3. Existing survey

information will be reviewed if it becomes publicly accessible, and surveys of this pond will be undertaken at a later date if access becomes available to inform future reserved matters applications for the Site.

Water Vole Survey

7.72 Ditches and watercourses were identified within the Site, during a review of aerial and OS imagery. A water vole *Arvicola amphibius* survey of these ditches and of the small onsite stream, was undertaken by TEP ecologists in July 2017 and in July 2019. This survey was undertaken in line with the current guidelines for water vole surveys taken from The Water Vole Mitigation Handbook (Ref 7-29).

7.73 The survey involved identifying potentially suitable ditches and searching their banks from within the channel, looking for evidence of water vole activity such as burrows, runs, tracks, latrines and feeding remains.

7.74 The full methodology for the water vole survey is included within the technical report in **Appendix 7.12**.

Limitations

7.75 The water vole surveys were undertaken during the recommended seasonal window (April to October) and therefore no seasonal constraints were encountered. Typically, two survey visits would be undertaken; however, given that the majority of the ditches were found to be dry and the only wet ditch was isolated from connecting habitat a second survey visit was considered unnecessary.

Sensitivity, Value or Importance

7.76 CIEEM EcIA guidance confirms that detailed assessment of ecological features that are 'widespread, unthreatened and resilient to project impacts' is not necessary. It is therefore necessary to determine which ecological features are sufficiently important (and potentially affected by the Proposed Development). Decisions on relative importance consider quality, extent, rarity (including local rarity) and threats or declines of a feature. Relevant statutory and non-statutory designations, legislation and policies are taken account of, although not all populations of legally protected species show the same rarity or distribution, so contextual information is presented where relevant (for example, while great crested newts are afforded statutory protection at a European level, a small population situated within an optimal geographic location is unlikely to be of ecological value at a European level). Importance could also relate to the supportive function of the ecological feature (i.e. providing a buffer, connections or opportunities for expansion or climate change resilience of a neighbouring feature).

7.77 The importance of an ecological feature is identified within a defined geographical context and the scales relevant to the Proposed Development and its ecological features are presented in Table 7.1. These criteria provide a framework for the assessment but specific site conditions, together with information on the local and wider context, may result in different criteria being applied.

Table 7.1: Geographic Context of Important Ecological Features

Geographic Context	Criteria
International and European	Designated or proposed/candidate Special Areas for Conservation (SAC) and Special Protection Areas (SPA) (now known as National Site Network sites) and Ramsar Sites and their qualifying features, some of which may depend on land outside the designation boundaries. Candidate or proposed designations are treated as of equal value to fully designated sites. Species populations or habitat areas (such as those listed in Annex I, II or IV of the Habitats Directive (Council Directive 92/43/EEC) (Ref 7-30) or Annex I of the Birds Directive (Directive 2009/147/EC) (Ref 7-31)) of international importance due to relative size, rarity or quality of the feature.
National	Designated or proposed Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Marine Nature Reserves (MNR) and their qualifying features, some of which may depend on land outside the designation boundaries. A viable area of ancient woodland. Species populations or habitat areas (including legally protected or NERC Section 41 (S41) species or habitats) of national importance due to relative size, rarity or quality of the feature.
County	Designated or proposed Biological Heritage Sites (BHS) and their qualifying features where they occur within the designation boundaries. 'Important' hedgerows (as described under the Hedgerows Regulations 1997 where these occur as an extensive network. Species populations or habitat areas (including legally protected or S41) or Nationally Scarce species or habitats of district or county importance due to relative size, rarity or quality of the feature. Sites should comfortably exceed BHS criteria if these exist, but not meet SSSI selection criteria.
Local	Local Nature Reserves (LNR) and unless also designated at a higher level, and other nature conservation designations (under local planning policies). Green infrastructure designations where these contribute to local landscape connectivity and/or buffer other ecological features valued at least this geographic scale. Species populations or habitat areas (including legally protected or S41 species or habitats) of local importance due to relative size or quality. Features that appreciably enrich the local ecological resource, although these may themselves be common and widespread, such as long-established hedgerows, woodlands and ponds.

Characterisation of Impact

7.78 Although not necessary, it is good practice to describe potential impacts without and with mitigation. The Proposed Development may result in multiple potential impacts on an important ecological feature. The CIEEM approach requires that only those that are likely to occur and have significant impacts need be assessed, although a precautionary approach to scoping potential impacts is recommended. The following characteristics are used to describe impacts:

- Positive or negative;
- Extent;
- Magnitude;
- Duration;
- Timing;
- Frequency; and

- Reversibility.

Significance Criteria

7.79 Once an impact has been characterised it is necessary to determine if the effect is 'significant'. In the context of the CIEEM approach, a significant effect is one that either 'supports or undermines biodiversity conservation objectives for 'important ecological features'. This can include impacts on the structure and function of sites and habitats or the conservation status (i.e. the extent, distribution or abundance) of habitats and species. The decision on significance is made irrespective of the geographical scale at which the ecological feature is valued; if an effect is found not to be significant at the level at which the feature has been valued, it may be significant at a more local level.

7.80 At this stage, to provide continuity with other Chapters, it is proposed to transpose the significance derived following CIEEM guidelines into the more traditional levels of significance seen in EIA based on the character of the remaining effects. Table 7.2 shows how this will be achieved. The traditional description of significance will be shown in brackets after the CIEEM description of significance.

Table 7.2: Transposition of Ecological Impact Significance to Traditional Terminology (Ref 7-32)

Scale of Significance following the CIEEM Guidelines	Equivalent Significance using the Matrix Approach
International or national	Major (adverse or beneficial)
County or other Local Authority-wide area	Moderate (adverse or beneficial)
Local	Minor (adverse or beneficial)
Not significant	Neutral

Assumptions/Limitations

7.81 The assessment is made on the best available data, based on the information that has been gathered from stakeholders, other data sources and the baseline surveys undertaken. Some limitations to the surveys were identified and have been discussed in the relevant sections above and are identified in the relevant sections of **Appendices 7.1 to 7.12**.

Consultation

7.82 A summary of consultation which has been undertaken is included in Table 7.2 below and includes comments received as part of the previous application (now withdrawn) that followed the same site area.

Table 7.3: Consultation

Consultee	Date and Time	Comments	Actions
Greater Manchester Ecology	15 Sept 2020	Comments to South Ribble Council which included the need for additional surveys on land within	Although not forming part of this application, additional surveys of third

Consultee	Date and Time	Comments	Actions
Unit (GMEU)		revised masterplan area; concern over retention of the Traditional Orchard Habitat of Principal Importance (NERC 2006) on Lords Lane and support for 10% biodiversity net gain commitment.	party land were undertaken where access was granted. Lords Lane Orchard is now excluded from the Masterplan area.
	03 March 2021	Phase 1 habitat surveys should include condition assessments in order to be suitable for biodiversity net gain (BNG) assessment. In newly accessed areas, the survey should be extended to include to identify potential for protected/notable and invasive species. Updated surveys only required for: badger; bat roost and barn owl surveys for buildings scheduled to be demolished or impacted; bat roost surveys in trees scheduled to be removed or impacted; native bluebell (*Hyacinthoides non-scripta*); invasive species (INNS). Nesting bird surveys including ground nesting assessment will be required in advance of vegetation clearance. Confirmation was provided that updated surveys for great crested newt, water vole, breeding birds, bat activity and wintering birds were not required. It was agreed that Biodiversity Metric 2.0 would be used for the BNG assessment and a detailed report produced.	Extended Phase 1 habitat survey and condition assessment has been undertaken where new access was confirmed. Updated Phase 1 habitat and condition assessment undertaken over previously surveyed areas and the potential off-site offsetting site. Updated species surveys have been undertaken. With the release of Biodiversity Metric 3.0, this is now the Metric being used for the BNG assessment.

Baseline Conditions

7.83 This section describes the baseline conditions at the Site (and surrounding area as appropriate).

Designated Sites

7.84 The technical report for the DBA is included in **Appendix 7.1**.

7.85 The site lies within the Impact Risk Zone for Ribble Estuary SSSI, which is located approximately 6.79km to the west of the Site and is designated for its coastal habitats and bird assemblages. However, residential development does not fall under a category that would trigger a consultation between the Local Planning Authority (LPA) and Natural England.

7.86 There are seven statutory designated sites within 10km of the Site and these are detailed in Table 7.4 below. These are taken forward for assessment as important ecological features in accordance with the context outlined in Table 7.1 above.

Table 7.4: Statutory designated sites within 10km of the Site

Statutory Site Name	Distance from Site	Reason for Designation
Ribble and Alt Estuaries Ramsar	6.79km west	Ramsar criterion 2: This site supports up to 40% of the Great Britain population of natterjack toads *Bufo calamita*. Ramsar criterion 5: Supports assemblages of international importance for overwintering waterfowl. Ramsar criterion 6: Species/populations of passage and overwintering birds occurring at levels of international importance.
Ribble and Alt Estuaries SPA	6.79km west	The site qualifies under article 4.1 of the Directive (79/409/EEC) as it is used regularly by 1% or more of the Great Britain populations of several wintering and breeding species listed in Annex I. The site qualifies under article 4.2 of the Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical populations of several regularly occurring migratory species (other than those listed in Annex I) and by over 20,000 waterbirds in the non-breeding season.
Ribble Estuary NNR	6.79km west	The Ribble estuary is of international importance for the passage and wintering waterfowl it supports, being a major link in the chain of estuaries down the west coast of Britain used by birds on migration between the breeding grounds in the far north and their wintering grounds further south.
Beeston Brook Pasture SSSI	5.77km east	Beeston Brook Pasture is one of the few remaining unimproved herb-rich pastures present in this part of Lancashire. This vulnerable habitat has become increasingly scarce nationally and has been largely destroyed in Lancashire due to agricultural intensification.
Ribble Estuary SSSI	6.79km west	The Ribble Estuary has extensive intertidal sand-silt flats with one of the largest areas of grazed greenmarsh in Britain and includes small areas of recently reclaimed saltmarsh. The estuary is of international importance for the passage and wintering waterfowl it supports, being a major link in the chain of estuaries down the west coast of Britain used by birds on migration between the breeding grounds in the far north and their wintering grounds further south. The site lies within the impact risk zone for this SSSI; however residential and infrastructure schemes do not fall under criteria which would trigger a requirement for consultation with Natural England.
Red Scar and Tun Brook Woods SSSI	7.41km northeast	Red Scar and Tun Brook Woods constitute one of the largest areas of deciduous woodland in Lancashire and provide a valuable refuge for wildlife close to the urban areas of Preston.
Newton Marsh SSSI	7.5km northwest	Newton Marsh constitutes 162 acres of grazed, improved pasture reclaimed from former saltmarsh but retaining a number of pools and ditches. These features, the relative lack of disturbance, its size and proximity to the Ribble Estuary and

Statutory Site Name	Distance from Site	Reason for Designation
		its position along a major migration route down the west coast of Britain account for the importance of the Site for over-wintering and migrant birds.

7.87 There are six non-statutory designated sites within 2km of the Site and these are detailed in Table 7.5 below. These are taken forward for assessment as important ecological features in accordance with the context outlined in Table 7.2 above.

Table 7.5: Non-statutory designated sites within 2km of the Site

Non-Statutory Site Name	Distance from Site	Reason for Designation
Preston Junction LNR	850m northeast	The site comprises a length of disused railway line with a rich and varied habitat mosaic which is important for local wildlife including invertebrates.
Preston Junction BHS	850m northeast	The site comprises a length of disused railway line with a rich and varied habitat mosaic which is important for local wildlife including invertebrates.
Cop Lane Cutting BHS	1.09km northwest	The site comprises a length of road embankment with rich neutral grassland, trees and scrub.
Hurst Grange Park BHS	1.1km northwest	The site comprises an area of former agricultural grassland and a cluster of five field ponds now managed as public open space. The habitats support a rich diversity of plant species and the ponds support frog, toad, smooth newt and palmate newt.
Carr Wood BHS	1.25km northeast	The site comprises ancient semi-natural woodland.
Ribble Estuary Upper Tidal Section BHS	1.7km north	The site comprises a section of the River Ribble and its banks, running from the mouth of Preston Dock upstream to London Road Bridge. It is designated for its riverine habitats and flowering plant and fern assemblage. The site adjoins 'River Ribble Lower Tidal Section' BHS (to the west) and 'River Ribble from London Road Bridge Preston, in west, to County boundary' BHS (to the east).

Habitats and Flora

7.88 The technical report for the Phase 1 habitat survey is included in **Appendix 7.2** which includes the Phase 1 habitat map for the Site.

7.89 The following habitat types are present within, or adjoining, the outline planning application site:

- Improved grassland (39.41ha);
- Poor semi-improved grassland (5.60ha);
- Arable (4.59ha);

- Amenity grassland (0.55ha);
- Dense/continuous and scattered scrub (0.14ha);
- Hardstanding (0.28ha);
- Bare ground (0.15ha);
- Standing water (0.10ha);
- Buildings (0.05ha);
- Inundation vegetation (0.03ha);
- Tall ruderal vegetation (0.02ha);
- Marsh/marshy grassland (0.01ha);
- Private garden (0.02ha);
- Broad-leaved and coniferous trees (171 individual trees and 95 groups of trees);
- Species-rich hedgerows (5077m);
- Species-poor hedgerows (3456m);
- Dry ditches (676m);
- Running water (41m); and
- Plantation broad-leaved woodland (adjacent to the Site).

7.90 In addition, it was not possible to directly survey 1.34ha within the Site. Review of aerial imagery indicates that these areas are a combination of improved grassland, poor semi-improved grassland, buildings and private gardens.

7.91 In line with CIEEM EcIA guidance detailed assessment of ecological features that are 'widespread, unthreatened and resilient to project impacts' is not necessary. The majority of the habitats within the Site fall into this category. Only those habitats identified as important ecological features are described in the following paragraphs. While some habitats provide shelter and/or foraging for faunal species, to reduce repetition any impacts on fauna as a result of habitat loss, degradation or fragmentation within the Proposed Development are described in the relevant faunal section.

Traditional Orchard

7.92 The DBA identified two parcels of traditional orchard ("habitat of principal importance" under S41) adjacent to the Site. One parcel lies adjacent to Lord's House Farm and Nib Lane and contains old apple *Malus domestica* and pear *Pyrus communis* trees. This parcel has been left unmanaged and is heavily overgrown and therefore is classified as dense/continuous scrub within the Phase 1 habitat survey (target note TN12). The second parcel is located within

private grounds off Moss Lane. Both parcels of traditional orchard are separated from the Site by hedgerows and the old orchard trees are set within the parcels rather than being close to the edges.

7.93 Due to the unlikely risk of significant effects on these habitat parcels, traditional orchard is not taken forward for assessment. The potential for damage and degradation to the boundaries of these habitat parcels is discussed within the assessment of Hedgerows.

Woodland

7.94 The DBA identified parcels of deciduous woodland ("habitat of principal importance" under S41) which fall outside of the application boundary but adjacent to the north-west corner of the Site.

7.95 A middle-age plantation forms a screen along the south-western boundary of the Site with the A582 Penwortham Way consisting of predominantly native broad-leaved species.

7.96 Broad-leaved woodland is listed as a Lancashire BAP habitat due to its relative scarcity within the county.

7.97 Woodland is brought forward for assessment as an important ecological feature at County level due to its relative scarcity within the county.

Trees

7.98 The technical report for the Arboricultural Survey is included in **Appendix 7.4**.

7.99 Tree cover is evenly distributed throughout the Site and primarily associated with field and road boundaries with occasional open grown trees and trees around buildings.

7.100 Common ash *Fraxinus excelsior* is the most widespread individual tree species with English oak *Quercus robur* and common alder *Alnus glutinosa* second and third. Hawthorn *Crataegus monogyna* is the most commonly recorded species within tree groups whilst also being present in the majority of hedgerows.

7.101 Within the Site there are 171 individual trees and 95 groups of trees; out of this population 11 individual trees and 4 groups of trees were categorised as high quality (Category A), 83 individual trees and 62 groups of trees were of moderate quality (Category B) and 77 individual trees and 29 groups of trees were of low quality (Category C) features. This is a reflection of the general good condition and relative maturity of the population.

7.102 There is a Tree Preservation Order present on the Site.

7.103 There are no Conservation Areas, Ancient Woodland or Veteran Trees present on the Site.

7.104 Trees are brought forward for assessment as an important ecological feature at the Local level due to their quality and maturity.

Hedgerows

7.105 The technical report for the hedgerow assessment is included in **Appendix 7.3**.

7.106 Although 137 hedgerows were recorded as part of the arboricultural survey, qualification as a hedgerow under BS 5837 differs to that of a Phase 1 habitat survey and each should be interpreted independently. For the purposes of this assessment, hedgerows are discussed with reference to the Phase 1 habitat survey baseline information, as detailed below.

7.107 A total of 75 hedgerows were identified within the Site as part of the Phase 1 habitat survey. One of the hedgerows (H21) are formed solely of Leyland cypress *Cupressus × leylandii*. The remaining hedgerows are native and comprise a combination of species-rich and species-poor intact and defunct hedgerows and hedgerows with trees. Hawthorn is dominant throughout the majority of the hedgerows and English oak trees are also prevalent. Many of the hedgerows are managed or affected by grazing. The ground flora of most of the hedgerows within the Site is poor and is reminiscent of the surrounding improved grassland.

7.108 Of the 75 hedgerows surveyed as part of the Phase 1 habitat survey 34 were subject to assessment due to their potential ecological value and 20 were found to be "Important" under the Hedgerow Regulations 1994, due to them containing at least six woody species and/or qualifying features. The remaining hedgerows were scoped out due to a lack of woody species or qualifying features. However, all native hedgerows are "habitats of principal importance" under S41.

7.109 Hedgerows are also a Lancashire BAP habitat and fall under South Ribble Borough Council Local Plan Policy G13.

7.110 Hedgerows are brought forward for assessment as an important ecological feature at County level due to their allocation under Lancashire BAP and S41.

Waterbodies

7.111 A small stream flows from south to north in the north of the Site, adjacent to a public footpath. The channel of the stream is approximately 2m wide and 1m deep and contained shallow, slow flowing water approximately 5cm deep (the stream was found to be largely dry during the water vole survey). The stream is culverted under Bee Lane and, beyond that to the north, is heavily shaded by bankside trees. To the south of Bee Lane, the channel becomes more heavily vegetated with broad-leaved herbs and scrub including nettle *Urtica dioica*, bramble *Rubus fruticosus agg*. and hedge bindweed *Calystegia sepium* and eventually dries out. No other running water was identified on the Site (the twenty-two ditches within the Site were dry or contained standing water).

7.112 Rivers and streams are listed as "habitats of principal importance" under S41 and as a local BAP habitat. However, this stream does not fulfil the criteria to be classified as a S41 habitat and the Lancashire BAP indicates that only rivers and connecting watercourses are applicable. The small onsite stream does not connect to any other watercourses and therefore does not fall under the Lancashire BAP criteria. There are no relevant local planning policies to watercourses. For this reason, and given the condition of the stream, it is considered that this

watercourse is of ecological value at Site level. Therefore, the requirement for assessment has been scoped out (as assessment is only required for features of importance at Local area or higher), however appropriate mitigation has been outlined later in this chapter.

7.113 There are two ponds within the Site (Ponds P1 and P2). Pond P1 is adjacent to a public footpath along the west site boundary and is colonised by willow *Salix sp*. scrub and some aquatic vegetation. Pond P2 is a shallow muddy pond in a field which has been exposed to fly tipping. Ponds may be classified as "Habitats of Principal Importance" under S41; however, these ponds are not of good enough quality to qualify.

7.114 A small patch of inundation vegetation is present within improved grassland to the south of Nib Lane within the outline planning application site. This is likely to dry out during the summer months. Aquatic vegetation including common duckweed *Lemna minor*, water starwort *Callitriche stagnalis* and floating sweet-grass *Glyceria fluitans* have begun to colonise.

7.115 A large number of ditches are present along field boundaries within the Site which are likely in place for drainage purposes. The majority of these ditches were found to be dry or partially damp with limited aquatic vegetation.

7.116 These waterbodies are not brought forward for assessment as an important ecological feature due to their low quality. However, it is recognised that the waterbodies may be of value in comparison to other habitats within the Site and therefore appropriate mitigation has been outlined later in this chapter.

Protected and invasive plant species

7.117 Native bluebell *Hyacinthoides non-scripta*, a nationally protected species under Schedule 8 of the WCA, is present within Hedgerow H13 within the Site. No other protected plant species were recorded within the land parcels which were surveyed.

7.118 Protected plant species are not brought forward for assessment as an important ecological feature due to the low numbers within the Site. However, it is recognised that the protected plant species are afforded some protection and therefore appropriate mitigation has been outlined later in this chapter.

7.119 Japanese knotweed *Fallopia japonica*, an invasive non-native plant species listed under Schedule 9 of the WCA, is present adjacent to Hedgerow H50 in the Site. No other invasive plant species were recorded within the Site.

7.120 Invasive non-native species are not brought forward for assessment as an important ecological feature however measures to eradicate Japanese knotweed, and any other invasive species which may be present on the non-surveyed land parcels, are included in the mitigation section.

Fauna

Badgers

7.121 The technical report for the badger survey is included in **Appendix 7.5**.

7.122 No badger records were returned within 1km of the Site in the DBA (**Appendix 7.1**).

7.123 No badger setts were recorded during the survey or updated survey. A number of mammal paths were noted in the grassland fields to the south of Bee Lane; however, no conclusive evidence of badger was identified and these paths were attributed to fox due to the presence of fox scat and a fox earth nearby.

7.124 The field boundary hedgerows and woodland areas on and adjacent to the Site could provide sett excavation opportunities for badgers. The arable and grassland areas also provide suitable foraging habitat for this species.

7.125 Badgers are not brought forward for assessment as an important ecological feature due to the lack of evidence of this species within the Site. However, it is recognised that badgers are afforded some protection and therefore appropriate mitigation has been outlined later in this chapter.

Bats

7.126 The technical report for the bat activity survey is included in **Appendix 7.7** and the technical report for the bat roost survey is included in **Appendix 7.8** and **Appendix 7.13**.

7.127 Three records of pipistrelle *Pipistrellus sp* bats were returned within 1km of the Site in the DBA.

7.128 Given the presence of potential bat roost and foraging habitat within the Site, as well as the status of bats as an EPS, bats are classified as important ecological feature at Local level and are taken forward for assessment.

Bat Roost Survey

7.129 One building (Building B3, off Lord's Lane and now outside the Site) was found to have high suitability for summer roosts of low numbers of common species. The remaining ten buildings, which are to be demolished under the Proposed Development, have negligible suitability for roosting bats due to a lack of potential roost features. Roosting has been confirmed in B3, with a single common pipistrelle recorded emerging from a large hole in the building on the first survey visit in June 2021, although this is now outside the Site.

7.130 A total of 142 trees within the Site were identified to have bat roosting suitability including 15 trees with high suitability, 35 trees with moderate suitability and 92 trees with low suitability. None of these trees are highlighted to have suitability for hibernation but could support summer roosts.

7.131 No bat roosts were identified on the Site during any of the back-tracking surveys undertaken. Given the low number of bat passes during these surveys and also during the activity surveys undertaken across the entirety of the active bat season (detailed below) it is not anticipated any maternity roosts or other large summer roosts of high conservation concern are present within the Site or immediately adjacent land.

7.132 Of the trees which were identified for felling to facilitate development, eight had moderate or high suitability for roosting bats. No bat roosts have been identified following the 2021 emergence/ re-entry surveys.

Bat Activity Survey

7.133 Six bat species were identified within the Site during the activity surveys:

- Common pipistrelle Pipistrellus pipistrellus;
- Soprano pipistrelle Pipistrellus pygmaeus;
- Pipistrelle species Pipistrellus sp.;
- Noctule Nyctalus noctula;
- Brown long-eared bat; and
- Myotis species Myotis sp.

7.134 Pipistrelle bats were most frequently recorded with occasional passes by noctule, brown long-eared bat and Myotis species. This assemblage represents a low diversity of bat species, as categorised by Wray et al (Ref 7-33), which reflects the low suitability of the habitats present – high quality habitat is limited to the hedgerows within the Site with the remaining habitats generally of low quality and too exposed to be of value to bats. The site also has limited connectivity to suitable habitat in the local area due to its isolation by surrounding major roads and urban development.

7.135 The abundance of pipistrelle species reflects the national trend. A reasonable level of Myotis species are present. Due to the nature of the habitats present these are most likely to be whiskered bats. A low number of brown long-eared bats are present, most likely due to the relatively low suitability of the habitats within the Site for this species. Myotis and brown long-eared bats tend to favour woodland habitats which are located adjacent to the western site boundary.

Birds

7.136 The technical report for the barn owl survey is included in **Appendix 7.6**, the technical report for the BBS is included in Appendix 7.9 and the technical report for the wintering bird survey is included in **Appendix 7.10**.

Barn Owl Survey

7.137 One barn owl record was returned within 1km of the Site in the DBA (**Appendix 7.1**).

7.138 One barn owl was recorded emerging from building B3 during the nocturnal bat surveys in June 2021. None of the other buildings, which are to be demolished under the Proposed Development, have suitability for nesting barn owls due to a lack of potential nest features and/or access points into the buildings. None of the trees identified for felling have suitability to support barn owl.

7.139 Foraging habitat within the Site for barn owl is limited due to the heavily grazed nature of the grassland, which is classed as Type 3 habitat with reference to Shawyer (2012) (Ref 7-34). However incidental sightings of a pair of barn

owls flying through the Site were observed during 2019 bat surveys, suggesting that this species may roost and/or nest in the locality as has been confirmed in the 2021 surveys.

7.140 Nesting barn owls are protected under Schedule 1 of the WCA including from disturbance. For this reason barn owls are classified as important ecological feature at Local level and are taken forward for assessment.

Breeding Bird Survey

7.141 Fifty bird species were recorded within the Site and surrounding 100m buffer during the BBS in 2018 (as detailed within **Appendix 7.9**). This represents a medium species diversity, considering the large size of the Site, with the majority of species recorded being commonplace and widespread.

7.142 Forty-one confirmed, probable and possible breeding bird species were recorded within the Site and 100m buffer and this indicates that the Site is of significance at the local level. Six notable bird species were confirmed to be breeding: tree sparrow, starling, mistle thrush, mallard, house sparrow and dunnock. All six of these notable species were confirmed to breed within the Site, rather than within the 100m buffer. An additional three notable species probably nested within the Site, including bullfinch, song thrush and swallow. The large majority of the species recorded as potentially breeding within the Site are associated with woodland, scrub and shrub habitats and were likely to be nesting within the large volume of hedges present across the Site.

7.143 Given the number and range of species which use the Site during the breeding season, breeding birds are classified as an important ecological feature at Local level and are taken forward for assessment.

Wintering Bird Survey

7.144 The technical report for the wintering bird survey is included in **Appendix 7.10**.

7.145 During the winter bird survey no SPA or Ramsar qualifying species for the nearby designated sites, in particular Ribble and Alt Estuaries SPA/ Ramsar and Martin Mere SPA/ Ramsar, were recorded on the ground within 500m of the survey area, although a small number of pink-footed geese were recorded flying over the survey area during one of the survey visits.

7.146 Twenty one other raptor, waterbird, protected and BoCC species were recorded on the ground within 500m of the survey area during the winter bird survey. The majority of these were BoCC passerine species supported by the hedgerows and open fields throughout the survey area (as identified in the BBS).

7.147 Wintering birds are not brought forward for assessment as an important ecological feature due to the low aggregations of these species within the Site. As the Site was not found to be of value to wintering birds no mitigation is proposed.

7.148 Given the very low aggregations of overwintering birds, associated with the nearby SPAs, which were recorded on the Site during the surveys, wintering birds are not taken forward as an important ecological feature.

Great Crested Newts

7.149 The technical report for the great crested newt survey is included in **Appendix 7.11**.

7.150 Fourteen ponds were identified through aerial imagery within 500m with habitat connectivity to the Site. Thirteen of these ponds within the 500m radius were accessed for the survey. Eight of these ponds were found to not be present or to have dried out. eDNA results indicated a likely absence of great crested newts in the remaining five ponds.

7.151 One pond (P3) was not accessible to survey and therefore likely absence of great crested newts cannot be confirmed in this waterbody. Given the likely absence of great crested newts from other ponds within the Site, and the lack of records locally, it is considered highly unlikely that this species would be present in Pond P3.

7.152 The hedgerows and tree roots within the Site provide some opportunities for sheltering amphibians, including great crested newts, with some connectivity to nearby aquatic habitat. The remaining land is arable or closely grazed grassland which is too exposed to be used by these species.

7.153 Due to the likely absence of great crested newts from the Site, and the limited number of ponds which hold water in the locality, amphibians are not brought forward for assessment as an important ecological feature. However, it is recognised that amphibians may have some value within the Site and therefore appropriate mitigation has been outlined later in this chapter.

Water Voles

7.154 The technical report for the water vole survey is included in **Appendix 7.12**.

7.155 Twenty two ditches were identified within the Site, through a review of aerial and OS imagery, and these could provide suitable foraging and burrowing habitat for water voles. This includes the small onsite stream which was largely dry at the time of the water vole survey. The remaining habitats in the Site are considered to be unsuitable for this species as water voles tend to inhabit riparian or marshy areas.

7.156 The twenty two ditches are all associated with field boundaries and drainage. The majority of the ditches were adjacent to hedgerows and were found to be heavily vegetated, shaded, significantly impacted by cattle and/or completely dry or with shallow stagnant pools of water.

7.157 Twenty one of the ditches were found to be unsuitable for water voles due to the factors detailed above and were not subject to survey.

7.158 Ditch 20 was found to be suitable for water voles and was subject to a survey during which no evidence of water voles were found. The ditch is isolated from other suitable water courses as a bund separates it from Ditch 2 to the north which was found to be dry. Therefore, it was considered highly unlikely that water voles would be present in this ditch.

7.159 Due to the likely absence of water voles from the Site, and the limited number of suitable watercourses or ditches which hold water in the locality, water voles are not taken forward as an important ecological feature and no mitigation is anticipated to be required.

Other fauna

7.160 The field boundary hedgerows within, and woodland areas adjacent to, the Site could provide opportunities for hedgehogs *Erinaceus europaeus* to shelter. The arable and grassland areas also provide suitable foraging habitat for this species.

7.161 Due to the lack of evidence of hedgehogs within the Site, this species is not brought forward for assessment as an important ecological feature. However, it is recognised that hedgehogs may be present within the Site and are afforded some protection and therefore appropriate mitigation has been outlined later in this chapter.

7.162 The grassland and arable fields are heavily disturbed by cattle and grazed or cut to a short sward and overall the Site is very uniform in nature which has limited suitability for brown hare *Lepus europaeus,* reptiles or notable invertebrate species or communities. The watercourses on the Site are considered to be unfavourable for otter *Lutra lutra*. Given the nature of the onsite habitats it is not anticipated that any other protected fauna would occur on the Site and none are taken forward as an important ecological feature.

Identification of Ecological Features

7.163 Table 7.6 provides a summary of the designated sites, habitats and fauna that have been identified as important ecological features in the Site, which have the potential to be impacted by the Proposed Development.

7.164 CIEEM guidance requires ecological features of importance at International and European, National, County and Local levels to be taken forward for assessment.

7.165 Ecological features of importance at Site level are not required to be taken forward for assessment; however appropriate mitigation measures have been included later in this Chapter.

Table 7.5: Summary of Important Ecological Features within or within influencing distance of the Site

Ecological Feature	Policy/Legislation	Ecological Value	Description
Ribble and Alt Estuaries Ramsar	The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 Ramsar Convention South Ribble Borough Council Local Plan Policy G16	International and European	6.79km west and designated for populations of natterjack toads and birds
Ribble and Alt Estuaries SPA	The Conservation of Habitats and Species	International and European	6.79km west and designated for populations of birds

Ecological Feature	Policy/Legislation	Ecological Value	Description
	(Amendment) (EU Exit) Regulations 2019 South Ribble Borough Council Local Plan Policy G16		
Ribble Estuary NNR	Wildlife and Countryside Act 1981 (as amended) South Ribble Borough Council Local Plan Policy G16	National	6.79km west and designated for its bird assemblage
Beeston Brook Pasture SSSI	Wildlife and Countryside Act 1981 (as amended) South Ribble Borough Council Local Plan Policy G16	National	5.77km east and designated for its unimproved grassland habitat
Ribble Estuary SSSI	Wildlife and Countryside Act 1981 (as amended) South Ribble Borough Council Local Plan Policy G16	National	6.79km west and designated for its coastal habitats and bird assemblage
Red Scar and Tun Brook Woods SSSI	Wildlife and Countryside Act 1981 (as amended) South Ribble Borough Council Local Plan Policy G16	National	7.41km northeast and designated for its woodland habitat
Newton Marsh SSSI	Wildlife and Countryside Act 1981 (as amended) South Ribble Borough Council Local Plan Policy G16	National	7.5km northwest and designated for its bird assemblage
Preston Junction LNR	The Town and Country Planning Act 1990 (Ref 7-35) South Ribble Borough Council Local Plan Policy G16	County	850m northeast and designated for its mosaic of habitats
Preston Junction BHS	The Town and Country Planning Act 1990 South Ribble Borough Council Local Plan Policy G16	County	850m northeast and designated for its mosaic of habitats
Cop Lane Cutting BHS	The Town and Country Planning Act 1990 South Ribble Borough Council Local Plan Policy G16	County	1.09km northwest and designated for its artificial habitats
Hurst Grange Park BHS	The Town and Country Planning Act 1990 South Ribble Borough Council Local Plan Policy G16	County	1.1km northwest and designated for its grassland habitats and amphibian populations

Ecological Feature	Policy/Legislation	Ecological Value	Description
Carr Wood BHS	The Town and Country Planning Act 1990 South Ribble Borough Council Local Plan Policy G16	County	1.25km northeast and designated for its woodland and scrub habitats
Ribble Estuary Upper Tidal Section BHS	The Town and Country Planning Act 1990 South Ribble Borough Council Local Plan Policy G16	County	1.7km north and designated for its riverine habitats and plant assemblage
Woodland	British Standard 5837: 2012 Trees in relation to construction S41 NERC 2006 Lancashire BAP South Ribble Borough Council Local Plan Policy G13	County	Parcels of deciduous woodland (S41) within 1km of the Site (closest being adjacent to north west corner of the Site). Also a middle-age plantation forms a screen along the south-western boundary with the A582 Penwortham Way.
Trees	British Standard 5837: 2012 Trees in relation to construction S41 NERC 2006 South Ribble Borough Council Local Plan Policy G13 Lancashire BAP South Ribble Borough Council Local Plan Policy G16 and G18 Central Lancashire Core Strategy Policy 22	Local	171 individual trees and 95 groups of trees
Hedgerows	Hedgerow Regulations 1997 British Standard 5837: 2012 Trees in relation to construction S41 NERC 2006 Lancashire BAP South Ribble Borough Council Local Plan Policy G13	County	75 hedgerows within the Site, 20 of which are “Important”.
Bats	Annex 4 Habitats Directive Conservation of Habitats and Species 2010 Schedule 5 Wildlife & Countryside Act (1981) S41 NERC Act 2006 (some) Lancashire BAP (some) South Ribble Borough Council Local Plan Policy G16	Local	Common Pipistrelle roost confirmed in building B3 (off Lord’s Lane and outside the Site) and 142 trees within the Site with roosting suitability. Of trees identified for felling eight have moderate or high roost suitability, no roosts have been identified. Hedgerows in the Site and woodland adjacent provide foraging habitat.

Ecological Feature	Policy/Legislation	Ecological Value	Description
	Central Lancashire Core Strategy Policy 22		
Barn owl	Wildlife & Countryside Act (1981) S41 NERC Act 2006 Lancashire BAP South Ribble Borough Council Local Plan Policy G16 Central Lancashire Core Strategy Policy 22	Local	Barn owl observed emerging from building B3 off Lord's Lane. Barn owls also observed flying through site.
Breeding birds	Wildlife & Countryside Act (1981) S41 NERC Act 2006 Lancashire BAP (some) South Ribble Borough Council Local Plan Policy G16 Central Lancashire Core Strategy Policy 22	Local	Six notable bird species were confirmed to be breeding: tree sparrow, starling, mistle thrush, mallard, house sparrow and dunnock

Embedded Mitigation

7.166 The design process has been iterative throughout. Information derived from ecological surveys and the consultation process has been used, alongside other environmental survey data, to inform the masterplan. The final layout, construction design and working methods avoid or, where this is not possible, will minimise effects on important ecological features, including designated wildlife sites, priority habitats and habitats associated with protected species.

7.167 Specifically, the parcels of traditional orchard, which are S41 habitats of principal importance have been excluded from the Site. Other measures include:

- Retention of internal layout of 'green' lanes (Moss Lane, Bee Lane, Nibb Lane and Lords Lane);
- Retention of a number of hedgerows across the Site;
- Provision of a pylon corridor;
- Replacement tree planting at a ration of 3:1; and
- Replacement hedgerow planting of 1.5:1.

Assessment of Likely Significant Effects

7.168 The following sections quantify and characterise the potential effects of the Proposed Development on important ecological features during both the construction and operational phases, with the assumption that embedded mitigation is implemented but in the absence of any additional mitigation measures. The development will be phased but it is not anticipated that the phasing will have any additional implications on ecology other than those outlined below.

7.169 Within this section "the Site" refers to land that falls within the application boundaries (**Figure 1.1** and **1.2**).

Demolition and Construction

7.170 The key activities which will have a potential effect on the ecological features of the Site and local vicinity include site clearance, works to the small onsite stream, building demolition, bulk earthworks, site levelling/excavation of flood storage areas, construction of access roads and houses, lighting and landscaping works.

7.171 Construction impacts that could lead to potential indirect effects on ecological features such as contamination, dust, vibration and noise are discussed in detail in Chapters 10, 13 and 14 respectively.

7.172 Potential effects likely to arise during the construction phase will include, but may not be limited to:

- Loss of and/or degradation of designated nature conservation sites and the species they support;
- Loss of and/or degradation to habitats of ecological value e.g. grassland, watercourses;
- Killing or injuring of protected species; and
- Disturbance and/or displacement of protected species or those of conservation concern, due to loss of habitat, noise, vibration, light and physical activity.

Ribble and Alt Estuaries Ramsar and SPA

7.173 Due to the distance of Ribble and Alt Estuaries SPA and Ramsar from the Site (6.79km west), and their separation from the Site by urban development, no direct impacts or indirect impacts resulting from lighting or pollution are anticipated on these designations, nor on the natterjack toad population which the Ramsar site supports, during the demolition and construction phase of the development.

7.174 With respect to indirect disturbance effects through vibration and noise, any birds utilising these protected areas will be sufficiently distant so as not to be disturbed by construction activities. The habitats onsite were not found to support significant numbers of Annex I bird species associated with the SPA and Ramsar sites due to the heavily grazed nature of the fields and existing disturbance levels and therefore will not lead to displacement of birds which are features of these protected sites. Therefore, there will be **no impact** on these designated sites.

Beeston Brook Pasture SSSI

7.175 Due to the distance of Beeston Brook Pasture SSSI from the Site (5.77km east), and its separation from the Site by urban development, no direct or indirect impacts resulting from vibration, noise, lighting or pollution are anticipated on this designation, nor on the unimproved grassland habitat for which it is designated, during the demolition and construction phase of the development. Therefore, there will be **no impact** on this designated site.

Ribble Estuary SSSI and NNR

7.176 Due to the distance of Ribble Estuary SSSI and NNR from the Site (6.79km west), and their separation from the Site by urban development, no direct impacts or indirect impacts resulting from lighting or pollution are anticipated on these designations, nor on the coastal habitats for which they are designated, during the demolition and construction phase of the development.

7.177 With respect to indirect disturbance effects through vibration and noise, any birds utilising this protected area will be sufficiently distant so as not to be disturbed by construction activities. The habitats onsite were not found to support significant numbers of Annex I bird species associated with the SSSI and NNR site due to the heavily grazed nature of the fields and existing disturbance levels and therefore will not lead to displacement of birds which are features of these protected sites. Therefore, there will be **no impact** on these designated sites.

Red Scar and Tun Brook Woods SSSI

7.178 Due to the distance of Red Scar and Tun Brook Woods SSSI from the Site (7.41km north east), and its separation from the Site by urban development, no direct or indirect impacts resulting from vibration, noise, lighting or pollution are anticipated on this designation, nor on the woodland habitat for which it is designated, during the demolition and construction phase of the development. Therefore, there will be **no impact** on this designated site.

Newton Marsh SSSI

7.179 Due to the distance of Newton Marsh SSSI from the Site (7.5km north west), and its separation from the Site by urban development, no direct impacts or indirect impacts resulting from lighting or pollution are anticipated on this designation during the demolition and construction phase of the development.

7.180 With respect to indirect disturbance effects through vibration and noise, any birds utilising these protected areas will be sufficiently distant so as not to be disturbed by construction activities. The habitats onsite were not found to support significant numbers of Annex I bird species associated with the SSSI site due to the heavily grazed nature of the fields and existing disturbance levels and therefore will not lead to displacement of birds which are features of this protected site. Therefore, there will be **no impact** on this designated site.

Preston Junction BHS and LNR

7.181 Due to the distance of Preston Junction BHS and LNR from the Site (850m north east), and their separation from the Site by urban development, no direct or indirect impacts resulting from vibration, noise, lighting or pollution

are anticipated on this designation, nor on the mosaic of habitats for which it is designated, during the demolition and construction phase of the development. Therefore, there will be **no impact** on these designated sites.

Cop Lane Cutting BHS

7.182 Due to the distance of Cops Lane Cutting BHS (1.09km north west), and its separation from the Site by urban development, no direct or indirect impacts resulting from vibration, noise, lighting or pollution are anticipated on this designation, nor on the artificial habitats for which it is designated, during the demolition and construction phase of the development. Therefore, there will be **no impact** on this designated site.

Hurst Grange Park BHS

7.183 Due to the distance of Hurst Grange Park BHS (1.1km north west), and its separation from the Site by urban development, no direct or indirect impacts resulting from vibration, noise, lighting or pollution are anticipated on this designation, nor on the grassland habitats or amphibian populations for which it is designated, during the demolition and construction phase of the development. The distance between the Site and Hurst Grange Park BHS is beyond the typical ranging distance for amphibians (500m). Therefore, there will be **no impact** on this designated site.

Carr Wood BHS

7.184 Due to the distance of Carr Wood BHS (1.25km north east), and its separation from the Site by urban development, no direct or indirect impacts resulting from vibration, noise, lighting or pollution are anticipated on this designation, nor on the woodland and scrub habitats for which it is designated, during the demolition and construction phase of the development. Therefore, there will be **no impact** on this designated site.

Ribble Estuary Upper Tidal Section BHS

7.185 Due to the distance of Ribble Estuary Upper Tidal Section BHS (1.7km north), and its separation from the Site by urban development, no direct or indirect impacts resulting from vibration, noise, lighting or pollution are anticipated on this designation, nor on the riverine habitats and plant assemblage for which it is designated, during the demolition and construction phase of the development. Therefore, there will be **no impact** on these designated sites.

Woodland

7.186 No woodland will be lost as a result of the Proposed Development as these areas lie outside of the Site. However, the movement of machinery and construction materials within close proximity to the trees, within the Site, could result in accidental damage to the tree canopy. Root zones could also be damaged through site run-off pollution or encroachment and soil compaction by construction machinery. Therefore, there is the potential for a **significant adverse effect at Local level (minor adverse)** on the woodland next to the Site during construction due to physical damage and degradation.

Trees

7.187 Some loss of high and moderate value trees will be unavoidable within the Site. Tree loss as a result of the residential-led mixed use development is currently unknown. Taking a precautionary approach, this could result in a **significant adverse effect at Local level (minor adverse)**.

7.188 The movement of machinery and construction materials within close proximity to retained trees within the Site could result in accidental damage to tree canopies. Root zones could also be damaged through site run-off pollution or encroachment and soil compaction by construction machinery. Therefore there is the potential for a **significant adverse effect at Local level (minor adverse)** on retained trees during construction for the Site, due to physical damage and degradation.

Hedgerows

7.189 Some loss of hedgerows will be unavoidable within the Site and likely include the loss of some hedgerows classified as 'important' with respect to the Hedgerow Regulations 1997. Hedgerow loss as a result of the residential-led mixed use development is currently unknown. Taking a precautionary approach, this could result in a **significant adverse effect at County level (moderate adverse)**.

7.190 The movement of machinery and construction materials within close proximity to the retained hedgerows within the Site could result in accidental damage. Root zones could also be damaged through site run-off pollution or encroachment and soil compaction by construction machinery. Therefore there is the potential for a **significant adverse effect at County level (moderate adverse)** on retained hedgerows during construction for the Site, due to physical damage and degradation.

Bats

7.191 Of the trees which have been identified for removal from the Site, eight have moderate or high potential for bats, while two have low potential for bats. No roosting bats have been recorded in these trees. A common pipistrelle roost has been identified in building B3 off Lord's Lane, although this is now outside the Site. The loss of trees with PRFs may result in the loss of bat roosting habitat. Direct impacts may include the disturbance, modification or destruction of roosts of low or medium conservation significance (i.e. not maternity or hibernation roosts which are of high conservation significance) and the injury or killing of individual bats, if present. This may also be applicable for any proposed tree pruning activities. Therefore, there is the potential for a **significant adverse effect at Local level (minor adverse)** on bats during construction due to impacts to roosts and roosting habitat.

7.192 The loss of hedgerows and trees from the Site could result in a loss of bat foraging habitat and the fragmentation of dispersal corridors throughout the Site and the wider landscape. This may impact the functionality of existing roost sites, if present, within the wider area. Therefore, there is the potential for a **significant adverse effect at Local level (minor adverse)** on bats during construction due to impacts to foraging habitat.

7.193 Indirect impacts such as lighting disturbance on retained habitats may also impact any bat activity present within influencing distance of the Site. Therefore, there is the potential for a **significant adverse effect at Local level (minor adverse)** on bats during construction due to light spill.

Barn Owl

7.194 A barn owl was recorded emerging from building B3 off Lord's Lane during nocturnal bat surveys, with the conclusion that this building is used for roosting by barn owl. While this roosting site is outside the development boundary, there is still the potential for disturbance and the injury or killing of individual barn owls, if present. Therefore, there is the potential for a **significant adverse effect at Local level (minor adverse)** due to impacts to roosting barn owl.

7.195 Barn owl have been recorded flying across the Site and their presence in building B3 means it is likely they disperse across or forage within the Site, despite much of the habitats being of low value due to the heavily grazed nature of the grassland. However, the loss of existing habitats from the Site, including the agricultural land, may result in the fragmentation of barn owl dispersal corridors throughout the Site and the wider landscape. This may impact the functionality and survival of the building B3 roosting site and existing nesting sites, if present, within the wider area. Therefore, there is the potential for a **significant adverse effect at Local level (minor adverse)** on barn owl during construction due to impacts to dispersal corridors.

7.196 Indirect impacts such as lighting disturbance on retained habitats may also impact any nesting, roosting or foraging barn owl present within influencing distance of the Site. Therefore, there is the potential for a **significant adverse effect at Local level (minor adverse)** on barn owls during construction due to light spill.

Breeding Birds

7.197 The seven buildings to be demolished, along with trees and dense vegetation which will be lost within the proposals may result in the loss of breeding bird habitat from the Site as well as loss of foraging opportunities. Direct impacts may include the disturbance or destruction of active nests, if present. Indirect impacts such as lighting on retained habitats may also impact any nesting birds present within influencing distance of the Proposed Development. Therefore, there is the potential for a **significant adverse effect at Local level (minor adverse)** on breeding birds during construction due to impacts to nests and loss of nesting habitat

The Completed and Operational Development

7.198 The key activities which will have a potential effect on the ecological resource of the Site and vicinity during operation of the Site include occupation and use of the residential, public open space and supporting infrastructure. The actions of future users would include vehicle and pedestrian traffic movements, sports and leisure activities and an increase in the presence of domestic pets. Direct habitat losses have been addressed within the Demolition and Construction section above.

7.199 Potential effects likely to arise during the operational phase will include, but may not be limited to:

- Movement of vehicles into, around and out of the Site;
- Movement of pedestrians into, around and out of the Site including public open space areas;
- Operation of a new lighting regime across the Site; and
- Maintenance of landscaped areas.

Ribble and Alt Estuaries Ramsar and SPA

7.200 The completed development will not have a direct effect on Ribble and Alt Estuaries SPA and Ramsar, due to the distance of this designation from the Site. The site falls within the impact risk zone for Ribble Estuary SSSI which falls in the same location as Ribble and Alt Estuaries and Ramsar. Residential development is not listed as an impact risk in relation to the SSSI and therefore it is considered unlikely that residential development would be a risk to the Ramsar and SPA. It is likely that a small (but not significant) increase in visitor numbers to Ribble and Alt Estuaries SPA and Ramsar will occur, however, given the distance to this Ramsar and SPA (6.79km), dog walkers and recreational users are more likely to use the public open space provided on the Site on a regular basis.

7.201 Therefore, **no impact** is anticipated, in relation to increased visitor numbers upon completion of the development.

Beeston Brook Pasture SSSI

7.202 **No impact** is anticipated on Beeston Brook Pasture SSSI once the Proposed Development is completed. There are no PRoW through or within close proximity to this designation.

Ribble Estuary SSSI and NNR

7.203 The completed development will not have a direct effect on Ribble Estuary SSSI and NNR, due to the distance of this designation from the Site. The site falls within the impact risk zone for this SSSI; however residential development is not listed as an impact risk for this SSSI. It is likely that a small (but not significant) increase in visitor numbers to these sites will occur given the nature of the Proposed Development however, given the distance to this SSSI and NNR (6.79km) dog walkers and recreational users are more likely to use the public open space provided on the Site on a regular basis. It is not anticipated that a Habitat Regulations Assessment would be required.

7.204 Therefore, **no impact** is anticipated, in relation to increased visitor numbers upon completion of the development.

Red Scar and Tun Brook Woods SSSI

7.205 The completed development will not have a direct effect on Red Scar and Tun Brook Woods SSSI, due to the distance of this designation from the Site. It is likely that a small (but not significant) increase in visitor numbers to this site will occur given the nature of the Proposed Development, however, given the distance to this SSSI (7.41km) dog walkers and recreational users are more likely to use the public open space provided on the Site on a regular basis. It is not anticipated that a Habitat Regulations Assessment would be required.

7.206 Therefore, **no impact** is anticipated, upon completion of the development.

Newton Marsh SSSI

7.207 **No impact** is anticipated on Newton Marsh SSSI once the Proposed Development is completed. There are no PRoW through or within close proximity to this designation.

Preston Junction BHS and LNR

7.208 The completed development will not have a direct effect on Preston Junction BHS and LNR, due to the distance of this designation from the Site.

7.209 The Proposed Development comprising up to 1,100 residential units has potential to have an indirect negative impact on the BHS and LNR through an increase in public pressure as it is only 850m from the Site. An increase in public pressure could lead to nitrification of the mosaic of habitats present (associated with dog fouling) and physical disturbance/erosion of susceptible habitats. However, review of aerial imagery suggests there are no visitor facilities or parking for this BHS/LNR which may limit visitors from the far side of the Proposed Development. The BHS/ LNR already has a good network of paths which would limit physical degradation of habitats due to increased visitor numbers. In addition, recreational users are likely to also use the public open space provided on the Site on a regular basis.

7.210 Therefore, **no impact** in relation to increased visitor number is expected.

Cop Lane Cutting BHS

7.211 The completed development will not have a direct effect on Cop Lane Cutting BHS, due to the distance of this designation from the Site.

7.212 The Proposed Development comprising up to 1,100 residential units has potential to have an indirect negative impact on the BHS through an increase in public pressure as it is only 1.09km from the Site. An increase in public pressure could lead to nitrification of the neutral grassland habitat present (associated with dog fouling) and physical disturbance/erosion of susceptible neutral grassland, trees and scrub habitats. However, review of aerial imagery suggests there are no visitor facilities or parking for this BHS nor any PRoW links to the Site which may limit visitors from the far side of the Proposed Development. The BHS already has a good network of paths which would limit physical degradation of habitats due to increased visitor numbers. In addition, recreational users are likely to also use the public open space provided on the Site on a regular basis.

7.213 Therefore, **no impact** in relation to increased visitor numbers is expected.

Hurst Grange Park BHS

7.214 The completed development will not have a direct effect on Hurst Grange Park BHS, due to the distance of this designation from the Site.

7.215 The Proposed Development comprising up to 1,100 residential units has potential to have an indirect negative impact on the BHS through an increase in public pressure as it is only 1.1km from the Site. An increase in public pressure could lead to nitrification of the agricultural grassland and pond habitats present (associated with dog fouling) and physical disturbance/erosion of susceptible habitats and associated plant assemblages. However, review of aerial imagery suggests there are no visitor facilities or site-specific parking for this BHS nor any PRoW links to the Site which may limit visitors from the far side of the Proposed Development. The BHS already has a good network of paths which would limit physical degradation of habitats due to increased visitor numbers. In addition, recreational users are likely to also use the public open space provided on the Site on a regular basis.

7.216 Therefore, **no impact** in relation to increased visitor numbers is expected.

Carr Wood BHS

7.217 **No impact** is anticipated on Carr Wood BHS once the Proposed Development is completed. There are no PRoW through or within close proximity to this designation.

Ribble Estuary Upper Tidal Section BHS

7.218 The completed development will not have a direct effect on Ribble Estuary Upper Tidal Section BHS, due to the distance of this designation from the Site.

7.219 The Proposed Development comprising up to 1,100 residential units has potential to have an indirect negative impact on the BHS and LNR through an increase in public pressure as it is only 1.7km from the Site. An increase in public pressure could lead to nitrification of the riverine habitat present (associated with dog fouling) and physical disturbance/erosion of susceptible habitats and associated plant assemblages. However, review of aerial imagery suggests there are no visitor facilities or site-specific parking for this BHS nor any PRoW links to the Site which may limit visitors from the far side of the Proposed Development. The BHS already has footpaths either side of the river which would limit physical degradation of habitats due to increased visitor numbers. In addition, recreational users are likely to also use the public open space provided on the Site on a regular basis.

7.220 Therefore, **no impact** in relation to increased visitor number is expected.

Woodland

7.221 The completed development will not have a direct impact on woodland. The parcels of deciduous woodland adjacent to the Site are not accessible to the public and therefore no indirect impacts are anticipated. Therefore, **no impact** on woodland will occur as a result of the completed development.

Trees

7.222 No operational effects are anticipated for trees except for general site management practices such as pruning of retained trees within the Site, assuming they are in public open space as opposed to private gardens. If the trees are pruned at an inappropriate time of year or too extensively this could result in long-term damage, although the

likelihood of this occurring is relatively slim. Therefore, a **significant adverse effect at Local level (minor adverse)** may occur in relation to damage to trees following completion of the development.

Hedgerows

7.223 No operational effects are anticipated for hedgerows except for general site management practices such as pruning of retained hedgerows within the Site, assuming they are in public open space as opposed to private gardens. If the hedgerows are pruned at an inappropriate time of year or too extensively this could result in long-term damage and loss of functionality of the hedgerow, although the likelihood of this occurring is relatively slim. Therefore, a **significant adverse effect at Local level (minor adverse)** may occur in relation to damage to hedgerows following completion of the development.

Bats

7.224 The completed development will not have a direct impact on roosting bats at this stage. It is likely that the local cat population will increase following completion of the Proposed Development, which may lead to the potential for predation of bats, if present. Therefore, a **significant adverse effect at Local level (minor adverse)** may occur in relation to predation of bats within the Site, following completion of the development.

7.225 The completed development will not have a direct impact on foraging or commuting bats. However indirect impacts may include lighting disturbance of foraging and commuting habitat within the Site. Therefore, a **significant adverse effect at Local level (minor adverse)** may occur in relation to lighting disturbance and bats.

Barn Owl

7.226 The increased traffic using the roads within the residential development may increase the risk of collision between barn owls and vehicles. Therefore, a **significant adverse effect at Local level (minor adverse)** may occur in relation to collision risk and barn owl for the Site. Indirect impacts may include lighting disturbance of dispersal corridors within the Site. Therefore, a **significant adverse effect at Local level (minor adverse)** may occur in relation to lighting disturbance and barn owl upon completion of the development.

Breeding Birds

7.227 The completed development will not have a direct impact on breeding birds at this stage. However indirect impacts may include lighting disturbance of nesting habitat. Therefore, a **significant adverse effect at Local level (minor adverse)** may occur in relation to lighting disturbance and nesting birds.

7.228 It is likely that the local cat population will increase following completion of the Proposed Development, and there is the likelihood that they will predate on birds leading to a potential reduction in breeding pairs of certain species, if present within the Site. Therefore, a **significant adverse effect at Local level (minor adverse)** may occur in relation to birds and predation for the Site.

Additional Mitigation / Enhancement Measures

7.229 This section describes the measures which are required to mitigate any significant environmental effects with regards to ecology. This should detail mitigation measures which are not designed into the proposals and which requires a commitment from the applicants to carry out further actions. These include a range of measures to ensure legal compliance will be implemented for the duration of the construction phase, which will be delivered through the implementation of a Construction Environmental Management Plan (CEMP).

7.230 Within this section "the Site" refers to land that falls within the application boundary and study area identified in the Land Use Parameter Plan (**Figure 5.1**).

Demolition and Construction

CEMP

7.231 A Construction Environmental Management Plan (CEMP) will be produced prior to commencement on site and will be implemented during the construction stage for both the outline application sites. The CEMP describes measures applicable to all construction activities:

- Pre-construction surveys will be carried out to ensure baseline data remains up to date;
- An appropriately qualified Ecological Clerk of Works (ECoW) will be appointed. The role of the ECoW is set out in the CEMP and the appointed person(s) would be a member of the Chartered Institute of Ecology and Environmental Management or hold equivalent accreditation;
- There will be a demarcation of the working areas (including storage areas and accesses), using appropriate fencing, to protect retained habitats and features; and
- Clearance of trees, hedges, grassland and other habitats will take place under supervision and at the appropriate time of year, as appropriate to the habitat/species in question.

7.232 The CEMP will include:

- General Method Statements for habitat protection;
- Species-specific Method Statements, addressing protected and priority species; and
- Provisions for tree protection including felling, pruning, pollarding, replacement tree and hedgerow planting, and use of protective fencing and root protection zones in accordance with BS5837:2012; and
- The approach to post-construction monitoring relating to mitigation activity including triggers for and details of appropriate remedial action.

Tree Protection

7.233 Appropriate tree protection measures will be implemented, for both the outline residential-led planning application sites, where required when works are in close proximity to retained woodland, hedgerows and trees and will be included in an Arboricultural Method Statement (AMS) appended to the CEMP. These measures will accord with BS 5837:2012 'Tree in relation to design, demolition and construction- Recommendations'. All tree and hedgerow works will comply with BS 3998:2010 'Tree Work – Recommendations' (Ref 7-36). These measures will minimise incidental damage and disturbance to the habitats and the species they support.

7.234 To restrict spread of tree pathogens, all equipment and machinery and vehicles used for tree, hedge and shrub removal will be cleaned, disinfected and used in accordance with current Forestry Commission biosecurity guidance and the ECoW will advise on whether each working area requires 'red' or 'amber' level biosecurity precautions.

7.235 These measures will be effective upon commencement of construction.

Pollution Prevention

7.236 The CEMP will include measures to ensure that site run-off and potential pollution events will be prevented from entering the surrounding drainage network and watercourses in line with Environment Agency pollution prevention guidance notes and a range of good practice working methods. This will be achieved through the use of bunds to catch and divert runoff, drip trays to prevent any oil and fuel spillages spreading and the avoidance of storage of any materials in close proximity. Windblown dust will be minimised by using wheel washing and damping down, while net fencing will catch windblown rubbish. To address the risk of singular accidental events, mitigation measures include provision of spill kits and emergency response procedures. These measures will be effective upon commencement of construction.

Habitat Creation

7.237 The loss of high and moderate value trees will be avoided where possible or replacement planting will be provided within the scheme at a 3:1 ratio, using locally appropriate species.

7.238 The loss of hedgerows will be minimised where possible or replacement planting with locally suitable species-rich hedges will be provided elsewhere within the scheme on a 1.5:1 ratio. Gap planting of retained hedgerows will also be implemented where appropriate.

7.239 Public open space, wildlife-friendly habitats and green corridors will be provided within the landscaping scheme for the Site.

Bats

7.240 The following mitigation measures will be undertaken in relation to roosting bats and trees in line with statutory guidance, including:

- Updated ground-level and aerial inspections of trees when the existing survey data is over one year old;
- Nocturnal roost surveys of trees with Moderate and High bat roost suitability;
- Natural England licence application and appropriate mitigation design if any bat roosts are found;
- Supervised felling of all trees with High and Moderate, where no roosts are found, or Low roost suitability and implementation of Reasonable Avoidance Measures by a licensed bat ecologist; and
- Natural England licence application and appropriate mitigation design if any bat roosts in trees are found and will be affected.

7.241 Bat boxes will be installed to mitigate for the loss trees with roosting suitability at a ratio of 3:1. These will be installed on retained trees, away from direct disturbance and lighting, prior to commencement of site clearance works to ensure that alternative roost sites are immediately available. Bat boxes should be installed approximately 3m high and should be south or west facing, with no obstruction to the box entrances. The box specifications will be appropriate for locally occurring bat species including pipistrelle bats and could include Schwegler 2F bat boxes on retained trees.

7.242 Bat boxes will also be installed to enhance roosting opportunities at the Site and assist in offsetting potential increased mortality from cat predation. These will be integral to new buildings and be located away from direct disturbance and lighting. Bat boxes should be installed approximately 3m high and should be south or west facing, with no obstruction to the box entrances. The box specifications will be appropriate for locally occurring bat species including pipistrelle bats and could include Schwegler 1FR bat tubes in new buildings.

7.243 New habitat creation and wildlife-friendly landscaping design, including tree and hedgerow planting and green corridors through the Site, will mitigate for the loss of foraging and commuting habitat.

7.244 A sensitive lighting design will be implemented for the scheme to avoid indirect impacts of lighting on nocturnal and crepuscular species during construction and post-construction. This will apply to retained and newly created habitats on and adjacent to the Site. There are four key lighting design principles:

- Use of unnecessary lighting will be avoided;
- Spatial spread of lighting – the horizontal and vertical spread of artificial light will be minimised, and take into account both primary and reflected light sources. Directional lighting can be achieved by angle and orientation of beam, use of a cowl, louvre or other light shield, or a combination of these;
- Timing and duration of lighting – timers and bespoke dimming regimes may be used to ensure that luminaires are reduced at times of predicted low use. These can be set to change with the seasons and therefore reflect the shifting time of dusk and dawn throughout the year. Motion sensors provide further control to ensure that areas are illuminated only when required;

- Intensity and colour of lighting – light intensity will be as low as possible whilst meeting the objectives of the intended function. The colour of lighting will need to take into account the sensitivity of the ecological receptors on site. Light sources selected should emit zero ultra-violet light wherever possible. Interim guidance from the Bat Conservation Trust (2014) recommends that white and blue spectrum light should be avoided or, where white lights are required, these should be of warm/neutral colour and have a peak wavelength above 550 nanometers. Narrow spectrum light sources should be used (to lower the range of species affected by lighting).

Barn Owls

7.245 New habitat creation and wildlife-friendly landscaping design, including tree and hedgerow planting and green corridors through the Site, will assist in mitigating for the loss of dispersal corridors and will enhance foraging opportunities within the Site.

7.246 Barn owl boxes are not recommended within 1.5km of a main road or railway line (Shawyer, 2011) (Ref 7-34) which border the site to the west and east respectively. In order to mitigate for the likely fragmentation effects to the barn owl/s using building B3, it is proposed that up to three barn owl boxes or towers will be installed on the edge of the new development and facing open countryside. These will be installed on retained trees, away from direct disturbance and lighting, prior to commencement of site clearance works to ensure that alternative roosting and nesting sites are immediately available. Barn owl boxes should be installed approximately 3m high and should be north or east facing, with no obstruction to the box entrances.

7.247 A sensitive lighting design will be implemented for the scheme to avoid indirect impacts of lighting on nocturnal and crepuscular species during construction and post-construction within the Site. This will apply to retained and newly created habitats on and adjacent to the Site. There are four key lighting design principles as detailed in Paragraph 7.244 above.

Breeding Birds

7.248 Clearance of dense vegetation will be carried out outside of the nesting bird season (March - August inclusive), where possible. Where this is not possible a nesting bird check will be carried out by a suitably qualified ecologist no more than 24 hours prior to the works commencing, to establish that no active bird nests will be disturbed or destroyed. If active nests are found a protective buffer will be retained around vegetation until the chicks have fledged.

7.249 Bird boxes will be installed to mitigate for the loss of buildings and trees with nesting suitability at a ratio of 2:1. These will be installed on retained trees, away from direct disturbance and lighting, prior to commencement of site clearance works to ensure that alternative nest sites are immediately available. Bird boxes will also be incorporated into new buildings away from direct disturbance and lighting. Bird boxes should be installed approximately 3m high and should be north or east facing, with no obstruction to the box entrances. Bird boxes will also be installed on new buildings. The box specifications will be appropriate for locally occurring bird species and could include

Schwegler 1B bird boxes on retained trees or Schwegler 16 swift boxes or Schwegler 1SP sparrow terraces on new buildings.

7.250 New habitat creation and wildlife-friendly landscaping design, including tree and hedgerow planting and green corridors through the Site, will mitigate for the loss of foraging habitat and enhance opportunities for local bird populations.

Other Mitigation Measures

Native Bluebell

7.251 Native bluebell plants adjacent to Hedgerows 13 in the Site will be protected in situ or translocated to a non-disturbed area within the scheme under a protected species management plan. A pre-commencement survey for native bluebell and other protected plant species should be undertaken in April/ May and between April and October respectively prior to each phase of development.

Japanese Knotweed

7.252 Japanese knotweed should be eradicated from the Site under a non-native invasive species management plan. A pre-commencement survey for non-native invasive plants will be undertaken between April and October to map and identify presence of any additional species prior to each phase of development.

Amphibians

7.253 Reasonable Avoidance Measures will be implemented to minimise impacts to common amphibians, if present, during construction. This will include hand searches prior to site clearance and a staged strimming approach during vegetation clearance.

7.254 New habitat creation and wildlife-friendly landscaping design, including tree and hedgerow planting and green corridors through the Site, will mitigate for the loss of terrestrial habitat and enhance opportunities for local amphibian populations.

Badgers

7.255 A pre-commencement survey for badgers will be undertaken if construction does not commence within one year of the previous survey. If an active badger sett is found to be present within 30m of the proposed working area then a Natural England licence may need to be obtained in order to disturb or close the sett.

7.256 Reasonable Avoidance Measures will be implemented to minimise impacts to badgers, if present, during construction. This will include covering of excavations or the provision of mammal ladders to allow trapped animals to escape.

7.257 New habitat creation and wildlife-friendly landscaping design, including tree and hedgerow planting and green corridors through the Site, will mitigate for the loss of habitat and enhance opportunities for local badger populations.

Hedgehogs

7.258 Reasonable Avoidance Measures will be implemented to minimise impacts to hedgehogs, if present, during site clearance and construction. This will include hand searches prior to site clearance, a staged strimming approach for the scrub and the covering of excavations or the provision of mammal ladders to allow trapped animals to escape.

7.259 New habitat creation and wildlife-friendly landscaping design, including tree and hedgerow planting and green corridors through the Site, will mitigate for the loss of habitat and enhance opportunities for local hedgehog populations.

The Completed and Operational Development

Habitats

7.260 A landscape and habitat management plan will be produced and implemented upon completion of the development. This management plan will serve to enhance and maintain the quality of retained and newly created habitats in the long-term, including deciduous woodland, trees and hedgerows as well as maintenance of bat, barn owl and bird boxes.

Bats

7.261 Sensitive lighting design, based on the principles outlined above, will ensure that lighting is minimised along wildlife corridors such as hedgerows and tree lines which are used by bats for foraging and commuting and around trees which have bat roost potential.

Barn Owls

7.262 Sensitive lighting design, based on the principles outlined above, will ensure that lighting in the vicinity of nest sites and foraging areas is minimised.

Breeding Birds

7.263 Additional bird boxes should be installed in order to offset the risk of higher mortality of birds due to cat predation. These should be installed approximately 3m high and should be north or east facing, with no obstruction to the box entrances. The box specifications will be appropriate for locally occurring bird species and could include Schwegler 16 swift boxes or Schwegler 1SP sparrow terraces on new buildings, along with Schwegler 1B bird boxes on retained trees.

Other Fauna

7.264 Brash piles will be created in the outline planning application site for hedgehogs. These may be created from any deadwood and brash that may arise from tree pruning and should be located in areas of the Site away from recreational disturbance.

7.265 Gaps will be created under garden and boundary fences within the Site to allow the passage of hedgehogs through the Site. These will be signposted to minimise the likelihood of them being blocked up.

Likely Residual Effects of the Development and their Significance

7.266 The assessment of effects of an impact after mitigation measures have been applied is described as the residual impact. Residual impact significance is determined using the same process of characterisation as for the potential impact assessment above. Table 7.7 details the anticipated residual effects of the Proposed Development both during the demolition and construction and the completed development on those ecological receptors, where a significant effect was identified prior to mitigation.

7.267 Within this section "the Site" refers to land that falls within the application boundaries identified in the Site Location plans (**Figure 1.1** and **Figure 1.2)**.

Table 7.7: Residual Effects Summary

Description of Effect	Potential effect including significance	Mitigation	Residual Effect including significance
Construction and Demolition			
Woodland - accidental damage, site run-off pollution or encroachment and soil compaction by construction machinery could result in loss of habitat	Significant adverse effect at Local level (minor adverse)	Implementation of best practice pollution prevention and tree protection measures	Not significant (neutral)
Trees – loss of habitat	Significant adverse effect at Local level (minor adverse)	Replacement planting of high to moderate value trees at a 3:1 ratio	Newly planted trees will be young in age and will not immediately compensate for the loss of mature specimens – minor adverse effect in the short term As the trees mature this will become a significant beneficial effect at the Local level

Description of Effect	Potential effect including significance	Mitigation	Residual Effect including significance
			(minor beneficial) in the medium-term.
Trees - accidental damage, site run-off pollution or encroachment and soil compaction by construction machinery	Significant adverse effect at Local level (minor adverse)	Implementation of best practice pollution prevention and tree protection measures	Not significant (neutral)
Hedgerows – loss of habitat	Significant adverse effect at County level (Moderate adverse)	Replacement like-for-like planting within the scheme	Newly planted hedgerows will be young in age and will not immediately compensate for the loss of mature hedgerows – minor adverse effect in the short term As the hedgerows mature this will become not significant (neutral) in the medium-term.
Hedgerows - accidental damage, site run-off pollution or encroachment and soil compaction by construction machinery	Significant adverse effect at Local level (minor adverse)	Implementation of best practice pollution prevention and tree protection measures	Not significant (neutral)
Bats – disturbance, modification or destruction of bat roosts in trees (if present) and loss of roosting habitat, killing and injury of bats	Significant adverse effect at Local level (minor adverse)	Updated bat surveys when necessary, supervised felling and EPS licensing if appropriate. Installation of bat boxes prior to loss of existing roosting habitat and into buildings during construction	Not significant (neutral)
Bats – loss of foraging and commuting habitat	Significant adverse effect at Local level (minor adverse)	New habitat creation including woodland, tree and hedgerow planting and green corridors through the Site	Not significant (neutral)
Bats – light spill on to foraging and commuting habitat	Significant adverse effect at Local level (minor adverse)	Implementation of sensitive lighting principles	Not significant (neutral)

Description of Effect	Potential effect including significance	Mitigation	Residual Effect including significance
Barn owls – disturbance of barn owl nesting and roosting site in building B3	Significant adverse effect at Local level (minor adverse)	Installation of barn owl boxes prior to loss of existing roosting habitat.	Not significant (neutral)
Barn owls – fragmentation of dispersal corridors	Significant adverse effect at Local level (minor adverse)	New habitat creation including green corridors through the Site	Not significant (neutral)
Barn owl – light spill on to foraging and commuting habitat	Significant adverse effect at Local level (minor adverse)	Implementation of sensitive lighting principles	Not significant (neutral)
Barn owl – collision risk with traffic	Significant adverse effect at Local level (minor adverse)	Areas of tree planting to encourage barn owls to fly up and over key roads	Not significant (neutral)
Breeding birds – disturbance or destruction of active bird nests (if present) and loss of nesting habitat	Significant adverse effect at Local level (minor adverse)	Avoidance of vegetation clearance during nesting season or pre-commencement survey Installation of bird boxes prior to loss of existing nesting habitat and into buildings during construction	Not significant (neutral)
Completed Development			
Trees - If the trees are pruned at an inappropriate time or year or too extensively this could result in long-term damage	Significant adverse effect at Local level (minor adverse)	Implementation of a landscape and habitat management plan	Not significant (neutral)
Hedgerows - If the hedgerows are pruned at an inappropriate time or year or too extensively this could result in long-term damage and loss of functionality	Significant adverse effect at Local level (minor adverse)	Implementation of a landscape and habitat management plan	Not significant (neutral)
Bats – lighting disturbance	Significant adverse effect at Local level (minor adverse)	Implementation of sensitive lighting principles	Not significant (neutral)
Bats - predation	Significant adverse effect at Local level (minor adverse)	Installation of additional bat boxes on new builds and trees	Not significant (neutral)

Description of Effect	Potential effect including significance	Mitigation	Residual Effect including significance
Barn owl – lighting disturbance	Significant adverse effect at Local level (minor adverse)	Implementation of sensitive lighting principles	Not significant (neutral)
Breeding birds - lighting, disturbance	Significant adverse effect at Local level (minor adverse)	Implementation of sensitive lighting principles	Not significant (neutral)
Breeding birds - predation by cats	Significant adverse effect at Local level (minor adverse)	Installation of additional bird boxes on new builds and trees	Not significant (neutral)

Conclusions

7.268 Data searches identified two internationally designated sites within 10km of the Site, five nationally designated sites within 5km of the Site and six locally designated sites within 2km. No impacts are anticipated on these designations during construction or upon completion of the development.

7.269 Field surveys and data searches identified the majority of the Site comprises improved grazed grassland and arable fields with an extensive network of hedgerows and mature trees and deciduous woodland adjacent (habitats of principal importance). An iterative design process has resulted in the retention and protection of key habitat features or like-for-like replacement within the scheme as a minimum. Replacement tree planting at a ratio of 3:1 will result in a significant beneficial effect at Local level (minor beneficial). Therefore no significant impacts are anticipated on habitats as a result of the proposals.

7.270 Field surveys and data searches identified the presence of bats, barn owls, and other breeding birds within the scheme. Key habitat features for these species will be retained or replaced within the Site. Where applicable Natural England licences will be obtained and appropriate mitigation or reasonable avoidance measures mitigation strategies will be implemented. The proposals will include the installation of artificial habitats including barn owl, bat and bird boxes and sensitive lighting design.

7.271 Mitigation measures will also be implemented for features which may hold importance at site level including the small onsite stream, native bluebell, badgers and hedgehogs.

7.272 Overall the assessment shows that even prior to mitigation, impacts in traditional EIA terms are not significant (i.e. in CIEEM terms impacts are significant at no more than the local context). Furthermore, the assessment concludes that after mitigation the overwhelming majority of residual impacts are reduced to neutral, with the few remaining impacts reducing to neutral within only a medium term.

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