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ECOLOGICAL IMPACT ASSESSMENT

Prickleden Mills, Holmfirth, West Yorkshire

Report Reference: BG20.316

August 2021





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Report	Name	Signature	Date
Prepared by	Tom Hough Ecologist		02/08/2021
1 st Check by	Ellen Marshall Head of Ecology		01/08/2021
2 nd Check by	Lucinda Sweet MCIEEM		21/09/2021
Issued by (PDF)	Lucinda Sweet MCIEEM		29/10/2021
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Project Details

Project carried out by:

Brindle and Green

Unit 3, Silverhill Court

Radbourne

Derby.

DE6 4LY

Head Office: 01332 825771

Email: info@brindlegreen.co.uk

Website: www.brindlegreen.co.uk

Project carried out for:

Acumen Designers & Architects

Headrow House

Old Leeds Road

Huddersfield

HD1 1SG

Project site:

Prickleden Mills

Holmfirth

West Yorkshire

HD9 2JU

Grid Ref. SE 13796 07913

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1 Summary

- 1.1 The production of an Ecological Impact Assessment (EclA) is considered the best practice methodology (by the Chartered Institute of Ecology and Environmental Management (CIEEM)) for documenting all ecological issues associated with proposed development and supersedes the more out of date method of preparing individual reports for differing species and habitats. The aim is to consider any impacts alongside each other, to provide a coordinated solution when considering mitigation, and to set out clear and well-defined enhancement prescriptions that work in line with the plans for development. Through assessing the scale of impact (Page 17) the aim is to result in a scheme that is assessed as making a positive contribution to biodiversity at a local level at the very least.
- 1.2 This EclA draws upon the results of the Preliminary Ecological Appraisal (PEA) undertaken and reported upon previously (BG20.316, January 2021) and adds the results of additional protected species and/or habitat surveys that have been completed since. In the case of this site, the PEA identified habitats suitable for supporting breeding birds, bats, amphibians including great crested newt (GCN) (*Triturus cristatus*), reptiles, badgers (*Meles meles*), water vole (*Arvicola amphibius*), white-clawed crayfish (*Austropotamobius pallipes*) and otter (*Lutra lutra*), as well as considering the usual impacts associated with other species of principle importance listed under section 41 of The Natural Environment and Rural Communities (NERC) Act 2006.
- 1.3 Further protected species surveys undertaken during the active season of 2021 failed to identify the presence of resident populations of roosting bats, GCN, reptiles, water vole, otters or white clawed crayfish within the application boundary. However, the frequency of suitable habitat for these species dictates that Reasonable Avoidance Measures are employed during the development works, and as such, where required appropriate compensation and mitigation has been proposed.
- 1.4 This report was compiled following the revised Guidelines for EclA in the UK and Ireland (CIEEM, 2017) and highlights and addresses the following ecological constraints as shown in (Table A) overleaf.

Table A: Summary of ecological constraint assessment for Prickleden Mills and proposed mitigation

Ecological constraint	Value	Effect	Significance prior to mitigation	Mitigation / precautionary measures	Significance of residual effect	Securing mitigation
Habitat	District	Impacts to the River Holme	Likely Negative (Not Significant)	LEMP to guide landscaping and CEMP to safeguard habitats	Neutral (Not Significant)	Mitigation secured through planning condition
Designated Sites	Local	Indirect effects of pollution discharge into waterway	Negative (Not Significant)	LEMP to guide landscaping and CEMP to safeguard habitats	Neutral (Not Significant)	Mitigation secured through planning condition
Invasive Species	N/A	Presence of Indian Balsam and Japanese Knotweed	Negative (Significant)	Clearance by certified contractors.	Positive (Significant)	Secured through planning condition.
Birds	Local	Disturbance/ Injury to individuals	Likely Negative (Not Significant)	Pre-works check. Clearance of vegetation outside of breeding season	Neutral (Not Significant)	Precautionary measures secured through planning condition
Roosting Bats	Site	Disturbance / loss of roosting habitat	Unlikely Negative (Not Significant)	Pre-works dawn survey/inspections of suitable features on site	Neutral (Not Significant)	Precautionary measures secured through planning condition
Foraging & Commuting Bats	Local	Disturbance / loss of foraging and commuting habitat	Unlikely Negative (Not Significant)	Sensitive lighting scheme during and post construction	Neutral (Not significant)	Precautionary measures secured through planning condition
Badgers	Site	Disturbance/ Injury to individuals Habitat loss	Negative (Not Significant)	Reasonable Avoidance Measures outlined within CEMP	Neutral (Not significant)	Precautionary measures secured through planning condition
Amphibians – Common toad	Site	Disturbance/ Injury to individuals Habitat loss	Unlikely Negative (Not Significant)	Reasonable Avoidance Measures outlined within CEMP	Neutral (Not significant)	Precautionary measures secured through planning condition
Reptiles	Site	Disturbance/ Injury to individuals Habitat loss	Unlikely Negative (Not Significant)	Reasonable Avoidance Measures outlined within CEMP	Neutral (Not significant)	Precautionary measures secured through planning condition
Water Voles	Site	Injury/Disturbance to individuals	Unlikely Negative (Not Significant)	Reasonable Avoidance Measures outlined within CEMP	Neutral (Not significant)	Precautionary measures secured through planning condition
Otters	Site	Injury/Disturbance to individuals	Unlikely Negative (Not Significant)	Reasonable Avoidance Measures outlined within CEMP	Neutral (Not significant)	Precautionary measures secured through planning condition
MSPI Hedgehog	Site	Disturbance/ Injury to individual	Unlikely Negative (Not Significant)	Maintenance of connective habitat	Neutral (Not significant)	Precautionary measures secured through planning condition

2 Introduction

2.1 Brindle and Green Ltd were commissioned by Acumen Designers and Architects to provide an Ecological Impact Assessment (EclA) of the site of Prickleden Mills, Holmfirth, West Yorkshire (Figure 1). This EclA report documents the constraints identified within the Preliminary Ecological Appraisal undertaken by Brindle and Green Ltd (BG20.316) and adds the results of additional protected species and habitat surveys undertaken during March – July 2021. The EclA includes the following sections:

- Baseline Ecological Conditions
- Assessment of effects and mitigation measures
- Enhancement strategy
- Summary of residual effects

2.2 The application site is approximately 1.1 hectares in extent and situated at the southern edge of Holmfirth, directly south of the A6024. Residential development is present immediately to the north, east and west. The wider environment to the south comprises arable and pastoral farmland interspersed by hedgerows with treelines leading to woodland further south.

2.3 The site is the subject of a full planning application for the development of three residential apartment buildings and underground car park, with associated soft landscaping, facilitated by partial site clearance. A bridge is also proposed to be constructed across the river to facilitate access. Design plans are provided within Appendix 6 of this report.

2.4 The layout and design of the development should be informed by the recommendations within this report which prescribes additional mitigation measures during construction and post- construction phases to avoid, reduce or reverse adverse impacts and prevent biodiversity loss.

2.5 Results presented within this report have been prepared by an experienced ecologist and are therefore the view of Brindle & Green Limited. The survey is based on information provided by our client, the development proposals, and the results of the desk study and our survey of the site. This report pertains to this information only.

3 Methodology

3.1 Desk Study

Table 1 below lists organisations and/or resources used as part of the desk study process. Data regarding any known statutory or non-statutory sites in addition to any records for protected species were requested from the following sources:

Table 1. Ecological Data Resources

Consultant	Requested Data	Search Radius	Date Requested
Local Ecological Records Centre West Yorkshire Ecology Service	Protected and notable species records Local, National and International Site Designations	2km	07/01/2021
MAGIC Maps	National and International Site Designations Granted EPS Development Licences	2km	14/01/2021

3.2 Extended Phase 1 Habitat Survey

3.2.1 A Phase 1 habitat survey was undertaken following survey guidance (JNCC 2007) to establish the presence and distribution of habitat types within the site and potential ecological constraints to development. A Phase 1 Habitat Map was produced (Appendix 1) and where additional details were required Target Notes have been provided (Appendix 2). A plant species list (Appendix 2) summarising all plants identified on site was produced during the survey and all scientific nomenclature was produced according to Stace (2010).

3.2.2 This survey was extended to note the potential for habitats on-site to support protected and/or notable species and for evidence of any such species. The habitats on site were assessed for their suitability to support protected species in relation to the habitat types found at the site. Any incidental sightings of field signs were noted at the time of survey. Where evidence of, or the confirmed presence of a protected species was identified, further, species specific surveys are recommended to ensure that the presence or otherwise of a legally

protected species is fully considered prior to the determination of any planning approval or to guide an EPS development licence.

3.2.3 Hedgerows on site were assessed following the Hedgerow Survey Handbook (DEFRA 2007) and defined as species-rich if the structural species making up a surveyed 30m section of hedgerow included at least four native woody species. Results were compiled and assessed against the UK Biodiversity Action Plan.

3.2.4 Legislation, guidance and methodology for species relevant to this site are presented in full within Appendix 3 of this report.

3.2.5 The survey was undertaken by Tom Hough MSc, Natural England Bat Licence Class 1 (2020-50050-CLS-CLS), Assistant Ecologist. The survey was supervised by Lucinda Sweet PhD, MCIEEM, Natural England Bat Licence Class 2 (2019-39122-CLS-CLS), Great Crested Newt licence (2016-22852-CLS-CLS), Principal Ecologist

3.3 Phase 2 Surveys

Within the Preliminary Ecological Appraisal (PEA), The following ecological phase 2 surveys have been recommended to allow a full impact assessment on the ecological value of the application site.

- i) Roosting Bat Endoscope Survey
- ii) Great Crested Newt Survey
- iii) Reptile Survey
- iv) Water Vole Survey
- v) Otter Survey
- vi) White-clawed Crayfish Survey

3.3.1 Bat Endoscope Survey

3.3.1.1 Suitable roosting features were recorded within stone walling along the northern boundary of the site and endoscopy was undertaken to determine the suitability of features to allow classification under BCT guidelines. Gaps and crevices suitable for roosting bats were systematically inspected for roosting bats or evidence of roosting bats with a Ridgid CA-350x Endoscope Camera

(Appendix 9E) to determine roost suitability and provide further recommendations.

The survey was undertaken on 29^h June 2021 by Ellen Marshall BSc (Hons) MRes Natural England Bat Licence Class 1 (CL17-2017-28407), Senior Ecologist. The survey was supervised by Lucinda Sweet PhD, MCIEEM, Natural England Bat Licence Class 2 (2019-39122-CLS-CLS), Principal Ecologist

3.3.2 Great Crested Newt Survey

3.3.2.1 Suitable water bodies found within the project site and within 500m of the project site were subjected to a minimum of 4 presence/absence surveys which were undertaken in suitable conditions, at the optimal time of year (between mid-March and mid-June) as per Natural England guidelines; described in the Great Crested Newt Mitigation Guidelines, English Nature, (2001).

3.3.2.2 The water bodies were subjected to three of the following survey methodologies.

- **Bottle Trapping.** This method involves setting bottle traps around the water body margin and leaving the traps overnight. Some studies indicate that bottle trapping is the most reliable method for detecting the presence of great crested newts and other amphibians, particularly when surveying turbid waterbodies, or waterbodies with dense macrophyte cover.
- **Egg Search.** This method involves searching both live and dead submerged vegetation for amphibian eggs. This is often a very effective method for detecting great crested newt presence.
- **Netting.** A professional Hand Net with Wooden Handle (250mm Wide Frame) is used to search for great crested newt adults/immature adults and larvae within the margins of the pond.
- **Torch Survey.** A SM126 Smartlite torch with 1 million candle power and 1000m beam is used to illuminate the ponds and allow the surveyor to record any great crested newts observed after sunset.

- **Terrestrial Refuge Searching.** This method involves looking underneath objects such as rocks, logs, moss and discarded debris in the vicinity of a pond. Adult and juvenile great crested newts can be found underneath such objects, between March and October. Refuge searching is not a reliable method on its own and is only used as a supporting method to the other methods described.

Bottle trapping, torch survey and egg searching were the methods used during the suite of surveys

3.3.2.3 Suitable, permissible ponds were surveyed on four occasions, 17/03/2021, 29/03/2021, 19/04/2021 and 29/04/2021 by Tom Hough MSc QualCIEEM, Consultant Ecologist, Kerry Baker MSc QualCIEEM, Consultant Ecologist, Phoebe Collier BSc, Graduate Ecologist and Amy Dennett BSc, Graduate Ecologist. The survey was supervised by Lucinda Sweet PhD, MCIEEM, Great Crested Newt licence (2016-22852-CLS-CLS), Principal Ecologist

3.3.2.4 Survey conditions, pond descriptions and results can be found within Appendix 9A.

3.3.3 Reptile Survey

3.3.3.1 A seven-visit, presence or likely absence survey was undertaken during suitable conditions between April and June 2021. Reptiles are considered to be active between March and October with optimal survey conditions during April and May or September. Surveys were undertaken during suitable weather conditions when the air temperature was between 9 - 18°C (Froglife, 1999).

3.3.3.2 Reptile refugia (1m x 1m) constructed from roofing felt were used to observe basking and sheltering reptiles. Refugia were laid at a density of between 5 and 10 per hectare of suitable habitat (Froglife, 1999).

3.3.3.3 Thirty mats were laid on 17/03/2021 and were left to embed for a minimum period of two weeks, with a series of seven visits undertaken on: 19/04/2021, 20/04/2021, 06/05/2021, 10/05/2021, 17/05/2021, 24/05/2021, and 04/06/2021 by Tom Hough MSc, Consultant Ecologist, Kerry Baker MSc, QualCIEEM, Consultant Ecologist and John Harvey BA (Hons.), ACIEEM, Ecologist. Survey conditions, and a refugia map can be found within Appendix 9B.

3.3.4 Water Vole Survey

3.3.4.1 Two surveys were undertaken following guidance set out in Water Vole Conservation Handbook, 2nd Edition. A walkover of the accessible areas of the brook bordering the western boundary was undertaken to identify key parameters, identify suitable points for access, areas of likely presence and to check for water vole sightings.

3.3.4.2 The survey involved establishing sub-sections and recording observations on habitat type and suitability or otherwise, alongside searching for evidence of water vole presence. The habitat suitability was recorded following the method in 3.10.4.

3.3.4.3 Field signs typically involve searching for burrows, latrines, feeding stations, mammal runs and footprints.

3.3.4.4 A single camera trap was deployed within the river at a location near identified possible burrows for a 5 night period in August 2021. To determine if they were occupied or not?

3.3.4.4 Habitat Suitability Assessment (HSA)

Harris et al. 2009 devised a method to assess the suitability of habitat for water voles. Under this approach the presence or absence of a number of well-documented environmental features favoured by water voles is recorded, providing an indication of the habitat suitability on site. The resulting scores are categorised as follows:

- Less than 3 Unsuitable (no potential for enhancement)
- 3-5 Sub-optimal (potential for enhancement)
- Greater than 5 Optimal

3.3.4.5 The surveys were undertaken on 17/06/2021 and 05/07/2021 by Tom Hough MSc, QualCIEEM, Natural England Bat Licence Class 1 (2020-50050-CLS-CLS), Consultant Ecologist, and John Harvey BA (Hons.), ACIEEM, Ecologist. Maps and survey conditions can be found within Appendix 9C.

3.3.5 Otter Survey

3.3.5.1 The otter survey was carried out in accordance with current best practice guidelines with reference to Monitoring the Otter (Life in UK Rivers 2003) and The Design Manual for Roads and Bridges; Volume 10 Section 4 Part 2 (Highways Agency, 2001).

3.3.5.2 The River Holme within the application site was searched for field signs of otter alongside bankside habitat. Signs include:

- Dung (spraints)
- Tracks (footprints or visible paths)
- Feeding remains
- Otter slides (into water)
- Dens (that lead underground)
- Couches (temporary areas used by otters for resting, grooming) or feeding whilst on the move).

3.3.5.3 The surveys were undertaken on 17/06/2021 and 05/07/2021 by Tom Hough MSc, QualCIEEM, Consultant Ecologist and Phoebe Collier BSc, Graduate Ecologist

3.3.6 White-clawed crayfish Survey

3.3.6.1 Habitat Assessment

A single habitat assessment was conducted along the River Holme which runs through the application site. The assessment involved recognising sections, termed 'patches', of the brook most suitable for hosting white clawed crayfish through identifying features offering suitable refugia such as submerged tree roots, artificial debris, undercut banks and substantial stones.

3.3.6.2 Active Search

Active search involves lifting large stones, woody detritus or other suitable refuges and carefully examining the substrate beneath before replacing the refuge. 100 refugia were lifted in 5 different locations (500 total) along the river. A small hand-net was positioned downstream of the refuge in order to capture escaping crayfish.. Where there are submerged roots, aquatic plants, or bankside vegetation that trails into the water, crayfish will often be actively

foraging in these, and can be captured by sweeping a net through the roots or plants.

3.3.6.3 Torching

The waterway was subjected to a torching survey where a torch with 1 million candle power and 1000m beam is used to illuminate the water from the bankside. The survey was undertaken 1 hour after sunset, during clear conditions allowing the surveyor to record any active crayfish. The torch was directed towards potential refuge and undercuts along the bank.

Virkon was used prior to and following the survey to disinfect waders and nets to prevent the risk of transferring crayfish plague (Aphanomycosis) to or from the watercourse.

3.3.9.4 Habitat assessment, active search and torching was undertaken by Dr Phil Eades MCIEEM (Class licence 2016 20900-CLS-CLS), and Belinda Wiggs MCIEEM (Class licence 2016 23974-CLS-CLS) on 24/04/2021 and 13/07/2021.

3.4 Limitations

3.4.1 It should be noted that whilst every effort has been made to provide a comprehensive description of the site, no investigation could ensure the complete characterisation and prediction of the natural environment.

3.4.2 Sections of steep riverbank and deep water limited access for assessment of water voles and otters in some areas, and the deployment of camera traps directly on possible burrows. A camera trap was deployed slightly further upstream from both the possible water vole burrows and otter holt.

3.4.4 Some crevices within the wall were located beyond reach of the ladder, on uneven ground to be able to survey for roosting bats. As such, an additional pre-works dawn survey will be included within the proposed mitigation measures.

3.4.5 Due to low temperatures at the time of the final GCN survey, bottle trapping was avoided. As per the methodology netting was used as an alternative.

3.4.5 Due to a backlog in applications in relation to the Covid-19 Pandemic, a trapping licence for the site was not able to be acquired and no crayfish trapping was undertaken. Torching and a manual search was undertaken and was considered suitable to determine the presence of a population.

3.4.6 Works on site were being undertaken on the smaller southern side of the river during the initial set-up of the reptile survey. Habitats in this section were also less suitable compared to the rest of the site. As a result, no mats were deployed in this section. The mats laid across the remainder of the site were considered sufficient to determine if a population was present and provide appropriate mitigation if required.

3.5 Report Lifespan

Given the transient nature of the subject we would consider the survey results contained to be accurate for 1 year.

3.6 Evaluation Methodology

3.6.1 The site and protected and notable species within the zone of influence were classified into one of the following 6 groups (Table 2) following the Guidelines for Ecological Impact Assessment (CIEEM, 2016), depending on the size, rarity, diversity and fragility for a species population. The evaluation also considers County and nationally prepared documents such as LBAP and Red Data books.

3.6.2 Ecological Impact Assessment

The Ecological impacts of a development were assessed using data collected from historic records and current field surveys to and were categorised following EcIA guidelines (CIEEM, 2016) as follows:

- i) Highlight Protected or notable species which could be impacted as part of the development (Section 5).
- ii) Determine the severity of the impact and effect without specific mitigation measures (Section 6).
- iii) Outline a mitigation strategy highlighting areas of potential environmental improvement, which upon implementation aims to avoid or reduce negative impacts and effects (Section 6).

- iv) Assess the feasibility and likelihood of success of the mitigation strategy (Section 7).
- v) Assess the residual impact of the development assessing that the mitigation has been successfully implemented and all prescriptions have been implemented (Section 7).

3.6.3 **Classifying the extent of impacts and effects**

The extent of impacts and effects need to be described in an unambiguous, consistent manner. The direction of change 'Positive' or 'Negative' should be assessed in relation to the overall biodiversity outcome, and should consider the duration, timing and reversibility of the constraint and be classified into one of the following five categories:

- i) **Positive (Significant)** Activity will create a beneficial effect over a long term, created a valued ecological feature
- ii) **Positive (Not Significant)** Activity will create a beneficial effect without markedly improving the conservation status
- iii) **Neutral (Not Significant)** Effects or neutral or no net change will occur
- iv) **Negative (Not Significant)** Negative effect without causing long-term irreversible damage
- v) **Negative (Significant)** Significant Negative effect including loss or long-term irreversible damage to integrity or status of a valued ecological feature

Table 2. Definitions of each of the six evaluation brackets, indicating the importance of each habitat type and an example of their possible habitat status.

Evaluation Value	Example of Habitat or species
International	An internationally designated site or candidate site, including habitat or species included within Special Protection Areas (SPA) / Special Areas of Conservation (SAC), Ramsar Sites, listed under Annex 1 of the Habitats Directive.
National	<p>Sites designated at UK level, e.g. Sites of Special Scientific Interest (SSSI), supporting species considered nationally threatened or rare.</p> <p>A regularly occurring regionally or county significant population/number of any nationally important species</p> <p>A feature identified as of critical importance within Section 41 of the NERC Act (2006).</p>
Regional	Key Habitat type included within BAP. A regularly occurring, locally significant number of a regionally important species.
County	Designated sites, such as Sites of Biological Importance (SBIs) or viable habitat / species populations of value at a county level (LBAP).
District	<p>District level designated sites, such as Local Wildlife Sites (LWS) or habitats / species populations of value at a district (Which have features qualifying for LWS status).</p> <p>Sites/features that are scarce within the district or which appreciably enrich the district habitat resource.</p>
Local / Site	<p>Habitats or species populations of value in a local (i.e. within ~ 5km of the site) context.</p> <p>Habitats of poor to moderate biological diversity e.g. established conifer plantations, species poor hedgerows and un-intensively managed grassland which supports species which are common to the local area and whose loss can be easily mitigated.</p>

4 Site Context

4.1 Site Description

4.1.1 The application site can be found at SE 13796 07913 and is located within the rural town of Holmfirth, west Yorkshire. The site comprises an area of cleared land supporting ephemeral short perennials and bare ground with scattered trees recorded along the southern site boundary. The clearance is estimated to have been undertaken less than 6 months prior to the site survey. The River Holme passes through the site from the north-east to the south-west connecting to a large onsite pond positioned to the west of the site.

4.1.2 The site is situated at the southern edge of Holmfirth directly south of the A6024, with residential development present immediately to the north, east and west. The wider environment to the south comprises arable and pastoral farmland interspersed by hedgerows with treelines and small pockets of woodland becoming dominant in the landscape.

4.1.3 Waterbodies in the surrounding environment include Wickins Dike and Mark Bottoms Dike, both positioned approximately 0.9km to the north, and Black Sike Dike located 0.9km to the east. Binns Wood and Attorney Croft Wood are located approximately 0.2km north and 0.5km north-east of the site, respectively. There is connectivity to the surrounding environment via the scattered trees present along the southern site boundary, however, the A6024 and the A635 associated with residential development, beyond the northern site boundary and extending south-west, provide barriers to species dispersal in this direction.

4.2 Zone of Influence

The zone of influence is used to describe the geographic extent of potential impacts of a proposed development. This is determined by the type of development proposed in relation to individual species and described within each of the species assessments within section 5 of this report. Maps, aerial photographs, historic data records and field survey results were examined to assess the relationship of the location and its connection to the surrounding environment and habitats beyond the site boundaries.

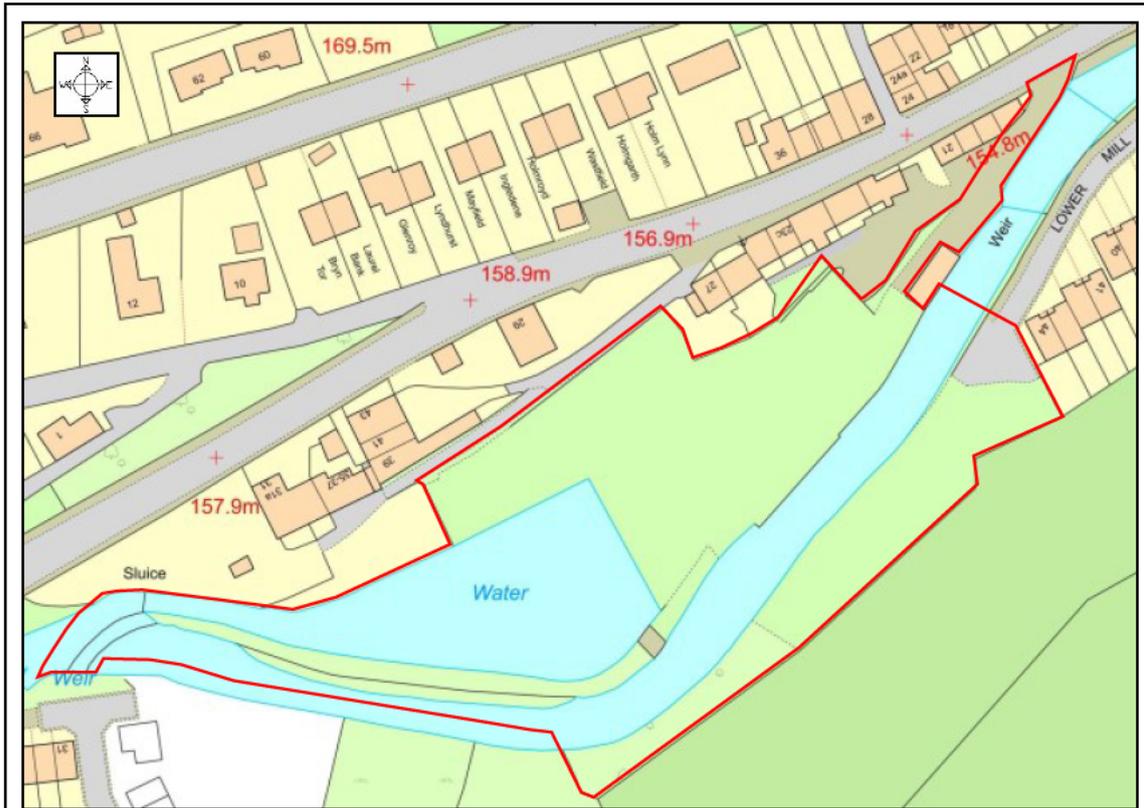


Figure 1. OS map of the project site and surrounding area.

Red line boundary depicts application site.

5 Baseline Ecological Conditions

5.1 Desk Study

5.1.1 Designated Sites

The site was subjected to a search for designated sites within a 2km radius of the site using data supplied by the Local Records Centre (West Yorkshire Ecology Service) and the online desk-based resource MAGIC.

5.1.2 The data supplied by West Yorkshire Ecology Service was received on the 07/01/2021 and is summarised within Table 3. The search revealed 4 non-statutory sites within a 2km radius of the site.

5.1.3 A search of the online resource Magic Maps found no sites with Statutory designations within the 2km radius search.

Table 3. Summary of Designated Sites with a 2km radius of the application site

Site Name	Grid Ref	Status	Reason for Designation	Distance from site
Malkin House Wood	SE132073	LWS	Species rich acid woodland	0.65km SW
Carr Green Meadows Holmbridge	SE121075	LWS	Diverse and semi-natural hay meadows	1.6km SW
New Laith Fields Holmbridge	SE116077	LWS	Species rich neutral grassland	1.7km W
Holmroyd Wood	SE132099	LWS	Ancient semi-natural woodland with native bluebell cover	1.9km N

5.1.4 Evaluation

Nearby designated sites are considered to have 'Local value' following evaluation (Table 2).

5.2 Extended Phase One Habitat Survey

- 5.2.1 A Phase 1 Habitat Survey Map is presented in Appendix 1 of this report. The habitat descriptions below should be read in conjunction with the Phase 1 plan and the Target Notes in Appendix 2.
- 5.2.2 A plant species list for those plants identified during the field survey is provided in the Target notes within Appendix 2.
- 5.2.3 Table 4 below provides a list of habitat types present on site along with their inclusion (or otherwise) as a National and / or Local Habitat of Principle Importance (HPI) (Previously referred to as Biodiversity Action Plan (BAP)).

Table 4. JNCC Habitat Types found on site and inclusion within UK BAP / HPI

Habitat Type	N HPI	L HPI	N/A
Ephemeral short perennials			✓
Hardstanding			✓
Bare ground			✓
Running water	✓	✓	
Standing water	✓	✓	
Scattered trees			✓

3.2.6 Ephemeral short perennials

The site had undergone recent clearance a few months prior to the survey, therefore the majority of the site both along the northern and southern side of the River Holme supports ephemeral short perennials. This was of a varying density, with some areas densely vegetated intermixed with bare ground. Species identified include frequent chickweed (*Stellaria media*), ivy (*Hedera helix*), common nettle (*Urtica dioica*), creeping buttercup (*Ranunculus repens*), ground ivy (*Glechoma hederacea*), hedgerow cranesbill (*Geranium pyrenaicum*), and ribwort plantain (*Plantago lanceolata*). Perennial rye grass (*Lolium perenne*) was also noted frequently to the west of the site, along the area of land between the river and the pond. The site showed evidence of secondary succession throughout the further surveys with the site becoming increasingly dense with ephemeral species, though no new species were noted.



Figure 2. Ephemeral short perennials to the centre of the site, view to the west.



Figure 3. View to the east of the site.

3.2.7 Hardstanding

Concrete hardstanding extended from the eastern boundary into the centre of site providing access to the northern half of the site. An area of hardstanding was also present at the eastern end of the site, south of the river.

3.2.8 Bare ground

Areas of permeable bare ground were present within the northern half of the site, in the location of former buildings. Ephemeral species were noted colonising these areas throughout the surveys.

3.2.9 Running water

The River Holme flows through the site, from the east to west. At the time of survey, the river was approximately 0.5m in depth and fast flowing within the section of the river within the redline boundary. The river supports clay banks in sections, with other portions of the riverside comprising built-up brickwork. The substrate of the riverbed was rocky, with a small weir across one section. This weir was not considered substantial enough to impact species dispersal.



Figure 4. The River Holme extending through the site.



Figure 5. Vegetation has recolonised the banks throughout the survey period.

3.2.10 Standing water

A large pond is present to the western end of the site, connected to the River Holme. A description of this pond can be found in Table 6.

3.2.11 Scattered trees

Scattered trees were present along the area of land between the pond and the river varying from immature to mature, with frequent sycamore (*Acer pseudoplatanus*), oak (*Quercus robur*), and crack willow (*Salix fragilis*), with occasional alder (*Alder glutinosa*), hawthorn (*Crataegus laevigata*) and horse chestnut (*Aesculus hippocastanum*). Mature trees were also located along the southern boundary of the site, comprising occasional oak, ash (*Fraxinus excelsior*) and holly (*Ilex aquifolium*) along a steep earth bank.



Figure 6. Mill Pond, located within the site.



Figure 7. Ephemeral short perennials to the south of the site. Scattered trees along southern boundary.



Figure 8. Ephemerals have recolonised the site throughout the survey season. Indian balsam was colonising along this section of the river bank.

3.2.12 Invasive Weeds Assessment

An assessment of the site was made to establish the presence of invasive weeds included on schedule 9 of the Wildlife and Countryside Act 1981 (as amended). Indian balsam (*Impatiens glandulifera*) was densely colonising along the riverbank to the west of the site (Target Note 9; Appendix 1, 2 - SE 13762 07851), and Japanese knotweed (*Fallopia japonica*) was recorded along the river at the eastern end of the site (Target Note 10; Appendix 1, 2 - SE 13838 07928).

5.2.4 Site Evaluation

The habitats on site have been evaluated as having District value in relation to the immediate surroundings and a county context as a result of the presence of the River Holme and associated riparian habitat. The terrestrial habitats onsite were of low ecological value and were considered to be locally frequent within the wider landscape.

5.3 Protected and Notable Species

5.3.1 Plants

5.3.1.1 The zone of influence for botanical species was determined to include habitat parcels within or adjacent to the application boundary of the site. The desk study and further site visits did not identify any notable or rare floral species within the application site. Terrestrial habitats on site were found to be of a low biodiversity value comprising areas of ephemeral short perennials, scattered trees, bare ground and hardstanding

5.3.1.2 Evaluation

Notable plants were considered to be absent from site and therefore this ecological receptor is not considered further within this report.

5.3.2 Breeding Birds

5.3.2.1 The zone of influence for breeding birds was considered to be areas within and immediately adjacent to the site boundaries. The data search revealed species such as goldfinch (*Carduelis carduelis*), grey wagtail (*Motacilla cinerea*) and lapwing (*Vanellus vanellus*) within the wider area, as well as a white-throated dipper (*Cinclus cinclus*) within the River Holme.

Vegetative ground cover was low on site due to recent clearance works, however, scattered trees provide suitable nesting habitat for common bird species. The River Holme had the potential to support species such as white throat dipper and kingfisher (*Alcedo atthis*) although the bankside habitat within the redline boundary was considered unsuitable to support nesting behaviours of kingfisher. During surveys two grey heron (*Ardea cinerea*) were observed along the river.

5.3.2.2 Evaluation

The area within the red-line boundary was considered to hold 'local value' for breeding birds, due to the riverine habitats present through the site, and nesting suitability around the pond.

5.3.3 Bats

5.3.3.1 *Roosting Bats.*

A section of stone walling along the northern boundary was found to support cavities (Appendix 9E) within the mortaring considered to have a negligible/low suitability for roosting bats. Approximately 20 features in the stone walling were endoscoped, with some of the features being heavily cobwebbed indicating a lack of use during the current season and downgraded to negligible. No roosting bats, or evidence of roosting bats were found during the bat endoscope survey, however a few of the cavities could not be fully investigated due to the depth and shape of the cavity, extending past the length of the endoscope.

5.3.3.2 Scattered trees were present along the River Holme, and along the southern boundary of the site. Visible trees were assessed and categorised based upon Bat Conservation Trust guidance (Appendix 5). Two mature trees (Target Notes, 1, 2; Appendix 1, 2) were identified as having low suitability to support roosting bats, due to cracked limbs and loose bark. Trees along the southern boundary were not able to be fully assessed due to restricted access, however current proposals suggest these trees will be retained post-development. All remaining trees within the site boundary were assessed as negligible, with mature and semi-mature trees not supporting suitable cracks, fissures or holes to support roosting bats.

5.3.3.3 *Foraging and Commuting Bats*

5.3.3.3.1 Scattered trees to the west of the site around Pond 1, and along the southern boundary, connect to woodland along the wider river corridor outside of the site and the wider landscape. The boundary vegetation was considered to hold high suitability foraging and commuting habitat for bats. It is highly likely that species such as common pipistrelle (*Pipistrellus pipistrellus*) and common noctule (*Nyctalus noctula*) will utilise the river corridor for foraging and commuting, however, no further surveys were undertaken as these suitable habitats are located outside of the proposed area of impact by the development.

5.3.3.3.2 The development area contains no suitability for foraging and commuting bats due to an absence of linear vegetative features along this section of the river corridor. The proposed development plans confirms that no woodland habitats along the river corridor will be removed.

5.3.3.4 Evaluation

The site has been assessed as supporting 'Site Value' for roosting bats. Foraging and commuting habitat is 'Local Value' due to connectivity to linear features along boundaries away from the development footprint.

5.3.4 Amphibians

5.3.4.1 The zone of influence for amphibians including great crested newts (*Triturus cristatus*) was determined following the desk study. A radius of 500 metres was searched for the presence of suitable waterbodies to support great crested newts using 4 different methods (OS Mapping via Pro Map, Google Earth Pro, Google Maps and an On-Site Walkover).

5.3.4.2 The site supports habitat suitable to support the terrestrial phase of this species, including ephemeral short perennials and deadwood from scattered trees. The data search did not provide any records of this species within 2km of the site. There was a single pond (Pond 1) located within the application boundary, and an additional 2 ponds within 500 metres of the site (Appendix 9A). Pond 1 was assessed and assigned a GCN Habitat Suitability Index (HSI) score (Oldham et al, 2000) displayed within Table 6 below. Ponds 2 and 3 were not accessible at the time of the survey. However the urban surroundings fragment the site from these ponds excluding access.

Table 5. Pond Locations and Suitability for Great Crested Newts. Descriptions of each pond can be found within Appendix 9A.

Pond No.	Grid Ref.	Habitat Suitability Index Score	Distance from Site
1	SE 13753 07873	0.73 - good	Located on site
2	SE 13300 07896	No access	400m west
3	SE 14108 08006	No access	350m east

5.3.4.3 No newt species were identified in Pond 1 during presence / absence surveys. A single common frog (*Rana temporaria*) was identified by torchlight during the first survey visit.

5.3.4.4 Incidental sightings of common toad (*Bufo bufo*) were made during the phase 2 surveys. A single toad was identified on site during one of the visits undertaken as part of the reptile survey.

5.3.4.5 Evaluation

The application site was therefore considered to have 'site value' for common toad a species of principle importance under Section 41 of the NERC Act not sure of the year.

5.3.5 Reptiles

5.3.5.1 The zone of influence for reptiles was considered to be within the site and 500 metres of connective habitat. The site supported a suitable habitat matrix comprising suitable terrestrial habitats along the river, ponds and dead wood refugia which are considered suitable to support reptile populations, particularly grass snake (*Natrix helvetica*) and slow-worm (*Anguis fragilis*). The undulating topography of the site also provided suitable basking areas. The data search returned no records of reptiles within 2km of the site.

5.3.5.2 The reptile survey showed no evidence to suggest that there was a permanent population of reptiles onsite or within suitable adjoining habitats. The survey results are presented within Table 6 below:

Table 6: Results of the seven visits undertaken during April – June 2021 (Refugia Locations can be found within Appendix 10B)

Survey Date / Time	Temp °C	Cloud Cover	Humidity %	Wind Speed	Findings
19/04/21 19:30	14	0	49	0	No reptiles found Field Vole
20/04/21 08:45	13	1	49	0	No reptiles found
06/05/21 12:00	13	1	43	3	No reptiles found
10/05/21 10:45	16	7	44	3	No reptiles found
18/05/21 18:30	13	1	66	0	No reptiles found
24/05/21 16:30	13	7	78	2	No reptiles found
04/06/21 10:30	15	0	51	1	No reptiles found Common Toad

5.3.4.3 Evaluation

The optimal habitat on site provides 'Site Value' for this protected species group, following evaluation criteria (Table 2).

5.3.6 **Badger**

5.3.6.1 The zone of influence relating to badgers was considered to be within the application site and the immediate connective habitat. Records relating to certain protected species including badger sett locations are sensitive in nature, and due to the risk of public interference are kept confidential.

5.3.6.2 No evidence of badger setts, or activity such as mammal runs, snuffle holes and latrines were found during the ecological appraisal of the site and the zone of influence. The application site supported habitat features such as thick hedgerows and ditches which provide suitable commuting habitat for this transient species, which are highlighted as present in the wider environment following a review of the data search. As a result of the site extent and the location within an agricultural dominated landscape it is considered that badgers could use the site for foraging and commuting purposes on an episodic basis, but are not dependant on the site.

5.3.6.3 **Evaluation**

The site supports suitable connective and foraging habitat for badgers of 'site value'. Badgers are considered to be absent from the site, however the transient nature of this species could result in individuals foraging or commuting through the zone of influence of the proposed development.

5.3.7 **Water Vole**

5.3.7.1 The zone of influence was considered to be the section of the River Holme extending throughout the site, as well as downstream habitats. No evidence for this species was identified on site, with no records provided by the data search. However, the bankside of the River Holme was considered to provide suitability for this species. Although some of the bankside on site comprised built-up brickwork, sections of suitable earth bank were present along the river near the proposed bridge, with abundant ephemeral bankside vegetation, and no emergent aquatic vegetation providing sub-optimal foraging opportunities. Although the river is fast flowing in part, the section on site features slower flowing and deep sections due to the weir across the river. Suitability was also recorded within sections of the riverbank extending away from the site and within Pond 1, with sections of suitable bankside also located here providing additional burrowing opportunities.

5.3.7.2 A systematic search of the bankside habitat found a small number of disused burrowing holes within survey section 7, however, no recent evidence of water vole activity such as latrines, runways, or feeding remains were identified during the survey, and there was no indication the burrows were not created by other rodents due to their size. A camera was placed in the river a short distance away from these burrows, with no recordings of water voles captured during the survey period. A Habitat Suitability Assessment (HSA) following Harris et al 2009 was undertaken (Appendix 9D; Table A) which concluded a varying suitability for water vole, ranging from attributed a suitability score of between 1 and 7, with three of the ten surveyed sections considered to be optimal for water vole.

5.3.7.4 **Evaluation**

The site is considered to have 'Site Value' to water vole following evaluation criteria (Table 2). Given the varying suitability of the riverside habitats it is not considered likely that this species is located permanently on site, although there is potential for this species to be present up and downriver and may utilise the surveyed sections of the brook adjacent to the application site, on an episodic basis.

5.3.8 **Otter**

5.3.8.1 The zone of influence was the section of the River Holme extending throughout the site and habitats downstream of the site. The bank side of the river Holme within the site and extending from the site was suitable for supporting holts or couches for this species, however suitability is present in the wider environment, associated with the river corridor. A single record for this species was recorded within the data search (no precise location was provided).

5.3.8.2 A search of the river and bank failed to identify definitive evidence of otter within the survey area, however, an area of bankside appeared to show evidence of use by mammals, attributed to an otter holt within section 7 of the river. A camera trap was subsequently deployed within the river close to this feature, which did not record any evidence of otter activity. The site was considered to be suboptimal for otter activity, but it is likely that individuals in the wider landscape can commute through this area.

5.3.8.3 Evaluation

The site was considered to hold 'Site Value' for otter populations.

5.3.9 White-clawed Crayfish

5.3.9.1 The zone of influence for white-clawed crayfish (WCC) was determined to be within the section of the River Holme located within the site, as well as Pond 1. The River Holme supported a varied current that created areas of pools and riffles and the bed substrate within the river consisted of scattered stones and rock providing some refugia. Portions of the bankside of the river comprised of clay supported undercuts which might be utilised by crayfish species for burrowing. The river did not contain any significant aquatic vegetation but did support suitable invertebrate populations. Fish are likely to be present, with the potential for larger fish species preying on crayfish species which could reduce the distribution. Pond 1 also supported similar features suitable for this species

5.3.9.2. The torching survey revealed no evidence of either white clawed-crayfish or any invasive crayfish species on the two surveys. A total of 500 stones in 5 discrete patches along the length of the river within the site, and along the river and pond margins were torched on both occasions (Appendix 9D).

5.3.9.3 Evaluation

The site is considered to have 'Site Value' to white-clawed crayfish following evaluation criteria (Table 2).

5.3.10 Mammal Species of Principle Importance

5.3.10.1 The NERC Act 2006, Section 41 highlights 17 species of principle importance within England. Although these species were not surveyed directly because of their distribution and habitat preferences, evidence for activity by these species was searched for during the Phase 1 habitat and Phase 2 protected species surveys.

5.3.10.2 The zone of influence was within ecological connective habitat along the boundaries of the site, within 30 metres of the boundary. The site offered habitat capable of supporting foraging and commuting West European hedgehog, namely areas of woodland adjacent to the western boundary, the hedgerows

defining the eastern and southern boundaries as well as those within the residential gardens surrounding Building 1 and areas of scrub and tall ruderals primarily located within the semi-improved grassland. However, no evidence of activity was found during the initial PEA or the subsequent phase two surveys.

5.3.10.3 Evaluation

The site was considered to offer 'site value' for west European hedgehog. The species is not likely to be permanently present on site, but individuals may occasionally enter the site for foraging purposes.

6 Assessment of effects and mitigation measures

6.1 The proposed development

The site is the subject of a full planning application for the development of a three residential apartment buildings and underground car park, with associated soft landscaping, facilitates by partial site clearance. The proposals also include the construction of a bridge across the river. Design plans are provided within Appendix 6 of this report.

6.2 Potential Impacts to habitats and notable species on site

Where evaluations within Section 5 have highlighted potential constraints to protected and notable species or habitats further assessment has been made to quantify the effect of the potential constraints. Plants, great-crested newts, and white clawed crayfish are not considered further within this section as they not considered to be a constraint to the application.

6.2.1 Designated sites and habitats

6.2.1.1 The application site is positioned 0.65km north-east of the nearest designated site, the Malkin House Wood LWS, with all sites designated for their terrestrial habitats. The initial proposals set out for the site (Appendix 6) show that the extent of the development proposals are contained within the site boundary, with only a portion of the site proposed for development and limited removal of connective habitats. That said, with Malkin House Wood LWS located along the River Holme, with this river providing connectivity between the site and the LWS and without mitigation it is possible works could result of pollution, silting and leaching. This could present a Unlikely Negative (Significant) effect to the Malkin House Wood LWS as well as other habitats downstream of the site.

6.2.1.2 Mitigation Measure:

A suitable CEMP (Construction and Environmental Management Plan) should be generated to propose guidelines in order to avoid direct and indirect impacts of the river and pond within the site, as well as the wider river corridor. This will include specifications for buffer zones, storage of machinery, and how works should be undertaken along the riverbank to avoid impacts such as pollution incidents and impacts to protected species. In addition to this, a suitable LEMP (Landscape and Ecological Management Plan) should be generated to

propose suitable enhancement for the site as part of the development in compensation for lost habitats. Enhancement to the site can mitigate the impacts of the development to Neutral (Not Significant).

6.2.2 Invasive Species

6.2.2.1 Indian balsam (*Impatiens glandulifera*) was noted in abundance during the further survey works to the western end of the site between Pond 1 and the River Holme. In addition, Japanese Knotweed (*Fallopia japonica*) was noted along the River Holme to the eastern end of the site. Without adequate clearance, works could risk the spread of these invasive species to neighbouring habitats and other habitats downstream from the site, resulting in a Negative (Significant) impact.

6.2.2.2 Mitigation Measures

Clearance by certified invasive species removal contractors should be undertaken on site prior to development to ensure these species are absent from the site. Invasive species should be disposed of as contaminated waste. This will reduce the impact to Positive (Significant) if subject to suitable long-term management within an LEMP.

6.2.3 Breeding Birds

6.2.3.1 The riverine habitat and scattered trees on site were considered to provide suitable nesting habitat for bird species associated with the riverine habitat, such as white-throated dipper and kingfisher (a Schedule 1 species), as well as populations of birds of local and national interest. Impacts to these river-side species are considered minimal, however a Likely Negative (Not significant) effect is anticipated because of the development through the loss of suitable nesting habitat across the remainder of site. This impact is short term and reversible with the following mitigation in place.

6.2.3.2 Mitigation Measures

Given their protection, development must be sympathetic to the value of this habitat and potential impacts on breeding birds, their eggs, nests and young. The breeding bird season is generally accepted as being between March and September, works should be avoided during this period where possible, and developers should consider and implement the options (below) appropriate to their scheme to reduce the effect to Neutral (Not significant):

- Undertake any vegetation clearance between the months of October and February where possible (Outside of the breeding season);
- No bankside vegetation removal should be undertaken aside from the area proposed for the bridge construction.
- Any vegetation proposed for removal between the months of March and September should be subjected to a search for active birds' nests 24 hours prior to commencement of works. This should confirm whether all or some clearance is achievable.
- In addition to a pre-works check the clearance of vegetation between the months of March and September should be supervised by a suitably qualified ecologist;
- Should bird nesting activity occur within the application site during any works then activity in that area will cease until the bird(s) have vacated the site (a minimum of 4 weeks). Such measures should be adhered to so as to prevent unnecessary disturbance to breeding birds or their young.

6.2.3.3 Suitable enhancements for breeding birds are contained within Chapter 7, the implementation of which will lead to a Positive (Not Significant) impact.

6.2.4 **Roosting Bats**

6.2.4.1 No roosting bats were identified on site by the endoscope survey; however features hold low suitability for individual crevice dwelling species. Due to the exposed nature of the roosting features and lack of connecting vegetation it is considered unlikely that bats will regularly roost on site within these features, however, bats may utilise these features on a transient basis. It is understood this walling is being retained, however. in the circumstance of roosting bats being present within these features, nearby development works could result in disturbance to roosting bats through noise and vibration or obstruction resulting in a Unlikely Negative (Not Significant) effect upon local bat populations.

6.2.4.2 **Mitigation Measures**

Should works adjacent to this walling be undertaken within the active bat season April to September, a pre-works dawn re-entry survey should be undertaken to confirm continued absence of roosting bats and ensure the impacts of the development are Neutral (Not Significant). This survey should be undertaken prior to the phase of development works adjacent to this walling

where disturbance most likely occur. The works adjacent to the wall should be programmed following the survey, and any activities which could cause unnecessary noise and vibration undertaken In the subsequent days, This will prevent a bats from using the features, and then subjecting themselves to disturbance. Light should be directed away from these features during works, and postconstruction, so the area retains the roosting suitability. Should works take longer than six months a further survey may be required. If roosting bats on are found on site, further mitigation measures or an EPS development licence may be required. In addition, suitable enhancements for roosting bats are contained within Chapter 7, the implementation of which will lead to a Positive (Not Significant) impact

6.2.5 Foraging and Commuting Bats

6.2.5.1 The habitats within the area proposed to be developed, comprising ephemeral short perennials and areas of bare ground, was considered to have negligible foraging and commuting suitability with no tree removal proposed for the site. That said, although no areas of foraging habitat are proposed for removal as part of the development, mitigation will be required to avoid Unlikely Negative (Not Significant) on retained habitats from factors such as lighting.

6.2.5.2 Mitigation Measures

To mitigate effects to commuting and foraging bats to Neutral (Not significant), the physical characteristics and current management of the boundary features should be maintained and where possible enhanced. Where vegetation has been proposed for removal, compensatory planting should be undertaken. The details of planting and enhancements should be secured within the Landscape Ecological Management Plan (LEMP).

6.2.5.3 The extent of disturbance to bat commuting lines should be reduced to a Neutral (Not Significant) impact where possible by removing any vegetation outside of the bat activity season and employing a sensitive lighting scheme during construction works. Post construction, artificial security lighting should not be installed directed at, the river corridor, across any adjacent riverine habitats or facing Pond 1. The river corridor should be kept as dark as is feasible, with light fittings positioned away from windows and external lighting avoided along the side of buildings adjacent to the river. Night works which require the lighting of the site should be avoided.

6.2.6 **Amphibians**

6.2.6.1 No GCN were recorded on site. However, an individual common toad was found during one of the reptile checks. Development works may result in a Unlikely Negative (Not Significant) impact on this species due to habitat loss or direct injury.

6.2.6.2 **Mitigatory measures**

Should any incidental sightings of toads occur during works, individuals should be moved out of the zone of impact to a receptor area near to Pond 1 before works can proceed. These measures will mitigate the impact to this species to Neutral (Not Significant) and should be outlined as part of the CEMP.

6.2.7 **Reptiles**

6.2.7.1 A permanent population of this species group is not considered to be present on site, however individual reptiles could enter the site from optimal adjoining habitat. In the absence of mitigation direct harm or injury could be sustained to individuals during ground clearance posing an Unlikely Negative (not significant).

6.2.7.2 **Mitigation Measures**

In order to mitigate the impacts of the development to Neutral (Not Significant), a site-specific methods statement, as part of the CEMP, should be compiled to set out precautionary methods to safeguard this species in the unlikely event individuals are present on site.

6.2.8 **Water Vole and Otter**

6.2.8.1 No evidence of these species was located on site. That said, connectivity remains up and down the River Holme, and it is expected they are present within the wider area. The impacts of the bridge construction are considered to result in an Unlikely Negative (Not Significant) impact due to the small possibility of individuals passing through and becoming active on site.

6.2.8.2 **Mitigation Measures**

To ensure development works only result in a Neutral (Not Significant) impact on these species, a pre-works check of the river should be undertaken prior to development works to ensure continued absence. This should be implemented as part of the CEMP and will involve five days of camera trapping in the vicinity

of the proposed bridge construction. Aside, from the immediate area of the bridge construction, suitable buffer zones should be incorporated along the riverbanks. These can also be specified within the CEMP.

6.2.9 Mammal Species of Principle Importance – West European Hedgehog and Badger

6.2.9.1 The ground clearance works necessary to prepare the site could result in injury or death of badger and west European hedgehog presenting a Negative (Not significant) impact. The development proposals suggest that the hedgerows around the periphery of the site are to be retained during and post development reducing the likelihood of a significant effect however further mitigation should be implemented to safeguard this species.

6.2.9.2 Mitigation Measures

In addition to habitat retention, habitat considered suitable for supporting west European hedgehogs should be retained around the periphery of the site, and vegetative connectivity through the site should be maintained through post construction landscaping as part of the LEMP. As part of the CEMP a set of Reasonable Avoidance Measures for the above species will be outlined including a pre works check to ensure badgers have not moved onto and become active site. This will include the following measures;

- Any excavations left overnight are to be covered at the end of each working day, or include a means of escape, such as wood planks. In addition, any temporarily exposed open pipe systems are to be capped in such a way as to prevent badgers gaining access.
- If individuals of either species are found or encountered during ground clearance works, works should cease until the individual has been moved out of the way of development works or left the site. Once removed/left, the area should be searched, and works can recommence. This should be specified within the CEMP.
- A pre-works check to ensure badgers have not moved into the site should be undertaken, if works do not begin within 12 months of the initial report.

6.3 **Residual effects of proposed Development**

The measures proposed within the above sections will mitigate all Negative effects to a level where the constraint is not considered significant or negative in terms of Ecological Impact Assessment. Upon completion there should be no adverse residual effects because of the development.

6.4 **Cumulative effects**

The mitigation and impact avoidance measures proposed for each ecological receptor should be secured through planning condition or obligation. At the time of writing there are no further consented developments within a 500m local area, so a cumulative effect is not predicted, and upon successful implementation of these measures the site will increase the value of the site in terms of local biodiversity.

6.5 **Biodiversity Impact Assessment to determine Net Gain**

A biodiversity Impact Assessment will be compiled to assess whether a biodiversity net gain can be achieved within the current design plans. Draft plans for the site have been used to produce an initial baseline calculation for the site.

Baseline habitat units have been calculated as 4.74 units. By assuming a worst case scenario, with areas proposed for landscaping considered to be low quality amenity grassland and with no enhancement proposed, results an initial loss of approximately 0.79 units from the site, equating to a -16% loss for the site (Table 7). Therefore, with suitable enhancement to the site it is considered the is scope to achieve a net gain for this site. A Landscape Ecological Management plan (LEMP) is recommended to secure ecological enhancements within the landscaping and ensure that any habitat enhancements are implemented to their full ecological potential and managed for 30 years. Once these enhancements have been specified the calculations for the site can be redone and a gain to the site established.

Table 7: Initial biodiversity net gain calculation for the site.

On-site baseline	<i>Habitat units</i>	4.74
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	4.09
On-site post-intervention (Including habitat retention, creation & enhancement)	<i>Habitat units</i>	3.95
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	4.09
On-site net % change (Including habitat retention, creation & enhancement)	<i>Habitat units</i>	-16.64%
	<i>Hedgerow units</i>	0.00%
	<i>River units</i>	0.00%
Off-site baseline	<i>Habitat units</i>	0.00
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00
Off-site post-intervention (Including habitat retention, creation & enhancement)	<i>Habitat units</i>	0.00
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	<i>Habitat units</i>	-0.79
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	<i>Habitat units</i>	-16.64%
	<i>Hedgerow units</i>	0.00%
	<i>River units</i>	0.00%

7 Compensation, Enhancement and Monitoring

7.1 Compensation

Compensatory measures are not required within this scheme of works, because no significant residual or cumulative effects are anticipated because of the development.

7.2 Enhancement

In light of the National Planning Policy Framework (NPPF) that seeks net biodiversity gain within developments and the Natural Environment and Rural Communities (NERC) act that stipulates an authority's duty to conserve and enhance biodiversity the following enhancements are suggested (All enhancements should be overseen by an appropriate experienced ecologist):

7.2.1 Habitats

The construction of a Landscape Ecological Management Plan (LEMP) for the site will secure enhancements and appropriate landscaping to enhance biodiversity within areas of open space. Landscaping carried out on site is to undertaken using locally abundant, native species which can tolerate a range of climatic conditions. Open space should be managed to benefit local biodiversity following an appropriate management plan and seek to compensate for loss of habitats on site. Loss of vegetative features should be compensated for by planting native scrub, the transplantation or reseeded of grassland and the planting of native trees.

7.2.2 Bats

7.2.2.1 Post construction landscaping should be sympathetic to bat species and seek to enhance habitats for bat species. Mitigation should be secured within the above mentioned LEMP, particularly along the river corridor and southern tree boundary. The car park to be constructed on the southern river side should be minimally lit (Appendix 11). Lighting will be installed following a sensitive lighting scheme approved as a condition of planning.

7.2.2.2 Provide roosting provisions along the southern elevations of new residential structures (Appendix 11). During construction at least four integrated bat boxes

should be positioned on elevations facing a south – south easterly direction at a height of above 4 metres.

7.2.2.3 To provide additional roosting opportunities for common bat species and mammals of principle importance, four Kent boxes should be installed on large, retained trees along the river corridor. 4 boxes should be integrated around the site, in clusters facing in a southerly, easterly or westerly direction, above 5 metres in height. The specific location of bat mitigation should be secured within the LEMP.

7.2.3 **Birds**

7.2.3.1 During the construction phase two 1SP Schwegler Sparrow Terraces and four Woodstone Swift nest boxes should be integrated into the north or north-easterly elevations of the new residential units across the site (Appendix 11). The Bird boxes should be positioned at a height of between 4 and 5 metres with an unobstructed flight line to and from the boxes.

7.2.3.3 The LEMP should secure the inclusion of soft landscaping in the form of native trees, hedgerows and shrubs, planted across the site to offset any loss of vegetation and to provide supplementary habitat for overwintering and breeding birds within the area.

7.2.4 **Herptiles**

A hibernacula should be installed in a suitable location near the pond to act as a receptor site during the translocation and left in place post- development to enhance the area. This should comprise a suitable timber pile to provide refuge approximately 1 metre in height and width. These can be placed directly on the ground or in a shallow excavation with spoil and turf in between and on top of the timbers / logs. Where possible, log piles should be positioned in shady places and avoid direct sunlight, and flooding.

7.2.5 **West European Hedgehog**

A suitable hibernaculum, such as a Wooden Hedgehog Nest Box, or similar, should be placed on site as a receptor point for any individuals found during the development and retained on site post development (Appendix 9).

7.3 **Monitoring**

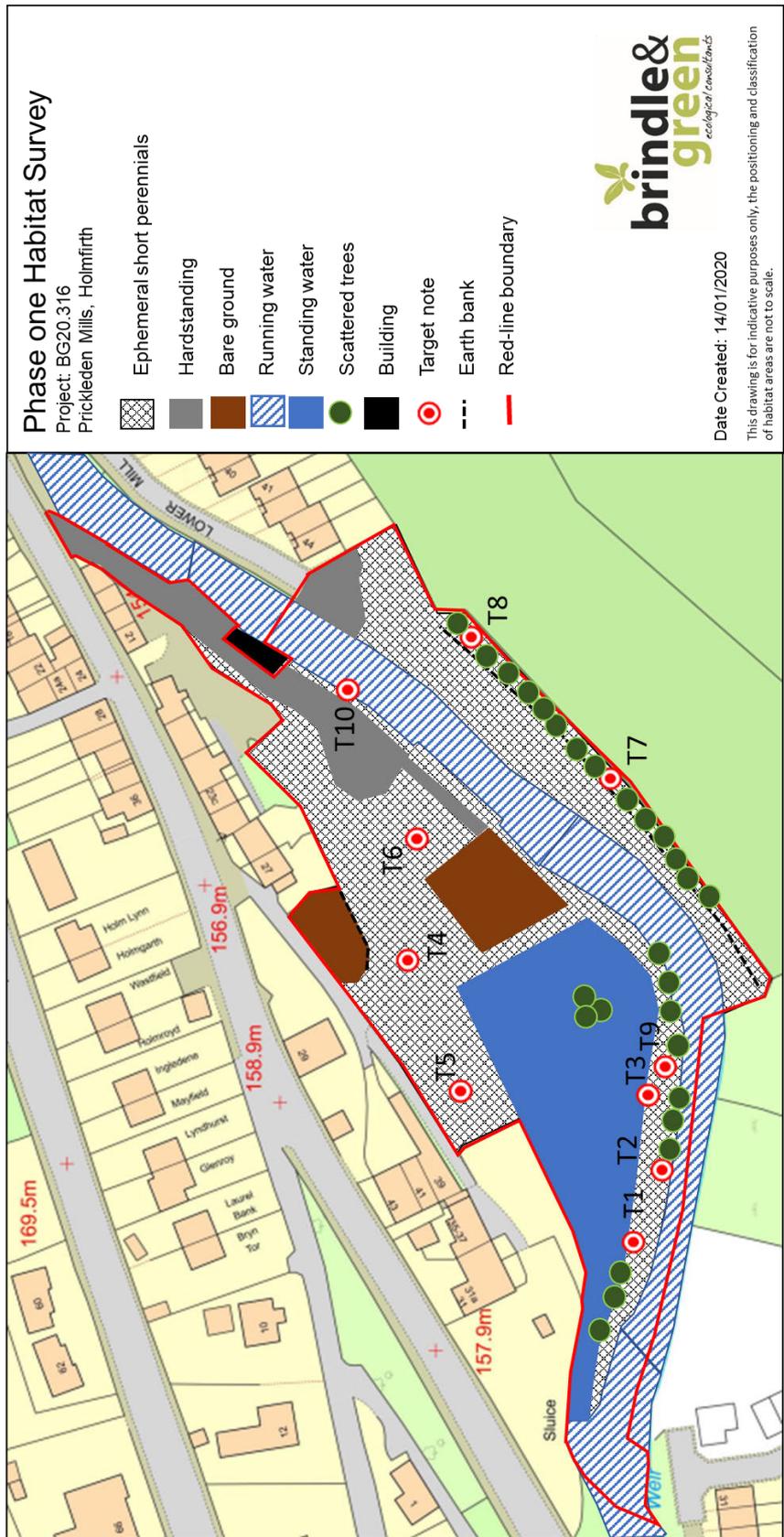
- 7.3.1 As a result of the low impact of the proposed development, no post construction monitoring is required.

- 7.3.2 If works do not commence within two years of the Phase 1 habitat survey, and 1 year of the phase 2 surveys the baseline conditions may need to be reassessed.

8 Conclusions

- 8.1 The application site at Prickleden Mills, Holmfirth has been the subject of a series of protected species surveys undertaken following best practice guidelines. The site was found to support habitats ranging between 'site' and 'district' value at an ecological level (Table 2).
- 8.2 The Phase 1 habitat survey and Phase 2 surveys confirmed that bats, breeding birds, badgers, common toad, reptiles, water vole, otters and hedgehogs have the potential to be negatively affected by the proposed development and as such mitigation measures have been created to safeguard the status of these protected and notable species, reducing the effect to neutral or a positive effect.
- 8.3 The mitigation strategies outlined above should be secured through planning condition or obligation, to ensure that a negative effect for local wildlife populations and biodiversity is avoided and potentially enhanced through the landscaping plan and prevent residual effects. The remaining habitats recorded during the baseline survey were locally frequent and of low ecological value. As a result, the loss of these habitats is not considered to be significant. The construction of residential gardens, and open space onsite will improve the structural and botanical diversity on site enhancing the application site for a number of local species populations.
- 8.4 The implementation of enhancements listed within Section 7.2 would secure positive gains to local biodiversity when compared to the baseline ecological conditions of the application site.
- 8.5 The mitigation proposals detailed in Section 6 successfully address the potential impacts from the development to comply with both wildlife legislation and policy.

Appendix 1. Phase 1 Habitat Plan



Appendix 2. Phase 1 Target Notes and species list

Target Note Number	Description
T1	Mature sycamore with low suitability for roosting bats - SE 13709 07858
T2	Horse chestnut with a low suitability for roosting bats - SE 13709 07858
T3	Mature sycamore, cavity present but shallow. - SE 13709 07858
T4	Waste timber pile
T5	Waste timber pile
T6	Cavities in stone walls with a negligible – low suitability for roosting bats.
T7	Steep inaccessible bank.
T8	Waste timber pile
T9	Indian balsam - SE 13762 07851
T10	Japanese knotweed - SE 13838 07928

Plant Species List with DAFOR Scale

Scientific nomenclature follows Stace (2010) for vascular plant species and common names follow BSBI List of British & Irish Vascular Plants and Stoneworts.

Please note that this plant species list was generated as part of a Phase 1 Habitat survey and does not constitute a full botanical survey.

Abundance was estimated using the DAFOR scale as follows: D = dominant, A = abundant, F = frequent, O = occasional, R = rare, LF = locally frequent

Common Name	Scientific Name	Estimated Abundance (DAFOR)
Ash	<i>Fraxinus excelsior</i>	O
Alder	<i>Alder glutinosa</i>	O
Buddleja	<i>Buddleja sp.</i>	O
Chickweed	<i>Stellaria media</i>	O
Common nettle	<i>Urtica dioica</i>	O
Crack willow	<i>Salix fragilis</i>	F
Creeping buttercup	<i>Ranunculus repens</i>	F
Ground ivy	<i>Glechoma hederacea</i>	F
Hawthorn	<i>Crataegus laevigata</i>	F
Hedgerow cranesbill	<i>Geranium pyrenaicum</i>	F
Holly	<i>Ilex aquifolium</i>	F
Horse chestnut	<i>Aesculus hippocastanum</i>	O
Ivy	<i>Hedera helix</i>	F
Oak	<i>Quercus robur</i>	F
Perennial rye-grass	<i>Lolium perenne</i>	O
Ribwort plantain	<i>Plantago lanceolata</i>	F
Sycamore	<i>Acer pseudoplatanus</i>	F

Appendix 3. General References

- Bell, S. McGillivray, D. (2006) *Environmental Law*. 6^h ed. Oxford University Press.
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- Edgar P., Foster J. & Baker J. (2010) *Reptile Habitat Management Handbook*, Amphibian and Reptile Conservation, Bournemouth
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- Gilbert G, Gibbons DW, Evans J. (1998) *Bird Monitoring Methods: Breeding Bird Survey* (pages 389-393). RSPB.
- Harris S, Cresswell P and Jefferies D (1989). *Surveying Badgers*.
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- Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal* 10 (4), 143-155
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- Stace, C. (2010). *Field Flora of the British Isles*. Cambridge University Press
- Sutherland, W.J. (1996) *Ecological Census Techniques*. Cambridge University Press.

The Design Manual for Roads and Bridges; Volume 10 Section 4 Part 2 (Highways Agency, 2001

Treweek, J. (1999) *Ecological Impact Assessment*. Blackwell Science.

Williams, C. (2010) *Biodiversity for Low and Zero Carbon Buildings, A Technical Guide for New Build*. Riba Publishing.

Appendix 4. Legislation, Policy and Guidance

Articles of British wildlife and countryside legislation, policy guidance and both Local and National Biodiversity Action Plans (BAPs) are referred to. The articles of legislation are:

- The Wildlife and Countryside Act 1981 (as amended)
- The Conservation of Habitats and Species Regulations 2017 (as amended)
- Department for Communities and Local Government. National Planning Policy Framework. March 2021
- EC Council Directive on the Conservation of Wild Birds 79/409/EEC
- The Protection of Badgers Act 1992
- The Natural Environment and Rural Communities Act 2006
- The United Kingdom Biodiversity Action Plan 2006
- Hedgerow Regulations 1997
- Local Biodiversity Action Plan (LBAP).

Appendix 5. Legislation, Guidance and Methodology in Relation to the Identified Constraints

Legislation, Guidance and Methodology

Breeding Birds

All nesting birds are protected under the Wildlife and Countryside Act 1981, which makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs. In addition, for species listed on Schedule 1 of the Wildlife and Countryside Act 1981 it is an offence to intentionally or recklessly cause disturbance at, on or near an 'active' nest.

The bird breeding season is typically accepted to start in February/March and continue through until September/October, however breeding birds can be found all year round depending on the given species and climatic conditions.

A sites habitat composition, locality, association to designated sites as well as current usage and management are all considered in the decision as to whether further bird related surveys are required. In addition, surveys may be recommended based on incidental bird records collected during a Preliminary Ecological Appraisal, species identified within an ecological data search or target species listed within a local biodiversity action plan.

Bird surveys are carried out in accordance with:

Gilbert G, Gibbons DW, Evans J. (1998) *Bird Monitoring Methods*. RSPB.

Bats

Roosting Bats

All bats in the United Kingdom and their habitats are fully protected under the Wildlife and Countryside Act 1981 (as amended), and the Conservation of Habitats and Species Regulations 2017 (as amended). It is an offence to damage or destroy any bat roost, intentionally or recklessly obstruct a bat roost, deliberately, intentionally or recklessly disturb a bat or intentionally kill, injure or take any bat.

Areas of concern; can be encountered in many types of structure and care should therefore be taken when undertaking maintenance or demolition of suitable structures and trees.

Site assessments of buildings, commuting and foraging habitat and trees are undertaken in accordance with: Collins, J (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines*, (3rd edition), Bat Conservation Trust, London. (Table 1 & 2 Below).

Preliminary Ecological Surveys look for evidence of bat presence such as feeding remains, bat droppings, roosting individuals and staining around potential access points. The suitability of site features are also assessed because absence of bat evidence, is not confirmation of a negative result.

Within trees, features searched for include; natural holes, woodpecker holes, cracks/splits in major limbs, loose bark, hollows, and dense cover of ivy over the tree. If evidence is found, or a building supports features conducive to supporting roosting bats then further presence / absence bat surveys and/or roost characterisation surveys will be recommended.

Foraging and Commuting bats

Habitat features on site are assessed for their suitability to support foraging and commuting bat populations. This assessment is independent from the suitability of the site to support roosting bats, and provides information on the likeliness of bat foraging activity within the local environment, and the dependence of individuals on these features for commuting to alternative roosting sites, foraging and migration.

Table 1: Guideline for assessing the suitability of a structure to support roosting habitat (Buildings and Trees), amended from Collins, J (2016)

Category	Description of roosting habitat	Number of additional presence / absence surveys required
Negligible Suitability	Suitable cavities may exist, but these are less than ideal.	None
Low Suitability	A structure with one or more potential roost sites that could be used by individual bats opportunistically. The feature and surrounding habitat do not provide enough shelter, conditions* space for larger roost types such as a maternity or hibernation roost. A tree of sufficient size and age to support roosting bats, but with no features observed from the ground, or the features only have a limited potential to support roosting bats.	One survey between May and August Trees – No further surveys required
Moderate Suitability	A structure or tree considered to have one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions* and surrounding habitat but are unlikely to support a roost of high conservation status (With regard to roost type only – assessments are made irrespective of species conservation status, which is established after presence is confirmed).	Two surveys between May and September (with at least one survey undertaken between May and August) One Dusk emergence and One Dawn re-entry survey to ideally be undertaken at least two weeks apart.
High Suitability	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions* and surrounding habitat.	Three surveys between May and September (with at least two surveys undertaken between May and August) One Dusk emergence and One Dawn re-entry survey to be undertaken. The third survey can be either Dusk or Dawn, undertaken at least two weeks apart.
Confirmed	This category is where positive evidence of bats has been recorded. For example, bats are found; bat droppings may be present at a suitable location for roosting bats; existing bat records may be associated with the structure.	

(* in this context conditions refers to the level of disturbance, light, height above ground, temperature, and humidity etc)

Table 2: Potential suitability of foraging and commuting habitat within an application boundary. Features should be assessed following this guide and professional judgement. Adapted from Collins J (2016)

Category	Description of commuting and foraging habitat	Survey effort to establish the value of commuting and foraging habitat**
Negligible Suitability	Negligible habitat features on site likely to be used by commuting or foraging bats.	None
Low Suitability	Habitat which could be used by low numbers of commuting bats such as an isolated gappy hedgerow, or an unvegetated stream unconnected to suitable habitat in the wider environment.	Transect /spot count/ timed search survey: One survey visit per active season AND Static automated surveys: One location per transect, over a five-night period, per season.

	Suitable, yet isolated habitat that could be used by foraging bats such as individual trees, or a patch of scrub.	
Moderate Suitability	<p>Continuous habitat connected to the wider landscape that could be used by commuting bats, notably tree lines, hedgerows or linked back gardens.</p> <p>Habitat that is connected to the wider landscape which could be used by bats for foraging such as trees, open water, scrub or grassland.</p>	<p>Transect /spot count/ timed search survey One survey visit per month At least one survey should comprise dusk and pre-dawn (or dusk to dawn) within one 24-hour period. AND Static automated surveys: Two locations per transect, over a five-night period, per month (April to October)</p>
High Suitability	<p>Continuous, High-quality habitat that is well connected to the wider landscape which is considered to be highly conducive to commuting bats including river valleys, stream, hedgerows, and woodland edge</p> <p>High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree lined watercourses, and grazed parkland.</p> <p>Site is close to and connected to known roosts.</p>	<p>Transect /spot count/ timed search survey Up to two survey visit per month (April to October)</p> <p>At least one survey should comprise dusk and pre-dawn (or dusk to dawn) within one 24-hour period. AND Static automated surveys: Three locations per transect, over a five-night period, per month (April to October)</p>

(** This is only a guide for survey effort required, the complexity of the site and the proposed disturbance / loss of features will determine the extent of works required on a site by site basis).

Badgers (*Meles meles*)

Badgers are protected under the Protection of Badgers Act 1992. It is illegal to wilfully kill, injure, disturb or take any badger, or attempt to do so and it is an offence to intentionally or recklessly damage, destroy, or obstruct access to any part of a badger sett.

Site assessments are undertaken in accordance with:
Harris S, Cresswell P and Jefferies D (1989). *Surveying Badgers*.

During the PEA, the site and the 30 metre zone of Influence considered for this species are searched for evidence of badger activity. The surveyor will identify evidence of activity, or habitat suitability for this protected species. Even if no evidence of badger activity is found, if local conditions suggest that the habitat may be suitable for badger, further surveys will be recommended.

Amphibians

The great crested newt and natterjack toad are fully protected under Schedule 5 of the wildlife and countryside Act 1981. The legislation protects these amphibians and their place of shelter or protection which may extend 500m from the breeding pond.

Great Crested Newt (*Triturus cristatus*)

The great crested newt, is fully protected under the Habitat regulations 2017, making it an offence to intentionally or recklessly kill, injure, disturb or take great crested newts, intentionally or recklessly damage destroy or obstruct access to any place used by the animal for shelter or protection.

The legislation protects these amphibians and their place of shelter or protection which may extend 500m from the breeding pond. Sites should be considered suitable to support great crested newts if distribution and historical records suggest newts may be present, there is a pond within 500m of the development or the development site includes suitable terrestrial habitat refuges.

Great crested newt site assessments are undertaken in accordance with:

English Nature. (2001) *Great Crested Newt Mitigation Guidelines*. English Nature, Peterborough. and Langton T, Beckett C and Foster J (2001) *Great Crested Newt Conservation Handbook*. Froglife, Halesworth.

Prior to a site visit, a desk study pond search is undertaken. When searching for ponds, Brindle & Green apply a total of 4 sources to establish their location. The following online sources are used:
OS MAPPING VIA PRO MAP, GOOGLE EARTH PRO, GOOGLE MAPS and MAGIC MAPS

Each identified pond (Access permitting) is subjected to a Habitat Suitability Index (HSI) assessment providing a score for each pond. This survey should be undertaken during the summer period to be fully accurate, however assumptions can be made out of season to guide survey recommendations.

Reptiles

Two species of reptile, the sand lizard and smooth snake, and their habitats are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981. All other native British reptiles are protected against intentional killing and injury.

British reptiles are found in exposed, undisturbed areas, such as areas without cultivation with differing areas of grassland sward length. Suitable areas include abandoned sand quarries, fallow farmland land, heathland, post-industrial land, railway corridors etc. If these types of suitable features are found then further reptile surveys are recommended.

Edgar P, Foster J and Baker J (2010) *Reptile Habitat Management Handbook*. Amphibian and Reptile Conservation, Bournemouth.
Gent T and Gibson S (2003) *Herpetofauna Workers Manual*. JNCC, Peterborough.

Water Vole (*Arvicola amphibius*)

The water vole receives full protection Schedule 5 of the Wildlife & Countryside Act 1981 (as amended). Legal protection makes it an offence to intentionally kill, injure or take (capture) a water vole. It is also an offence to intentionally or recklessly damage, destroy or obstruct access to any structure or place which water voles use for shelter or protection or disturb water voles while they are using such a place.

Water vole site assessments were undertaken in accordance with:

Strachan R. Moorhouse T, and Gelling M (2011) *Water Vole Conservation Handbook*. (3rd Edition) Wildlife Conservation Research Unit.

Water vole are usually found along water bodies that have still or slow flowing deep water with an abundance of bankside herbaceous vegetation. Such areas include dykes, rivers, streams and drains, but they can also be found on isolated large ponds.

If these types of suitable features are found during a PEA, then water vole surveys are recommended.

Invasive non-native weeds

Plant species such as Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*) and giant hogweed (*Heracleum mantegazzianum*) are examples of invasive non-native weeds classified under Part II of Schedule 9 of the Wildlife and Countryside act 1981. Any person who causes these species to grow or spread in the wild by dumping or other means is guilty of an offence. The plant and the soil these species are found growing in are classified as waste material and should be treated as such.

A simple walk over survey of the site to determine if these species are present was carried out during the PEA. A full list of Schedule 9 species can be found at Plantlife.org

Botanical Value

There are 60 plant species listed under Schedule 8 of the Wildlife and Countryside Act 1981 where it is an offence to intentionally pick or uproot or destroy any of these plant species.

During the PEA, a phase one habitat survey was undertaken following JNCC guidance. Further assessments are made to determine whether habitats comprise those identified as Habitats of principle Importance under S42 of NERC Act 2006.

Surveys can be undertaken year-round, however, if species or site conditions suggest higher botanical interest a full botanical survey will be recommended.

Ecological Enhancement

In March 2021 the Department for Communities and Local Government published the National Planning Policy Framework. This sets out planning policies on protection of biodiversity through the planning system. The document states - *opportunities to incorporate biodiversity in and around developments should be encouraged.*

For new buildings guidance such as in the following will be used:

Williams, C. (2010) *Biodiversity for Low and Zero Carbon Buildings, A Technical Guide for New Build.* Riba Publishing.

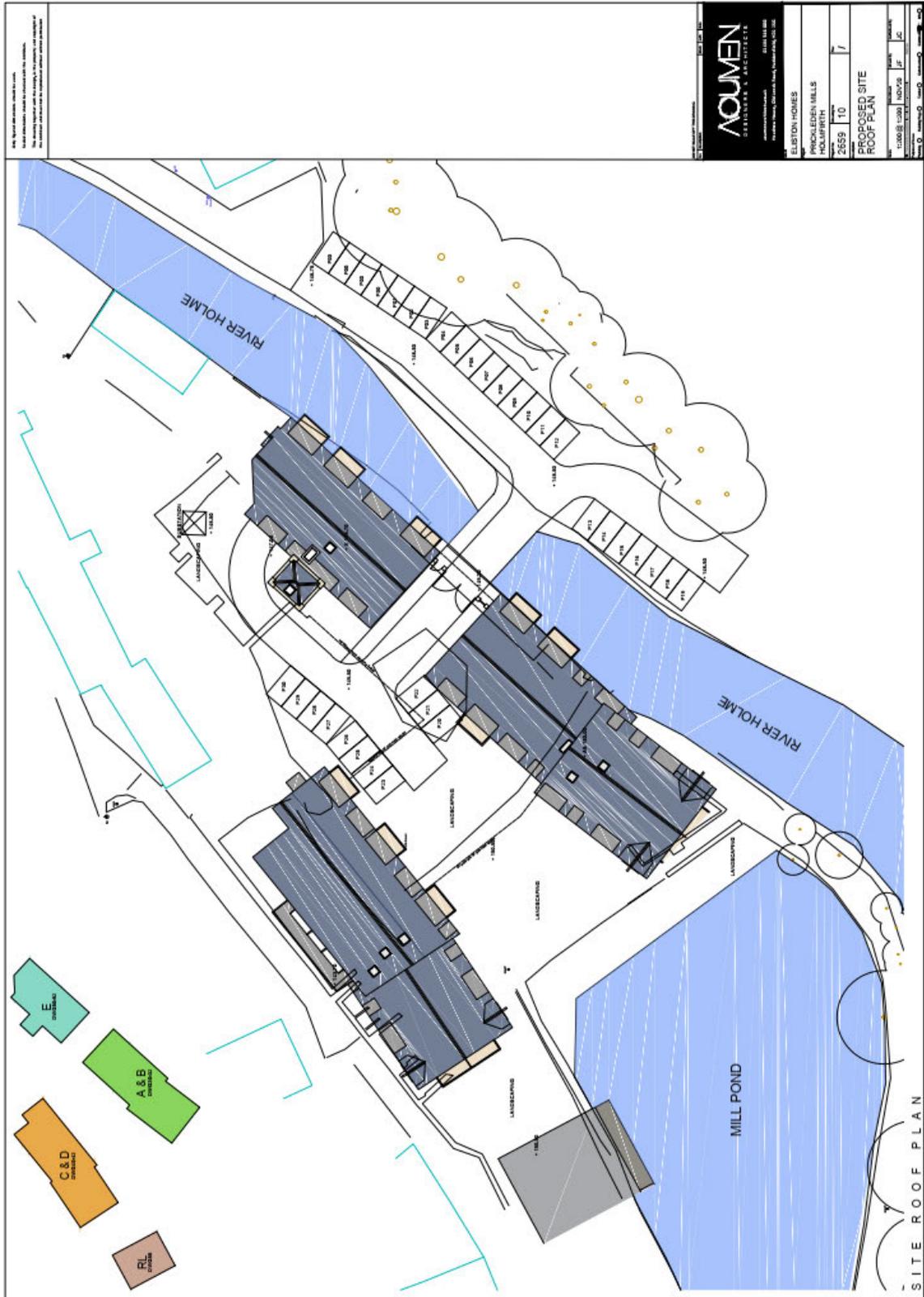
Designated Sites

Designated areas are Sites of Special Scientific Interest (SSSI) while others have been designated as having European protection status. Local authorities can also designate areas for nature conservation and in doing so may impose local authority byelaws to support local nature conservation objectives.

European designated status includes Special Protection Areas (SPAs) that preserve areas for birds and Special Areas of Conservation (SACs) which provides protection for habitats and the species which these habitats supports.

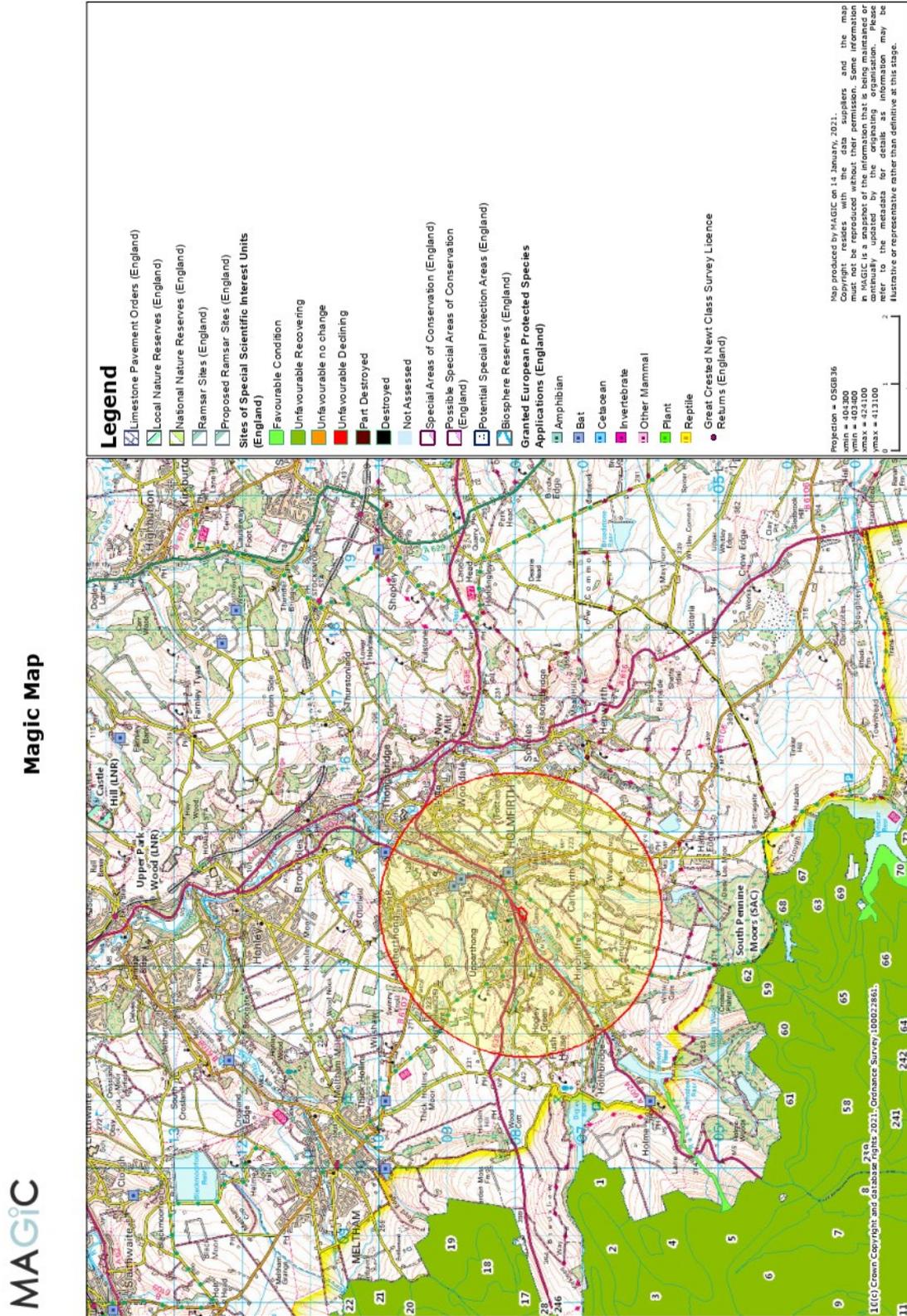
Information of Designated Protected Areas is received through Ecological Data Searches and Magic Map searches.

Appendix 6. Proposed Plans



Appendix 7. Magic Data

Two kilometre radius search of the project site.



1/14/2021

Site Check Report Report generated on Thu Jan 14 2021
You selected the location: Centroid Grid Ref: SE13760790
The following features have been found in your search area:

Granted European Protected Species Applications (England)

Case reference of granted application	EPSM2010-2268
Species group to which licence relates	Bat
Species on the licence	C-PIP
Site county of licence	West Yorkshire
Licence Start Date	15/12/2010
Licence End Date	31/08/2011
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	EPSM2009-863
Species group to which licence relates	Bat
Species on the licence	LEIS
Site county of licence	West Yorkshire
Licence Start Date	24/04/2009
Licence End Date	30/06/2009
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	N
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Case reference of granted application	EPSM2012-4393
Species group to which licence relates	Bat
Species on the licence	C-PIP
Site county of licence	South Yorkshire
Licence Start Date	11/10/2012
Licence End Date	01/10/2014
Does licence impact on a breeding site	N
Does licence allow damage of breeding site	
Does licence allow damage of a resting place	
Does licence allow destruction of breeding site	N
Does licence allow destruction of a resting place	Y
Does licence impact on a hibernation site	Unknown
NERC agreement reference	Unknown

Great Crested Newt Class Survey Licence Returns (England)

No Features found

Areas of Outstanding Natural Beauty (England)

No Features found

Limestone Pavement Orders (England)

No Features found

Local Nature Reserves (England) - points

No Features found

Local Nature Reserves (England)

No Features found

National Nature Reserves (England) - points

No Features found

National Nature Reserves (England)

No Features found

Ramsar Sites (England) - points

1/2

1/14/2021

No Features found

Ramsar Sites (England)

No Features found

Proposed Ramsar Sites (England) - points

No Features found

Proposed Ramsar Sites (England)

No Features found

Sites of Special Scientific Interest Units (England) - points

No Features found

Sites of Special Scientific Interest Units (England)

No Features found

Special Areas of Conservation (England) - points

No Features found

Special Areas of Conservation (England)

No Features found

Possible Special Areas of Conservation (England) - points

No Features found

Possible Special Areas of Conservation (England)

No Features found

Potential Special Protection Areas (England) - points

No Features found

Potential Special Protection Areas (England)

No Features found

Biosphere Reserves (England) - points

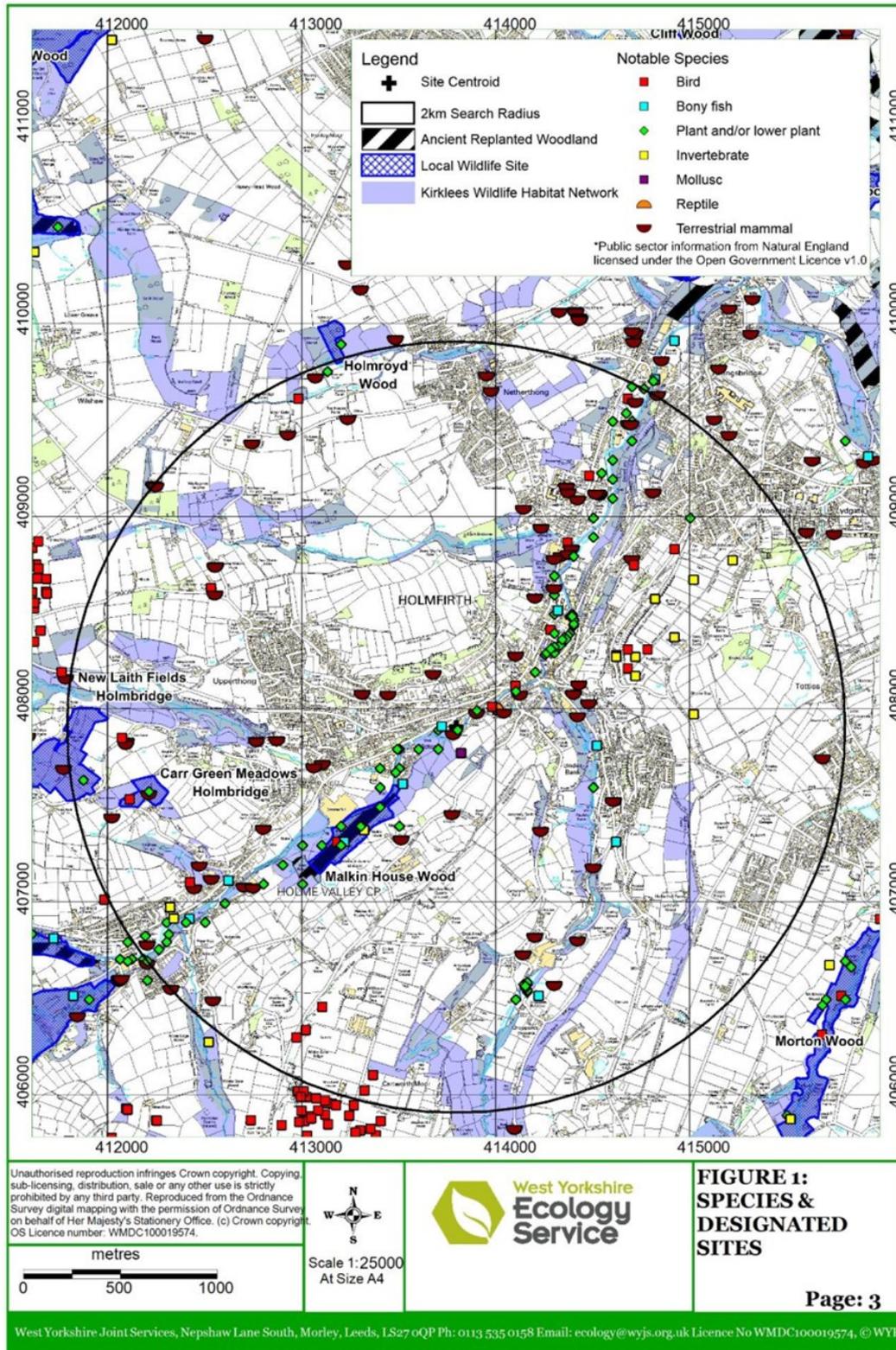
No Features found

Biosphere Reserves (England)

No Features found

Appendix 8. Ecological Data Search Information

The project site can be found at Grid Ref. SE 13796 07913



Appendix 9 Phase 2 Survey Data

Appendix 9A Great Crested Newt Survey

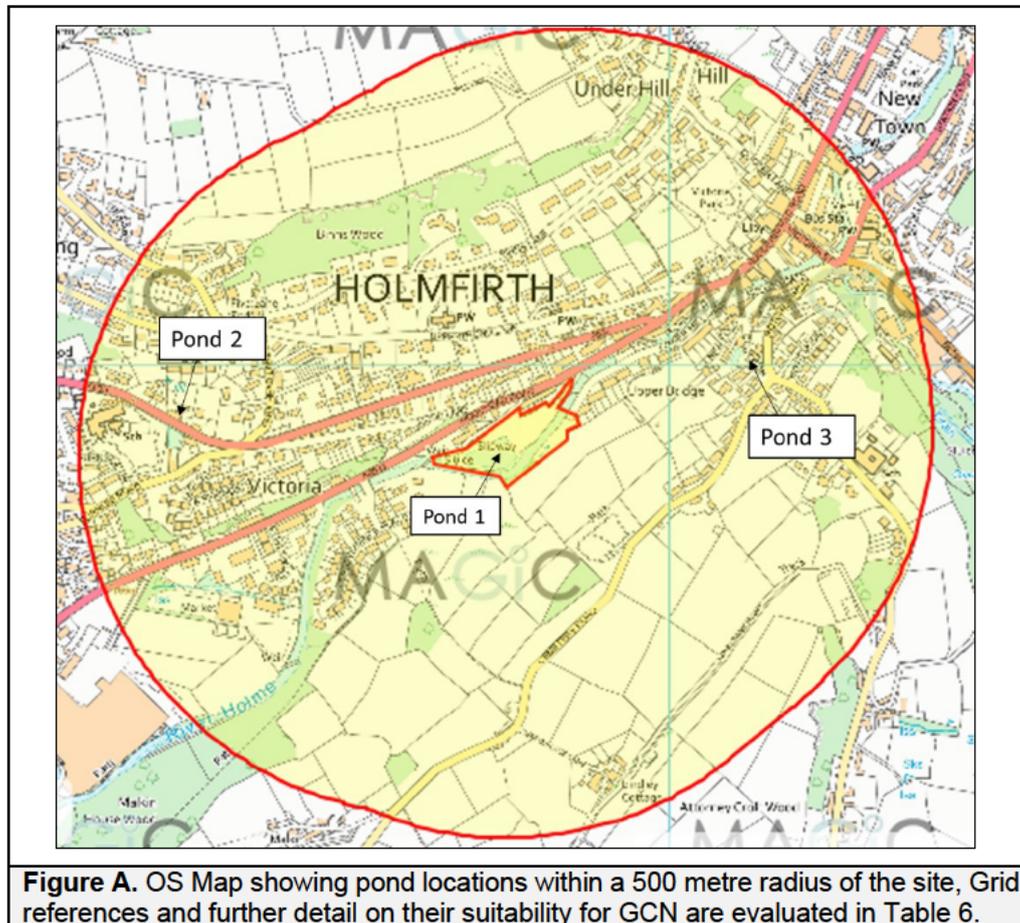
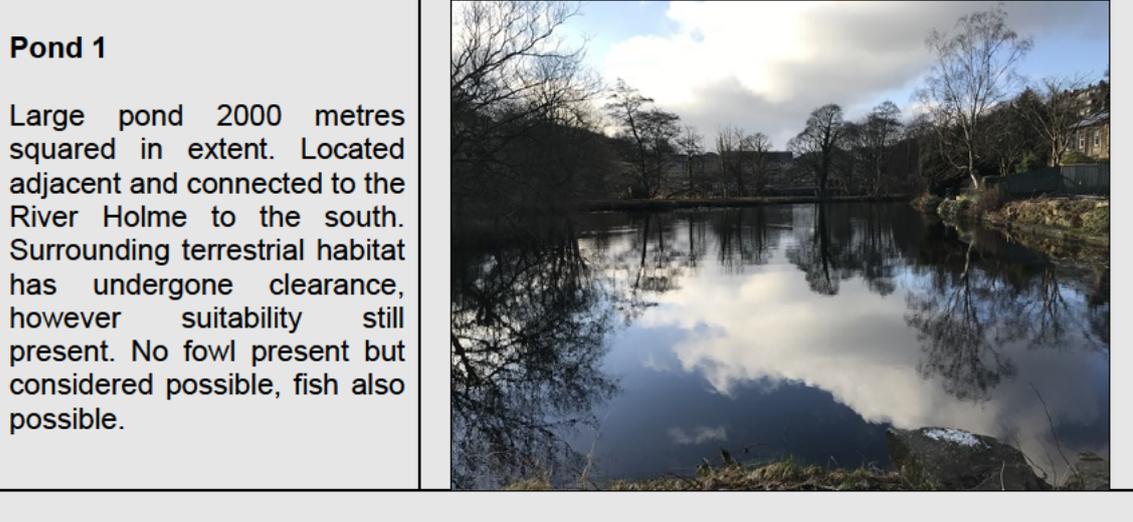


Table A: Pond details

Pond No.	Grid Ref.	Habitat Suitability Index Score	Distance from Site
1	SE 13753 07873	0.73 - good	Located on site
2	SE 13300 07896	No access	400m west
3	SE 14108 08006	No access	350m east

Figure B: Images and pond descriptions



Survey Conditions

The surveys were undertaken in weather conditions considered conducive to bat activity. The weather conditions for the surveys are summarised within Table A below.

Table A. Survey dates and weather conditions

Survey No.	Date	Precipitation	Wind	Cloud Cover	Temp.
1	17/03/2021	0	0	0	10
2	29/03/2021	0	0	0	13
3	19/04/2021	0	0	0	12
4	29/04/2021	0	0	1	5

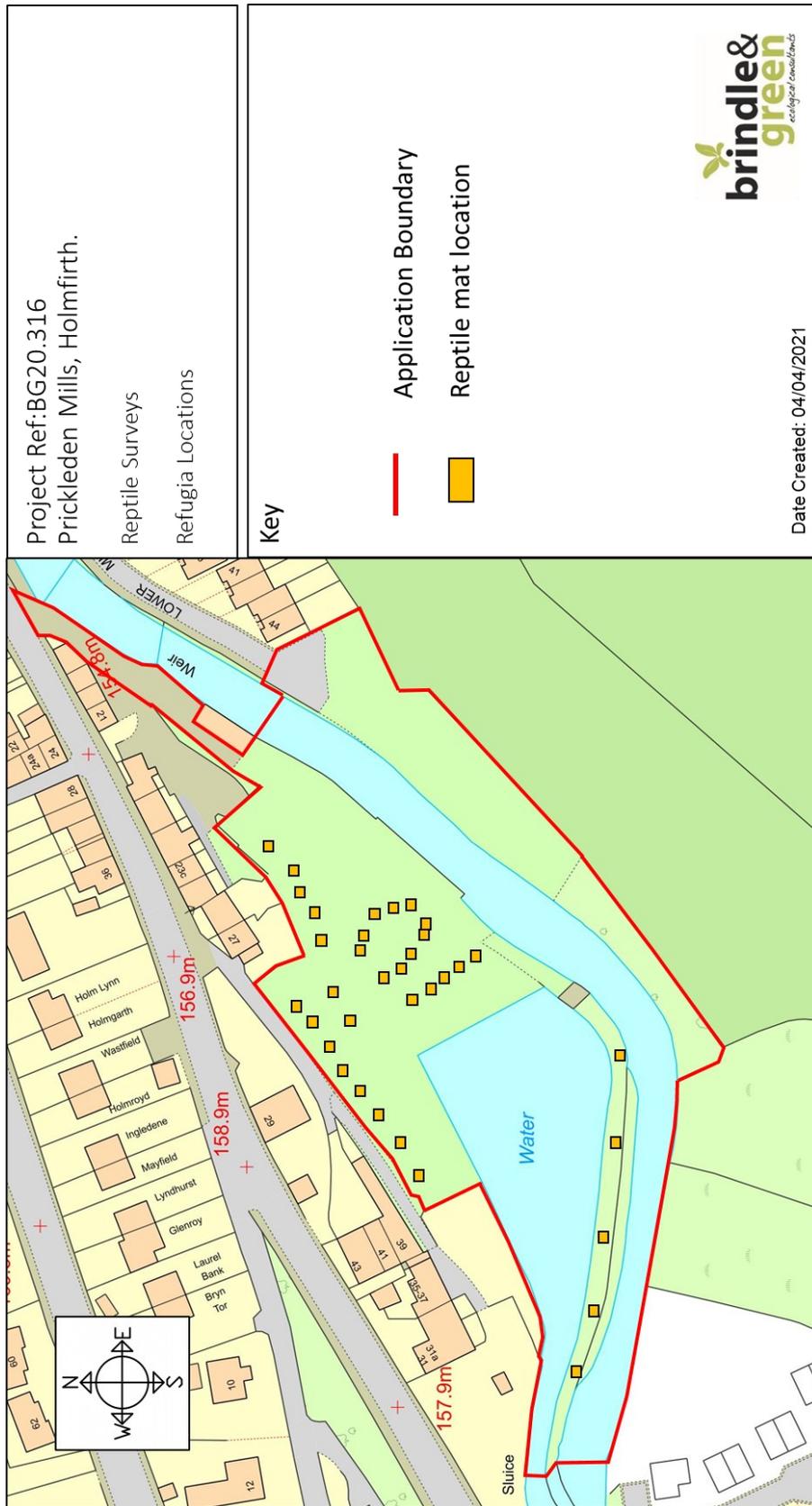
Table B: GCN Survey results

Vegetation cover score (0-5; 0 = no vegetation obscuring survey; 5 = water completely obscured by vegetation), and turbidity score (0-5; 0 = completely clear; 5 = very turbid). F= Female, M =Male, I = Immature, SMN = Smooth newt, **GCN = Great crested newt.**

Pond No. 1			No. of traps used: 35				
Survey No.	Date	Veg cover	Turbidity	Torch	Net	Eggs	Bottle trap
1	17/03/21	0	3	None	N/A	None	None
2	19/03/21	0	3	None	N/A	None	None
3	19/04/21	0	2	None	N/A	None	None
4	29/04/21	0	4	None	None	None	N/A
Note: NO GCN FOUND. 1 Common frog found S1							

Appendix 9B Reptile Refugia Plan

Figure A: Map depicting the location of artificial refugia set during reptile survey



Appendix 9C Water Vole Survey

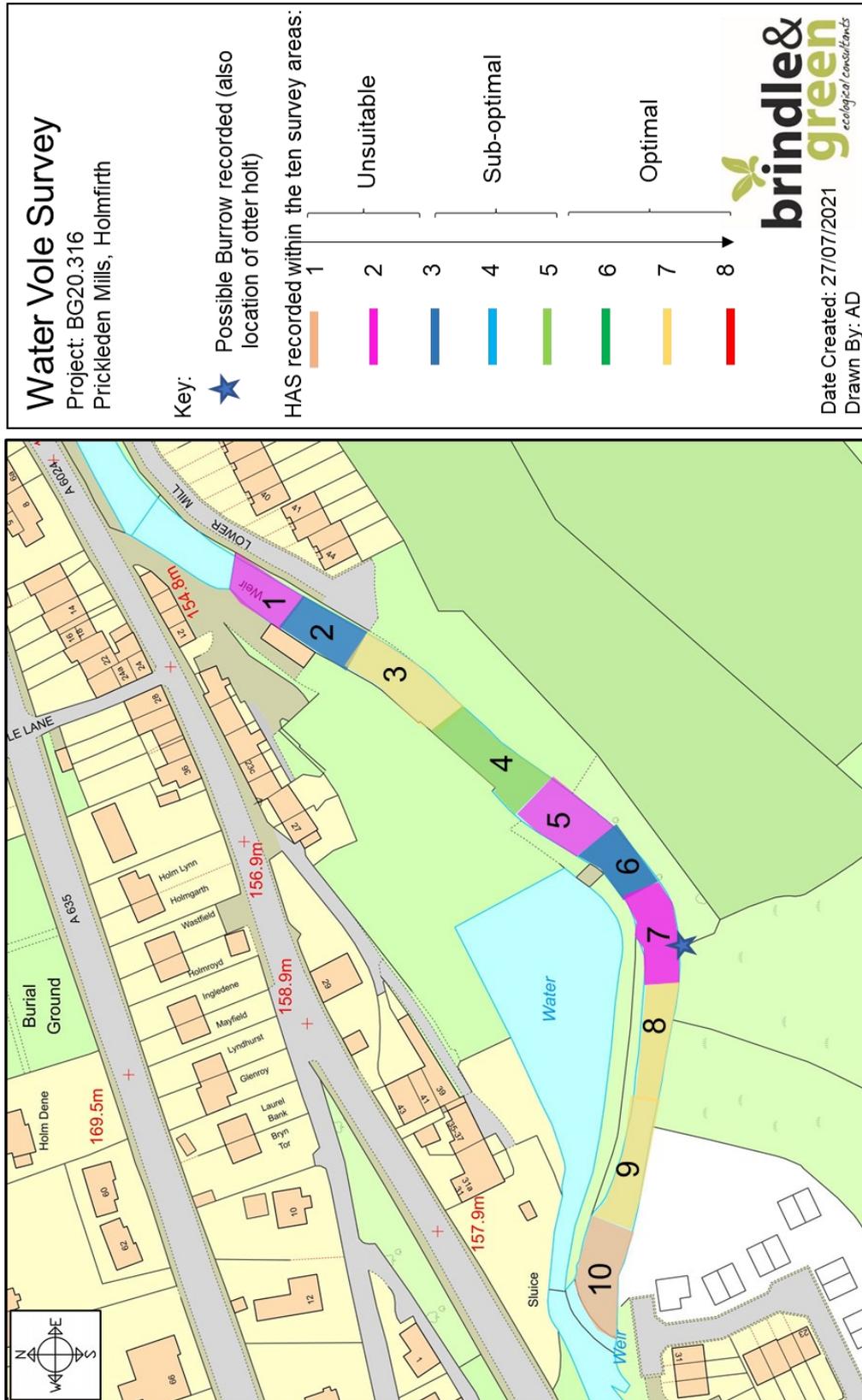
Table A. Habitat Suitability Assessment for Water vole

Habitat Suitability Feature	Score (1 If present)									
	1	2	3	4	5	6	7	8	9	10
Well-developed (>60%) bank side and emergent vegetation to provide cover	0	0	1	1	0	0	0	1	1	0
Year-round availability of food sources	0	0	0	0	0	0	0	1	1	0
Suitable refuge areas above extremes in water levels	0	0	1	1	0	0	0	0	1	0
Steep banks suitable for burrowing	0	0	1	0	0	0	0	1	1	0
Permanent open water	1	1	1	1	1	1	1	1	1	1
Presence of berm (ledge at water level)	0	0	1	1	0	1	0	1	0	0
Lack of disturbance through poaching, grazing and/or recent management	1	1	1	1	1	1	1	1	1	0
Nest building opportunities in vegetation above water level	0	1	1	0	0	0	0	1	1	0
Total	2	3	7	5	2	3	2	7	7	1

Table C. Summary of Water vole survey results at each sample point (HSA Calculated using Harris et al. 2009).

Survey point	Grid reference	Land use, and adjoining vegetation	HAS
1	SE 1307 8595	Built up surroundings, banks made of stone wall water depth 50cm, stream width 3m, current water flow speed 1m/s.	2
2	SE 1307 8594	Built up surroundings, with tree roots present banks made of stone wall water depth 50cm, stream width 3m, current water flow speed 1m/s.	3
3	SE 1307 8492	Steep dirt bank on one side, build up brick wall on the other side. depth 20cm, stream width 3m, current water flow speed 30cm/s.	7
4	SE 1307 8289	Steep dirt bank on one side, build up brick wall on the other side. depth 30cm, stream width 3m, current water flow speed 1m/s.	5
5	SE 1307 7987	Brick wall on northern bank, ruderal herbs under oaks trees on south bank. depth 30cm, stream width 3m, current water flow speed 20cm/s.	2
6	SE 1307 7885	Brick wall on northern bank, waste land and scattered trees on south bank. depth 50cm, stream width 3m, current water flow speed 20cm/s.	3
7	SE 1307 7684	Brick wall on both banks. depth 20cm, stream width 3m, current water flow speed 20cm/s.	2/2
8	SE 1307 7484	Depth 1m, stream width 4m, current water flow speed 10cm/s. close to grassland pond.	7
9	SE 1307 7085	Grassland on both banks. Depth 1m, stream width 4 water almost still.	7
10	SE 1307 6685	Disturbed land, depth 30cm, width 3m, water flow 30cm/s.	1

Figure A: Water Vole Survey Map.



Otter and Water Vole Survey Figures

Figure B:

Section 1
SE 13856 07943



Figure C:

Section 2
SE 13848 07932



Figure D:

Section 3
SE 13838 07919



Water Vole Survey Figures

Figure E:

Section 4
SE 13824 07906

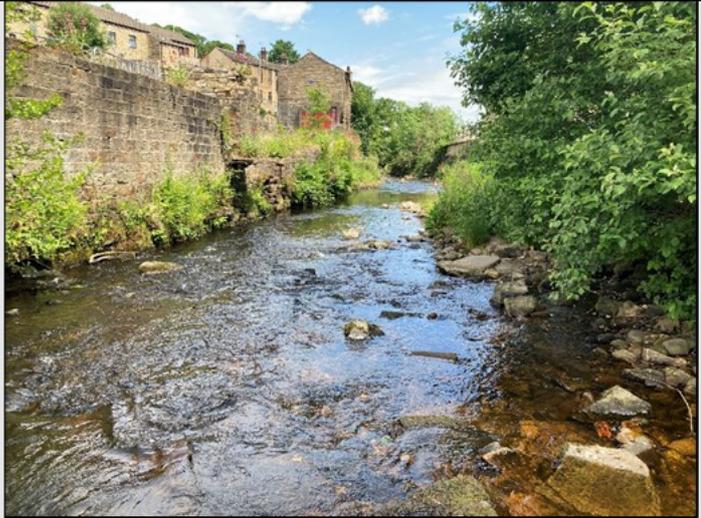


Figure F:

Section 5
SE 13808 07881



Figure G:

Section 6
SE 13795 07868



Water Vole Survey Figures

Figure H:
Section 7
SE 13785 07856



Figure I:
Section 8
SE 13758 07846



View of the potential otter holt located within section I



Figure J:

Section 9
SE 13735 07847

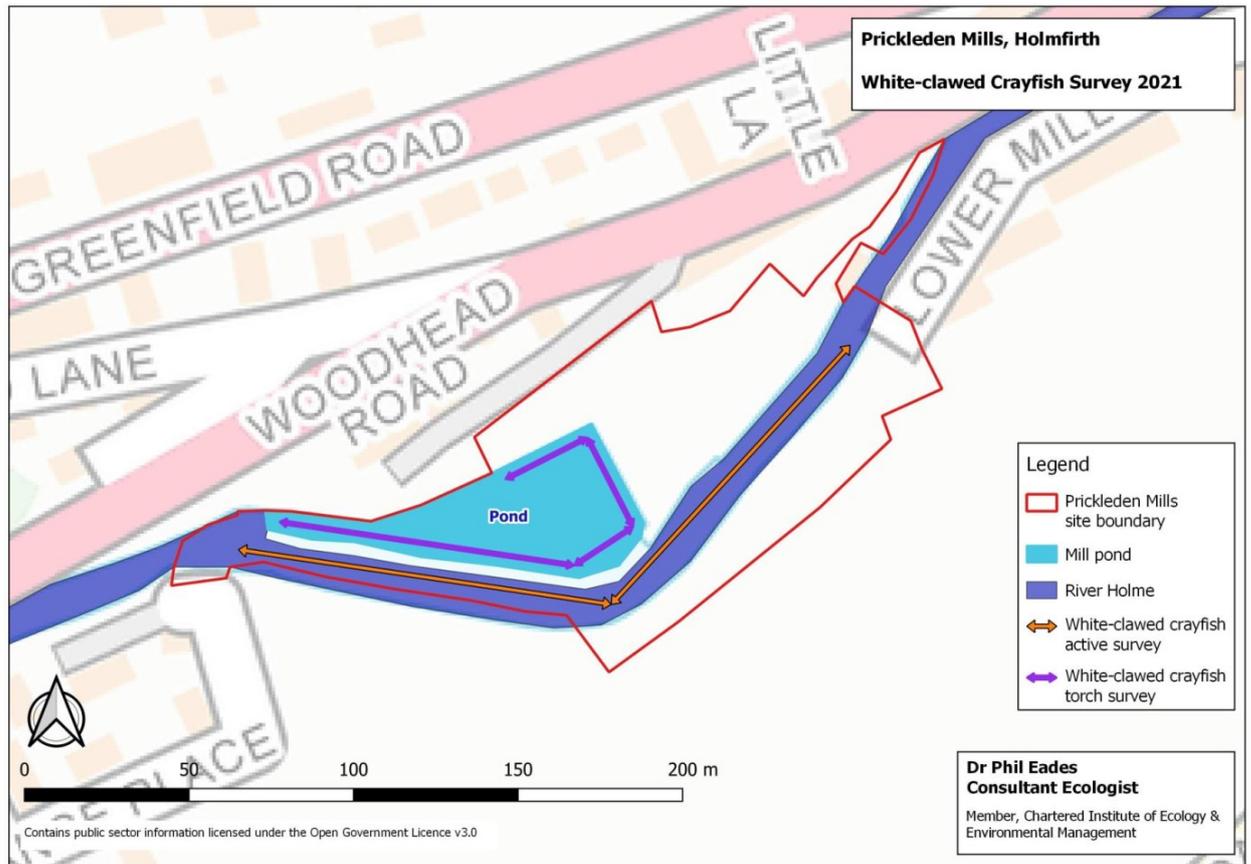


Figure K:

Section 10
SE 13700 07859



Appendix 9D White Clawed Crayfish Survey



Crayfish Record - Manual Survey

Site name	Prickleden Mills		Watercourse	River Holme	Catchment	Aire & Calder	NGR	SE 13760 07870	
Date	12/07/2021		Time	pm	Refuges	500	Area searched	75 m2	
Temp	13.8 C		pH	5.5	Conductivity	180 micros/cm	Agency contact	Tim Selway	
Surveyors	Phil Eades & Be Wiggs		Contact no.	07791 428242	Licence no	2016-20900-CLS-CLS	Water colour	slightly peaty	
Mean flow (max 20cm/s)	20		Max depth (max 40cm)	30cm	Turbidity	low	% <25mm CL	n/a	
No not caught/juvs	n/a		Crayfish/100 refuges	0	% Thelohania	n/a			
Photos									
Species	M	F	C.L.	<25mm C.L.	Thelohania	F+ young/eggs	Injured	Mori/dead	Notes
	✓	✓		✓	✓	✓	✓	✓	
NO CRAYFISH SEEN BY ACTIVE SEARCH									

Torch Survey Record

The mill pond is approximately 80m long by 30m wide, tapering to the narrow western inlet. There is a small island near to the eastern end. The water is fairly clear but with a slightly peaty colouration. There are few aquatic plants, but there are some submerged fallen tree branches. Much of the eastern end is vertical sided and deep, but there are shallow margins along all of the southern side. The pond is frequented by abundant geese and ducks, and frequent fish were seen (species not known). There was safe access to about 70% of the pond margins, and torch viewing was possible along the entirety of this. Whilst the bottom could not be seen at the deeper north-eastern end, there were abundant fallen branches and twigs that would provide good foraging habitat for crayfish. The shallow southern margins were easily viewable along the entire length. Torch surveys were undertaken in late April (29 April) and mid July (13 July).

NO CRAYFISH SEEN DURING TORCH SURVEYS.

Habitat Record Card						
Refuges: tick all present, ring main types searched			Main substrate beneath		Refuges in bank	
cobble (6.5-15cm)	Y		bedrock		none	
cobble (15-25.6cm)	YY		cobble (6.5-15cm)		cobble/boulder	
boulder (25.6-40cm)	Y		pebble (<6.5cm)		tree roots, large	Y
boulder (>40cm)			gravel (<1.6cm)	Y	vertical or undercut bank	Y
rubble (give size)			sand (<2mm)		dry stone wall	Y
woody debris			clay		other reinforced	
other urban debris			silt		crayfish burrows	
tree roots, fine			Shading above (>30%)		Evaluate crayfish habitat for whole site (0 - none; 1 - pres; 2 - freq; 3 - abund)	
moss					in margins	3
filamentous algae					in mid channel	3
other submerged veg			40%		in banks	2
emergents						
Siltation			Description of the site and any additional comments, including problems			
none			At this point the River Holme is a 5-7m wide small rocky river with steep banks, a mixture of rock, earth and drystone wall. Shaded partially by sycamore, hawthorn, willow and oak. Quite shallow 10-50 cm deep, with predominantly large cobbles and boulders. Within the survey site there are 3 small weirs about 40-100cm tall. The river had moderate flow at the time of survey. It is about 4km downstream of three water supply reservoirs fed by streams from peat-covered moorland. The water is moderately acidic, and few signs of life were observed other than occasional bullhead and frequent cased caddisfly larvae.			
low						
moderate	Y					
high						
Problems:						
1 - pollution						
2 - erosion (E if >33% affected)						
3 - non-native crayfish						

Appendix 9E Bat Endoscope Survey

