# Ecological Impact Assessment

Heybeck Lane, Chidswell

CC Projects

Report reference: R-3280-12-A
December 2019

| | |
|---|---|
| Report Title: | Ecological Impact Assessment<br>Land off Heybeck Lane, Chidswell |
| Report Reference: | R-3280-12-A |
| Written by: | Christopher Shaw BSc (Hons) MCIEEM<br>Senior Ecologist |
| Technical review: | Rob Weston BSc MSc MCIEEM<br>Technical Director |
| QA review: | Charlie Foreman BSc (Hons) Grad CIEEM<br>Assistant Ecologist |
| Approved for issue: | Rob Weston BSc MSc MCIEEM<br>Technical Director |
| Date: | Written 28.11.19<br>Amended 13.12.19 |

*Brooks Ecological Ltd has prepared this report for the sole use of the commissioning client. The information which we have prepared and provided is in accordance with the CIEEM's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions. This report does not constitute legal advice. The report is in accordance with the agreement under which our services were performed. No warranty, express or implied, is made as to the advice in this report or any other service provided by us. This report may not be relied upon by any other party except the person, company, agent or any third party for whom the report is intended without the prior written permission of Brooks Ecological Ltd. The content of this report may, in part, be based upon information provided by others and on the assumption that all relevant information has been provided by those parties from whom it has been requested. Information obtained from any third party has not been independently verified by Brooks unless otherwise stated in the report. This report is the copyright of Brooks Ecological Ltd. Unauthorised reproduction or usage by any person is prohibited.*

Brooks Ecological
Grounded advice

Unit A, 1 Station Road, Guiseley, Leeds, LS20 8BX
Phone: **01943 884451**
**01943 879129**
Email:admin@brooks-ecological.co.uk
www.brooks-ecological.co.uk
Registered in England Number 5351418

smas worksafe consultant
www.smasltd.com
as recognised by SSIP SAFETY SCHEMES IN PROCUREMENT

# Contents

# Summary

The proposals have engaged with the NPPF Mitigation Hierarchy and been able to avoid most potential significant effects at the Site.

Residual significant effects can be Mitigated and Compensated on site and secured via standard conditions provided in the British Standard BS42020.

Delivery of the features and precautions in these documents will remove any residual significant effects on ecology.

# 1. Introduction

1.1.1 Brooks Ecological Ltd was commissioned by the CC Projects to carry out an Ecological Impact Assessment (EcIA) for a Site referred to as Heybeck Lane, Chidswell, Dewsbury, Huddersfield, West Yorkshire (SE 27056 24296). It is proposed to develop the Site for housing.

1.1.2 The British Standard BS 42020 recommends that a proportional assessment of Ecological Impacts should be made - such that decision making relating to the NPPF 'mitigation hierarchy', the planning balance', and the use of conditions is suitably informed.

1.1.3 The purpose of the EcIA report is to use the information gathered, alongside the proposals for the Site, to:

- Identify any significant effects associated with the proposed development
- Set out any mitigation (including monitoring) required to address these effects, and to ensure compliance with legislation and policy
- Identify suitable enhancement
- Identify measures required to secure mitigation and enhancement
- Identify and assess any residual effects and their legal, policy and development management consequences

1.1.4 This report adapts the format set out in the Chartered Institute for Ecology and Environmental Management (CIEEM) guidelines for Ecological Report Writing (December 2017).

# 2. Method

## 2.1 Scope of Assessment

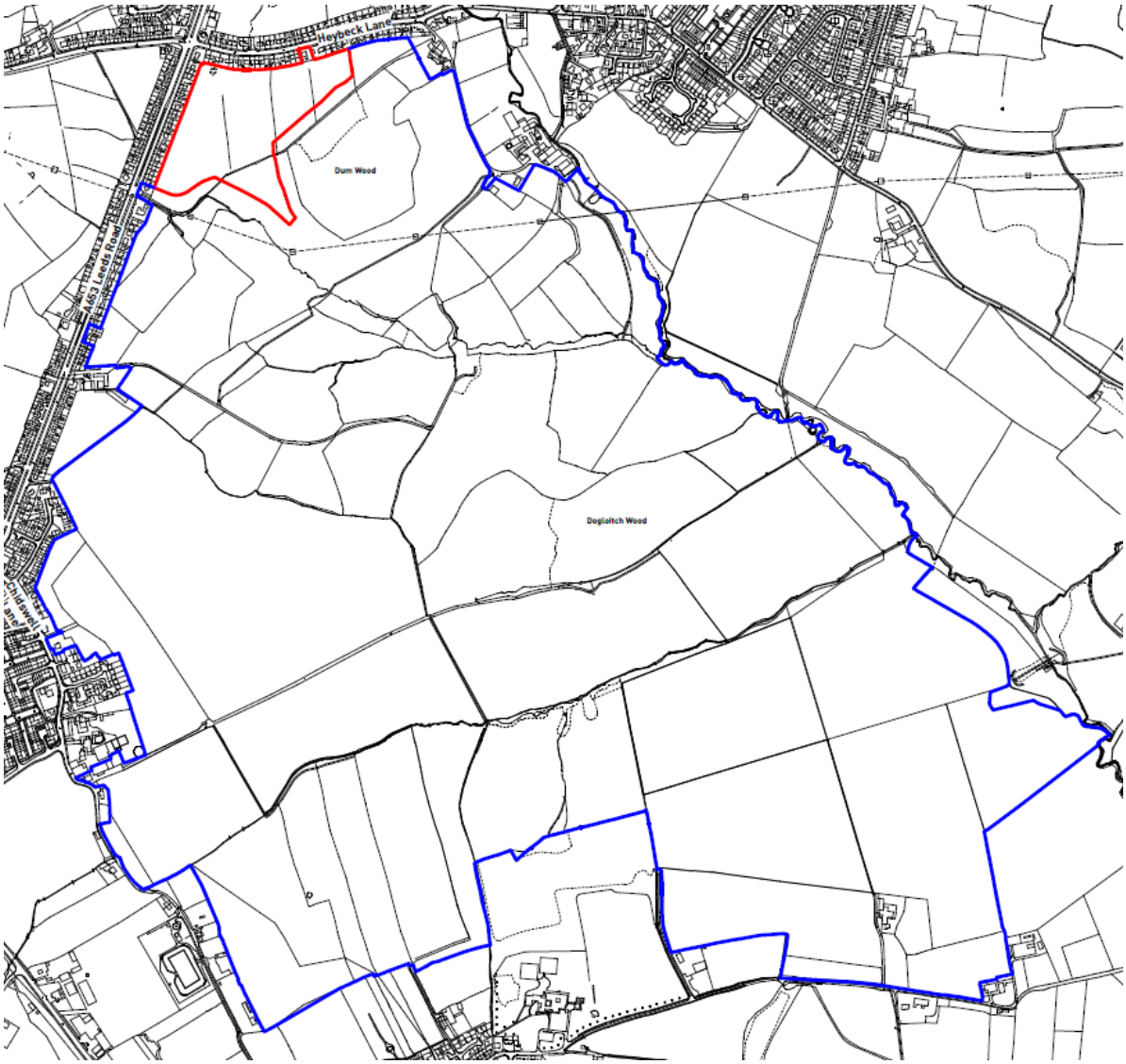
2.1.1 An Extended Phase 1 Habitat Survey of the Site was carried out in July 2016 by WYG Environment Planning Transport Ltd. This was followed up by recommended surveys for Breeding Birds, Barn Owl, Great Crested Newt, Bats, Water vole, Reptile and Hedgerows, all carried out by Brooks Ecological during the relevant seasonal windows of 2018.

2.1.2 The extent of the application site ('the Site') is the land within the red line boundary defined in Figure 2.1. Where possible or relevant, this was extended into adjacent habitat to provide context to the Site. The Survey Site included all land within the blue line boundary, along with Dum Wood and Dogloitch Wood.

2.1.3 The assessment uses a 2 km area of search around the Site for records of protected and notable species and locally or nationally designated wildlife sites.

2.1.4 The Site encompasses a series of agricultural fields

**Figure 2.1** The Survey Site




2.1.5 To provide information on the Site's ecological value, the following studies have been carried out; with the relevant reports produced being:

- Extended Phase 1 Habitat Survey (WYG Report A054074) July 2018
- HSI Assessment & Report (R-3280-01) May 2018
- Barn Owl Scoping Assessment & Report (R-3280-02) April 2018

- Ornithological Summary (Breeding Birds) (R-3280-03) October 2018
- Badger Assessment & Report (R-3280-04) April 2018
- Bat Roost Suitability Assessment & Report (Trees) (R-3280-05) April 2018
- Bat Activity Survey (R-3280-06) November 2018
- Water vole Assessment & Report (R-3280-07) September 2018
- Reptile Survey (R-3380-08) October 2018
- Hedgerow Assessment & Report (R-3280-09) July 2018
- Bat Roost Suitability Assessment & Report (Houses) (R-3280-10) August 2018
- Bat Emergence Survey (R-3280-11) August 2018

## 2.2 Desk Study

2.2.1 A full desk study including consideration of local biological records, aerial photographs, local designations and planning guidance has been carried out.

## 2.3 Field Survey

Walkover – Extended Phase 1 Habitat Survey

2.3.1 The survey was carried out during July 2016 and followed Phase 1 Habitat Survey Methodology (JNCC, 2010).

HSI Assessment

2.3.2 Information on four off-site ponds, situated within a 500m radius of the Site Survey Area and not separated by barriers, was collected on 9th March 2018. This information was then used to calculate each ponds Habitat Suitability Index (HSI) score. Based on an index produced by Oldham et al (2000), the HSI is recognised by Natural England as a useful tool in evaluating the potential of ponds to support great crested newt (GCN) and therefore the likelihood of offences in relation to this species.

Barn Owl Scoping

2.3.3 Survey was undertaken on 26th March 2018 and followed the methodology outlined by Gilbert, Gibbons & Evans (1998), Hardey et al. (2009), Shawyer (2011) and the Barn Owl Trust (2012).

2.3.4 An intensive walkover survey of the Site was made to systematically search, map and assess potential Barn Owl breeding and roosting sites within the red-line boundary. The walkover was undertaken while trees were still leafless to enable trees with suspected cavities to be located, assessed and checked.

Breeding Bird Survey

2.3.5 Three breeding bird survey visits were made on the 18th April, 21st May and 22nd June 2018. Amended visit Common Birds Census (CBC) territory mapping methodology was used to record breeding bird activity on Site. Registrations of all bird species observed within the Site red-line boundary or overflying the Site and heard singing and/or calling were entered onto field survey maps using standard British Trust for Ornithology (BTO) species and activity codes. The Site was walked to less than 100m of every point within the red-line boundary and the survey route was reversed accordingly on each visit to alleviate recording bias. Bird registrations within peripheral areas of habitat were also incorporated.

Badger Survey

2.3.6 A walkover survey was undertaken on 9th March 2018 by an experienced ecologist with significant experience of badger survey and mitigation. The Survey Site was thoroughly searched for evidence of badger activity by looking for the setts, latrines or dung pits, snuffle holes and evidence of foraging, mammal paths, footprints in areas of soft mud and hairs caught on fencing.

Bat Survey

2.3.7 A thorough daytime inspection of trees and buildings was made in March 2018 and August 2018, respectively. Survey looked for evidence of bats and assessed suitability for roosting. Bat roosting potential of the trees was classified according to the following criteria set out in the Bat Conservation Trust Good Practice Guidelines (2016).

2.3.8 All buildings with roost suitability were subject to emergence survey between 14th – 16th August 2018, in accordance with the Bat Conservation Trust, Survey Good Practice Guidelines (2016). The surveyors, using heterodyne detectors, were in place at least half an hour before dusk and left once all species of bat would be expected to have left a roost and patterns of activity within the Site had been appraised.

2.3.9 Monthly bat activity transects were carried out between April and September 2018 in accordance with the Bat Surveys for Professional Ecologists – Good Practice Guidelines, Bat Conservation Trust (2016). To supplement data collected during transects, static monitoring devices (Wildlife Acoustic SM4+) were deployed in strategic locations around the Site prior to the start of each survey. These were then left to run for a minimum of 5 nights.

Water vole Survey

2.3.10 An early season visit was carried out on the 20th April 2018, with a late season visit on 6th September 2018. Both were undertaken in suitable weather conditions and led by

an experienced field worker. Water vole survey followed Dean et al. (2016) and attempted to locate evidence of water vole activity.

Reptile Survey

2.3.11 Reference was made to The Herpetofauna Worker's Manual (Gent and Gibson, 2003) for the survey methodology with seven official reptile survey visits being carried out.

Hedgerow Survey

2.3.12 Survey was carried out on the 6th June 2018 and followed the methodology set out in the Hedgerow Regulations 1997 and the Hedgerow Survey Handbook (DEFRA, 2007).

## 2.4 Assessment Method

2.4.1 In assessing the significance of effects, we refer to Section 5 of CIEEM (2018) - that a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. In relation to ecological features we consider the following factors in combination, including;

- the feature's value on an ascending scale from Site, to international value
- the Site's position in the local landscape,
- its current management and
- its size, rarity or threats to its integrity

2.4.2 There are several tools available to aid this consideration, including established frameworks such as Ratcliffe Criteria or concepts such as Favourable Conservation Status. Also, of help is reference to Biodiversity Action Plans in the form of the Local BAP and Section 41 of the NERC Act (2006) to determine if the Site supports any Priority Habitats, Habitats of Principal Importance or presents any opportunities in this respect.

2.4.3 The assessment considers the development proposals set out below; from which the potential impacts can be summarised as:

- Vegetation and habitat removal
- Disturbance, pollution or interference arising from the Site's construction
- Disturbance, pollution or interference arising from the Site's operation

2.4.4 This report deals with any significant effects potentially arising from these impacts. It looks at how the mitigation hierarchy can be applied to any effects and the implications of any residual significant effects.

# 3. Ecology Baseline

3.1.1 A *summary* of the points salient to this assessment are set out below:

## 3.1 Designated Sites and Conservation Areas

3.1.1 Impacts on International and National Designations or their interests have been ruled out at PEA Stage.

3.1.2 Ten Local Designations fall within a 2km search radius. Of these, only a single site is considered to be within the Ecological Zone of Influence (EZoI).

**Table 3.1** Summary of Locally Designated Sites

| Name | Designation | Location | Reason for Designation |
|---|---|---|---|
| Dum Wood | Local Wildlife Site (LWS)<br>Site of Wildlife Significance (SWS) | 20m SE | Woodland with high bluebell density cover.<br><br>Valued at District Level |

3.1.3 The Site does not include any land mapped land within the Kirklees Wildlife Habitat Network (KWHN), with the closest section encompassing Dum Wood and an adjacent section of hedgerow (see below figure).

**Figure 3.1**

Extract of the KWHN

## 3.2 Habitats

3.2.1 The Site comprises of the following habitat types all of which have been described and mapped in the Extended Phase 1 Habitat Survey.

**Figure 3.2** Phase 1 Habitat Plan*


* Plan based on most recent Site visit in 2018

**Table 3.2** Summary of habitat features

| Habitat Feature | Extent | Notes |
|---|---|---|
| Arable Land | 7.00 ha | *Valued at Site Level*<br>*Low value habitat* |
| Hedgerows | 530m | *Valued at Local Level*<br>All hedgerows meet the criteria for 'Habitat of Principal Importance' as listed under Section 41 of the NERC Act (2006).<br>A single hedgerow (labelled in Figure 3.2 below) qualifies as 'Important' under the Hedgerow Regulation 1997.<br>Policy will require that any loss of hedgerow is compensated on Site. |
| Other habitat | 0.07ha | *Valued at Site Level*<br>*Existing residential property and garden of very low value habitat* |

*Potential future changes to the baseline*

3.2.2 The Site's use and ecological baseline will likely be unchanged until the time of the proposed development.

3.2.3 In the absence of development its use as arable land of low ecological value would continue. Hedgerows will continue to be managed at low intensity and it is likely that more standard trees will develop in time.

## 3.3 Species and Species Groups

3.3.1 Potential constraints relating to some groups were investigated through specific survey.

**Table 3.3** Summary of relevant faunal issues

| Species/ Group | Presence | Notes |
|---|---|---|
| Bats | Very low numbers of common pipistrelle recorded foraging during monthly transects.<br><br>Remote monitoring also identified limited activity by soprano pipistrelle, noctule and a single myotid. | *Valued at Site Level*<br><br>Survey has revealed the Site to be of very low value to local bat populations.<br><br>No significant impacts. |
| Breeding Birds | No breeding associated with the Site's open areas.<br><br>Species breeding on Site were limited to hedgerows and consisted of:<br><br>• 1 Red List (Song thrush)<br>• 1 Amber List (Dunnock)<br>• 4 Green List | *Valued at Site Level*<br><br>Standard precaution will be required in relation to clearance in nesting season.<br><br>Some low value foraging habitat will be lost and will be displaced to ample similar habitat locally.<br><br>Structure boundaries (hedgerow) should be retained / created and nest boxes provided for breeding. |
| Invasive Non-Native Species | Himalayan balsam is scattered throughout the arable field margins and is abundant along the adjacent watercourse and woodland. | *Valued at Local Level*<br><br>Development risks further spread of this invasive plant through the Site, and potentially off-site.<br><br>An Invasive Weed Management Plan will need to be produced. |
| Other notable species | Detailed survey has been able to demonstrate the absence of great crested newt, barn owl, badger, water vole and reptiles. | No significant impacts. |

# 4. Description of Proposed Development

4.1.1 The Site will be developed for housing with relevant infrastructure, open space, gardens and landscaping.

4.1.2 The Site's indicative layout and the parameter plan that underpins it, have been produced at a time when it could respond to the findings of all ecological surveys.

**Figure 4.1** Indicative Site Layout from Enjoy Design project 18,006 - dwg. 00-101 Rev C (01.11.19)

# 5. Impacts and Effects of the Proposed Development

5.1.1. Figure 5.1 below shows the development footprint, based on the indicative masterplan, in relation to the mapped habitats. The exact construction footprint will be fixed at the Reserved Matters stage. The indicative masterplan, and the figures below, therefore, show how the Site could be developed.

5.1.2. Based on the Illustrative Masterplan, all habitat within the EcIA development footprint will be cleared and lost from Site. There is scope to retain most of the hedgerows and this will be agreed at the Reserved Matters stage.

**Figure 5.1** Development footprint and habitats

**Table 5.1** Summary of impacts and effects

| Feature | Impact* | Significant Effects |
|---|---|---|
| Dum Wood LWS, SWS | No direct impacts from development (c.20m standoff observed).<br><br>Potential indirect impacts from construction activities (noise/ light disturbance) and release of air borne pollutants (dust).<br><br>Potential indirect during operation resulting from increased footfall (damage to woodland ground flora, disturbance), fly tipping, fires, etc. | Significant at District Level<br><br>Long-term degradation of woodland ground layer and displacement of wildlife. |
| Low Value Habitats | Permanent loss of 7 ha of arable land, along with all hardstanding, buildings and gardens. | No significant effects above Site level |
| Hedgerows | Loss of 150m of hedgerow during Site clearance, 80m of which is classed as 'Important'. | Significant at the Local level<br><br>Degradation of hedgerow network. |
| Bats | Loss of low value habitat during construction.<br><br>Inadvertent creation of low-moderate value habitat during operation (gardens and POS). | No significant effects above Site level<br><br>Temporary displacement of small numbers of common bats. |
| Breeding Birds | Permanent loss of arable fields and small sections of hedge used for nesting and foraging.<br><br>Degradation of retained hedgerows.<br><br>Inadvertent creation of new nesting and foraging habitat on bare ground. | No significant effects above Site level<br><br>Small decrease in nesting habitat for farmland birds. Displacement of much of the existing bird assemblage. |
| Invasive Non-Native Species | Potential spread of Himalayan balsam during construction. | Significant at the Local level<br><br>Potential spread of INNS within, and off-Site. |

* the predicted impacts and significant effects are based on the indicative masterplan and show how the Site could be developed. The exact construction footprint will be fixed at the Reserved Matters stage.

# 6. Mitigation and Residual Effects

6.1.1 **Avoidance** of unnecessary impacts on hedgerows has already been designed into the plan at this stage. The proposals will incorporate the following **mitigation** in relation to the identified **effects** above.

- A BS:42020 Biodiversity Management Plan (BMP) will be produced prior to detailed landscape plans being finalised. This can be secured by use of a standard condition and will set out the measures detailed below;
- A BS:42020 CEMP (Biodiversity) will be produced this can be secured by use of a standard condition and will set out measures detailed below;
- An Invasive Weed Management Plan (IWMP) will be produced prior to any works commencing; this can be secured by use of a standard condition and will set out measures detailed below;

**Table 6.1** Summary of Mitigation and Residual Effects

| Effect | Features | NPPF Hierarchy | Residual Effect |
|---|---|---|---|
| Degradation of Dum Wood (off-site) | The CEMP will detail the protection of sensitive off-site habitat.<br>The BMP will show dedicated management of Dum Wood to address increased visitor pressure. | **Mitigation** | **Negligible**<br>All significant effects addressed |
| Loss & degradation of Hedgerows | The CEMP will detail the protection of retained hedgerows during construction.<br>The BMP and landscaping plans will show:<br>• The planting of new, species-rich, hedgerows.<br>• Enhancement of retained hedgerows* | **Mitigation, Compensation** *and* **Enhancement** | **Negligible**<br>Hedgerow loss compensated for through new planting and increase in existing hedgerow quality |
| Spread of INNS | The IWMP will detail how Himalayan balsam will be dealt with on Site to prevent its spread. | **Mitigation** | **Negligible**<br>All significant effects addressed |
| Low Value Habitats | The BMP will detail:<br>• Habitat creation within POS, i.e. wildflower lawn mixes, native tree & shrub planting.<br>• The provision of a range of faunal habitats such as bird & bat boxes | **Mitigation, Compensation** *and* **Enhancement** | **Negligible**<br>Substitution with other low value habitats. |

* Retained habitat is based on the indicative masterplan. The exact construction footprint will be fixed at the Reserved Matters stage.

6.1.2 No significant residual effects have been identified after these measures are put in place.

**Biodiversity Net Gain Calculations**

6.1.3 In an effort to assess the residual impact of development on the Site's habitats (and thus calculate a net loss or gain for each receptor), the following table has been produced. This is based on the Indicative Masterplan, not the parameter plans, and thus should be used as an indication of how the Site could be developed to achieve a net gain.

6.1.4 The Biodiversity Metric 2.0 Calculator Tool has been used to calculate a standardised Biodiversity Impact Score.

**Table 6.2** Residual Biodiversity Impact

| Habitat Feature | Extent | Baseline Value* | Impact Score* | Compensation | Habitat Mit. Score* | Residual Biodiversity Impact |
|---|---|---|---|---|---|---|
| Arable | 7.00 ha | 14.00 | -14.00 | *Built Environment (Buildings & Gardens)* | *+11.19* | *Area Habitat*<br><br>*Habitat Units lost = -14.14*<br>*Habitat Units delivered = +15.76*<br><br>***Total net change = +1.62*** |
| Residential | 0.07 ha | *0.14* | -0.14 | *POS – Amenity grass* | *+4.57* | |
| Native Hedgerow | 270m | 0.54 | -0.06 | *Enhance retained hedgerows* | +1.16 | Hedgerow<br><br>*Hedge Units lost = -0.46*<br>*Hedge Units delivered = 0.00*<br><br>***Total net change = -0.46*** |
| Native Hedgerow with Trees | 180m | 0.36 | -0.08 | *Enhance retained hedgerows* | *+0.75* | |
| Native Species Rich Hedgerow | 80m | *0.32* | -0.32 | *New planting* | *TBC at Reserved Matters* | |

* Values and *Scores based on Biodiversity Metric 2.0 Calculator Tool.*

6.1.5 This exercise identifies an overall net gain in Habitat Units (+1.62/ 11.45%) and a net loss in Hedgerow Units -0.46/ -37.70%).

6.1.6 The baseline calculations are based on the loss of all existing area habitat (arable and residential) and the loss of 150m of hedgerow (to facilitate access). In the absence of a finalised landscape masterplan and Biodiversity Management Plan (BMP), the post development calculations have been based on a generic landscape scheme, with all POS being sown with amenity grass and retained hedgerows being managed as per standard landscape regime.

6.1.7 Based on the Indicative Masterplan, most of the Site would be occupied by a mosaic of suburban residential development (5.8 ha), with the rest (1.27 ha) planted up and

managed as Public Open Space. Once a BMP has been produced, it is anticipated that there will be an increase in the net gain for Habitat Units, and there will be a change to net gain in Hedgerow Units; as retained hedgerows can then be shown as enhanced, and new hedgerow planting added.

# 7. Timing Issues

7.1.1 There are no significant timing issues.

# 8. Cumulative Effects

8.1.1 Two large-scale schemes are proposed for the local area, both of which are likely to act in combination with the proposed Heybeck Lane development.

8.1.2 These are the 'Land off Leeds Road' development, situated immediately south of the Site, and the 'Land off Owl Lane' development, situated approximately 1.1km south. The closest is a proposed mixed residential and employment scheme, with proposals for 1,354 dwellings and 35 hectares of employment development, with a primary school, local centre, green space and other associated infrastructure. This will impact on a similar, all be it larger, suite of habitats, with similar or more complex faunal issues. The Owl Lane scheme is a 7.8ha residential scheme, again, supporting a similar suite or habitats and faunal issues. These three developments will need to be assessed in relation to one another.

# 9. Offsite Measures or Compensation

9.1.1 Not required – the scheme is predicted to achieve an overall net gain through on-site mitigation and compensation.

# 10. Enhancement

10.1.1 Opportunities to provide enhancement, and how to secure this, have been identified in Table 6.1 above and will be detailed in the BMP document to be produced as a condition of planning.

# 11. Monitoring

11.1.1 The CEMP document will detail the role of an Ecological Clerk of Works (ECoW) in overseeing protection measures.

11.1.2 The BMP document will identify any management specific monitoring which might be required in respect of habitat creation.

# 12. Policy and Legislation

12.1.1 Given the implementation of the mitigation set out above, it is anticipated that the proposals will comply with the relevant policy and legislation relating to wildlife and ecology.

# 13. Conclusion

13.1.1 On-Site mitigation to be agreed by standard conditions of planning will be able to address all significant effects resulting from the development.

13.1.2 There are no significant residual effects requiring further consideration or compensation.

## References

Andrews H. L. (2011) A habitat key for the assessment of potential bat roost features in trees.

Bat Conservation Trust (2016) Bat Surveys for Professional Ecologists – Good Practice Guidelines

Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Freshwater Habitats Trust: Oxford.

BSI (2013) British Standards Institute *BS 42020:2013 Biodiversity — Code of Practice for Planning and Development.*

CIEEM (2017) Guidelines for Ecological Report Writing 2nd Edition. Chartered Institute of Ecology and Environmental Management, Winchester.

CIEEM (2017) Guidelines for Preliminary Ecological Appraisal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 3rd edition. Chartered Institute of Ecology and Environmental Management, Winchester

English Nature (2004) Bat Mitigation Guidelines. English Nature, Peterborough.

English Nature (2001) Great Crested Newt Mitigation Guidelines. http://www.naturalengland.org.uk/Images/GreatCrestedNewts_tcm6-21705.pdf

Harris S, Jefferies D, Cheeseman C and Booty C (1994). Problems with Badgers, revised 3rd Edition. *RSPCA*, ISBN 0-901098-04-3

Gent T and Gibson S, 2003, *Herpetofauna Workers' Manual*, JNCC

IEA. (1995). *Guidelines for Baseline Ecological Assessment*. Chapman and Hall

Hill et al. 2005, *Handbook of Biodiversity Methods*. Cambridge

JNCC (2004) The Bat Workers Manual. 3rd Edition.

JNCC (2010). *Handbook for Phase 1 Habitat Survey: A technique for environmental audit*.

Ratcliffe, D.A. (1977) *A Nature Conservation Review*, Cambridge University Press

Strachan and Moorhouse (2006), Watervole Mitigation Handbook, University of Oxford.

Natural England (2013) Standing Advice Species Sheet: Great crested newts http://publications.naturalengland.org.uk/publication/810429?category=30014