

**ECOLOGICAL IMPACT ASSESSMENT**  
**LAND NORTH OF RECTORY FARM, YATTON**

carried out by



commissioned by

**PERSIMMON HOMES LTD SEVERN VALLEY**

**MARCH 2023**



# ECOLOGICAL IMPACT ASSESSMENT

## LAND NORTH OF RECTORY FARM, YATTON

### CONTENTS

<b>EXECUTIVE SUMMARY .....</b>	<b>3</b>
<b>1 INTRODUCTION.....</b>	<b>5</b>
1.2 Report Aims.....	5
1.3 Site Description Summary.....	5
1.4 Development Proposals .....	7
1.5 Quality Assurance.....	8
1.6 Assessment Scope / Consultation .....	8
<b>2 BASELINE CONDITIONS .....</b>	<b>9</b>
2.1 Introduction.....	9
2.2 Evaluation Methodology.....	9
2.3 Desk Study .....	9
2.4 Habitat Survey.....	17
2.5 Protected Species Survey and Species of Conservation Concern .....	26
2.6 Summary of Ecological Importance .....	58
<b>3 ASSESSMENT OF EFFECTS .....</b>	<b>60</b>
3.1 Methodology .....	60
3.2 Biodiversity Impact Assessment Calculator .....	60
3.3 Summary of Development Proposals.....	60
3.4 Designated Sites .....	61
3.5 BNG assessment.....	63
3.6 Habitats .....	67
3.7 Protected Species and Species of Conservation Concern .....	71
3.8 Summary of Assessment of Effects .....	82
<b>4 CONCLUSIONS.....</b>	<b>87</b>
<b>APPENDIX A: WILDLIFE LEGISLATION &amp; SPECIES INFORMATION .....</b>	<b>88</b>
<b>APPENDIX B: PHOTOGRAPHS OF SITE FEATURES.....</b>	<b>93</b>
<b>APPENDIX C: BRERC INVERTEBRATE RECORDS .....</b>	<b>95</b>
<b>APPENDIX D: DETAILED BAT DETECTOR RECORDS.....</b>	<b>99</b>
<b>APPENDIX E: HABITAT EVALUATION PROCEDURE CALCULATIONS .....</b>	<b>103</b>
<b>APPENDIX F: HABITAT SURVEY RESULTS OFF-SITE LAND .....</b>	<b>108</b>
<b>APPENDIX G: DETAILED BREEDING BIRD SCOPING SURVEY DATA.....</b>	<b>112</b>
<b>APPENDIX H: BNG ASSESSMENT.....</b>	<b>114</b>



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The information, data and advice which has been prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM) Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions. This report and its contents remain the property of Clarkson and Woods Ltd. until payment has been made in full.



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## EXECUTIVE SUMMARY

- Persimmon Homes Severn Valley commissioned Clarkson and Woods Ltd to undertake a series of ecological surveys and prepare an ecological impact assessment to inform the development of Land North of Rectory Farm in Yatton central national grid reference ST 42470 65510.
- The Outline Planning Application for the development of up to 190 homes (including 50% affordable homes), 0.13ha of land reserved for Class E uses, allotments, car parking, earthworks to facilitate sustainable drainage systems and open space.
- The existing habitats present on the Site included a series of fields containing grazed, modified grassland, a large interconnected network of ditches and a small number of mature trees and hedgerows of varying quality. To the west the Site is bound by the Strawberry Line, beyond which lies further grassland and wet ditches which form part of the Biddle Street SSSI
- Additional protected species surveys were undertaken for reptiles, great crested newt and water vole to confirm presence or likely absence. A single breeding bird scoping survey was also undertaken. As the Site is located in band B of the North Somerset and Mendip Bat Special Area of Conservation extensive monthly bat activity surveys were undertaken including both transect and static detector surveys in line with the bat SAC guidance on development to inform the likely impacts on horseshoe bats. Checks during the walkover and subsequent surveys were also undertaken for the presence of species including otter, badger, nesting birds, and invasive species.
- The reptile surveys recorded a low population of grass snake and slow-worm present on the eastern boundary. The eDNA surveys confirmed the likely absence of great crested newt from adjacent ponds. Bat activity surveys revealed that both greater and lesser horseshoe forage in the pasture on Site and the hedgerows are used by a range of bat species for both foraging and commuting. The Site is of particular value to lesser horseshoe bats which foraged extensively throughout the landholding. Greater horseshoe bats were recorded foraging on a few occasions. The Site is considered to be valuable to both species being within close proximity to the Kings and Urchin Wood component of the North Somerset and Mendip Bat SAC.
- A single otter spraint was recorded on the eastern boundary adjacent to one of the ditches. The breeding bird scoping survey recorded a good assemblage of common



garden and farmland birds predominantly associated with the hedgerows. The water vole surveys undertaken indicated this species is likely to be absent within the red line boundary.

- Habitat mitigation proposed includes the retention and enhancement of all of the hedgerows with the exception of small lengths (33m) which will require removal to create the access road and a public footpath. Approximately 858m of new, species-rich hedgerow will be planted as mitigation for a range of species. 0.74ha of broadleaved woodland will also be established as part of the proposals.
- Approximately 6ha of modified grassland will be enhanced to other neutral grassland sward through sensitive management. This grassland will also include some scattered scrub to enhance foraging potential for horseshoe bats. Within the grassland will be three large SUDS engineered to hold water throughout the year. 0.74ha of traditional orchard will also be created along with the provision of a large number of urban trees.
- Overall, the mitigation habitat proposals result in a significant increase in the value of habitats present within the red line boundary which is illustrated by use of the Natural England Biodiversity Metric 3.1
- Specific mitigation measures for horseshoe bats associated with the North Somerset and Mendip Bat SAC are proposed. In addition to the provision of 7.37ha of mitigation habitat within the red line boundary an additional 2.9ha of improved pasture outside (adjacent to the west) of the development site will also be enhanced through sensitive grassland management and planting of scattered broadleaf orchard trees. This will compensate for foraging impacts on greater and lesser horseshoe bats associated with the Special Area of Conservation.
- Reptile mitigation is proposed along with appropriate fencing and creation of a log pile and hibernaculum to ensure reptiles are protected throughout the construction process and retained on Site in the long term. Mitigation for nesting birds will include the provision of nest boxes.
- To ensure pollution prevention measures remain in place and to check on the ongoing maintenance of the reptile receptor area and status of invasive plant species checks of the Site during construction are proposed every quarter. In addition, monitoring surveys will be required. These include a check of the installed lighting against the lux contour plan in the first year following completion of construction. Monitoring of horseshoe activity is also proposed in years 5, 10 and 15 to ensure the mitigation and compensation proposed is effective.



## 1 INTRODUCTION

- 1.1.1 Clarkson and Woods Ltd. was commissioned by Persimmon Homes Severn Valley to carry out an Ecological Impact Assessment at Land to the North of Rectory Farm, Yatton, BS494EU thereafter referred to as 'the Site'.
- 1.1.2 This Impact Assessment discusses the likely effects of the Proposed Development on the ecology of the Site using information collected during a baseline site survey a UKHab survey to categorise the habitats was carried out by Clarkson and Woods Ltd on the 22<sup>nd</sup> of April 2022. The assessment is to inform an outline application for housing on the Site.
- 1.1.3 This design was informed by an initial Preliminary Ecological Appraisal (PEA) and Ecological Constraints and Opportunities Plan (ECOP) produced by Clarkson and Woods in May 2022.
- 1.1.4 The assessment has been prepared by Henry Sturgess, an experienced ecologist, who is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM). The report has been subject to a two-stage quality assurance review by appropriately experienced senior consultants who are full members of CIEEM.
- 1.1.5 Unless the client indicates to the contrary, information on the presence of species collected during the surveys will be passed to the county biological records centre in order to augment their records for the area. This is in line with the CIEEM code of professional conduct<sup>1</sup>.
- 1.1.6 If no action or development of the Site takes place within twelve months of the date of this report, then the findings of the assessment and supporting surveys should be reviewed. An update of the surveys and/or assessment may be required.

### 1.2 Report Aims

- 1.2.1 The aims of this report are:
- To establish, as far as possible, the baseline ecological conditions existing on Site at the time of survey and to identify any likely future changes in the baseline conditions up to the point of commencement.
  - To determine likely significant effects resulting from the proposals upon the ecological features identified within the assessment.
  - To assess whether the proposals are likely to be in accordance with relevant nature conservation legislation and planning policies.
  - To identify where further surveys to establish baseline conditions, inform assessment or develop mitigation or compensatory measures are required.
  - To identify how mitigation or compensation measures will be secured, maintained and monitored.
  - To identify ecological enhancements to be carried out and how they will be implemented, maintained and monitored.

### 1.3 Site Description Summary

- 1.3.1 The Site consists of a series of intensively farmed, agriculturally improved fields managed as pasture (sheep and horse grazing) which are bounded by mature hedgerows and intersected by a network of rhynes. The Site contains limited hedgerows aside from those which form the boundaries, and a small number of mature trees sit within the fields on the banks of the ditches.
- 1.3.2 To the north of the red line boundary is similar agricultural pasture, to the east is the existing edge of Yatton comprising the back gardens and boundary fences of existing residential development. To the south is Rectory Farm comprising a farmyard, bungalow and caravans. Further south beyond the farm lies Chescombe Road. To the west of the Site is the strawberry line (Sustrans cycle route) and ditches associated with the Biddle Street Site of Special Scientific Interest (SSSI) which form the eastern site

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<sup>1</sup> Code of Professional Conduct. CIEEM, January 2019.





boundary beyond this is a series of low agricultural fields managed for grazing which form part of the Congresbury and Yeo Site of Nature Conservation Interest (SNCI).

- 1.3.3 The approximate centre of the Site was at Ordnance Survey Grid Reference ST 42468 65501. The location of the Site is shown in Figure 1 below.
- 1.3.4 The development Site is approximately 13.7 hectares (ha) in size. An aerial photo of the Site and surrounding area is provided in Figure 2. The red line of the development area and key area to be used for proposed on Site ecological mitigation is provided below. In addition, an area of offsite bat compensation land which will be utilised by the application is also indicated shown in blue.

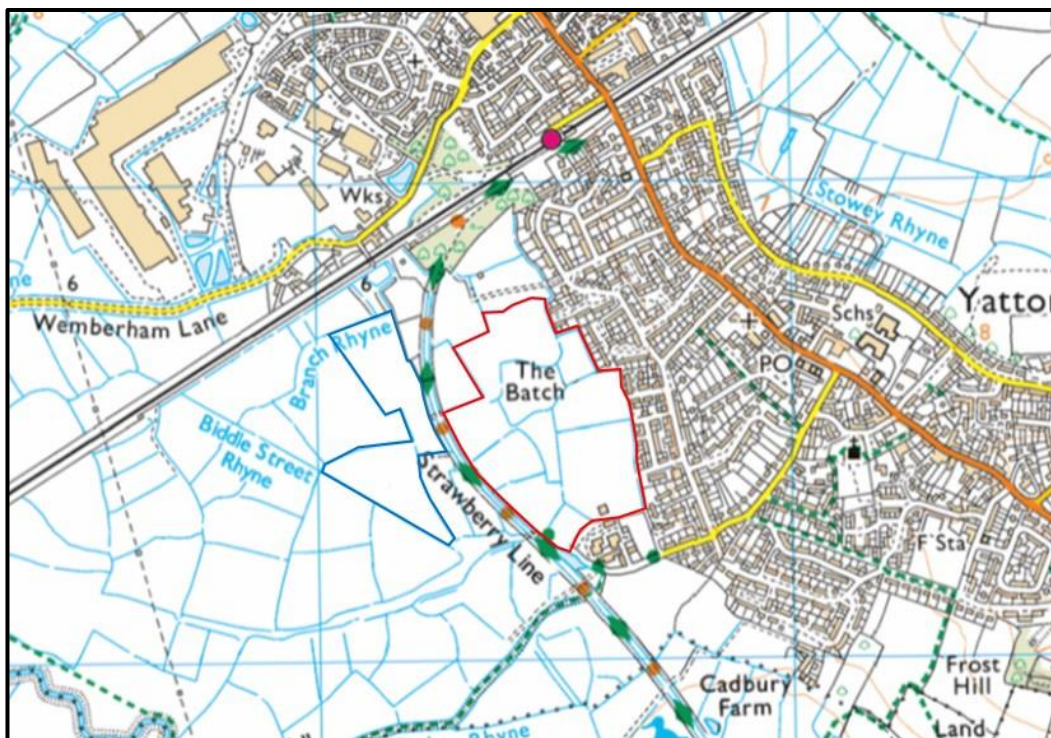


Figure 1: Ordnance Survey Map Showing Location of Site and compensation habitat for bats (©2020 Bing Maps)



Figure 2: Aerial photograph of Site boundary and compensation habitat for bats (©2022 Bing Maps)

## 1.4 Development Proposals

- 1.4.1 The Outline Planning Application for the development of up to 190 homes (including 50% affordable homes), 0.13ha of land reserved for Class E uses, allotments, car parking, earthworks to facilitate sustainable drainage systems, open space and all other ancillary infrastructure and enabling works with means of access from Shiners Elms for consideration. All other matters (means of access from Chescombe Road, internal access, scale, layout, appearance and landscaping) reserved for subsequent approval.
- 1.4.2 The proposals will retain the fields within the west of the red line boundary to provide a buffer to the Strawberry Line and the Biddle Street SSSI. This retained and enhanced habitat will provide mitigation for horseshoe bats and a range of other species.
- 1.4.3 The proposals will result in the loss of modified pasture fields currently primarily used for sheep grazing. These fields lie within the east of the RLB, and sit adjacent to existing dwellings which form the western settlement boundary of Yatton. Hedgerows and ditches will be primarily retained with the exception of short sections to accommodate the access road. All of the ditches will be culverted under these features to ensure they continue to function.
- 1.4.4 To address the impacts from the loss of habitat on greater horseshoe bats *Rhinolophus ferreus* land to the west of the strawberry line will also be enhanced to compensate for the loss of habitat and ensure the favourable conservation status of this protected species can be maintained locally.
- 1.4.5 Any changes to the building design and layout and landscaping made subsequent to publication of this report should be issued to Clarkson and Woods Ltd. for review. Ecological impacts and mitigation opportunities may be affected by any such changes.



Figure 3: Extract of Illustrative Masterplan EDP 14 March 2023 - drawing reference edp7842\_d003g





## 1.5 Quality Assurance

- 1.5.1 All ecologists employed by Clarkson and Woods are members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow the Institute's Code of Professional Conduct<sup>2</sup> when undertaking ecological work.
- 1.5.2 The competence of all field surveyors has been assessed by Clarkson and Woods with respect to the CIEEM Competencies for Species Survey (CSS)<sup>3</sup>.
- 1.5.3 This report has been prepared in accordance with the relevant British Standard: *BS42020: 2013 – Biodiversity: Code of Practice for Planning and Development*<sup>4</sup>. It has been prepared by an experienced ecologist who is a member of CIEEM. The report has also been subject to a two-stage quality assurance review by appropriately experienced ecologists who are full members of CIEEM.

## 1.6 Assessment Scope / Consultation

- 1.6.1 The proposals have been informed by a preliminary ecological appraisal which identified the need to undertake further surveys for the following species; foraging bats, badgers, otter, water vole, reptiles, great crested newts (GCN) and breeding birds. As a result each of these species has been considered as part of the proposals. An initial breeding bird scoping survey indicated that further surveys for breeding birds were not considered necessary. Surveys for dormice have not been undertaken due to limited habitat suitability and the minor nature of impacts to hedgerows and scrub associated with the proposals.
- 1.6.2 The scheme will require a Habitats Regulation Assessment HRA to inform the impacts of the proposals on populations of greater and lesser horseshoe bat *Rhinolophus hipposideros* associated with the North Somerset and Mendip bat Special Area of Conservation (SAC) sites. Specifically, the populations associated with Kings and Urchin Wood SSSI (component SAC Site) which support the closest breeding populations of greater horseshoe bat.
- 1.6.3 The impact assessment will consider impacts arising during the construction and occupation phases of the scheme in order to encompass its entire lifespan as far as can reasonably be anticipated.
- 1.6.4 The Zone of Influence (ZOI) of the development will vary according to the impact or Site feature being assessed. Internationally designated sites are considered at a proximity of 5km, nationally designated sites are considered within 2km of the proposals and locally designated sites within 1km. Impacts from the scheme on bats associated with the North Somerset and Mendip Bat SAC are considered within 10km of the proposals. Other key species including GCN are considered on the basis of waterbodies present within 250m of the proposals. For a range of other species, a desk study has been conducted covering an area of 2km from the red line boundary.
- 1.6.5 No formal consultation With North Somerset or Natural England has been undertaken to inform the proposals to date.

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<sup>2</sup> CIEEM (2013). *Code of Professional Conduct*. [www.cieem.net/professional-conduct](http://www.cieem.net/professional-conduct).

<sup>3</sup> CIEEM (2013). *Competencies for Species Survey (CSS)*. [www.cieem.net/competencies-for-species-survey-css](http://www.cieem.net/competencies-for-species-survey-css).

<sup>4</sup> The British Standards Institution (2013). *BS42020: 2013 – Biodiversity: Code of Practice for Planning and Development*. BSI Standards Ltd.



## 2 BASELINE CONDITIONS

### 2.1 Introduction

- 2.1.1 This section sets out the results of the Desk Study and ecological field surveys along with an evaluation of their relative importance in order to inform the Impact Assessment. The methodologies associated with the baseline assessment are summarised with each ecological feature's subheading below.
- 2.1.2 The specific surveys carried out were chosen on the basis of the likelihood, in our considered opinion, of each protected species or Species of Conservation Concern being present on or within the vicinity of the Site. This is informed by the Site's geographic location and the habitat types present on and around the Site. The following species-specific baseline surveys were chosen: badgers; bats; otters; water vole; reptiles; amphibians; birds; invertebrates and other species of conservation concern including non-native invasive species.
- 2.1.3 Details of the legislative protection afforded to those protected species which have been identified as occurring or potentially occurring on the Site are given in Appendix A. Species of Conservation Concern are defined as those appearing in any of the following; Priority Habitats and Species under Section 41 of the Natural Environment and Rural Communities Act (2006); red or amber-listed birds within the British Trust for Ornithology's Birds of Conservation Concern (2015); and any specific local conservation priority species such as those listed in Red Data Books.

### 2.2 Evaluation Methodology

- 2.2.1 Each recorded ecological feature, whether it is a species, a habitat or a site designated for nature conservation, is described in turn in this section to provide the pre-development baseline conditions on Site. Subsequently, an evaluation of each feature's 'ecological importance' is made. The evaluation of ecological importance is informed by the criteria provided within the CIEEM Guidelines for Ecological Impact Assessment (2018)<sup>5</sup>.
- 2.2.2 With due consideration to the criteria, each feature is classified on a geographical scale of ascending importance as follows; Negligible, Site, Local, District, County, National and International. The chosen geographic level of importance is considered that which best represents the scale at which the loss of the Site's area or population of the feature would have the greatest impact. Where sufficient survey information not available to determine the importance of a species or habitat present on the Site, the importance of the receptor is marked as 'uncertain' and based upon the professional judgement of the author together with available relevant desk study information.
- 2.2.3 Once importance has been determined for each feature, those of Local importance or above will be considered to be Important Ecological Features (IEFs). Non-IEFs will typically not be considered further within the impact assessment. However, where a feature does not qualify as an IEF but is afforded specific legal protection or coverage under a particular legislation or planning policy it will also be assessed in order to ensure the scheme's legal and policy compliance.

### 2.3 Desk Study

#### Methodology

- 2.3.1 Statutory designated sites for nature conservation were identified using the Natural England/DEFRA web-based MAGIC map database ([www.MAGIC.gov.uk](http://www.MAGIC.gov.uk)). International-level sites such as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) within 5km from the Site were searched for. National-level sites such as National Nature Reserves (NNRs) and Sites of Special Scientific Interest (SSSIs) within 2km of the Site were searched for.
- 2.3.2 The Bristol Regional Environmental Records Centre (BRERC) was consulted for records of protected species and species of conservation concern within 2km of the Site. BRERC was also asked to provide details of locally designated and non-statutory sites for nature conservation within 1km of the Site.

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<sup>5</sup> CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Chartered Institute of Ecology and Environmental Management. [www.cieem.net](http://www.cieem.net)



- 2.3.3 Clarkson and Woods' own database of ecological records derived from past survey work was also consulted for further locally relevant data.
- 2.3.4 The Natural England/DEFRA web-based MAGIC map database was also consulted for records of European Protected Species (EPS) licences issued for mitigation projects concerning EPS within 2km of the Site.
- 2.3.5 The North Somerset Core Strategy (Adopted January 2017) and the North Somerset Management Policies, Sites and Policies Plan, Part 1 were consulted for details of planning policies relevant to designated sites, protected species and habitats, and general ecological and environmental protection.
- 2.3.6 The North Somerset Biodiversity and Trees document (December 2005) was consulted for information on conservation priority species and habitats which may require further consideration and weight within Ecological Impact Assessments.
- 2.3.7 Ordnance Survey maps (1:25,000) and aerial images of the Site were examined online (bing.com/maps and maps.google.co.uk) to allow a better understanding of the context of the Site and its connections to potentially important habitats, known species records and protected sites.
- 2.3.8 The data presented within this report constitutes a summary of the data obtained from the local records centre. Should additional detail be required on any of the records described within this report Clarkson and Woods Ltd. should be contacted.

### Limitations

- 2.3.9 No specific limitations to the desk study were encountered.
- 2.3.10 The data presented within this report constitutes a summary of the data obtained from the local records centre. Should additional detail be required on any of the records described within this report Clarkson and Woods Ltd. should be contacted.
- 2.3.11 It should be noted that the data obtained from within the search area will not constitute a complete record of habitats and species present within the search area. It is therefore possible that protected species may occur within the vicinity of the proposed development site that have not been identified within the desk study.

### Desk Study Findings

#### Designated Sites

##### Statutory Designated Sites

- 2.3.12 6 statutory designated sites for nature conservation were identified within the desk study and are summarised in **Table 1** below.

**Table 1: Summary of Statutory Designated Sites for Nature Conservation**

Site Name	Size, Distance and Direction from Site	Reason for Designation	Importance
Severn Estuary Special Area of Conservation (SAC), Special Protected Area (SPA), RAMSAR and Site of Special Scientific Interest (SSSI)	Located 4.1km west at its closest point.	Severn Estuary SAC is designated primarily for its Annex 1 habitats including estuaries, intertidal mudflats and sandflats, reefs and Atlantic salt meadows. Annexe 2 species river lamprey <i>Lampetra fluviatilis</i> , sea lamprey <i>Petromyzon marinus</i> and twaite shad <i>Alosa fallax</i> are also a primary reason for this designation.  The Severn Estuaries SPA is nationally and internationally important for the breeding, feeding, wintering and migration of rare and vulnerable species of birds. It sustains populations of the Annex 1 species Bewick's swan <i>Cygnus columbianus bewickii</i> and regularly occurring migratory species such as Dunlin <i>Calidris alpina</i>	International



		<p><i>alpine</i> and Gadwell <i>Anas strepera</i>. The Site also contains internationally important assemblages of several waterbird species.</p> <p>The Severn Estuary SSSI received national designation due to varied intertidal habitats that support internationally important populations of waterfowl, invertebrate populations of considerable interest and large populations of migratory fish.</p> <p>Overall the species assemblage qualifies the site as a wetland of international importance under the Ramsar Convention.</p> <p>All these designated Sites fall within the same geographical area.</p>	
North Somerset and Mendip Bats Special Area of Conservation (SAC)	<p>2km to the east of the proposals at closest point</p> <p>The Site lies within 'Band B' of the SAC Consultation Zone identified within the North Somerset and Mendip Bats SAC: Guidance on Development document (Version 2.1 – March 2019).</p>	<p>The North Somerset and Mendip Bat SAC is designated primarily for its Annexe 1 habitats and Annexe 2 bat species. Habitats which form a primary reason for designation include semi-natural dry grasslands associated with carboniferous limestone habitats supporting a range of rare plant species and assemblages. Tilio-Acerion forests of slopes scree and ravines are also a key habitat present within sites associated with this designation.</p> <p>Annexe 2 bat species which are a primary reason for the selection of the site are included on the basis of the size of population represented, 3% of the UK greater horseshoe bat <i>Rhinolophus ferrumequinum</i> population and its substantive value to lesser horseshoe bats <i>Rhinolophus hipposederos</i> as a hibernation site. The SAC provides good conservation of structure and function, having both maternity and hibernation sites. This site contains an exceptionally good range of the sites used by the population, comprising two maternity sites in lowland north Somerset and a variety of cave and mine hibernation sites in the Mendip Hills.</p> <p>The Site specifically lies within the consultation zone band B for greater horseshoes</p>	International
Biddle Street, Yatton SSSI	Immediately to the west of the proposals	<p>Biddle Street is drained by a network of rhynes and ditches which form the SSSI.</p> <p>The combination of management practices and the variation in the soils has resulted in the watercourses supporting a wide range of aquatic plant communities, many of which are of considerable nature conservation interest.</p> <p>In turn these habitats support a diverse assemblage of aquatic invertebrates.</p>	National



		Large portions of this SSSI are assessed (in their citations) as unfavourable and recovering or unfavourable and declining (83%) predominantly due to poor agricultural management. Adverse conditions are resulting from succession to scrub and shading out of the ditches, low water levels, water pollution, low diversity in aquatic plants and steep bank structure.	
Tickenham, Nailsea and Kenn Moors SSSI	675m north at its closest point	Tickenham, Nailsea and Kenn Moors form part of the Avon Levels and Moors, an extensive area of low-lying agricultural land. This land is divided by a series of ditches which vary in size and management. These ditches support a diverse array of aquatic and marginal plants.  Associated with these rich plant communities is an equally diverse invertebrate fauna, and the rhynes and ditches are known to support large numbers of aquatic Coleoptera, Molluscs and Odonata.	National
Kings Wood and Urchin Wood SSSI	2km to the east of the proposals	Kings Wood and Urchin wood are designated as a SSSI for being one of the largest areas of ancient woodland remaining in North Somerset. It contains stands of small-leaved lime <i>Tilia cordata</i> and also supports a population of greater and lesser horseshoe bats (as a component site of the bat SAC) as described in the SAC citation above. The disused mine workings to the north-east of the site are used by substantial numbers of greater horseshoe bats both as hibernation and maternity roosts. This site also supports hazel dormice <i>Muscardinus avellanarius</i> . The site also supports a nationally scarce Chrysomelid beetle <i>Clytra quadripunctata</i> .	National
Puxton Moor SSSI	2km to the south of the proposals	Puxton Moor is an area of low lying largely agricultural land, The moor lies entirely on the silty clays of the Wentlooge series.  Drained by a network of rhynes and ditches the area supports aquatic plant communities of great nature conservation interest. Preliminary investigation has also revealed a diverse assemblage of aquatic invertebrates.	National

2.3.13 The following sites are considered further in the impact assessment.

*North Somerset & Mendip Bat SAC*

2.3.14 The Site lies c.2km east of the closest component of the North Somerset & Mendip Bat SAC. This is the Kings Wood and Urchin Wood SSSI which constitutes a breeding site for greater horseshoe bats.





2.3.15 The SAC is designated for its grassland and forest habitats; caves not open to the public; and for its populations of lesser and greater horseshoe bats. The Site lies within Band B of the consultation zone for impacts on greater horseshoe bats associated with the SAC, as defined within North Somerset SPD and the SAC Guidance on Development document<sup>6</sup>.

*Biddle Street SSSI*

2.3.16 The Biddle Street SSSI comprises a series of ditches to the west of the Site with some sections forming the edge of the red line boundary. These ditches are designated primarily for rare aquatic vegetation and invertebrates. The ditches form the boundaries of the fields to the west of the Site which form the Congresbury Yeo SNCI.

2.3.17 The site is currently in an unfavourable condition due to eutrophication, grazing pressure, shading by scrub and hedgerows and other detrimental farming practices. The ditches which form the western boundary of Fields 3, 4 and 6 form part of the SSSI. These connect to the network of ditches which divide the fields.

*Tickenham, Nailsea and Kenn Moors SSSI*

2.3.18 The Tickenham and Kenn Moor SSSI part of the Avon Levels and Moors, an extensive area of low-lying agricultural land. This land is divided by a series of ditches which vary in size and management. These ditches support a diverse array of aquatic and marginal plants. Given its proximity to the proposals is unlikely to be impacted directly by construction or operation of the proposals but the development sits within the SSSI impact risk zone as a result of interconnecting hydrological features such as the ditches.

*Local and Non-statutory Designated Sites*

2.3.19 5 local or non-statutory designated sites for nature conservation were identified within the desk study and are summarised in Table 2 below.

**Table 2: Summary of Local and Non-statutory Designated Sites for Nature Conservation**

Site Name	Size, Distance and Direction from Site	Reason for Designation	Importance
Congresbury Yeo, adjacent land and rhynes SNCI	Approx 150ha, a ditch associated with this SNCI falls within the red line boundary (western boundary).	Running, standing water & marginal habitats, Unimproved neutral grassland, semi-improved neutral grassland and unimproved calcareous grassland are present along with smaller extents of semi-natural broad-leaved woodland. Priority Habitat Coastal and Floodplain Grazing Marsh is a major component of this site. The habitats support a diverse ditch flora & fauna including a diverse assemblage of aquatic invertebrates.	Local
Cheddar Valley Railway Walk Local Nature Reserve (LNR)/ Strawberry Line LNR	Immediately adjacent to the west	Not provided by BRERC but this LNR is listed online as The Cheddar Railway Path. The Strawberry Line management plan references the site as an LNR. This site follows the route of the Cheddar Valley Line, this linear reserve passes through the Biddle Street SSSI. The site supports birds, bats, amphibians and reptiles.	Local
Stowey Fields and Rhynes SNCI	10ha, 530m northeast	Marshy and Semi-Improved Neutral Grassland with Rhynes and Ditches including areas of Priority Habitat Coastal and Floodplain Grazing Marsh with Diverse	Local

<sup>6</sup> North Somerset and Mendip Bats Special Area of Conservation (SAC) Guidance on Development: Supplementary Planning Document Adopted January 2018, Mells Valley Special Area of Conservation (SAC), North Somerset and Mendip Bats SAC, Bath and Bradford on Avon Bats SAC Guidance on Development version 2.1 May 2019. Mendip District Council.



		aquatic and marshy flora and fauna. Majority of site lies within Nailsea Moor SPA	
Nailsea and Tickenham Moors SNCI	500+ha, 720m north	Marshy & semi-improved neutral grassland, which include Priority Habitats Coastal & Floodplain Grazing Marsh. Small areas of Wet Woodland are also present. Wide range of rhyme & ditch types with diverse aquatic flora and invertebrates.	Local
Horsecastle Pond SNCI	0.12ha northwest	850m Standing water (pond) with associated marginal habitats. Majority of site within Yatton Moor SNA Dominated by Spiked Water Milfoil <i>Myriophyllum spicatum</i> , White Water Lily <i>Nymphaea alba</i> , Cyperus Sedge <i>Carex pseudocyperus</i> , Fat-leaved duckweed <i>Lemna gibba</i> & Ivy-leaved Duckweed <i>Lemna trisulca</i> .	Local

2.3.20 Of the sites listed above the following are considered to have the potential to be impacted and will be discussed in the impact assessment

*Cheddar Valley Railway Walk Local Nature Reserve (LNR)/ Strawberry Line LNR*

2.3.21 The Strawberry Line LNR sits to the west of the Site beyond ditches forming the Biddle Street SSSI. The path is a reclaimed railway embankment featuring a shared cycling and walking route. The path is enclosed by hedgerows, ditches and scrub and forms a key wildlife corridor locally. It is well used by the public and suffers from issues including littering and dog fouling which have the potential to impact the adjacent ditches which form the Biddle Street SSSI.

*Congresbury Yeo, adjacent land and rhynes SNCI*

2.3.22 The Congresbury Yeo SNCI comprises a series of fields in the floodplain of the Congresbury Yeo river catchment. The ditches which separate fields of generally degraded floodplain grazing marsh locally form part of the Biddle Street SSSI. The SNCI supports a range of grassland types from modified agricultural pasture to unimproved neutral grassland. Historically the fields would be periodically flooded or waterlogged in the winter months providing nutrients to the pasture within the fields. Modern drainage practices have reduced this function with ditches deepened and flooding occurring rarely.

Local BAP

2.3.23 The North Somerset Biodiversity and Trees document (December 2005) was consulted for relevant species and habitats which are considered local conservation priorities. The following habitats and species of relevance were identified.

Habitats

- Woodlands
- Species-rich Grasslands
- Field boundaries and linear features
- Coastal and Floodplain Grazing Marsh
- Standing Open Water
- Traditional Orchards

Species

- Otter
- Water Vole
- Greater Horseshoe Bat



- Water Shrew

#### Planning Policy

2.3.24 The following policies of relevance are reproduced from North Somersets Core Strategy document (Adopted January 2017) and the North Somerset Development Management Sites and Policies Plan Part 1 (Adopted July 2016)

##### *CS4: Nature Conservation*

*North Somerset contains outstanding wildlife habitats and species. These include limestone grasslands, traditional orchards, wetlands, rhynes, commons, hedgerows, ancient woodlands and the Severn Estuary. Key species include rare horseshoe bats, otters, wildfowl and wading birds, slow-worms and water voles.*

*The biodiversity of North Somerset will be maintained and enhanced by:*

- 1) seeking to meet local and national Biodiversity Action Plan targets taking account of climate change and the need for habitats and species to adapt to it;*
- 2) seeking to ensure that new development is designed to maximise benefits to biodiversity, incorporating, safeguarding and enhancing natural habitats and features and adding to them where possible, particularly networks of habitats. A net loss of biodiversity interest should be avoided, and a net gain achieved where possible;*
- 3) seeking to protect, connect and enhance important habitats, particularly designated sites, ancient woodlands and veteran trees;*
- 4) promoting the enhancement of existing and provision of new green infrastructure of value to wildlife;*
- 5) promoting native tree planting and well targeted woodland creation, and encouraging retention of trees, with a view to enhancing biodiversity.*

##### *Policy DM8: Nature Conservation*

*Development proposals must take account of their impact on local biodiversity and identify appropriate mitigation measures to safeguard or enhance attributes of ecological importance.*

*Where appropriate, proposals should seek to conserve the local natural environment by retaining, protecting, enhancing and linking existing wildlife habitats; by incorporating retained habitats sensitively into the development through appropriate design; and by ensuring that such retained and enhanced habitats are managed appropriately. Where necessary, longer term management will be achieved through suitable planning conditions.*

##### *Sites of International and National Importance*

*Development which would have an adverse impact on identified sites of international importance (which include Special Areas of Conservation (SACs), Special Protection Areas (SPA) and Ramsar sites) will not be permitted.*

*The North Somerset and Mendip Bats SAC consultation area is defined on the Policies Map. The consultation will identify the potential impact of the proposed development in respect of, for example, bat navigation and foraging habitats and identify appropriate mitigation measures through site design and lighting strategies.*

*The Severn Estuary SAC, SPA and Ramsar site is defined on the Policies Map. Any proposals that could affect the sensitive bird species and other habitats and species of the Estuary will need to carry out adequate surveys and assessments of the cumulative, in-combination and offsite impacts (drainage, disturbance, runoff, impacts on managed realignment etc.) of the scheme.*

*Development within or in proximity to a Site of Special Scientific Interest (SSSI) or National Nature Reserve that is likely to have a direct or indirect adverse affect on its biodiversity or geological interest would not normally be permitted.*

##### *Local Nature Reserves and Local Sites*



Planning permission will not normally be granted for development that would result in loss in extent or otherwise have a significant adverse effect on Local Nature Reserves or Local Sites (locally designated Wildlife Sites and Geological Sites), unless the harm can be mitigated by appropriate measures.

*Legally Protected Species and Habitats and Species of Principal Importance in England – Priority Habitats and Species*

Development which could harm, directly or indirectly, species, which are legally protected, or species and habitats that have been identified as Species or Habitats of Principal Importance in England (also known as Section 41 or 'Priority' species and habitats) will not be permitted unless the harm can be avoided or mitigated by appropriate measures.

Development proposals should ensure that, where appropriate, provision is made for:

any lighting scheme to avoid adverse impacts on light averse wildlife;

- retention of native woodland, native trees (to include veteran trees), native hedgerows, watercourses, ponds, rhynes, other wetland habitats such as reedbeds, botanically diverse grasslands, traditional orchards, geological features, and other major natural features, habitats or wildlife corridors, and their protection during construction work;
- protection of ecosystem resources, to include water quality;
- compensatory provision, within the site itself, or immediate vicinity if practicable, of at least equivalent biodiversity value, where the loss of habitats or features of importance to wild flora and fauna is unavoidable;
- incorporation of habitat features of value to wildlife within the development (to include within building design) and including those which meet the needs of local species (e.g. provision of nesting features for swifts, swallows, house sparrows, bats);
- appropriate long term management of retained and newly created features of importance to wildlife; •
- provision of monitoring of key species to evaluate impact of site management;
- planting of locally appropriate native species of local origin wherever possible; and
- measures to link habitats within the development and also that link into adjoining wildlife corridor networks.

*Ecological mitigation measures provided within the development*

Where development proposals may impact legally protected and notable species and habitats, they will need to be accompanied by an up to date ecological survey assessment as part of the submitted application. This will include:

- site context information provided by a local records data search of designated sites, legally protected and notable species in proximity;
- a description of the biodiversity interest of the site, to include current land use; and including, where applicable, regard for any Strategic Nature Areas;
- the nature and extent of the impact on legally protected species and habitats, Section 41 species and habitats/or other notable species of the proposed development or change of use of land; and the measures that may be needed to avoid, mitigate or compensate the identified impacts;
- the steps to be taken to retain, protect, enhance, link and, where appropriate, create and manage the biodiversity interest over the longer term; which may include monitoring;
- where necessary effective lighting design to avoid artificial light spill to wildlife habitats/corridors to avoid impacts on light averse wildlife



## 2.4 Habitat Survey

### **Habitat Survey Methodology**

- 2.4.1 A habitat survey was carried out based on the UKHab methodology on 22/04/2022 with habitats recorded using the UKHab habitat classification system<sup>7</sup>. Condition assessments were undertaken in the field in line with the Biodiversity Net Gain Technical Supplement<sup>8</sup>. The survey was completed by Henry Sturgess BSc, MCIEEM. Henry has over 8 years' experience undertaking ecological surveys and has a BSc in relevant subjects. Henry holds a licence for the survey and handling of great crested newts (Level 1) Licence reference: 2016-27145-CLS-CLS and is an accredited agent for the survey of bats under Jo Robinson's bat licence (Level 2) licence ref: 2015-13642-CLS-CLS
- 2.4.2 Botanical names follow Stace (1997)<sup>9</sup> for higher plants and Edwards (1999)<sup>10</sup> for bryophytes.
- 2.4.3 The results of the Habitats Survey are included in map form on Figure 4. Habitats are mapped following the codes and conventions described within UK Habitat Classification User Manual and Target Notes (Table 3) are used to describe habitats not readily conforming to recognised types and evidence of, or potential for, protected species and species of conservation concern. Photographs of the Site are provided in Appendix C at the end of this report.

### **Habitat Assessment Limitations**

- 2.4.4 Although the survey was conducted in April which is early in the optimum survey season, it was possible to adequately classify and assess the nature conservation value of the habitats involved. Quadrat surveys were undertaken of the grassland at this time and the accuracy of the classification was checked during subsequent further protected species survey works undertaken on the Site throughout the year (April to October) which allowed the surveyor to check that the condition assessments and classifications resulting from the initial survey remained valid. As such this is not seen as a significant limitation to the outcomes of the habitat survey undertaken. Given the obvious improved quality of the grassland it was possible to obtain sufficient and reliable information of the grassland condition within march to inform the biodiversity net gain assessment calculations.

### **Biodiversity Net Gain Assessment**

- 2.4.5 A baseline Biodiversity Net Gain (BNG) assessment was undertaken during the walkover with the condition of all habitats assessed using the condition assessment criteria contained in the technical supplement for BNG version 3.1. The condition of each of the habitats is described in the habitat survey notes with justification at how each of the habitat conditions was derived. The baseline habitat areas were then mapped using QGIS to allow the accurate areas of each habitat to be inputted into the BNG 3.1 spreadsheet and the baseline habitat values to be calculated. The baseline mapping for BNG is included as the UKHab map as Figure 3 below. The baseline habitat scores for each on Site habitat were **31.71 habitat units, 14.86 hedgerow units and 5.90 river units** (from the ditches present). The headline results of the calculations are provided in the brief BNG section in the results section of this report. Justification of baseline and proposed habitat conditions are provided in Appendix H along with GIS mapping of the habitats proposed.
- 2.4.6 Off-site compensation land (refer to the blue line indicated in Figures 1 and 2) utilised for specific horseshoe bat mitigation has not been included within the BNG calculations. It may be possible to bank additional biodiversity credits provided by this habitat subject to additionality with regard to the mitigation directly required for these species.

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<sup>7</sup> Butcher, B., Carey, P., Edmonds, R., Norton, L. and Treweek, J. (2020), The UK Habitat Classification User Manual, Version 1.1 (<http://www.ukhab.org/>)

<sup>8</sup> Panks, S., White, N., Newsome, A., Nash M., A, Potter, J., Heydon, M., Mayhew, E., Alvarez, M., Russel, T., Cashon, C, Goddard, F., SCOTT, S. J., Heaver, M., SCOTT, S. H., Treweek J., Butcher, B., and Stone, D. (2022). Biodiversity metric 3.1: Auditing and accounting for biodiversity –User Guide. Natural England.

<sup>9</sup> Stace, C. (1997). *New Flora of the British Isles Second Edition*. Cambridge University Press

<sup>10</sup> Edwards, S.R. (1999). *English Names for British Bryophytes*. BBS, Cardiff





## Habitat Survey Results

### Modified Grassland

#### Desk Study Information

- 2.4.7 No specific desk study records were provided relating to modified grassland in terms of notable species. A search of Magic Map included the fields within the priority habitat mapping for Floodplain and Coastal Grazing Marsh (FCGM) in the local area. It is considered due to the lack of inundation of the fields (due to the installation of flood defences locally and the deepening of the ditches in recent years) that the modified grassland habitat recorded does not, at present represent a floodplain and coastal grazing marsh under the BAP definition<sup>11</sup>.

#### Field Survey Results

- 2.4.8 The Site consisted of ten fields, within the red line boundary, all of which contained modified grassland, primarily managed as pasture for grazing sheep and horses. Areas of the Site included sparsely vegetated areas which were covered in farmyard manure and other waste, but all of these were amongst species-poor agricultural grassland. Generally, the fields are grazed short on rotation with regular chemical fertilisation and use of farmyard manure applied. The fields are occasionally cut for silage and are reseeded using an agricultural grassland seed mix occasionally (every three to five years) to promote vigorous growth and improve its stocking capacity for livestock.
- 2.4.9 The grassland assemblages recorded within the fields are typical of highly managed agricultural grassland being species poor and containing a very low cover of flowering herbs. The typical species assemblage recorded within the modified grassland on Site included perennial rye grass *Lolium perenne* which was generally dominant throughout the Site with regular Yorkshire fog *Holcus lanatus* and rough stalked meadow grass *Poa trivialis*. Occasional grass species included crested dogs-tail *Cynosurus cristatus*, annual meadow grass *Poa annua* and sweet vernal grass *Anthoxanthum odoratum*. Grass species rarely recorded included false-oat grass *Arrhenatherum elatius* and cocksfoot grass *Dactylis glomerata* which were recorded in some of the boundary habitats and soft rush *Juncus effusus* which was recorded in small patches in certain fields. Herb species recorded included red clover *Trifolium pratense*, white clover *Trifolium repens*, dandelion *Taraxacum officinale* agg, common chickweed *Stellaria media*, creeping buttercup *Ranunculus repens*, doves-foot cranesbill *Geranium molle*, common nettle *Urtica dioica*, broad leaved dock *Rumex obtusifolius*, curled dock *Rumex crispus*, ragwort *Senecio jacobaea*, spear thistle *Cirsium vulgare* and creeping thistle *Cirsium arvense*.
- 2.4.10 Overall, the diversity of the fields was very low with an average of 3-4 species recorded per m<sup>2</sup> during the quadrats undertaken to inform the Biodiversity Net Gain Condition Assessments. There was some variation between fields in terms of sward height, levels of bare ground and grazing regime but all of the fields when assessed using the BNG condition assessment criteria scored a condition of 'Poor'. This was primarily due to high levels of bare ground recorded, lack of variation in sward height and damaging management practices. However, the low species diversity recorded in all fields would prevent the grassland from achieving moderate condition being under 6 species per m<sup>2</sup> in every quadrat undertaken.

#### Evaluation

- 2.4.11 The modified grassland is considered to be of **Site** Importance.

### Hedgerows:

#### Desk Study Information

- 2.4.12 The following hedgerow species were returned by BRERC within 2km of the Site since 2010 as part of the data search: wych elm *Ulmus glabra*. Butchers broom *Ruscus aculeatus*, whitebeam *Sorbus aria* and aspen *Populus tremula*. These tree and shrub species are rare locally and were recorded at either Rhodyate Hill or Congresbury both situated over 1km to the southwest. None of these species were recorded during the walkover.

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<sup>11</sup> UK Biodiversity Action Plan; Priority Habitat Descriptions. BRIG (ed. Ant Maddock) 2008



## Field Survey Results

- 2.4.13 16 hedgerow features were recorded during the walkover survey undertaken on the Site which are summarised in Table 3 below. Overall, these are confined to the boundaries of the Site with the only internal hedgerows present surrounding Field 1. The best quality hedgerows bounded Field 1 in terms of structure and age, forming boundaries to the strawberry line to the west as well as the northern boundary. Hedgerows to the east and south were generally sparse and in some cases defunct. Only three species rich hedgerows were present including H8, H13 & H15 which formed portions of the eastern northern and western hedgerows. Two of these are considered 'important' under the hedgerow regulations due to a number of additional features such as number of connections to other hedgerows, mature standard trees, the presence of parallel hedgerows or confirmed use by Schedule 5 species.
- 2.4.14 A number of hedgerows were in poor condition particularly H1, H6 and H7 which are sparse features along fence lines or abutting agricultural buildings. H16 was also in poor condition being poorly managed as a boundary hedgerow to dwellings to the east of the proposals with a high proportion of non-native woody species present. Historic aerial imagery of the Site indicated a network of hedgerows have been removed from alongside the central rhynes in the last decade reducing the extent of hedgerows within the Site. Historically, the mature trees present in the centre of the Site previously formed part of these features. The most important hedgerows still present form the western Site boundary where it adjoins the Biddle Street SSSI and Strawberry Line LNR which form a long unbroken linear feature with a parallel hedgerow within 10m outside of the Site. This forms a key wildlife corridor in the local area. The northern hedgerows H11-15 also have good structure but provide less connectivity to the wider landscape. The eastern boundary hedgerows were not continuous with several sections missing slightly reducing their value as wildlife corridors.

**Table 3: Hedgerow survey summary**

Hedgerow Number	Structure and Species recorded	Species rich/Important	Condition Assessment
H1	Native hedgerow associated with a ditch forming the southern boundary of Field 1. Contained hawthorn <i>Crataegus monogyna</i> , dogrose <i>Rosa canina</i> , blackthorn <i>Prunus spinosa</i> and goat willow <i>Salix caprea</i> with regular patches of bramble. This hedgerow was defunct at the time of the initial survey and additional sections had been removed in the October 2022. It was roughly 2-3m tall, 1.75m wide and unfenced. The understory was basic with ruderals such as nettle recorded.	Species poor/ Not important	Poor
H2	Native hedgerow with trees associated with a ditch forming the western boundary of Field 1. Contained: alder <i>Sambucus nigra</i> , goat willow, pedunculate oak <i>Quercus robur</i> and blackthorn. This feature sat the other side of a deep wet ditch. The hedgerow was generally intact but relatively unmanaged and overgrown. Overall height of 4m, a width of 2-3m and was unfenced. The understory was dominated by hairy willowherb <i>Epilobium hirsutum</i> and nettle.	Species poor/ Not important	Good
H3	Native hedgerow with trees associated with a ditch which forms the northern boundary of Field 1. This hedgerow is overgrown reaching 8-10m with a width of three meters and was fenced. Contained goat willow, hawthorn and pedunculate oak some of which contain potential bat roost features. The understory was generally sparse due to grazing livestock.	Species poor/ Not important	Moderate



Hedgerow Number	Structure and Species recorded	Species rich/Important	Condition Assessment
H4	Native hedgerow with trees associated with a ditch which forms the eastern boundary of Field 1. This hedgerow is overgrown reaching 8-10m with a width of three meters and was fenced. Contained blackthorn, hawthorn and pedunculate oak and dogrose. Two oaks which contain low potential bat roost features were recorded. This hedgerow had an understory containing lords and ladies <i>Arum maculatum</i> and bare ground.	Species poor/ Not important	Moderate
H5	Species- rich native hedgerow with trees associated with a ditch. A long variable hedgerow which forms the eastern Site boundary of Field 2. Contained: Ash <i>Fraxinus excelsior</i> , elm <i>Ulmus minor</i> 'atina', hawthorn, blackthorn and privet <i>Ligustrum vulgare</i> . This feature had variable height of between 4-10m with a width of 1.5-3m it was fenced along its length. A ditch was present on the outside of this feature along part of its length but sections were dry or culverted. The understory contained rough grassland and ruderals including thistle and nettle with occasional suckering blackthorn. Regular slow-worm and grass snake were encountered at the base of this feature during the reptile surveys.	Species poor/ Important (due to presence of reptiles)	Poor
H6	Native hedgerow associated with a ditch forming the eastern portion of the southern boundary of Field 2. A short defunct hedgerow consisting of two mature hawthorn and a fringe of bramble along a fence line. The hedgerow contained hawthorn, ash, dogrose and bramble, This hedgerow was between 1.5-4m tall, 1.25m wide and was fenced. A ditch was present on the inside of this feature which separates the farmyard of Rectory Farm from the red line boundary. The understory was sparse with occasional nettles.	Species poor/ Not important	Poor
H7	Native hedgerow associated with a ditch forming the western section of the southern boundary of Field 2 with the hedgerow to the north of the barn structure. A defunct woody linear feature containing three semi-mature goat willow with blackthorn, dogrose and bramble. This hedgerow was up to 4m tall and 1.5m wide with many sparse areas and tall ruderals forming the understory.	Species poor/ Not important	Poor
H8	Species-rich native hedgerow associated with a ditch. This hedgerow consistently contained: hawthorn, blackthorn, elm, oak, and goat willow. It also contained occasional ash saplings, honeysuckle <i>Lonicera periclymenum</i> and a range of other species including white bryony <i>Bryonia dioica</i> . This hedgerow was 6m tall, 3m wide and fenced. A ditch which forms part of the Biddle Street SSSI is present on its far side beyond which is the Strawberry Line LNR. The understory of this feature was sparse but lords and ladies, nettle and herb Robert <i>Geranium robertianum</i> were recorded.	Species rich/ Important (5 species per 30m and 4 additional features from subparagraph 4)	Moderate



Hedgerow Number	Structure and Species recorded	Species rich/Important	Condition Assessment
H9	Native hedgerow associated with a ditch. This hedgerow contained: hawthorn, blackthorn, dogrose crab apple <i>Malus sylvestris</i> and goat willow. This hedgerow was 6m tall, 3m wide and fenced. A ditch which forms part of the Biddle Street SSSI is present on its far side beyond which is the Strawberry Line LNR. The understory of this feature was sparse but lords and ladies, nettle and herb Robert <i>Geranium robertianum</i> were recorded. Overall, it was a species poor section of the western hedgerow featuring 4 species per 30m	Species poor/ Not important	Moderate
H10	Native hedgerow associated with a ditch. This hedgerow contained: hawthorn, blackthorn, alder, and dog rose. This section was sparser and unfenced than those to the south with gaps at the base of the hedgerow evident. This hedgerow was on average 6m tall and 3m wide with a ditch which forms part of the Biddle Street SSSI on its far side beyond which is the Strawberry Line LNR. The understory of this feature was sparse with bare ground and nettles dominant. Overall, it was a species poor section of the western hedgerow featuring 4 species per 30m	Species Poor/ Not important	Moderate
H11	Native hedgerow associated with a ditch. This hedgerow contained: hawthorn, blackthorn, dog rose and bramble. This hedgerow was approximately 6m tall, 2.5m wide and fenced with a large gap present to the west of its length. The understory was basic with modified grassland and tall ruderals present.	Species Poor/ Not important	Moderate
H12	Native hedgerow associated with a ditch. This hedgerow contained: hawthorn, blackthorn, alder, goat willow and dog rose. This feature was approximately 5m tall, 3m wide and was fenced. This feature is overgrowing the adjacent ditch substantially. It contained an understory which included lords and ladies and herb Robert.	Species poor/ Not important	Moderate
H13	Species-rich Native hedgerow with trees associated with a ditch. This hedgerow contained: privet, hawthorn, blackthorn, dog rose, pedunculate oak and alder. The feature was approximately 6m tall, 3m wide, predominantly fenced, intact and overgrowing the boundary ditch. It contained an understory of predominantly nettles and rough grassland.	Species-rich/Important hedgerow (5 species per 30m and 4 points from sub-paragraph 4.	Moderate
H14	Native hedgerow associated with a ditch. This hedgerow contained: hawthorn, blackthorn, goat willow and pedunculate oak. This feature was of variable height between 2-7m, 3m wide and fenced. The oak tree features some low potential bat roost features and featured some gaps at the base of the hedgerow. The understory included grassland species and nettles.	Species poor/ Not important	Moderate



Hedgerow Number	Structure and Species recorded	Species rich/Important	Condition Assessment
H15	Species-rich native hedgerow with trees associated with a ditch. This hedgerow contained: hawthorn, blackthorn, goat willow, crack willow, dog rose, pedunculate oak with two large mature trees including an oak and a crack willow. The hedgerow is approximately 6m tall, 3m wide, fenced and overgrowing a ditch. It had some small defunct sections at the base of the hedgerow but was generally intact. The understory featured lords and ladies, herb Robert and patches on nettle.	Species rich/Not Important	Moderate
H16	Native hedgerow associated with a ditch. This predominantly native hedgerow contained privet, leylandii and goat willow with a small patch of an ornamental Euonymus species. This hedgerow was managed to between 1-4m in height, with a width of up to 2m and fenced. It was sparse in places being managed by the occupants of the adjacent properties.	Species poor/ Not important	Moderate

#### Evaluation

- 2.4.15 Overall, the hedgerow features are considered to be of **Local** importance as is the Site contains a significant network of interconnecting hedgerows however the value of these is reduced due to the generally species poor hedgerows which are in poor to moderate condition as a result of current management.

#### **Mature Trees**

##### Desk Study Information

- 2.4.16 The desk study returned results relating to the following trees: whitebeam, wych elm, aspen and downy birch *Betula pubescens* which were recorded around the village of Congresbury. All of these species are scarce locally due to soil conditions and were not recorded within or surrounding the Site.

##### Field Survey Results

- 2.4.17 The Site had a small number of mature trees at the edges of the ditches on Site these included two mature oaks, a semi mature oak and a mature ash tree. A mature oak is present to the south of the junction between ditches 17 and 25 in Field 8. A further mature oak is present on D8 within Field 2. A semi mature oak was present in Field 7 at the junction between D6, D19 & D22. The mature ash was present to the north of D8 in field 7. All of the oaks have significant wildlife and aesthetic value. The ash within the fields are in poor condition and may require removal.
- 2.4.18 Several mature trees are present in the hedgerows of the Site with mature oaks present in H3, H4 and H13. H15 also features a mature oak and a mature crack willow. H5 contains some mature ash but these appear to be in poor health.
- 2.4.19 These trees were all inspected for their potential to support roosting bats. The mature oak in field 8 had a small covering of ivy but no other visible bat roost features. The mature oak present along D8 had a number of minor features suitable for roosting bats including damage to limbs which included peeling bark, knotholes and a limb sheer. Overall, this tree is considered to offer low suitability for roosting bats. The mature ash had few features other than some limited peeling bark surrounding previously removed limbs and is considered to offer low to negligible potential for roosting bats. This tree appears to have ash dieback. The semi mature oak is not old enough to have developed suitable bat roosting features. These are detailed further in 'Bats' below.

#### Evaluation

- 2.4.20 The mature trees on Site are considered to be of **Local** importance.





## Ditches

### Desk Study Information

- 2.4.21 The desk study identifies the presence of a number of important ditch networks locally primarily those associated with the Biddle Street SSSI, Tickenham, Nailsea and Kenn Moors SSSI and the Puxton Moor SSSI. All of which contain ditch networks which support a diverse assemblage of aquatic plants and invertebrates. The Biddle Street SSSI features ditches either side of the Strawberry Line LNR the easternmost of which effectively forms the red line boundary for the Site. Two of the ditches present are listed as managed by the Internal Drainage Board on their website.
- 2.4.22 A large number of records of specialist or rare plant species were returned by BRERC include the following aquatic plants recorded within 2km of the Site: lesser water-parasit *Berula erecta*, flowering rush *Butomus umbellatus*, sharp-flowered rush *Juncus acutiflorus*, smooth-stalked sedge *Carex laevigata*, lesser pond sedge *Carex acutiformis*, various-leaved water-starwort *Callitriche platycarpa*, blunt-fruited water-starwort *Callitriche obtusangula*, reed sweet-grass *Glyceria maxima*, greater duckweed *Spirodela polyrhiza*, fat duckweed *Lemna gibba*, Least duckweed *Lemna minuta*, ivy-leaved duckweed *Lemna trisulca*, Fennel pondweed *Potamogeton pectinatus*, hairlike pondweed *Potamogeton trichoides*, opposite-leaved pondweed *Groenlandia densa*, unbranched burr-reed *Sparganium emersum*, arrowhead *Sagittaria sagittifolia*, water horsetail *Equisetum fluviatile*, fan-leaved water-crowfoot *Ranunculus circinatus*, rigid hornwort *Ceratophyllum demersum* Alternate water-milfoil *Myriophyllum alterniflorum*, common club-rush *Schoenoplectus lacustris*, pink water-speedwell *Veronica catenate*, brown sedge *Carex disticha*, frogbit *Hydrocharis morsus-ranae*, tubular water-dropwort *Oenanthe fistulosa*, corky-fruited water-dropwort *Oenanthe pimpinelloides*, water pepper *Persicaria hydropiper* and water-cress *Rorippa nasturtium-aquaticum*.
- 2.4.23 Invasive species associated with ditches, rivers and ponds included water fern *Azolla filiculoides*, Nuttall's waterweed *Elodea nuttallii*, Canadian waterweed *Elodea canadensis* and giant rhubarb *Gunnera tinctoria*.

### Field Survey Results

- 2.4.24 The Site was bounded by and contained 31 ditches of varying depths, widths and levels of shading. In general, the boundary ditches and those associated with hedgerows were partially overgrown and shaded subject to occasional management and visibly polluted with duckweed blanketing the surface (an indicator of watercourse eutrophication). These boundary ditches were relatively shallow with the exception of D29, D30 and D31 which abutted neighbouring properties with variable fencing and shrub cover and which were cut to have deep banks. The ditches within the centre of the Site were generally deeper and wider than those that formed the boundaries (in excess of 2m in width) and contained a higher coverage of marginal vegetation and a higher diversity of aquatic plants. D2, D6, D8 and D13 featured the highest diversity of aquatic plants but generally the assemblage was relatively limited in comparison to the diversity of aquatic plants recorded locally.
- 2.4.25 The assemblage of aquatic plants within the ditches was relatively species poor overall with no ditch reaching the 10 species of emergent submerged or floating plants in a typical 20m section of ditch as specified in the BNG condition assessment criteria. Aquatic plants recorded include the following species common reed *Phragmites australis*, reed sweet grass, soft rush *Juncus effusus*, hard rush *Juncus inflexus*, reedmace *Typha latifolia*, water horsetail, lesser pond sedge, pendulous sedge *Carex pendula* float grass *Glyceria fluitans*, broad-leaved pondweed *Potamogeton natans*, Hemlock water-dropwort *Oenanthe crocata*, water figwort *Scrophularia auriculata*, lesser water parsnip, fool's-water-cress *Helosciadium nodiflorum*, celery leaved buttercup *Ranunculus sceleratus*, common water plantain and brooklime *Veronica beccabunga*.
- 2.4.26 All of the ditches surveyed contained a covering of duckweeds throughout the year the following species were recorded common duckweed *Lemna minor*, fat duckweed *Lemna gibba* and ivy-leaved duckweed *Lemna trisulca*. The presence of this species and high water turbidity indicate eutrophication from fertiliser runoff, farmyard manure stored in Field 3.
- 2.4.27 The bank structure of the ditches varied with those bounded by fences on one side or abutting the boundaries occasionally having steep banks greater than 45°. The majority had a shallow bank structure of less than 45° as a result of poaching of the banks by sheep and cows. Most feature a plateau at the water



level where livestock drink from the rhynes. Areas where livestock are accessing the water edge are generally poached with short marginal vegetation as a result of grazing.

2.4.28 A condition assessment was undertaken of each of the ditches on site. All of these assessments resulted in a condition score of 'poor'. This was primarily as all of the ditches failed condition assessment attributes 1, 2, 3 and 5. Which include conditions relating to water quality, diversity of aquatic vegetation, cover of filamentous algae or duckweeds and physical damage from farming activities including livestock poaching. Some of the ditches also suffered from excessive shading, insufficient water levels or lack of significant marginal vegetation.

2.4.29 Overall, the ditches were polluted, heavily poached by sheep, horses and cows and featured a fairly low diversity of common aquatic plants. It is considered that the current management of these features is damaging to the Biddle Street SSSI ditches which are directly linked to the Site through increasing eutrophication which in turn will lower aquatic plant and invertebrate diversity associated with the ditches of the SSSI. These features despite their poor condition provide a lot of benefits to local wildlife as a source of water and habitat for invertebrates, birds and mammals.

#### Evaluation

2.4.30 The ditches are considered to be of **Local** importance.

#### **Scattered scrub**

##### Desk Study Information

2.4.31 Very few species of plant of relevance to scattered scrub were returned by the data search. These included: Butchers broom, downy birch, butterfly bush *Buddleja davidii* and an introduced bramble Himalayan blackberry *Rubus armeniacus*. None of these species were identified during the habitat survey.

##### Field Survey Results

2.4.32 The Site contained two patches of scattered scrub within the open fields with a small patch of bramble *Rubus fruticosus* agg. and dogrose in Field 5 and a semi mature hawthorn in Field 7. Some small sparse regenerating scrub including blackthorn, goat willow and dog rose were recorded along the banks of some of the ditches where hedgerows have been removed historically. These patches are generally low in diversity and limited in extent.

#### Evaluation

2.4.33 The scattered scrub recorded on Site are considered to be of **Site** importance.

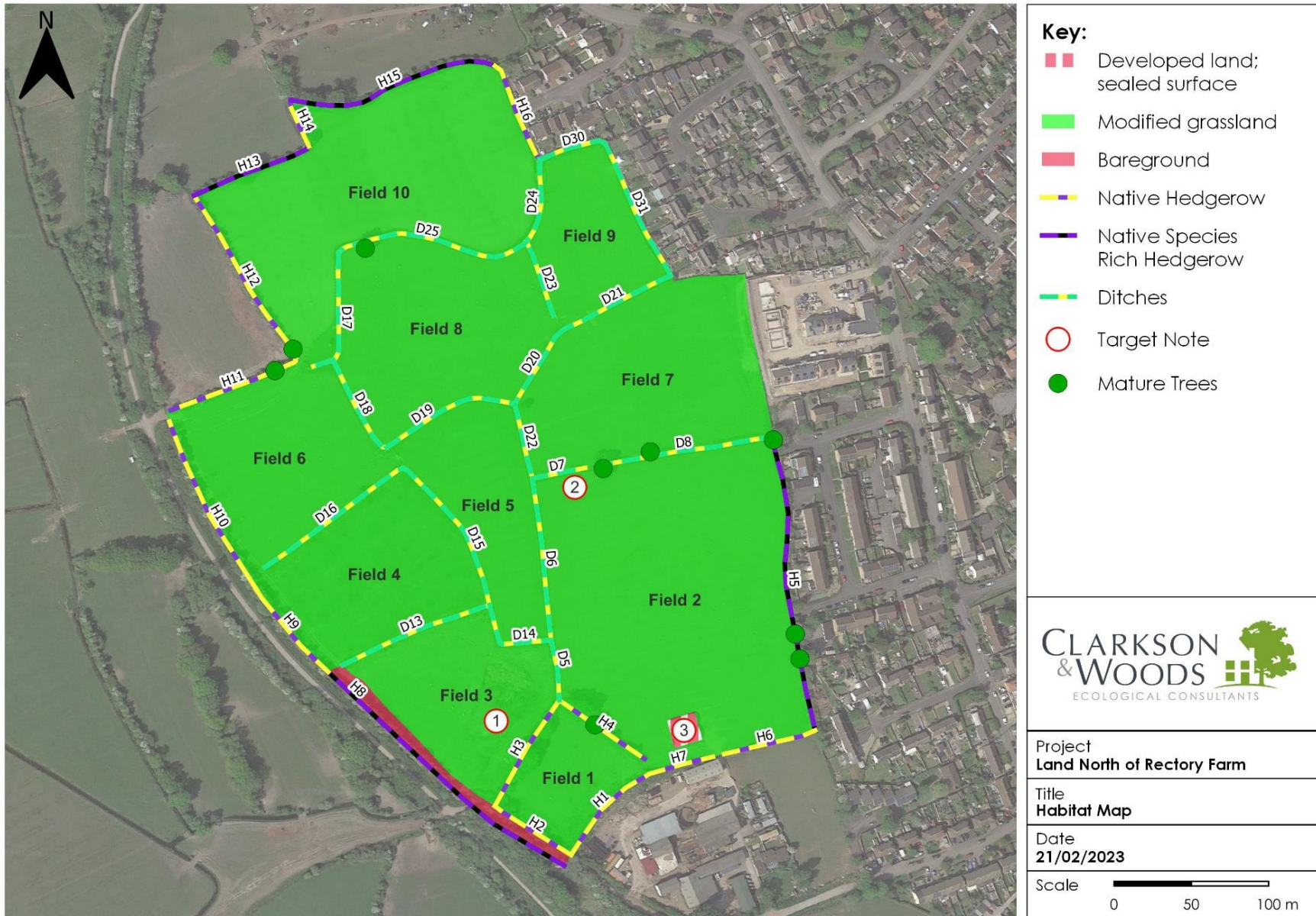


Figure 3 UK Hab Mapping



**Table 4: Target Notes**

No.	Description
TN1	Farmyard manure spread in low heaps
TN2	Log pile (recently felled trees)
TN3	Covered turkey enclosure

## 2.5 Protected Species Survey and Species of Conservation Concern

### Badgers

#### Methodology

- 2.5.1 A search was made for badger *Meles meles* setts, and any sett entrances found were checked for signs of use by badgers or other mammals. Setts were classified into the following categories; Main, Subsidiary, Annexe or Outlying<sup>12</sup>. Sett entrances found were counted and mapped to record tunnel direction and their relative level of usage.
- 2.5.2 Field signs such as 'snuffle holes' (holes dug by badgers when searching for invertebrates), pathways through vegetation, 'latrines' (small pits in which badgers deposit their faeces) and 'day nests' (nests of bedding material made by badgers for sleeping above ground) were also mapped, if found.

#### Limitations

- 2.5.3 The Site was generally open and no specific limitations were encountered during the walkover. Not all areas within 30m of the red line boundary in private ownership could be checked for the presence of badger setts and as such small setts could be present within the zone of impact of the proposals.

#### Desk Study Information

- 2.5.4 Records from BRERC included 8 records of badgers within 2km since 2010 the closest of which to the Site was located 600m to the east of the proposals. 20 records of badger setts are present within 2km of the proposals the closest of which is within 500m of the red line boundary, no specific locations of these setts were provided. During the survey work undertaken to the south to inform the Land at Rectory Farm application a single entrance outlier badger sett was recorded in a garden to the east of the proposals. General badger activity within this land immediately to the south of the Site was considered to be low.

#### Field Survey Results

- 2.5.5 The walkover survey and subsequent surveys have recorded no badger setts or significant badger activity within the Site. No badgers have been recorded during any of the bat surveys however a single badger was spotted on Chescombe Lane around 100m outside of the red line boundary to the south sheltering in a hedgerow during the September bat activity survey.
- 2.5.6 It is likely badgers use the Site occasionally for foraging but the low-lying fields and ditches offer limited sett building opportunities. A known sett is present in a garden to the south some 90m from the red line boundary under a garden shed identified during surveys of the land to the south of the proposals. This is a low status sett but its presence within such close proximity to the Site indicates a clan of badgers are present locally and are likely to use the grassland and hedgerow habitats. A number of mammal paths have been recorded on the northern and eastern boundary hedgerows which are likely used by this species.

#### Evaluation

- 2.5.7 Badgers on Site are considered to be of **Site** level importance.

<sup>12</sup> Lewns, P., Clarkson, T. & Lewns, D. (2019). *Badger Survey and Mitigation Guidelines (The Mammal Society Mitigation Guidance Series)*. Eds. Fiona Mathews and Paul Chanin. The Mammal Society, London. (as yet unpublished)





## **Bats**

### Methodology

- 2.5.8 The assessment of the suitability of the Site for foraging and roosting bats was based on current guidance set out by the Bat Conservation Trust<sup>13</sup>.
- 2.5.9 *Trees*: an inspection of trees on Site was carried out from the ground, using binoculars, to record any signs of use of the tree by bat species. Features such as frost cracks, rot cavities, flush cuts, split or decaying limbs (including hazard beams), loose bark and dense plates of ivy were inspected and recorded. Any signs of staining (from urine or fur rubbing) and scratch marks below potential access points were noted, and a search was made for droppings underneath these features.
- 2.5.10 *Habitat*: the habitats within the Site were appraised for their suitability for use by foraging and commuting bats. In particular, the connectivity of the habitats on site to those lying beyond was taken into account. Vegetated linear features are typically important for many species to navigate around the landscape, while the presence of woodland, scrub, gardens, grassland and wetland features increases a site's foraging resource value to bats. The potential for noise or lighting disturbance which may affect commuting links was also recorded.

### Bat activity surveys

- 2.5.11 The transect surveys involved walking predetermined transects at a consistent speed using handheld broad spectrum bat detectors and recording devices. The route was designed to provide a balanced overview of bat activity across the development Site. The Site was split into two transects with the southern site covered by a survey and the northern site and offsite bat compensation land being covered by a separate survey. Three minute stop points were included at various pre-determined locations throughout the transects. 10 full transects of the red line boundary were undertaken with a transect every month and 'additional' transects undertaken in June and September and a dawn survey undertaken in September. During the three 'additional' transects which covered only the red line boundary, a single longer transect was undertaken by a survey team. The split transect points are included in Figure 5 for reference. 36 stop points were chosen, in order to give comparable spatial and temporal levels of bat activity across the Site. The starting point during each transect survey was different to avoid bias during the surveys.
- 2.5.12 The surveys were carried out during suitable weather conditions (low wind, little to no rain and temperatures of at least 10°C). All of the update surveys undertaken at Dusk continued until three hours after sunset. The additional dawn activity survey undertaken in September started three hours prior to sunrise and finished 15 minutes after sunrise. Transects of the red line boundary only are indicated by italicised text in the table and the dawn is indicated in bold for clarity.
- 2.5.13 Surveyors were equipped with handheld bat detectors Echo Meter Touch II pro with an iPad Mini (wildlife acoustics), Anabat Scout or Anabat walkabout (Titley Scientific) both of which feature integrated recorders.
- 2.5.14 The survey recordings were later analysed on a computer using Audition (Adobe) or Kaleidoscope (Wildlife Acoustics) software to confirm or identify species. Table 5 below provides the dates, weather conditions, sunset/sunrise times, survey start and end times and ecologist details for each of the walked transects.

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<sup>13</sup> Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3<sup>rd</sup> edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1.



**Table 5: Bat activity transect details**

Survey Date	Weather Conditions	Start time	End time	Ecologist details
26/04/2022	Dry, 16-14°C, Wind 2, Cloud 0	20:24	23:25	Henry Sturgess Bex Sandey Matt Jones
24/05/2022	Dry, 13-12°C, Wind 1, Cloud 1-3	21:09	00:09	Harry Fox Molly Brown Sarah Richards
14/06/2022	Dry, 16-13°C, Wind 0-1, Cloud 0-1	21:29	00:29	Joel Wright Elizabeth Browne
27/06/2022	Dry, 15-11°C, Wind 0, Cloud 1-2	21:31	00:31	Harry Fox Molly Brown Sophie Brotherton
25/07/2022	Dry, 20-17°C, Wind 2-4, Cloud 1-3	21:10	00:10	Henry Sturgess Lauren Rose Sarah Richards
22/08/2022	Predominantly dry with short period of light rain 22-19°C, Wind 2, Cloud 6-8	20:19	23:19	Andrew Ross Sarah Richards Sophie Brotherton
06/09/2022	Predominantly dry some light rain half an hour after the start of the survey lasting for 20 mins, 19-16°C, Wind 2	19:43	22:46	Adèle Remazeilles Miranda Jones
14/09/2022 (Dawn Survey)	Dry, 12-10°C, Wind 2-3	03:29	07:00	Matt Jones Tom Miles
19/09/2022	Dry, 17-14°C, Wind 1, Cloud 3-6	19:17	22:17	Henry Sturgess Molly Brown Lauren Rose
12/10/2022	Intermittent light rain initially clearing after the first hour dry thereafter, 15-14°C, Wind 1-3, Cloud 8	18:25	21:25	Henry Sturgess Adèle Remazeilles Bex Sandey



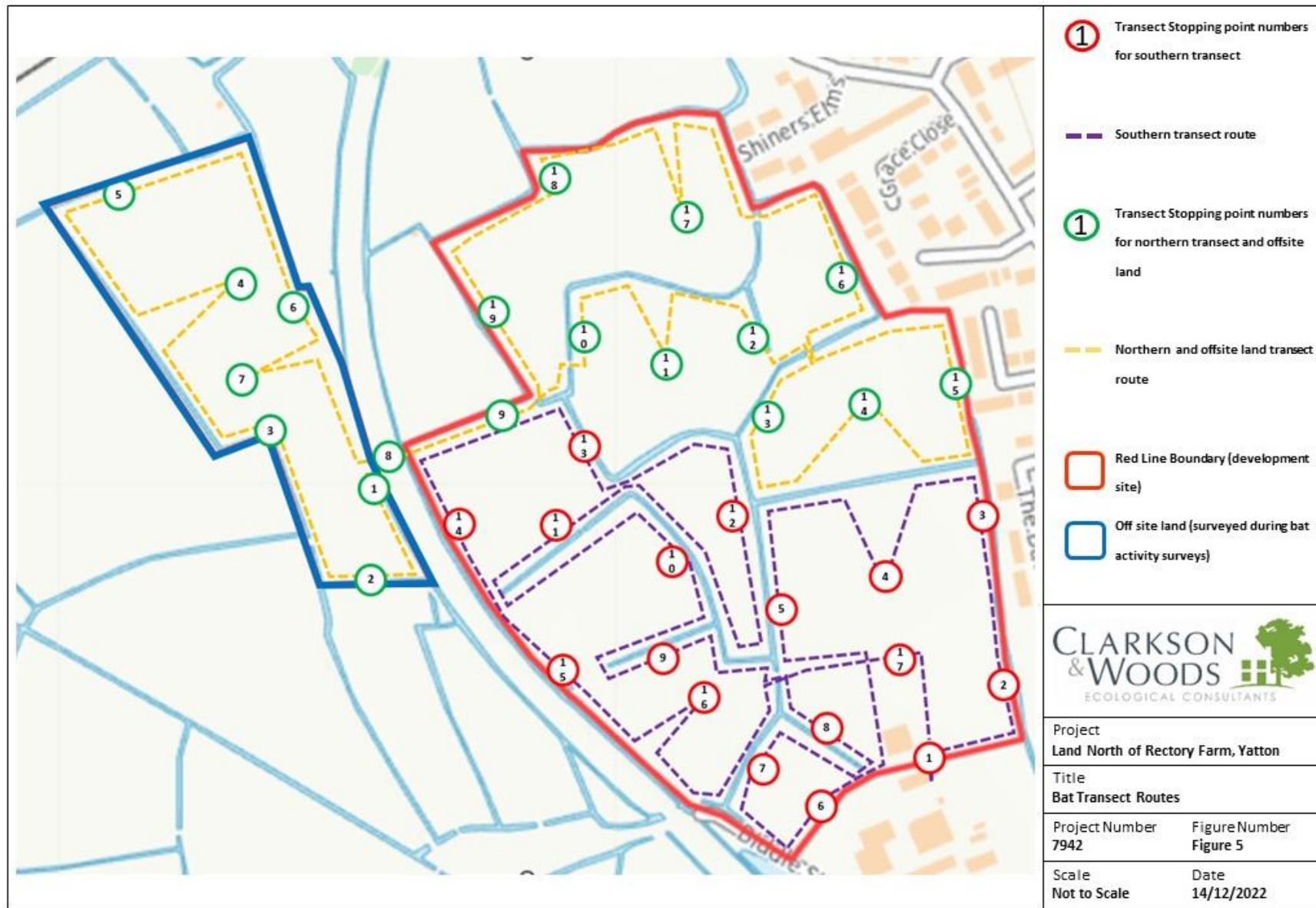


Figure 5 Walked bat activity transect routes



### Static detector surveys

- 2.5.15 Eight automated full spectrum static detectors (Anabat Swift) were deployed within the red line boundary and a further two were deployed in the offsite land following the combined monthly transect surveys for a period of at least 7 nights per deployment. Detectors covered some of the key boundary hedgerows, key ditches and areas anticipated to receive the greatest impacts. The deployment locations are provided in Figure 6 below. The detectors were programmed to begin recording at least 30 minutes before sunset and finish recording 30 minutes after sunrise each night and logged bat passes in each static detector location. In total the static detector surveys covered 52 survey nights.
- 2.5.16 The deployment dates are given in Table 6 below and the detailed weather conditions for each deployment are summarised. On a few occasions static detectors failed due to technical faults and in each instance, these were replaced in the field as soon as possible.

**Table 6: Static detector summary**

Date Deployed/Date Collected	Number of detectors	No of Nights Surveyed per deployment	Weather Summary
26.04.2022 – 04.05.2022	10	8	3-16°C, predominantly dry some light rain on the 27 <sup>th</sup> -28 <sup>th</sup> of April and heavy rain on the night of the 1 <sup>st</sup> o May. Strong winds on the 4 <sup>th</sup> of May
24.05.2022 – 30.05.2022  01.06.2022-06.06.2022	10  4 (replaced failed detectors)	7 (4 detectors failed during the initial deployment and were redeployed during the dates shown below.  between 2-5 nights each	9-15°C, Dry apart from three hours of heavy rain on the 26 <sup>th</sup> of May, high winds on the 27 <sup>th</sup> of May  8-20 °C, predominantly dry with drizzle recorded on the night of the 5 <sup>th</sup> and higher than average winds on the 4 <sup>th</sup> of June
27.06.2022 – 03.07.2022	10	7	11-18°C, predominantly dry with drizzle on the night of the 28 <sup>th</sup> and the 30 <sup>th</sup> . High winds on the 27 <sup>th</sup> of June and 1 <sup>st</sup> and 3 <sup>rd</sup> of July
25.07.2022-31.07.2022	10	7	10-25°C, Dry throughout after prolonged period of drought, high winds on the 25 <sup>th</sup> and 30 <sup>th</sup> of July
22.08.2022 – 29.08.2022	10	7	12-24°C, Dry throughout after a prolonged period of drought, minor drizzle and higher than average winds on the evening of the 25 <sup>th</sup> of August
19.09.2022 – 25.09.2022	10	7	9-20°C, Moderate rain on the 22 <sup>nd</sup> and 23 <sup>rd</sup> for an hour or so otherwise dry. Wind 1-3
12.10.2022 – 19.10.2022	10	8	9-15°C, Moderate rain on the morning of the 13 <sup>th</sup> and the evening of the 16 <sup>th</sup> otherwise dry, higher than average



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			winds on the 19 <sup>th</sup> of October
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**Figure 6: Static Deployment locations**

### Limitations

- 2.5.17 Bats are very small creatures, capable of secreting themselves away into extremely small spaces and it is possible that these animals, or their signs, might have been missed during the survey if they are normally present opportunistically or in small numbers for a short period of time each year.
- 2.5.18 During a small number of the ten bat activity surveys undertaken there was some suboptimal weather during the second or third hour of the surveys. This included some intermittent light rain and cooling temperatures. Given the number of surveys undertaken and the continuation of bat foraging throughout the transects undertaken this is not considered to be a significant limitation.
- 2.5.19 At 4 occasions in May static detectors failed to record the full seven survey nights. In such instances the failed detectors were deployed again to ensure all had the required number of nights of static detector recording undertaken. Given the number of detectors utilised it is not considered to present a significant limitation to the static detector survey findings. Due to the varying days recorded due to the replacements and the additional night of recording in April and October the monthly totals of all static detectors are not directly comparable. Where a detector had additional nights of recording this is indicated in the evaluation of results.
- 2.5.20 On three occasions the Site was subject to a single longer transect survey and therefore represents a marginally lower survey effort in comparison with the other surveys which were conducted by two transects. The data from these additional single transects therefore is not directly comparable to data collected from two transects, although clearly both survey approaches help to build an understanding on the level of bat activity on the Site.
- 2.5.21 Bat detectors are known to be more sensitive to certain bat calls than to others for reasons such as varying bat call loudness and directionality of certain calls. This can result in certain bat species (notably horseshoe, barbastelle and long-eared bats) being under-recorded due to the limitations of the current bat detectors. The difference in recording efficiency may therefore bias any results and this has been taken into account where possible during any assessment of the results.



- 2.5.22 Kaleidoscope Pro automatically identifies bat calls using various algorithms and provides statistical levels of confidence associated with each classified call. The confidence levels reflect the fact that there will be certain classification errors related to every classified bat call. With experience of using the software it is, on the whole, reliable when identifying certain bat calls, especially horseshoe bat calls due to their simple and unmistakable parameters. Other straightforward species are common pipistrelle, soprano pipistrelle, noctule and serotine. However, the software has been found to be less reliable when identifying other species (e.g. long-eared, Leisler's and barbastelle bat species).
- 2.5.23 The software does not accurately distinguish between the various *Myotis* species and simply classifies them to genus level (i.e. *Myotis* sp.). This is in line with classification that would be achieved by manual identification due to the similar nature of *Myotis* calls making species classification subject to a high degree of error. The on-board software used by the EchoMeter Touch does, however distinguish between *Myotis* species but this has been found to be inconsistent.
- 2.5.24 Due to the software limitations all calls are manually verified to confirm the identification made by the software is accurate. Furthermore, where the software is unsure of a bat call, it will classify the call as 'NoID'. For completeness, all NoID files were classified, where appropriate. Noise files were not checked as the vast majority of these cannot be analysed or attributed to bats or their calls.
- 2.5.25 Additionally, automated detectors are triggered to record when suitable ultrasound is detected and will not cease recording until either a window of 1 second of silence is recorded (or if 30s elapses since the trigger, whichever is sooner). If more than one species is present within a trigger, the software is only able to classify one species per trigger and so is forced to decide which species is 'dominant'. This potentially results in an under-recording of species which are quieter (such as horseshoe bats) or species which have a longer pulse repetition rate. Manual verification of the data ensures that such non-dominant species are correctly logged.
- 2.5.26 In conclusion, the classification data produced from Kaleidoscope Pro, along with manual verification of records is considered to provide an acceptably accurate record of bat species recorded by a static bat detector and as such has been used within this report.

#### Desk Study Information

- 2.5.27 165 records relating to bats species were returned by BRERC within 2km since 2010 along with 20 records relating to bat roosts. The following 14 species of bat were returned by the search (the vast majority of which relate to bat detector records a number of records for each species is provided in brackets): common pipistrelle, *Pipistrellus pipistrellus* (30), soprano pipistrelle *Pipistrellus pygmaeus* (24), Nathusius pipistrelle *Pipistrellus nathusii* (7), serotine bat *Eptesicus serotinus* (21), noctule *Nyctalus noctule* (28), Leisler's bat *Nyctalus leisleri* (10), long-eared bats *Plecotus Sp* (1), Brown long-eared bat *Plecotus auratus* (5), *Myotis* bats *Myotis Sp* (5), Daubentons bat *Myotis daubentonii* (5), whiskered bat *Myotis mystacinus* (1), Natterer's bat *Myotis nattereri* (1), Bechstein's bat *Myotis bechsteinii* (2), lesser horseshoe bat *Rhinolophus hipposideros* (11) and greater horseshoe bat *Rhinolophus ferrumequinum* (14).
- 2.5.28 Bat roosts were returned within 2km for the following species the number of roosts is indicated in brackets: Common pipistrelle (4), soprano pipistrelle (1), *Myotis* sp, (1), brown long-eared (1), Noctule (2) lesser horseshoe bat (10), greater horseshoe bat (1). Of these records two records relating to common pipistrelle are significant relating to maternity roosts, a record of a noctule roost also contained 20 individuals indicating it is of significant conservation value. Records relating to lesser and greater horseshoe bats related to individuals with many records reporting the presence of droppings. The number of lesser horseshoe roosts returned within 2km indicates this species is well represented locally.
- 2.5.29 Clarkson and Woods Ltd undertook bat surveys in line with the North Somerset and Mendip Bat SAC guidance on development on fields to the south during 2020. The results of these surveys can be read in the survey report Ecological Impact Assessment, Rectory Farm, Clarkson and Woods (January 2021). The surveys found a broadly similar assemblage of bats during the activity and static detector surveys undertaken. It should be noted that levels of activity from greater and lesser horseshoe bats were considered to be higher on the site to the south being at the convergence of several key flight lines including the Strawberry Line LNR and the Gang Wall.





## Field Survey Results

### *Habitat*

- 2.5.30 The habitats within the red line boundary were assessed for their suitability to support commuting, foraging and roosting bats. A further assessment of the foraging value of the habitats within the Site for greater and lesser horseshoe bats was made using the Habitat Evaluation Procedure (HEP) calculations to inform the mitigation required for foraging bats. Overall, the habitats were of relatively low foraging value for bats including horseshoe bats with the grassland being modified and species poor. Hedgerows and ditches provided the best quality foraging and commuting habitat present within the red line boundary. The HEP calculations for the baseline foraging value of the habitats within the red line boundary are provided in Appendix E and the habitat provision for horseshoe bats is summarised in the assessment of effects section.

### *Buildings*

- 2.5.31 The only structure present within the red line boundary was a large open polytunnel like structure for the rearing of turkeys which was present in the south of the Site. This structure had mesh elevations and plastic sheeting formed the roof. There were no crevice features suitable to support crevice roosting bat species and opportunities for night roosting were limited due to the open nature of the structure and few suitable features for hang roosting bats to perch. It was considered unsuitable to support roosting bats.
- 2.5.32 A purpose built night roost structure is present at the edge of the Titan ladders development on the eastern boundary of the Site. This was constructed as an enhancement for night roosting lesser horseshoe bats and measures approximately 1.5m in width, 1.5m in height and 2 meters deep with a large 0.75mx0.75m entrance in the eastern elevation. The structure is suspended 2m from the ground on a retaining wall. The structure was inspected during each activity transect for signs of use by horseshoe bat. On two occasions the interior was checked for droppings and feeding remains. No bats or signs of bats such as droppings were recorded during any of the surveys undertaken suggesting the feature is not currently used by roosting horseshoe bats.

### *Trees*

- 2.5.33 The mature trees were all inspected for their potential to support roosting bats. The mature oak in Field 8 had a small covering of ivy but no other visible bat roost features and is assessed as having low to negligible bat potential. The mature oak present along D8 had a number of minor features suitable for roosting bats including damage to limbs which included peeling bark, knotholes and a limb shear. Overall this tree is considered to offer low suitability for roosting bats. The mature ash present to the north of D8 had few features other than some limited peeling bark surrounding previously removed limbs and is considered to offer low to negligible potential for roosting bats. Other trees within the hedgerows were generally too young to have developed significant bat roost features. Two oaks present in H13 and H14 were mature enough to have developed some minor bat features including splits and peeling bark both were assessed as offering low suitability for crevice roosting bat species.

### *Activity Transect Surveys (red line boundary)*

- 2.5.34 Ten bat activity transects were undertaken across the red line boundary between April and October 2022. These included nine transects which started at sunset and were undertaken for the next three hours. A single dawn transect was also undertaken with the survey being undertaken for the three hours prior to dawn. A further seven surveys were undertaken on off-site land to inform its current level of use by horseshoe bats. Table 7 below shows the totals number of passes per bat species during each survey and Table 8 contains the results of activity surveys on the offsite land surveyed. Figure 7 shows the relative use of the Site by foraging and commuting bats using a heatmap to display areas where use of the Site and offsite land by bats is concentrated.
- 2.5.35 In total the bat activity surveys identified at least 9 species of bat using the Site. *Myotis* and long-eared bats were only identified to genus level and as such may represent more than one species.
- 2.5.36 The highest numbers of calls were attributed to common and soprano pipistrelle bats which were observed foraging throughout all of the transect surveys. Serotine were the next most frequently encountered species by number of calls but were only recorded in June, July, August and September.





- 2.5.37 Noctule were recorded regularly with 20 passes recorded over six of the surveys. Both long-eared bats and Myotis bats were encountered consistently with these bats being recorded during at least seven of the surveys. These species were recorded in low numbers with 12 calls attributed to long-eared bats and 15 to Myotis Sp.
- 2.5.38 Lesser horseshoe was recorded during just one survey with 6 calls from a foraging individual recorded in the late September survey representing 0.66% of the overall bat activity within the Site. Greater horseshoe bats were recorded on two occasions within the red line boundary in July and late September with a total of three calls recorded representing just 0.33% of the total calls. During the September survey a greater horseshoe bat was observed forging in the centre of Field 7. Leisler's bat was also recorded very infrequently with 3 calls recorded over just two of the surveys.
- 2.5.39 Levels of bat activity were variable between surveys with the highest number of bat passes recorded in April, July and September. Similar levels of use were record in August and October. Lower levels of bat activity were recorded in May and June. The single transect surveys undertaken in June and twice in September have lower numbers of bat calls due to the lower level of detector effort.
- 2.5.40 As can be seen from Figure 7 below the greatest levels of bat activity corresponded with the hedgerows, trees and more sheltered areas of the Site. The interior of field 1 was particularly well used, likely due to its tall hedgerows which provide shelter for night flying invertebrates. Portions of the northern hedgerow where the boundary forms a small enclave was also well used by foraging bats. Another key feature was the western boundary of the Site where this forms the eastern edge of the strawberry line. Regular commuting and foraging bats were observed using this feature including a higher proportion of light averse species including myotis and long eared bats. The eastern boundary where hedgerows were present was also relatively well used with peaks of activity noted at the listening stops. The eastern boundary is the only part of the Site which suffers from artificial light pollution and as a result of this fewer light averse species were recorded along this boundary with the majority of commuting and foraging by pipistrelles. The open fields were not particularly well used by foraging bats during the activity surveys although certain interior ditches received regular use particularly where these features had a fringe of scrub or were adjacent to mature trees. Trees alongside ditches also had the highest peaks of bat activity within the centre of the Site which was due to persistently foraging pipistrelle species.
- 2.5.41 In general bat activity was moderate throughout the Site with an average of 88 passes recorded per three hour activity survey. Although some parts of the Site were used by a restricted assemblage of bat species all parts of the Site are currently used by foraging and commuting bats. It should also be noted that the proportion of calls attributed to horseshoe bats was relatively high given the low level of detection of these species with just over 1% of the total across all of the surveys within the red line boundary. It is clear from the activity surveys that both greater and lesser horseshoe bats forage on Site albeit infrequently.

**Table 7: Bat activity survey summary within the red line (Transects)**

Bat Species	April	May	June 1	June 2	July	August	Sept 1	Sept dawn	Sept 2	October	Totals
Common pipistrelle	99	48	20	46	118	61	27	12	104	56	591
Soprano pipistrelle	20	11	7	15	38	30	10	0	34	43	208
Long-eared bat	1	2	0	2	1	4	1	0	1	0	12
Myotis Sp	2	1	0	0	2	1	1	5	1	2	15
Serotine	0	0	2	3	18	3	0	0	3	0	29
Leisler's bat	0	0	0	1	0	0	0	0	2	0	3
Noctule	0	2	0	4	2	7	2	0	0	3	20
Lesser	0	0	0	0	0	0	0	0	6	0	6



horseshoe											
Greater horseshoe	0	0	0	0	2	0	0	0	1	0	3
Total bat passes recorded	122	64	29	71	181	106	41	17	152	104	887

*Activity Transects – Off-site Land*

- 2.5.42 The off-site land (blue-line boundary) had a very similar level of use by bats during the activity surveys with at least 8 species recorded including myotis ad long-eared species which were only identified to genus level and as such may represent more than one species.
- 2.5.43 Levels of use by different bat species were very similar to that recorded in the red line boundary with common and soprano pipistrelle recorded frequently with calls from common pipistrelle during every survey and calls from soprano pipistrelle only absent in August.
- 2.5.44 Noctule calls were recorded during four surveys from July to October with 20 calls in total across the surveys. When observed this species was foraging high over the wider Congresbury Yeo SNCI and Strawberry Line LNR.
- 2.5.45 Greater horseshoe was recorded as a higher proportion of the total calls within the off-site land (1.5%) compared to on-site land, with 6 calls recorded over three of the seven surveys. On two occasions greater horseshoe were observed engaging in obvious foraging behaviour adjacent the Strawberry Line on the eastern boundary of the off-site land. The other call recorded was attributed to a commuting individual at stopping point 8 where it was observed commuting from Biddle Street up the Strawberry Line LNR path. Lesser horseshoes were not recorded during the transect surveys undertaken on the off-site land.
- 2.5.46 Myotis Sp., serotine and Leisler's bat were recorded at a slightly lower level with 5 passes from each of these species. Calls associated with these species were generally confined to the eastern and southern boundary of the field. Serotine and Leislars were recorded during just one survey each with short bouts of foraging recorded in July and August respectively. Myotis Sp. were recorded in low numbers across three surveys with two calls from the centre of the field. Long-eared bats were recorded on just one occasion in June where an individual was recorded commuting along the strawberry line path.
- 2.5.47 Bat activity within the off-site land was concentrated on the southern and eastern boundary as can be seen in Figure 6 below. A particular hotspot was transect point 8 of the northern transect where it crosses the strawberry line. This indicates that this local bat commuting route is particularly well used. The areas which feature a greater number of total calls within the off-site field are partially sheltered by hedgerows or patches of scrub. Higher levels of foraging by pipistrelles was recorded on the southern boundary which is sheltered by a belt of mature oaks. The eastern boundary was also relatively well used particularly the hedgerow and ditch which act as a sheltered area where more night flying invertebrates are present. Use of the western boundary was less frequent with activity generally associated with soprano pipistrelle foraging alongside the ditch higher concentrations of calls were recorded adjacent to scrub and other shelter features alongside the ditch. The northern boundary was generally used by foraging pipistrelles hawking invertebrates from the Branch Rhyne.
- 2.5.48 The open field was used infrequently predominantly by common and soprano pipistrelle with a single call from Noctule and to calls from Myotis Sp.
- 2.5.49 In general bat activity was moderate throughout the off-site land with an average of 54 passes recorded per activity survey. Given that this land was surveyed as part of a broader survey also covering the north of the application site the proportion of time attributed to the walkover of this land was around 1 hour and 15 mins. As a proportion of the overall time from both transects the offsite land received 26% of the survey effort. As such the lower total number of calls represents a slightly higher level of bat activity when compared to the habitats within the red line boundary. Although some parts of the Site were used by a restricted assemblage of bat species such as the western and northern ditches all parts of the Site are currently used by foraging and commuting bats. It should also be noted that the proportion of calls attributed to greater horseshoe bats was relatively high given the low level of detection of these species



with 1.5% of the total across all of the surveys within off-site land. It is clear from the activity surveys that greater horseshoe bats forage on Site albeit infrequently.



**Table 8: Bat activity survey summary off-site land**

<b>Bat Species</b>	<b>April</b>	<b>May</b>	<b>June</b>	<b>July</b>	<b>August</b>	<b>September</b>	<b>October</b>	<b>Total calls</b>
<b>Common pipistrelle</b>	32	23	8	40	36	29	65	233
<b>Soprano pipistrelle</b>	45	25	8	7	0	2	17	104
<b>Long-eared bat</b>	0	0	1	0	0	0	0	1
<b>Myotis Sp</b>	0	3	1	0	0	1		5
<b>Serotine</b>	0	0	0	5	0	0	0	5
<b>Leisler's bat</b>	0	0	0	0	5	0	0	5
<b>Noctule</b>	0	0	0	3	9	6	2	20
<b>Greater horseshoe</b>	2	0	1	0	0	0	3	6
<b>Total bat calls</b>	79	51	19	55	50	38	87	379







*Static Detector Surveys (Combined on-site and off-site bat assemblage)*

- 2.5.50 The detailed static detector survey results are included in Appendix D with each month's static detector results individually reproduced. Static detector location references are shown in Figure 6. A summary of the number of passes per bat species is included in Figure 8 below and a summary of the total number of calls each month from all detectors (including those in the off-site land) and the relative use of each detector location is also provided in Table 10. Locations A and B relate to the off-site surveyed.
- 2.5.51 Overall, at least 11 species of bat were recorded during the automated static detector surveys as shown below in Figure 8. This is likely to be an underestimate as the *Myotis* and long-eared Sp. are likely to constitute more than one bat species. The off-site land did not record calls from barbastelle, Leisler's bat or *Nathusius pipistrelle* during the static detector surveys but these species were recorded in very low numbers within the on-site land.
- 2.5.52 All of the species recorded during the transect surveys were picked up by the static detectors with additional species which included barbastelle and *Nathusius pipistrelle* which were both recorded in very low numbers.
- 2.5.53 The static detector surveys had similar relative levels of activity noted during the manned activity transects. Notable differences included a higher relative proportion of soprano pipistrelle calls, constituting 36% of the total. The highest numbers of calls were attributed to common pipistrelle bats with over 60,000 being recorded across all deployments representing 52% of the total bat calls. Both common and soprano pipistrelle were recorded across all detector locations and all months but the proportion of the use of the survey area by these species varied seasonally. In the early part of the year soprano pipistrelle were recorded at slightly higher levels than common pipistrelle. But by June 80% of the total calls were attributed to common pipistrelle and July- October static detector results consistently have a higher proportion of common pipistrelle calls as a percentage of the total calls.
- 2.5.54 The next most frequently recorded bat species were *Myotis* Sp. which had a high relative proportion of the overall bat calls accounting for 4.3% of the total. 67% of this total came from Location 5 during September indicating this location is used by the bats seasonally for foraging or potentially mating although this generally occurs in October for most species.
- 2.5.55 Lesser horseshoe was the next most frequently recorded with 2.9% of the overall bat calls from all detectors. This species was most frequently recorded at Location 3 indicating the Strawberry Line forms an important commuting and foraging habitat for this species. The seasonal distribution of calls was highest in the late season with September and October seeing the highest numbers of calls. A large proportion of these were related to Location 3 but good numbers of calls were recorded at locations 2 and 4. All locations had over 100 calls attributed to this species other than Location 7 and Location B which each had between 20 and 30 calls. Foraging by this species using the Millars foraging index was met in every month with the exception of July and was recorded in April, May and August within the off-site land.
- 2.5.56 Serotine calls were also frequently recorded representing 1.5% of the total calls. This species was recorded fairly consistently throughout the months and detectors with lower numbers of calls in April and October. A small number of detectors did not record this species in April, May and June but overall calls from this species were regularly recorded at low levels. Noctule had a very similar percentage of overall calls with 1.255% of the total and fewer calls in April and October. Two locations in June and one location in August recorded no calls by this species but otherwise it was consistently recorded across the Site and throughout the year.
- 2.5.57 Long-eared bats were recorded frequently with 0.75% of the total calls records were highest at Location 3, Location 5 and Location B which constitute some of the darkest and most sheltered areas of the Site all of which are adjacent to hedgerows or mature trees. Seasonally the peaks of calls were within the mid season with lower numbers recorded in April, May and October.
- 2.5.58 Greater horseshoe bats were recorded consistently in low numbers representing 0.36% of the total calls. Detection of this species is typically low due to their directional calls. This species was recorded at every detector location with the greatest numbers being recorded at Locations 8 & 3. Peaks of greater horseshoe calls at location 8 were recorded in June and July where foraging using the Millers index was reached on a single occasion. Location 3 had a consistent number of calls from statics suggesting this is used as a commuting route for the species. Combined calls for these species at other locations were





generally between 30-50 calls. Locations 5, 6 and 7 were used less frequently but Location 6 is subject to some pollution from artificial lighting from adjacent developments.

- 2.5.59 Those calls labelled *Nyctalus Sp.* are either Noctule or Leisler's bat but the plasticity of calls between the species makes it difficult to discern which species the calls are attributed to. Calls from Leislars were rare with only 19 calls recorded across all detectors and deployments. Similarly, *Nathusius pipistrelle* was infrequently recorded with just 28 calls in total. The lowest number of calls was attributed to *Nathusius pipistrelle* which was recorded on just two occasions.

#### *Seasonal variation in total bat calls*

- 2.5.60 Seasonally the highest number of calls were in the early season during April and May although a very high proportion of these were attributed to pipistrelle bats. June and July had approximately half of the total calls recorded in April, but a higher proportion of calls attributed to rarer bat species. August and September had the lowest number of total calls with the October static detector totals being slightly higher. The drop in the number of calls throughout the summer and autumn may be attributed to the drought experienced during the year which would impact invertebrate numbers, but the total number of calls does not drop in a corresponding way during the activity surveys that were undertaken.

#### *Relative use of the different areas of the red line boundary*

- 2.5.61 In terms of static detector locations, Location 5 to the south of Field 10 recorded the highest number of total calls, this was due to persistent foraging of pipistrelle and *Myotis Sp.* around the mature oak at this location. Location 1 also had a high total number of calls with pipistrelle species, serotine bats and lesser horseshoe recorded at this location frequently. It is considered the sheltered nature of Field 1 likely encourages increased foraging at this location. Location 7 had a similar number of total calls; this detector was situated at the junction of three ditches adjacent to a semi mature oak and some scattered scrub. Calls at Location 7 were attributed predominantly to pipistrelle and *Myotis Sp.* all other species accounted for less than 2% of the total calls.
- 2.5.62 Locations 3 and 4 had a similar relatively high level of use both situated on key boundary hedgerows (western and northern boundaries) which are considered to be key linear features. Location 6 was relatively well used but calls were predominantly from common pipistrelle, noctule and serotine bats which are less light averse as this location was relatively well lit from adjacent development. The lowest numbers of total calls within the red line boundary were from Locations 2 and 8 which are both reasonably isolated due to being situated on poor quality habitat features. This indicates neither of these locations are key commuting or foraging locations for bats.

#### *Relative use of the different areas of the off-site land*

The off-site land had a lower total number of bat calls recorded. Notable differences between the static detector totals between the red line boundary and the off-site land were a higher proportion of common pipistrelle and greater horseshoe calls recorded in the off-site land, otherwise the assemblages in both parcels of land were similar. Location A which was located on the eastern side of the off-site land surveyed, this location was generally used more often by bats being sheltered and adjacent a linear commuting feature. Location B was exposed on the open corner of the field. This detector recorded a generally lower number of average calls per deployment except in October when large numbers of calls attributed to common and soprano pipistrelle were recorded. The lower overall use of the off-site land could possibly be attributed to the prevailing south westerly winds which may reduce suitability for night flying invertebrates which are blown towards the Site and the Strawberry Line.

#### *Comparison of use by horseshoe bats*

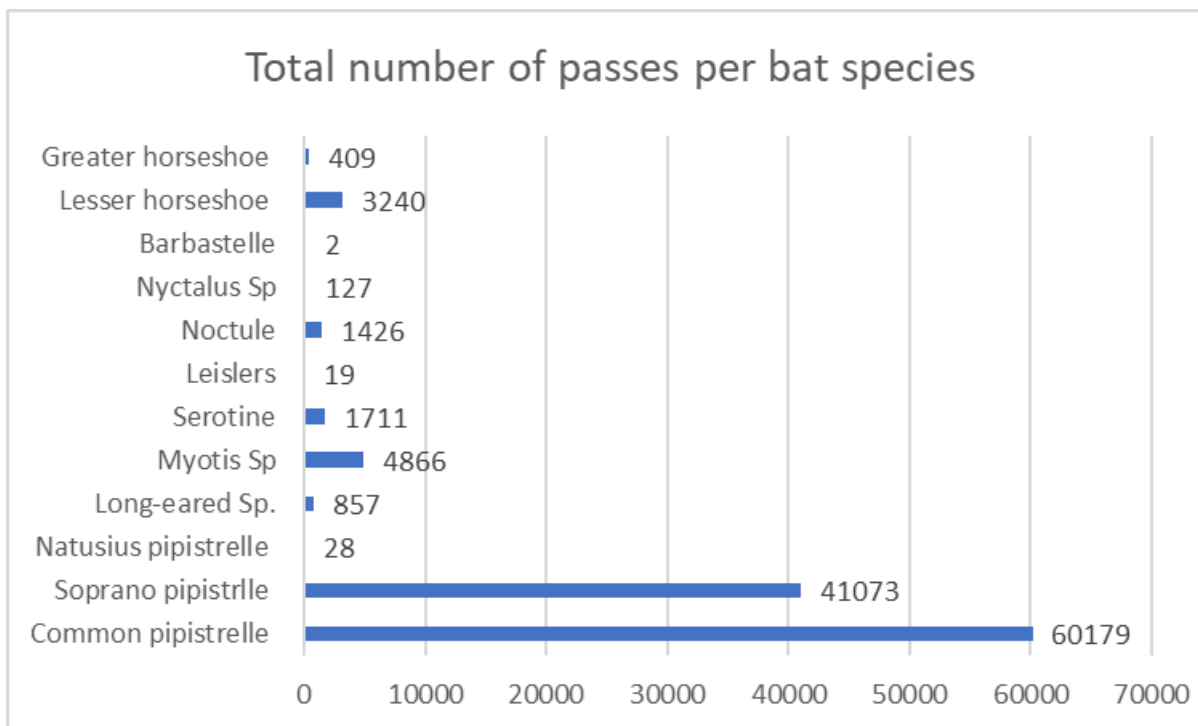
The total number of calls attributed to horseshoe bats from each detector location is provided in Table 9 below this shows the total number of calls per location with the locations at which foraging defined by the Milller's Foraging Index is reached highlighted in red. As can be seen from the results Lesser horseshoes use both the red line boundary and the off-site land for foraging. Greater horseshoes were recorded as foraging on two occasions at locations 7 and 8 within the red line boundary. They did not meet the threshold of foraging in the off-site land via repeated foraging contacts recorded on a single static detector. However as referenced in the activity survey results greater horseshoes were observed clearly foraging on two occasions by surveyors and as such the foraging multiplier has been applied to the off-site



compensation HEP calculations. Relative use of the red line boundary and off-site land were similar but as noted the proportion of greater horseshoe calls to total bat calls was higher in the off-site land.

**Table 9: Static detector summary of greater and lesser horseshoe passes**

Static detector location	Lesser horseshoe	Greater Horseshoe
Location 1	297	47
Location 2	314	31
Location 3	1564	67
Location 4	381	42
Location 5	123	8
Location 6	124	15
Location 7	28	28
Location 8	156	84
<b>Off-site Land Detectors</b>		
Location A	233	48
Location B	20	39



**Figure 8: Total number of bat passes from all detectors**



Table 10: total bat calls per location

Location /month	April	May	June	July	August	September	October	Total per location
Location 1	4171	7964	1835	869	201	413	168	15621
Location 2	165	5937	593	721	136	165	227	7944
Location 3	1083	773	1269	1659	1778	1349	3066	10977
Location 4	6579	859	694	1288	197	2039	452	12108
Location 5	7526	3042	1455	3451	2485	5889	260	24108
Location 6	1075	399	834	1781	3062	422	1509	9082
Location 7	6196	335	4941	582	771	270	232	13327
Location 8	987	999	2733	640	497	135	53	6044
Location A	1372	913	97	2221	1106	547	181	6437
Location B	379	194	445	794	118	250	6085	8265
Totals per month	29533	21415	14896	14006	10351	11479	12233	113913

2.5.63 Overall bat activity across the red line boundary was variable with the in-field trees, western and northern boundaries being the most valuable in terms of the species recorded and the frequency of use by rarer species. This includes horseshoe bats, with lesser horseshoes regularly recorded using these habitats for 'foraging'. The Site is considered valuable due to the general lack of illumination and excellent off-site habitat connectivity. Bat activity was relatively high throughout the year and the representation of bat calls recorded that were attributed to greater and lesser horseshoe bats illustrates the significant importance of the Site to these species. As initially indicated during the walked activity transects both species of horseshoe bat have been confirmed as foraging within the Site and both species met the threshold of foraging as defined by Millers index in the supplementary guidance through successive foraging contacts. It should be noted that greater horseshoes in particular recorded low rates of foraging than in land surveyed to the south as part of the surveys to inform the Rectory Farm site. Foraging using the Millar's index was recorded in limited locations within the Site including Locations 7 and 8.

2.5.64 The off-site land surveyed is of a similar level of importance to bats locally with a high proportion of greater horseshoe calls and the confirmation of foraging using the Millers index for both greater and lesser horseshoe species. Overall numbers of bat calls were generally lower than those recorded within the red line boundary presumably due to the lower availability of sheltered areas and well established linear vegetation supporting commuting.

Evaluation

2.5.65 Overall, it is considered that the Site is of **Regional** importance to bats.

**Offer**

Methodology

2.5.66 A search was made along the banks of all water courses and water bodies within the red line boundary and adjoining ditches for up to 100m outside of the red line boundary and their adjacent habitats for otter *Lutra lutra* signs including spraints, tracks, castling, and rolling. The banks of any water courses were searched for the presence or potential for holts or other sheltering areas. An initial survey was undertaken in April during the walkover survey with a detailed survey undertaken for signs of water vole with signs of use



by otter also searched for. A second specific otter and water vole survey was undertaken on the 3<sup>rd</sup> of October 2022 by Henry Sturgess BSc MCIEEM and Matt Jones MSc.

#### Limitations

- 2.5.67 During the second survey some light rain occurred in the previous day which had the potential to have washed some field signs such as spraints away. Given the two surveys undertaken this is not considered a significant limitation to the survey effort.

#### Desk Study Information

- 2.5.68 Otters are a Local BAP species listed in the North Somerset Biodiversity Action Plan. Four records of otter holts were provided by BRERC as sensitive records (1km grid square records), the most recent of which was from 2012. Due to the nature of sensitive records these could be present within 1km of the Site but no exact position is provided. The grid squares provided by the desk study are to the southeast (500m from the red line boundary at its closest point) and north west of the Site (900m at its closest point). A further 18 records of field signs or sightings were provided since 2010 in the surrounding 2km. The closest of which is 600m to the northeast of the Site. The concentration of records along the Congresbury Yeo is also significant indicating this is a habitat feature of great value to this species.

#### Field Survey Results

##### *Habitat evaluation*

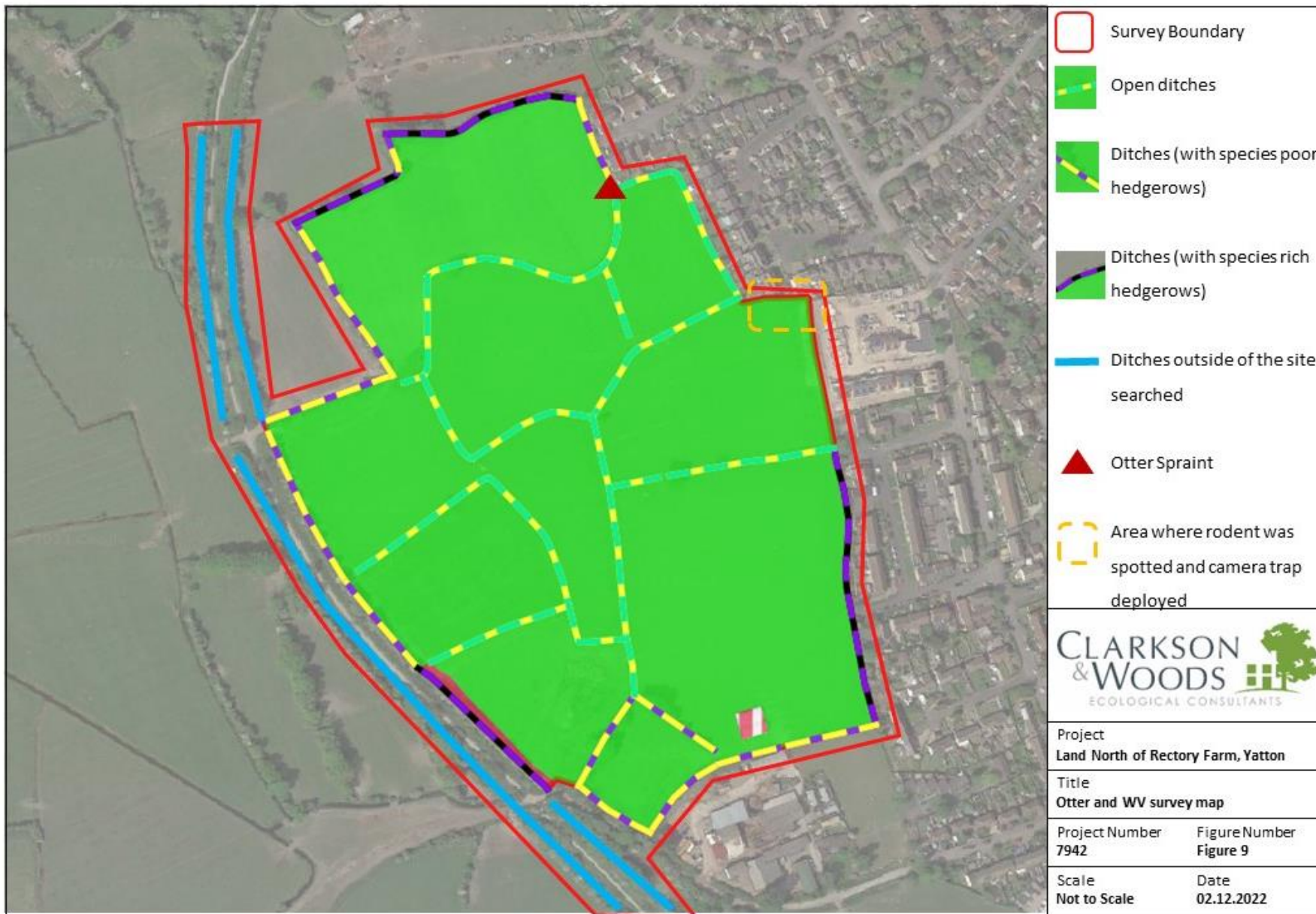
- 2.5.69 The ditches within the Site offer limited opportunities for foraging otter with prey items likely limited to small fish and potentially fresh water mussels (if present in the eutrophic waters). It is not considered the ditches within the Site are of high foraging value for this species as in their current state they are considered suboptimal to support significant populations of freshwater fish due to likely water quality issues due to existing nutrient run-off associated with current farming practices.
- 2.5.70 The ditches within the Site have some commuting value for otters allowing this species to move through the local landscape. They feature good connectivity to the Biddle Street Rhyne ditches and major drains to the west of the Strawberry Line which are likely to provide better foraging opportunities for this species.

##### *Otter Survey results*

- 2.5.71 The initial otter and water vole survey and subsequent October otter and water vole survey did not reveal any evidence of otters using the Site. However, during a reptile survey undertaken on the 28<sup>th</sup> of September an otter spraint was recorded on the corner of D29/D30 on the bankside north of the culverted section which provides access between Fields 9 and 10. This indicates this species will use the internal ditches of the Site on an occasional basis likely for foraging and potentially for shelter. Figure 9 below shows the survey boundary and the ditches surveyed for both otter and water vole surveys along with the location of the otter spraint recorded during the reptile surveys.

#### Evaluation

- 2.5.72 Otter on Site are considered to be of **Local** level importance.







## **Water Vole**

### Methodology

- 2.5.73 The banks of the water courses were searched for water vole *Arvicola amphibius* signs including latrines, burrow entrances, feeding stations, 'runways' and footprints. Surveys and field recording followed the protocol set out within the Water Vole Mitigation Handbook<sup>14</sup> Two survey visits were undertaken the first took place in the early spring on the 22<sup>nd</sup> of April 2022 with a subsequent late season survey undertaken on the 3<sup>rd</sup> of October. The initial survey was undertaken By Henry Sturgess BSc MCIEEM and Miranda Jones BSc with the second survey undertaken by Henry Sturgess BSc MCIEEM and Matt Jones MSc. The survey covered the ditches within the red line boundary and those within 200m of the red line boundary where public access to ditches allowed. The area and ditches covered during the survey are shown in Figure 9 above.

### Limitations

- 2.5.74 During the second survey some light rain occurred in the previous day which has the potential to have washed field signs, such as open latrines, away. Given that two surveys were undertaken, and a range of other field signs were searched for this is not considered a significant limitation to the survey undertaken.

### Desk Study Information

- 2.5.75 Water vole are listed as a priority species in the North Somerset Biodiversity Action Plan. Two records of water vole were returned by BRECR within 2km of the proposals both provide from 2021. The first was 1.5km to the north of the red line boundary to the North of Yatton. A second record was also provided 800m south of the Site on New Rhyne near the Strawberry Line indicating this species is present locally.
- 2.5.76 Survey of the limited ditches and off-site ditches of the Rectory Farm site to the south were undertaken in 2020. No signs of use by water vole were noted during the surveys undertaken.

### Field Survey Results

#### *Habitat suitability*

- 2.5.77 The ditches within the Site are suitable, albeit suboptimal, to support a population of water vole. The large network of ditch features present could provide a suitable extent of habitat to support a good population of this species. Foodplants which are favoured by this species including reed sweet grass, common reed and herbs including lesser water parsnip were present in good densities providing a food source and shelter for water vole. In places, however, vegetation is very poached by livestock and the softer more palatable species are often targeted by sheep reducing the availability of cover and food sources. The rotation of grazing across the various fields generally allows for regrowth across the network which would be sufficient to support a small population.
- 2.5.78 The banks of the ditches are generally suboptimal being shallow and trampled by grazing livestock which limits burrow creation opportunities. Fenced sections of the ditches and small areas which are densely vegetated provide some opportunities for burrowing. The substrates of the banks being a heavy clay are considered suitable for burrow creation. Levels of disturbance from grazing animals and ditch management are considered to be relatively high within the Site.

#### *Water Vole Survey*

- 2.5.79 No signs of water vole were recorded during either of the water vole surveys undertaken. Burrows, latrines, feeding signs and runs were all absent. The conspicuous lack of feeding signs and runs on all ditches suggests the ditches are not used by foraging water vole. Furthermore the lack of latrines and burrows on all of the ditches surveyed indicates the Site does not currently support a population of water vole.
- 2.5.80 During the second survey a rodent of similar size to a water vole was spotted swimming to the bank of at the junction of D30/31 observed by one of the surveyors at distance. As a precautionary measure a trail

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<sup>14</sup> Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series)*. Eds. Fiona Mathews and Paul Chanin. The Mammal Society, London.





cam was left covering the location for 9 days to ensure that water vole were not present in very low numbers at this location and had been missed by the two surveys. The trail cam recorded footage of mallards *Anas platyrhynchos* but no water voles or other rodents were recorded. Residents were asked if they had observed this species using the ditches in the past. They indicated that they had not seen water vole but rats are often present in the back gardens of the adjacent properties.

- 2.5.81 It is considered water vole are currently absent within the Site but due to the large extent of interconnecting ditches present locally and records of this species within 1km it is considered future colonisation by this species is a possibility particularly if the current level of disturbance of the ditches is reduced.

#### Evaluation

- 2.5.82 Water vole are considered to be absent within the Site and are therefore of **Negligible** importance.

#### **Dormouse**

##### Methodology

- 2.5.83 Any hedgerows, scrub and woodlands were assessed during the walkover for their suitability to support dormice *Muscardinus avellanarius*. Particular consideration was paid to the abundance of food sources within them, density for nesting and overnight shelter and the strength of connectivity to other suitable habitats leading off site. In addition, any direct sightings, nests or feeding signs during the Site visit were also recorded. Where hazel *Corylus avellana* was recorded on Site, a search for gnawed hazelnuts was conducted.

##### Limitations

- 2.5.84 No specific survey for dormice *Muscardinus avellanarius* has been undertaken in this instance due to the low likelihood of impacts to this species. Given the relatively small extents of suitable habitat available and the avoidance of impacts to these habitats it is not considered a significant limitation to the overall assessment.

##### Desk Study Information

- 2.5.85 Dormouse are listed as a priority species under the UK Biodiversity Action Plan and is listed as a species of principal importance under the NERC act (2006). Dormice are known to be present 2km away in the Kings and Urchin Wood SSSI with a high population density known at this site. no records relating to this species were returned by the data search provided by BRERC.

##### Field Survey Results

###### *Connectivity*

- 2.5.86 The western and northern hedgerows connect into the Strawberry Line LNR which then connects into a large network of hedgerows locally. These indirectly link the Site with known populations of dormice through a network of hedgerows which may allow dormice to colonise the Site and local area.

###### *Habitat suitability*

- 2.5.87 The Site itself contains a network of hedgerows which are suitable to support a limited number of hazel dormice. The western and northern hedgerows are tall and dense and provide some foraging potential from hawthorn, blackthorn, alder and a range of other fruit bearing shrubs. Diversity of hedgerow species is relatively low which reduces suitability for use by dormice throughout the year. The low-lying nature of the Site and surrounding land would make hibernation for dormice at ground level suboptimal, the high water table making creation of hibernation nests by this species risky. The lack of a large number of mature trees within the hedgerows reduces potential shelter features for dormice.
- 2.5.88 Despite a population of dormice being present within 2km of the proposals and the relatively strong connectivity it is considered the local topography and lack of records within these low-lying areas that dormice are likely to be absent within the Site. If dormice are present it is likely limited to low numbers of individuals dispersing through the local area using hedgerows and scrub associated with the Strawberry Line LNR.



## Evaluation

- 2.5.89 Dormice (if present) are considered to be of **Local** importance.

### **Great Crested Newts and Toads**

#### Methods

- 2.5.90 All waterbodies within 250m of the Site were identified using Ordnance Survey maps and aerial imagery. Waterbodies within the Site ownership and on publicly accessible land were assessed during the field survey for their suitability to support amphibian species where access was possible.
- 2.5.91 Where suitable water bodies were identified on accessible land a Habitat Suitability Index (HSI) score was calculated for each one following the methodology described by Oldham et al<sup>15</sup>. HSI scores give a relative indication of the likelihood that a water body would support breeding great crested newts (GCN). Factors which increase these scores include the presence of other ponds nearby, water quality, pond size, absence of fish/waterfowl, vegetation cover and shading.
- 2.5.92 Where permission and access could be arranged GCN eDNA surveys were undertaken of the potentially suitable waterbodies within 250m of the red line boundary. These were undertaken in line with the guidance provided in the Technical Advice Note provided by DEFRA<sup>16</sup> with analysis if samples undertaken by ADAS to test for the presence likely absence of great crested newts.
- 2.5.93 Terrestrial habitats were also assessed for their suitability for foraging and sheltering great crested newts. This species requires habitats such as grassland, scrub, woodland and hedgerows for dispersal and hibernation. Further hibernation features include buried rubble and logs, or mammal burrows.
- 2.5.94 Ditches were not subject to eDNA survey as they are generally considered less suitable for GCN breeding. This is due to the presence of fish, flow of water in channels (which can result in GCN DNA being detected from locations outside of the survey area).

#### Limitations

- 2.5.95 No specific limitations were encountered during the walkover survey. The GCN eDNA sampling was undertaken in line with the technical advice note as far as possible. Accessibility of Pond 1 was limited which reduced the ability to sample all sides of this waterbody. As a result, the samples were taken from one side of the pond which although sub-optimal is not thought to have presented a significant limitation to the survey. The ditches which intersect the Site were not surveyed using the eDNA method due to the low suitability of ditch habitats to support breeding GCN and the potential for weak flow within the ditches to carry GCN DNA from areas outside of the Site. Due to the low suitability of these features, it is not considered a significant limitation to the survey undertaken.

#### Desk Study Information

- 2.5.96 No toad crossing points were recorded within 2km but 8 records of toads were provided by the data search the closest of which was adjacent to the Site in the former titan ladder factory around 20m from the red line boundary to the east. 6 records of common frog were returned along with 6 records of smooth newt and 3 records of palmate newt.
- 2.5.97 A protected species records search on Magic map revealed a number of negative records for GCN presence in local ponds associated with historic eDNA survey results reported as part of licence returns. This includes a record of likely absence in Pond 1 (which is surveyed again as part of this application) and another farm pond located 475m to the south of the red line boundary. The closest record of GCN presence was returned from a licence return record 600m to the north of the Site to the north of the village of Yatton. This is a record relating to GCN found in an ornamental garden pond close to Stowey Rhyne. The only other record within 2km relates to a positive record for GCN presence south of Claverham. A single

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<sup>15</sup> Oldham, R.S., Keeble L., 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.

<sup>16</sup> 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. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford.

record was returned relating to this species from BRERC which recorded 2 larvae in a pond 650m to the north of the Site on the fringes of Yatton.

- 2.5.98 The Site falls within both the green and amber District Level Licence (DLL) zones for North Somerset. Fields 1, 2, 3, 4 and 5 fall within or partially within the amber zone with the remainder of the Site sitting in the green zone for DLL licencing.

*Field Survey Results*

- 2.5.99 The initial desk study identified two ponds within 250m of the red line boundary. Pond 1 was located within 20m of the red line boundary adjacent to Field 1. Pond 2 is 85m to the south of the red line boundary in land managed within the Congresbury Yeo, adjacent land and rhynes SSCI. This has been created in the past few years and managed by Yatton and Congresbury Wildlife Action Group (YACWAG). A further feature was also sampled labelled as Pond 3 constituting of a spur to the Biddle Street Rhyne around 40m to the south of the Site on the western side of the railway path. The location of these features is provided below in Figure 10.

*Habitat suitability index and eDNA survey results*

- 2.5.100 The ponds and waterbodies identified were subject to a Habitat Suitability Index assessment and samples were collected to undertake the GCN eDNA survey the results of which are provided below in Table 11. The two ponds sampled are suitable for use by breeding GCN containing water and aquatic vegetation. Pond 1 was more established but featured high levels of cover of Water Soldier *Stratiotes aloides* which is a rare species outside of eastern England. Pond 2 had recently been created/expanded and connected to the local ditch network via a large channel. Due to the recent expansion this pond had limited aquatic vegetation but a good fringe of common reed and ruderals were present. Pond 3 was a purposely enlarged section of a rhyne which forms part of the Biddle Street SSSI which had been expanded to create a deeper, wider pond like area. Flow in these rhynes was imperceptible, as such it was considered appropriate to sample this feature despite its function as part of a drainage channel. This waterbody was shaded by woody vegetation but featured marginal and floating species of aquatic plants.

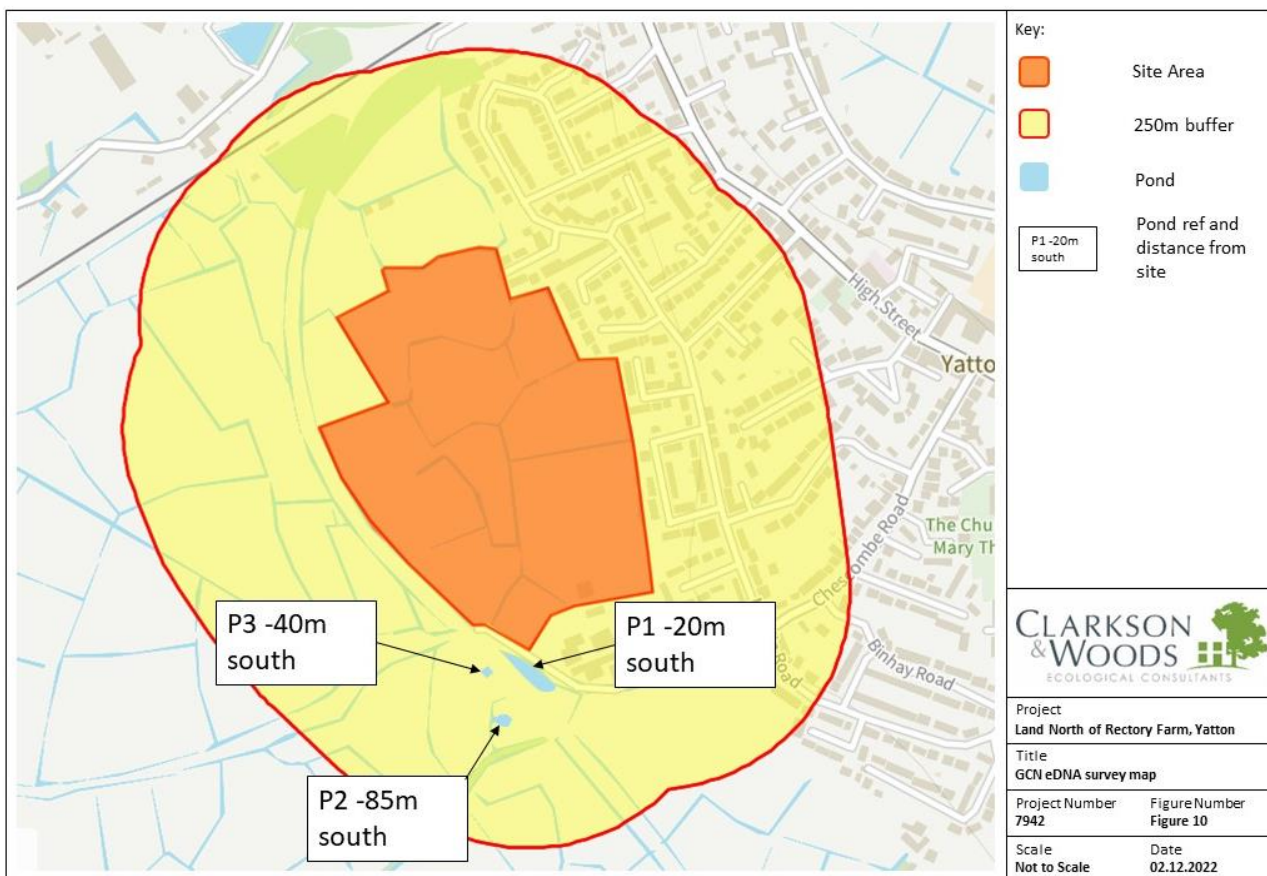


Figure 10: GCN eDNA Survey Map



**Table 11: GCN eDNA survey results.**

Pond reference	HSI score	eDNA survey result	Pond description
Pond 1	0.78 (Good)	<b>Negative</b> (likely absence of great crested newts)	Approximately 700m <sup>2</sup> this large pond which is used to attenuate surface runoff is old and established. It was predominantly shaded by woodland vegetation and contained wide variety of aquatic plants including reeds, water soldier, water mint <i>Mentha aquatica</i> and brooklime. Cover of duckweed was also high. At the time of survey water levels were low with 20-30cm of water
Pond 2	0.52 (Below average)	<b>Negative</b> (likely absence of great crested newts)	A recently created pond of around 100m <sup>2</sup> which connects to the local network of rhynes. This feature was sparsely vegetated but contained up to 1m of water which was clear and free from signs of eutrophication.
Pond 3	0.58 (Below average)	<b>Negative</b> (likely absence of great crested newts)	This waterbody is an enlarged spur of the Biddle Street SSSI rhyne which adjoins the western side of the Strawberry Line rail path. This feature was relatively small 60m <sup>2</sup> but would be suitable to support breeding amphibians. The rhyne was covered in duckweed indicating high nutrient levels.

- 2.5.101 Habitat suitability within the Site is relatively poor with the short-grazed grasslands providing little foraging or sheltering habitat for amphibians. The field edges, bases of hedgerows and margins of ditches are suitable but are considered to be limited in their extent and suboptimal to support a population of GCN. Reptile and water vole surveys recorded other widespread species of amphibian such as frogs and toads using the margins and ditches on several occasions. It is also possible some smooth newt may also be present within these features. The Site is considered to support a population of widespread amphibians.
- 2.5.102 Records of GCN to the north of Yatton are sparse and records of this species on the lower lying land such as the Somerset levels and Moors or the Congresbury Yeo floodplain are typically patchy in distribution. It is considered this may be due to the fish or waterfowl which populate extensive ditch networks of this nature or the poor diversity of habitats and shelter features present. In any instance the local topography and land use likely inhibit the establishment of GCN populations locally.
- 2.5.103 Given the result of likely absence returned from the GCN eDNA testing of ponds and suitable waterbodies within close proximity to the Site and the results of the data search it is considered great crested newts are likely to be absent within the Site and the immediate area.

#### Evaluation

- 2.5.104 Toad and other widespread amphibians are considered to be of **Site** importance.
- 2.5.105 Great crested newts are likely to be absent and are considered to be of **Negligible** importance.

#### **Reptiles**

##### Methods

- 2.5.106 Features on the Site were assessed for their potential to provide suitable habitats for use by reptile species. These include rough, tussocky grassland, scrub, disturbed land or refugia such as wood piles, rubble or compost heaps. Where present, suitable existing refugia were inspected for sheltering reptiles, and the ground was scanned whilst walking to look for basking species.
- 2.5.107 As a result of the initial habitat suitability assessment a reptile survey was undertaken in line with the froglife 'surveying for reptiles'<sup>17</sup> guidance. The survey utilised 126 refugia consisting of bitumen felts (106) steel tins (10) and a limited number of carpet tiles (10). The location of the refugia is provided below in Figure 11 Seven survey visits were undertaken between 25<sup>th</sup> of August and the 12<sup>th</sup> of September 2022. The dates,

<sup>17</sup> <https://ww6w.froglife.org/wp-content/uploads/2013/06/Reptile-survey-booklet-3mm-bleed.pdf>



weather conditions and surveyors are included in Table 12 below. A population class size assessment is made using the froglife advice sheet 10<sup>18</sup>.

**Table 12: Reptile survey visit details.**

Survey number	Date/(time)	Surveyor(s)	Weather conditions
1	25/08/2022/ (08:30-10:00)	HS & MJ	Dry and sunny, 17°C, Cloud 3/8, Wind 1
2	01/09/2022/ (08.45-10.00)	HS LB	Dry, warm and overcast, 18°C, Cloud 7/8, Wind 2
3	05/09/2022/ (09.15-10.00)	MB MIJ	Dry and overcast 17°C, Cloud 6/8, Wind 2
4	14/09/2022/ (09.00-10.15)	MB	Clear and dry, 14°C, Cloud 3/8, Wind 2
5	19/09/2022/ (17:00-18:30)	HS	Dry, humid and overcast. 17°C, Cloud 6/8, Wind 2
6	28/09/2022/ (11.05-13.10)	LB	Dry and sunny. 13°C, Cloud 4/8, Wind 4
7	03/10/2022/ (12:30-16:30)	HS/MJ	Clear, dry patches of sun. 14-16°C, Cloud 2/8, Wind 1



**Figure 11: Reptile Refugia Map**

### Limitations

2.5.108 The reptile survey was undertaken in the late summer and autumn in a year when temperatures during August and September were routinely high (often only dropping to 16°C overnight). Due to this, surveying the refugia during suitable weather conditions (10-18°C) was challenging. As a result, the surveys ran into

<sup>18</sup> Froglife (1999) Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife, Halesworth.





early October which is outside of the optimal survey time for reptiles. Given the weather had remained suitable at this time with overnight temperatures consistently above 10°C it is considered unlikely that reptiles had decreased activity or moved towards hibernation. It is not considered to be a significant limitation to the results or conclusions of the survey undertaken.

- 2.5.109 Levels of trampling of refugia by livestock was relatively high and around 10-20% of the overall refugia deployed were moved or damaged by livestock during the surveys. This is considered a minor limitation to the surveys effectiveness. No injured reptiles were found under any mats and where mats were routinely damaged they were moved to alternative positions within the core survey areas indicated.

#### Desk Study Information

- 2.5.110 The desk study from BRERC returned the following records of reptiles within 2km. 12 records relating to slow-worm were returned the closest of which was 300m to the east in a residential compost bin. Further records are present throughout Yatton and Congresbury. Records of grass snake were also returned with 6 records the closest of which was 800m to the east. A single record of common lizard was also provided from a garden 500m to the north of the Site. further C+W in house records relating to Yatton provided records of slow-worm and grass snake to the south of the Site within 100m from surveys undertaken to inform the proposals at the Rectory Farm development.

#### Field Survey Results

##### *Habitat suitability*

- 2.5.111 The Site had limited habitats of suitability for reptiles which included the field margins, ditches and the bases of hedgerows. The grassland within the body of the Site was generally short and frequently grazed lacking the cover features and habitat heterogeneity favoured by reptile species.

##### *Field Survey Results*

- 2.5.112 Due to the known presence of reptiles including grass snake and slow-worm locally it was considered proportionate to undertake a reptile survey of the suitable habitat within the Site to inform the presence/likely absence and distribution of reptiles present. Table 13 below shows the results of the reptile survey and Figure 12 shows the location of all reptiles recorded during the surveys undertaken.

**Table 13: Reptile survey results**

Survey number	Slow-worm			Grass snake		Other species recorded	Total Slow-worm	Total Grass snake
	Male	Female	Sub adult	Adult	Sub-adult			
1	0	0	0	1	0	Field vole & toad	0	1
2	0	0	0	1	0	-	0	1
3	0	0	0	0	0	-	0	0
4	0	0	1	0	0	4 vole	1	0
5	0	0	1	1	0	Field vole	1	1
6	0	1	2	0	0	-	3	0
7	1	1	2	0	0	Frog x 2, field vole	4	0
<b>Total per species/sex</b>	1	2	6	3	0	<b>Total per species &gt;</b>	9	3



Figure 12: Reptile survey results



- 2.5.113 As can be seen from the results of the surveys the Site supports a small population of slow-worm and grass snake which are present along the eastern boundary (adjacent to off-site gardens). Reptiles recorded were limited to a very small area of the overall Site. The peak count of adult slow-worm was 2 individuals, with the peak count of adult grass snake being 1. Overall, it is considered that the populations of both species recorded is consistent with a 'Low' population size with a peak count of less than 5 adult individuals recorded during every survey undertaken. It is considered that the reptiles recorded are concentrated on the marginal habitats adjoining gardens to the east. It is possible the gardens form the core habitat for the population of slow-worm recorded. It is considered likely that slow-worm and likely grass snake may use the banks of the ditches and other field margins in very low numbers.
- 2.5.114 The longer grassland areas and the margins of ditches represent suitable foraging and sheltering habitats for these species. They are likely limited primarily due to the high level of disturbance from livestock and lack of suitable shelter and hibernation habitats within the Site.

#### Evaluation

- 2.5.115 The reptile population recorded on Site is considered to be of **Local** importance.

#### **Birds**

#### Methodology

- 2.5.116 Any buildings and vegetation were surveyed for signs of use by nesting birds and any birds incidentally seen or heard during the baseline survey were noted. The Site's potential to support bird species of particular conservation concern (i.e. Schedule 1, NERC S41 and Red List species) was assessed, taking into consideration the bird species assemblage observed during the survey, the habitats present on and around the Site, the context of the Site in the wider landscape and the results of the desk study.
- 2.5.117 Due to the relatively open nature of the Site a scoping survey for breeding birds was undertaken to ascertain if ground nesting birds or wetland assemblages were present. A single breeding bird survey was undertaken by Mike Hockey BSc MCIEEM on the 15<sup>th</sup> of June 2022 to ascertain level of use by breeding bird and to try and identify any rare or notable species which utilise the Site. The survey started at 07:00 and continued until 09:10, the surveyor walked all the boundaries and central habitat features recording all of the birds encountered using the standard BTO methodology<sup>19</sup>.

#### Limitations

- 2.5.118 A single survey was undertaken as a scoping exercise to inform the proposals potential impacts on breeding birds associated with the Site. A full seasons survey was not considered necessary in this instance, no specific limitations to the survey were identified. The results of the survey are reported in table form and a discussion of the conservation significance of the assemblage is provided, no mapping has been produced for this survey data.

#### Desk Study Information

- 2.5.119 A large number of bird records relating to the surrounding 2km since 2010 were returned from BRERC. The following Amber listed species were returned; kestrel *Falco tinnunculus*, merlin *Falco columbarius*, peregrine *Falco peregrinus*, barn owl *Tyto alba* green woodpecker *Picus viridis*, bullfinch *Pyrrhula pyrrhula*, dunnock *Prunella modularis*, whitethroat *Sylvia communis*, willow warbler *Phylloscopus trochilus*, reed bunting *Emberiza schoeniclus*, stonechat *Saxicola rubicola*, wren *Troglodytes troglodytes*, goldcrest *Regulus regulus*, grey wagtail *Motacilla cinerea*, house martin *Delichon urbicum*, swallow *Alauda arvensis*, swift *Apus apus*, black redstart *Phoenicurus ochruros*, kingfisher *Alcedo atthis*, meadow pipit *Anthus pratensis*, mistle thrush *Turdus viscivorus*, nightingale *Luscinia megarhynchos*, teal *Anas crecca*, , mute swan *Cygnus olor*, mallard *Anas platyrhynchos*, Little egret *Egretta garzetta*, cormorant *Phalacrocorax carbo*, snipe *Gallinago gallinago*, lesser black-backed gull *Larus fuscus*, black-headed gull *Chroicocephalus ridibund* and, water rail *Rallus aquaticus*.

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<sup>19</sup> Marchant, J.H. 1983. Common Birds Census instructions. BTO, Tring. 1



2.5.120 The following red listed species were returned house sparrow *Passer domesticus* linnet *Linaria cannabina*, spotted flycatcher *Muscicapa striata*, song thrush *Turdus philomelos*, skylark *Alauda arvensis*, fieldfare *Turdus pilaris*, redwing *Turdus iliacus*, starling *Sturnus vulgaris*, lapwing *Vanellus vanellus* and herring gull *Larus argentatus*.

Field Survey Results

Habitat suitability

2.5.121 The habitats within and surrounding the Site offer some suitable habitat for foraging and nesting birds. The open fields are suitable for use by selected ground nesting species such as skylark due to their long unimpeded sight lines but the stocking density of sheep, horses and domestic fowl reduce suitability considerably due to disturbance. Foraging potential of this habitat is limited due to regular management and grazing. The ditches are suitable for use by waders, ducks and other waterfowl but the stocking of the fields and the relatively sparse vegetation along many of the central ditches limits suitability for nesting. Foraging potential of these habitats is good for a range of species particularly insectivorous species. The hedgerows and trees represent the best breeding and foraging habitats available within the red line boundary. Hedgerows that form the boundaries around Field 1 along with the western and northern hedgerows are of the highest quality being tall, thick and dense. The western and southern hedgerows are generally sparser and less suitable for nesting by common species. All of the hedgerows represent good foraging habitat for fruits and invertebrates and are likely to support a good range of common garden and farmland bird species.

*Breeding bird scoping survey*

2.5.122 Bird species of conservation concern recorded during the breeding bird survey are summarised below in Table 14. A full table of results are provided in Appendix G listing the numbers of all species recorded and their use of the broad habitats within the Site. A discussion of the significance of results is set out below.

2.5.123 In total 27 species of bird were recorded using the wider Site during the scoping survey. Species which are not of conservation concern were limited to common garden birds such as robin *Erithacus rubecula*, blackbird *Turdus merula* and chiffchaff *Phylloscopus collybita* or common species associated with wetland habitats including moorhen *Gallinula chloropus*, mallard *Anas platyrhynchos* and reed bunting *Emberiza schoeniclus* which were also recorded in low numbers and were associate with the central ditch habitats.

**Table 14: Bird Species of Conservation Concern Recorded During the Breeding Bird Scoping Survey**

Species	Latin	Conservation status
Dunnock	<i>Prunella modularis</i>	Amber listed/ SoPI under the NERC Act 2006
Greenfinch	<i>Chloris chloris</i>	Red Listed
Herring gull	<i>Larus argentatus</i>	Red Listed/ SoPI under the NERC Act 2006
House sparrow	<i>Passer domesticus</i>	Red Listed/ SoPI under the NERC Act 2006
Lesser black-backed gull	<i>Larus fuscus</i>	Amber listed
Reed bunting	<i>Emberiza schoeniclus</i>	Amber listed/ SoPI under the NERC Act 2006
Rook	<i>Corvus frugilegus</i>	Amber listed
Song thrush	<i>Turdus philomelos</i>	Amber listed/ SoPI under the NERC Act 2006
Sparrowhawk	<i>Accipiter nisus</i>	Amber listed



Species	Latin	Conservation status
Starling	<i>Sturnus vulgaris</i>	Red Listed/ SoPI under the NERC Act 2006
Woodpigeon	<i>Columba palumbus</i>	Amber listed
Wren	<i>Troglodytes troglodytes</i>	Amber listed

- 2.5.124 The species of conservation concern were limited to relatively common species associated with gardens and farmland. The majority of birds recorded were associated with the boundary habitats. Species including dunnock, greenfinch, song thrush and wren are all strongly associated with the hedgerow habitats and occur in low numbers. The highest numbers were recorded in hedgerows H8, H9 and H10 alongside the Strawberry Line LNR.
- 2.5.125 Herring gull and lesser black-backed gull were recorded either flying over the Site or foraging in the open fields with very low numbers of these species recorded. Sparrowhawk was recorded in a hedgerow bounding the strawberry line and woodpigeon were recorded in low numbers in the boundary habitats and open fields with two individuals recorded flying over the Site.
- 2.5.126 House sparrow and starling were recorded in good numbers. House sparrow were recorded perched in hedgerows but are likely to be associated with the houses and farm buildings to the south and east of the Site. Ten starling were recorded in the mid field habitats perching on the Turkey enclosure with a flock of 100 seen flying over the Site. A further 63 individuals were recorded in smaller groups using the boundary hedgerows.
- 2.5.127 It is considered likely that dunnock, greenfinch, reed bunting, song thrush, wood pigeon and wren have the potential to breed within the boundary hedgerows or the ditches of the Site. Other species of conservation concern are likely to be limited to foraging within and surrounding the Site.
- 2.5.128 Of the broad habitat types the boundary hedgerows were used the most frequently with 47% of all birds recorded in this habitat type. Around 40% of the individuals recorded were attributed to birds flying over the Site. The remaining broad habitat types included the open field habitats which accounted for 10% of the individuals recorded and the ditches which accounted for just 1.7% of the overall individuals recorded during the survey. This data indicates that the boundaries are the most important habitats.
- 2.5.129 It is considered that based on the survey results the Site supports a good assemblage of common garden and farmland birds including a proportion of conservation concern. Notable numbers of house sparrow and starling were recorded. A low number of species were recorded using the ditch habitats including reed bunting, reed warbler, moor hen and mallard. No further survey for breeding birds was considered necessary given the lack of ground nesting and specialist wetland birds recorded during the scoping survey.

#### *Wintering Birds*

- 2.5.130 A wintering bird survey was not considered necessary in this instance due to the low quality of the habitats present for species such as overwintering waders. The proximity of the Site from designated sites for wintering birds was also a factor. It is considered that the boundary hedgerows of the Site may be used by low numbers of overwintering thrushes such as fieldfare *Turdus pilaris* and redwing *Turdus iliacus*.

#### Evaluation

- 2.5.131 The assemblage of birds recorded during the breeding bird survey are considered to be of **Local** importance.

#### ***Invertebrates***

#### Methods

- 2.5.132 Any notable invertebrates identified during the survey were recorded. The habitat was also assessed for its suitability for notable invertebrates, including the presence of specific species known to be foodplants or





larval plants or habitats which may be favoured by invertebrates (such as bare ground, deadwood or grass tussocks). The habitat structure was also considered, such as mosaics, brownfield or unmanaged areas.

#### Limitations

- 2.5.133 No specific limitations were identified in relation to the assessment of the value of the Site for invertebrates.

#### Desk Study Information

- 2.5.134 The desk study identified the presence of notable invertebrate species associated with the adjacent Biddle Street SSSI along with similar assemblages in the nearby Tickenham, Nailsea and Kenn Moors SSSI and Puxton Moor SSSI. These sites support a diverse assemblage of aquatic invertebrates associated with botanically rich ditch networks. Species of note returned by the data search from BRERC are extensive. These records are reproduced in Appendix C. Overall the records returned within 2km constitute a diverse assemblage of aquatic beetles, snails, dragonflies associated with the local ditch habitats as well as a diverse assemblage of butterflies and moths. Cockchafer and rose chafer beetles are present locally along with a range of wasps, bees and sawfly. Overall, the assemblage of invertebrates returned by BRERC indicates the local area has a diverse population of invertebrates of conservation significance.

#### Field Survey Results

- 2.5.135 The Site contained some habitats of potential value to invertebrates including potential for dung beetles and macro moths associated with the open fields and grazing livestock. The hedgerows have the potential to provide habitat for a wide range of generalist species and include limited amounts of deadwood suitable for use by saproxyphytes. The ditches or rhynes of the Site provide the most unique habitat with marginal, emergent and in channel vegetation and open standing water. These have the potential to support a range of aquatic invertebrates. Currently the level of eutrophication in the ditches from agricultural pollution is likely to limit their value to aquatic invertebrates. High levels of nitrogen and phosphates will limit available oxygen and are known to reduce invertebrate diversity.
- 2.5.136 It is considered the Site is likely to support a range of common invertebrates and potentially a limited assemblage of specialist aquatic invertebrates. It is considered unlikely that the habitats present support an assemblage of invertebrates of conservation significance given the current grassland and ditch management.

#### Evaluation

- 2.5.137 The assemblage of widespread invertebrates are considered to be of **Site** importance.

### **Other Protected Species and Species of Conservation Concern**

#### Methods

- 2.5.138 The data search and initial site walkover were used to consider the likely presence of other protected species or species of conservation concern including invasive species. The following specific species are considered as part of this assessment Eurasian hedgehog *Erinaceus europaeus*, harvest mouse *Micromys minutus*, brown hare *Lepus europaeus* and a range of invasive plant species listed in Schedule 9 of the Wildlife and Countryside Act.

#### Limitations

- 2.5.139 Invasive plant species can become established in a short period of time. It is also possible if small areas of the Site had low numbers of invasive plants present that they may have been missed by the survey.

#### Desk Study Information

- 2.5.140 The following species of relevance were returned by the data search. Hedgehog appear to be locally abundant with 80 records returned by BRERC. The majority of these were records from 2020 and 2021 returned from local gardens. The closest record was from Shiners Elms just 10m from the eastern Site boundary. A single record of harvest mouse was returned by BRERC 850m to the north of the proposals within Ken Moor from trapping data. Three records of brown hare were returned the closest of which was 750m to the south in the YAKWAG Congresbury Moor reserve a further record 850m to the north on the northern side of Yatton at the YAKWAG Stowey Reserve. A further record of a road casualty was provided from Moor Rd.



2.5.141 The following invasive plant species were also returned by the data search: Nuttall's water-weed, Canadian waterweed, water fern, three cornered garlic *Allium triquetrum* and giant rhubarb. The closest invasive species record related to water fern which was present 600mm to the south of the site in a ditch to the west of the Strawberry Line.

Field Survey Results

2.5.142 The habitats of the Site are considered suitable to support Eurasian hedgehog being close to suburban development and within farmland a mix of habitats which are favoured by this species. It is unlikely that hedgehog use the Site extensively but there is potential for use as part of this species range. Harvest mouse are likely to be absent due to the limited extents of long grassland which are favoured as nesting habitat by this species. Brown hare are also likely to be absent due to the relatively small field sizes present and the lack of sightings during all of the further surveys undertaken on site.

2.5.143 No invasive species were recorded within the red line boundary during the walkover survey. Water fern *Azolla filiculoides* was recorded close to the Site within the ditches which form part of the Biddle Street SSSI surrounding the fields proposed as bat compensation habitat. This species can cover standing water habitats in a relatively short period of time and will harm native watercourses through outcompeting native aquatic plants. It is possible that this species will establish within the ditches of the Site in future if it is carried onto site by waterfowl.

Evaluation

2.5.144 Other protected species and species of conservation concern specifically Eurasian hedgehog are considered to be of **Site** importance.

2.5.145 Invasive non-native plant species are considered to be currently absent and therefore of **Negligible** importance.

**2.6 Summary of Ecological Importance**

2.6.1 Table 15 below gives all the identified ecological features on Site and their individual assessment of importance. Those coloured green are considered to be Important Ecological Features and will form the basis of the Assessment of Effects in Section 5. Those coloured yellow will be included on the basis of their specific legal protection or applicable planning policies.

**Table 15: Ecological Importance**

Feature	Importance
Designated Sites	
Severn Estuary Special Area of Conservation (SAC), Special Protected Area (SPA), RAMSAR and Site of Special Scientific Interest (SSSI)	International (outside ZOI)
North Somerset and Mendip Bats Special Area of Conservation (SAC)	International
Biddle Street, Yatton SSSI	National
Tickenham, Nailsea and Kenn Moors SSSI	National
Kings Wood and Urchin Wood SSSI	National
Puxton Moor SSSI	National (outside ZOI)
Congresbury Yeo, adjacent land and rhynes SNCI	Local
Cheddar Valley Railway Walk LNR/ Strawberry Line LNR	Local
Stowey Fields and Rhynes SNCI	Local (outside ZOI)



Feature	Importance
Nailsea and Tickenham Moors SNCI	Local (outside ZOI)
Horsecastle Pond SNCI	Local (outside ZOI)
Habitats	
Modified grassland	Site
Hedgerows	Local
Mature trees	Local
Ditches	Local
Scattered scrub	Site
Species	
Badgers	Site
Bats	Regional
Otter	Local
Water vole	Negligible
Dormouse	Local
Great crested newt	Negligible
Toads	Site
Reptiles	Local
Birds	Local
Other species of conservation concern	Site
Invasive non-natives	Negligible



### 3 ASSESSMENT OF EFFECTS

#### 3.1 Methodology

- 3.1.1 Continuing from the valuation of Important Ecological Features (IEFs), this section lists each IEF in turn together with a characterisation of any potential impacts upon them likely to arise from the proposals. This takes into consideration any measures inherent to the designed scheme which seek to avoid such impacts altogether. Next, any agreed mitigation measures chosen to reduce likely impacts are then set out, along with the mechanism(s) through which these would be secured.
- 3.1.2 Residual effects, being those effects which would likely still arise despite any avoidance measures or agreed mitigation efforts, are subsequently discussed. Residual effects are determined to be either significant or not significant and any significant residual effects are given a geographical scale at which they might be felt. This assessment methodology is in accordance with that set out in the CIEEM Guidelines for Ecological Impact Assessment, 2018.
- 3.1.3 Where residual effects are identified compensatory measures may be proposed to make up for the loss or permanent damage to an IEF, as far as possible. If applicable, recommendations are provided for any further work that might be required to determine baseline conditions, to help identify impacts or determine the necessary mitigation. This document should be updated to reflect the new findings and their implications as they arise. Monitoring or management schemes which may be necessary to ensure the long-term achievement of all intended mitigation and compensation are discussed.
- 3.1.4 Where potential for cumulative impacts upon IEFs in association with other proposed or ongoing local development are identified these are described as appropriate for the affected IEF. The Zone of Influence for each IEF, together with their level of ecological importance will be of relevance when considering the scope of a cumulative impact assessment.
- 3.1.5 Ecological enhancement measures that will be incorporated into the development are given in line with the National Planning Policy Framework.

#### 3.2 Biodiversity Impact Assessment Calculator

- 3.2.1 In line with the Environment Act and NPPF planning guidance, a Biodiversity Impact Assessment score has been calculated for the Site using the Biodiversity Metric 3.1 Calculation Tool. The metric was used to calculate the biodiversity value of area and linear habitats both before and after development. It has been used as a proxy measure to determine if the development is likely to result in an on-site habitat biodiversity net loss or gain.
- 3.2.2 Biodiversity Net Gain calculations headline results are provided below and the condition assessments and detailed noted on BNG are detailed within Appendix H. The BNG mapping was based upon the Illustrative Landscape Masterplan, SLR Consulting, YW-034 REV D March 2023.

#### 3.3 Summary of Development Proposals

- 3.3.1 The proposals consist of the construction of up to 190 dwellings, access roads, gardens, parking facilities and other associated infrastructure. The construction of the proposals will remove a large area of the improved grassland from the eastern portion of the red line boundary and smaller areas to the west to construct the SUDS and allotment spaces. Hedgerows and ditches will largely be retained and protected with the exception of portions of Ditches 7, 21 and 24 which will require sections culverting to create the access roads. Hedgerows 2, 6 and 16 along with their associated ditches will also require short lengths to be removed and hedgerow ditches to be culverted to allow creation of the access roads. In addition, some impacts from lighting on these features are anticipated.
- Overall, approximately 10.35ha of modified grassland will be removed to allow the construction of the proposals and formation of the landscaping, along with 71m length of poor quality ditch habitat and a further 33m of hedgerows and associated ditches.

The following habitats are proposed which will mitigate for the loss of low-quality grassland and to compensate for the loss of foraging habitat extent for horseshoe bats.



- 2.6ha of other neutral grassland with scattered native scrub retained and enhanced from the retained modified grassland in field 3, 4, 5 and 6 (2.334ha of which is accessible to horseshoe bats). – Proposed BNG condition Poor
- A further 3ha of habitat surrounding the retained ditches within the development will be created and enhanced through grassland management and planting of scrub mature trees and hedgerow features (Approximately 2ha of this habitat will be available to horseshoe bats.) - Proposed grassland BNG condition Poor
- 0.77ha of native plantation woodland will be planted alongside the western boundary (Available to horseshoe bats) – Proposed BNG condition Moderate
- 0.69ha of SUDS engineered to hold water throughout the year and planted with a fringe of native aquatic plant species to provide maximum wildlife value (0.68ha of which will be available to horseshoe bats) – Proposed BNG condition Good
- 0.15ha of allotment space will also be provided – BNG condition N/A
- Existing hedgerows totalling 266m (H1, H6, H7 and H11) will be enhanced through infill planting and sympathetic management.
- 858 linear meters of new species-rich hedgerow with trees and new species-rich hedgerow with trees associated with a bank or ditch will also be planted (579 linear meters of which will be available to horseshoe bats) – BNG condition Moderate
- 0.263 hectares of formal park (modified grassland managed for amenity) will be created with a scattering of other neutral grassland patches and native cultivars of urban trees planted within it and other public open space grassland (all of which are available to horseshoe bats). – Grassland BNG condition Poor
- 0.51ha of modified grassland managed for amenity will be established within and surrounding and development areas (which will be unavailable to horseshoe bats). – Grassland BNG condition Poor
- 1.06ha of vegetated gardens will also be created – BNG condition N/A
- 0.46ha of newly created hoggins paths and surfaced play areas will be created. BNG condition N/A
- 117 small urban trees are to be provided within the formal landscaping as street trees - BNG condition Poor
- A further 68 small urban trees and 30 medium sized urban trees will be planted within the wildlife mitigation area -BNG condition Moderate
- Up to a further 2.9 ha of off-site habitat contained in two fields to the west of the strawberry line will be enhanced including the off-site land surveyed for bats and an additional adjacent field to compensate for the loss of foraging habitat for both greater and lesser horseshoe bats. This will be enhanced over a fifteen-year period to target a species rich neutral grassland habitat with scattered belts of native scrub.

### 3.4 Designated Sites

#### **Statutory Designated Sites**

##### Potential Impacts

- 3.4.1 Several international and nationally designated sites were identified within the zone of influence of the development.
- 3.4.2 Biddle Street SSSI is located immediately adjacent to the Site and, in the absence of mitigation may be subject to adverse impacts during both construction and operation. Construction impacts are generally limited to pollution and damage through machinery. Operational impacts include pollution events, littering and increased recreational pressure.
- 3.4.3 Tickenham and Kenn Moor SSSI was also identified in the desk study as the proposals sit within the SSSI impact risk zone. There is some potential through pollution and runoff to impact these sites via pollution of the on-site ditches.
- 3.4.4 Kings Wood and Urchins wood SSSI are both considered highly unlikely to be affected directly by the proposals through direct impacts, such as pollution, due to the distance from the Site, however these form





a component part of the North Somerset and Mendip bat SAC. As such the development may result in adverse impacts on the SAC Annex I species through the loss of foraging habitat on Site and potentially the severance of commuting routes in the absence of robust mitigation. Consequently, in the absence of mitigation, proposals may adversely affect the SAC (and SSSI) bat population.

#### Mitigation, Compensation, Enhancement and Monitoring

- 3.4.5 Impacts to the adjacent Biddle Street SSSI will be mitigated through the provision of wide buffers to this feature as part of avoidance of impacts to the SSSI as part of the design of the development proposals. Further mitigation will include the production of a Construction Environmental Management Plan (CEMP) (Biodiversity). The CEMP should include details of measures such as appropriate fencing to protect retained on/off-site habitats, information on any timing restrictions and any species-specific sensitive clearance/management measures. Typically, the preparation of a CEMP will be a conditional requirement of the planning permission. Additionally, this CEMP will detail measures including silt fencing, air and water protection measures, bunding and safe storage and disposal of construction materials to prevent pollution impacts on Biddle Street SSSI. The CEMP will also detail the requirement for regular Site inspections to occur throughout construction, with reports provided to the LPA. Operational impacts to this feature are likely to be modest due to the large offsets of provided between the construction of new dwellings and the ditches which form the SSSI. Ditches within the developed area are also buffered from roads and dwellings by 6-10m offsets in most instances reducing the potential from pollution of these features. The drainage strategy will also help to prevent surface water runoff from entering the ditches directly allowing any particulates from surface water runoff to settle in the SuDs features. The belt of woodland proposed on the western boundary will help to reduce recreational pressure on this feature. Measures to protect the adjacent Biddle street SSSI outlined in the CEMP will also prevent hydrological issues occurring in relation to Tickenham and Kenn Moor SSSI which is a designated network of ditches present 675m north at its closest point.
- 3.4.6 There is potential for the management of the off-site land for horseshoe bats to contribute to the conservation aims of the Biddle Street SSSI through reduction of agricultural impacts, removal of features such as scrub alongside the ditches which currently shade the ditches and reduction of the current level of impacts from grazing livestock. Additional measures such as control of non-native invasive species should also be considered.
- 3.4.7 Further measures to reduce the impacts of recreational pressure on the Biddle Street SSSI are outlined in the non-statutory designated sites section below.
- 3.4.8 Impacts on foraging bats associated with the North Somerset and Mendip Bat SAC, will be mitigated for by the proposed on and off-site habitat provision. This is demonstrated in the HEP calculations undertaken as part of the SAC guidance and is detailed in the bats section below. A shadow HRA will also be prepared to support the application to address issues with cumulative impacts in relation to greater horseshoe bats and the North Somerset and Mendip Bat SAC.

#### Residual Effects

- 3.4.9 As long as the measures proposed in the CEMP and LEMP are implemented no residual adverse impacts are likely to occur on Biddle Street SSSI.
- 3.4.10 Furthermore, the provision of both on and off-site habitat for horseshoe bats provided by the scheme, in line with the North Somerset and Mendip Bat SAC requirements, will maintain the favourable conservation of these species, as qualifying features of the SAC, to ensure no residual adverse impacts occur on the North Somerset bat SAC component sites.

#### **Non-statutory Designated Sites**

##### Potential Impacts

- 3.4.11 The development proposals have the potential to adversely impact the non-statutory designated sites identified in the desk study particularly the Congresbury Yeo, adjacent land and rhynes SNCI and the Cheddar Railway Walk/Strawberry Line LNR which are situated adjacent to the Site on the western boundary. These have the potential to be impacted by pollution from construction activities, such as runoff. There is some potential for Cadbury Hill LNR and the Cheddar Railway Walk LNR to be subject to increased recreational pressure resulting from the additional local residents associated with the proposed development. Impacts from additional use of the Strawberry Line has the potential through general



recreational pressure particularly littering and dog fouling to pollute the adjacent Biddle Street SSSI ditches and impact the Congresbury and Yeo SNCI.

#### Mitigation, Compensation, Enhancement and Monitoring

- 3.4.12 Measures to ensure construction does not result in adverse impacts (specifically those associated with pollution) will be laid out in a CEMP (Biodiversity) produced for the proposals, as detailed above. This will ensure the construction process does not impact these designated sites.
- 3.4.13 The additional recreational pressure from the new residences is likely to be relatively low given the existing pressures on the well-used Strawberry Line LNR from walkers and cyclists. The provision of an additional public open space within the Site will reduce impacts from issues such as dog walking on this feature as far as possible. To further address the main issues anticipated with increased use of the Strawberry LNR and the potential for impacts on the adjacent designated sites (Biddle Street SSSI and Congresbury Yeo SNCI) the development proposals should include provision of additional waste disposal facilities along the path at the junction with the Site (dog waste and general litter). In addition, the development will fund the costs of collection of waste from these features by the local council and make available a fund for additional litter picking to be undertaken on the path to reduce the impacts of recreational pressure from residents associated with the Site. By committing to this the development would ensure the adjacent designated sites can be maintained and enhanced as part of the proposals.

#### Residual Effects

- 3.4.14 If the measures outlined in the CEMP are put into place there should be no residual impacts on the closest non-statutory sites from construction-based pollution. Measures outlined in relation to bins and litter collection will ensure additional recreational pressure on the Cheddar Valley Railway Walk LNR are mitigated as far as possible.

### **3.5 BNG assessment**

- 3.5.1 An assessment of the baseline habitat value was made using the Natural England Biodiversity Net Gain BNG metric 3.1 to ascertain the baseline value of the Site which is summarised within the habitats section of the results section. The proposed habitats were then inputted into the BNG calculator to ascertain if the proposal will result in a net gain. The following levels of net gain are anticipated as part of the landscaping proposals. Habitat units will result in an increase of 50.80%, Hedgerow units will be enhanced by 74.26% and river units by 19.51%. Figure 12 below details the headline BNG results and confirms the trading rules have been satisfied. Figure 13 below shows the BNG mapping the habitat mitigation figures have been based on. The uplift in biodiversity units anticipated is based on an assessment of the entire site including all habitats.



Land North of Rectory Farm, Yatton		Return to results menu	
Headline Results			
On-site baseline	Habitat units	31.71	
	Hedgerow units	14.86	
	River units	5.90	
On-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	47.83	
	Hedgerow units	25.89	
	River units	7.05	
On-site net % change (Including habitat retention, creation & enhancement)	Habitat units	50.80%	
	Hedgerow units	74.26%	
	River units	19.51%	
Off-site baseline	Habitat units	0.00	
	Hedgerow units	0.00	
	River units	0.00	
Off-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	0.00	
	Hedgerow units	0.00	
	River units	0.00	
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	16.11	
	Hedgerow units	11.03	
	River units	1.15	
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	50.80%	
	Hedgerow units	74.26%	
	River units	19.51%	
Trading rules Satisfied?	Yes ✓		

**Figure 13: Biodiversity Net Gain Headline Results**

- 3.5.1 As previously noted, the off-site mitigation habitat provided for horseshoe bats has not been included within the BNG calculations.
- 3.5.2 Due to the need to provide specific mitigation for horseshoe bats within the red line boundary the habitat, hedgerow and river units which are accessible to these species should be capped to 100% of the existing site value to avoid issues with BNG and additionality. In Table 16 below the BNG elements of the Site unavailable to bats within the landscaping are listed with the biodiversity units associated with each detailed. This allows a calculation of the BNG uplift provided by habitats inaccessible to horseshoe bats.

**Table 16: BNG Additionality and Horseshoe bat mitigation**

Habitat Type	Area (ha) /Length (linear meters)	Unit score	Percentage of baseline BNG score (total)
<b>Habitat Units</b>			
Modified grassland	0.5ha	1.08	3.4%
Other Neutral Grassland	0.97ha	3.97	12.51%
Vegetated gardens	1.09ha	2.25	7.09%
Small trees in landscaped areas	0.4761ha	1.47	4.63%
Total Habitat Unit percentage net gain contribution of habitats unavailable to horseshoe bats			27.31%
<b>Hedgerow Units</b>			
Hedgerows retained - H5, H6, H16,	H5- 193m	H5- 1.7	19.71%



	H6- 62m H16- 48m	H6- 0.76 H16 0.47	
Hedgerows New	279 meters	4.21	28.133%
Total Hedgerow Unit percentage net gain contribution of hedgerows unavailable to horseshoe bats			47.84%
<b>River Units</b>			
Ditches- D7, D8, D21, D24, D25, D30 & D31	D7-28m	D7- 0.22	29.66%
	D8-115m	D8- 0.46	
	D21-71m	D21- 0.28	
	D24-12m	D24- 0.06	
	D25-114m	D25- 0.6	
	D30-42m	D30- 0.22	
	D31-98m	D31-0.51	
Total River Unit percentage net gain contribution of ditches unavailable to horseshoe bats			29.66%

- 3.5.3 Habitat unit provision within the bat mitigation areas accounts for 123.49% of the baseline Habitat Unit score with the additional 27.31% provided by elements inaccessible to horseshoe bats including vegetated gardens, urban trees alongside the roads, unavailable other neutral grassland and modified grassland within the developed areas. As such adjusting for additionality the percentage net change in habitat units is 127.31%. Or a net gain in habitat units of 27.31%
- 3.5.4 The Hedgerow Unit provision within the bat mitigation areas accounts for 126.42% of the baseline hedgerow unit score with an additional 47.84% provided by retained and created hedgerows unavailable to horseshoe bats due to lighting or isolation to the west of the main access road. As such adjusting for additionality the percentage net change in hedgerow units is 147.84% of the initial baseline hedgerow value or a 47.84% net gain in hedgerow units.
- 3.5.5 The River Unit provision within land unavailable to horseshoe bats is 92.85% of the total baseline river unit score. The remaining 26.66% is provided within areas inaccessible to horseshoe bats. Due to the under provision of river units within the bat mitigation areas which through additionality would be capped to 100% of the baseline value the full uplift of 19.51% in terms of river units is maintained with no change due to additionality.
- 3.5.6 Overall, regardless of additionality the proposals are compliant with obligations to provide measurable biodiversity net gain of over 10% for each of the separate habitat units measured. The proposals are in line with current BNG policy in North Somerset.





Figure 14: Post development BNG habitat map





### 3.6 Habitats

- 3.6.1 A Construction Environmental Management Plan (CEMP) will be prepared to detail how the habitats within and surrounding the Site should be protected during the construction phase. The CEMP should include details of appropriate fencing to restrict access into key ecological areas, information on any timing restrictions and measures to prevent damage to water bodies and sensitive ecological habitats. Typically, the preparation of a CEMP will be a conditional requirement of the planning permission.
- 3.6.2 A Landscape and Ecological Management Plan (LEMP) will be prepared for the operational site and the off-site compensation habitat that will cover how retained habitats and newly planted areas should be managed so as to maximise their biodiversity value and achieve the objectives of ecological mitigation and compensation. The LEMP should also set out any measures necessary to ensure protected species are appropriately accommodated within the operational site.

#### ***Modified grassland.***

- 3.6.3 The dominant habitat within the Site is species poor modified grassland used for grazing livestock. Although this habitat is of low value this section is included to describe the losses associated with this habitat type and the proposals to enhance the proportion which is retained as part of the proposals.

#### Potential Impacts

- 3.6.4 The removal of modified grassland will be required to construct the proposals including housing, roads and other infrastructure. Other impacts to this habitat will include damage to areas during the construction process from plant and storage of materials. The proposals will result in a loss in area of poor-quality grassland locally.

#### Mitigation, Compensation, Enhancement and Monitoring

- 3.6.5 To compensate for the loss of poor-quality agricultural grassland the retained areas of modified grassland will be enhanced through sensitive management secured via the LEMP. Fields with grassland marked for retention are limited to Fields 3, 4, 5 and 6. This enhancement will be achieved primarily through cessation of grazing and agricultural management to allow a coarser grassland sward to develop. To achieve this the grassland will be scarified and oversown with an Emosgate EM10 tussocky seed mixture or a bespoke seed mix containing cocks-foot grass and false oat grasses and a selection of locally appropriate herbs. These will be sown on the retained scarified modified grasslands within the ecologically valuable public open space areas and managed as per the manufacturer's specifications in the first year to encourage establishment of herb species. This should be undertaken during the construction process to establish the grassland prior to completion of the proposals. Once established the grassland (including that within the orchard) will be mown once annually with all arisings collected to encourage a rank tussocky other neutral grassland sward suitable for a range of wildlife. Due to the potential for this grassland to remain fairly species poor the target condition of the habitat will be Poor in line with guidance contained in the BNG 3.1 technical supplement.
- 3.6.6 Grassland surrounding the retained ditches will be subject to some re-profiling works areas which are subject to vegetation removal should be reseeded using the same seed mix sown on the retained grassland sward. Retained areas on the banks of the ditches will be retained and managed appropriately to increase the fringe of vegetation along these valuable features. Due to the management proposed to create a coarse tussocky grassland there is potential for this created grassland to contain under 9 species per m<sup>2</sup>. The scattered scrub proposed is also considered to have an impact on the habitat condition of the retained and created grasslands. As a result of these factors the condition of the grassland has been set as a precautionary measure to Poor in the BNG calculations.
- 3.6.7 Areas of the grassland will be managed through selective mowing surrounding hoggin paths and to vary the height of the grassland. Up to 20% can be managed to below 7cm at any one time.

#### Residual Effects

- 3.6.8 The proposals will result in a loss of grassland extent, but the enhancement of grassland proposed will ensure that this impact is fully mitigated. The enhancement of the retained and created grassland will result in a significant beneficial impact to grassland available within the red line boundary.



## **Hedgerows**

- 3.6.9 The Site contains 16 hedgerows of varying quality these are predominantly present at the boundaries of the site and surrounding Field 1.

### Potential Impacts

- 3.6.10 The majority of the 16 hedgerows identified within the Site will be retained and where present within the landholding enhanced as part of the proposals. Small sections of H2, H5 and H6 will be removed to facilitate the proposals. The first removal is to create a 9m opening in H2 to create the allotment access. A further 2m opening will be created in H5 for a public footpath connection to Marsh Rd. The second proposed hedgerow impact will be the removal of approximately 12m of H6 which is a poor-quality defunct hedgerow present along the southern boundary This will be undertaken to connect the main access road to the highways associated with the Land at Rectory Farm development to the south.
- 3.6.11 A further 12m of H16 a defunct ornamental hedgerow associated with Shiners Elms will be required to create access. This will be undertaken to connect the main access road to the highways associated with Shiners Elms to the north east of the proposals. Overall the hedgerow removal proposed represents just 2.45% of the total hedgerow present within the red line boundary.
- 3.6.12 Other potential impacts to hedgerows could result from construction activities damaging these features. This has the potential to occur through compaction of roots or damage to the structure of the hedgerow by construction plant or indirect impacts such as dust deposition and pollution including runoff.
- 3.6.13 Impacts to hedgerows during the operation of the development through mismanagement are possible but as all of the hedgerows are kept from forming the curtilage of the new properties the potential for this is greatly reduced.

### Mitigation, Compensation, Enhancement and Monitoring

- 3.6.14 Construction based impacts will be managed through the production of a CEMP which will outline the measures required to retain and safeguard habitats including the hedgerows and hedgerow trees. The LEMP will include details for the ongoing management and enhancement of the retained hedgerows to improve their condition structure and diversity.
- 3.6.15 To mitigate for the small hedgerow losses proposed two broad approaches will be adopted. The first is to enhance H1, H6, H7 and H11 these are partially defunct and will be enhanced through planting and management. Specifically, the hedgerows to be enhanced will be augmented with additional native species to change their habitat categorisation to species rich native hedgerows, The habitat condition of each of these enhanced retained hedgerows is set to moderate due to the potential for these to fail up to 4 condition assessment criteria. Hedgerow 11 will maintain its Good condition with enhancement primarily aimed at increasing species richness and reducing gaps in the structure.
- 3.6.16 The remaining hedgerows will be retained and maintained at approximately their current height with minor infill planting where required, no measures to specifically enhance the remaining hedgerows are proposed so they will be retained in their current condition as part of the BNG assessment.
- 3.6.17 The second measure will be to introduce 858 linear meters of new species rich hedgerow with trees and species rich hedgerow with trees associated with a bank or ditch, this will reinstate hedgerow features which have been removed historically from alongside the ditches. Care has been taken to ensure the placement of the new hedgerows (offset or to the north of ditches) will not shade these features and result in a deterioration of their condition. Hedgerows will be grown to at least 1.5m in width and 2m in height planted with a diverse range of native woody species. Trees will be planted and maintained every 30m. This will increase the provision of hedgerows within the Site substantially and increase connectivity of the hedgerow network in the local area. The proposals will result in a substantial enhancement of hedgerow units as part of the BNG assessment. All new hedgerows are anticipated to achieve moderate habitat condition as part of the BNG assessment. This is a precautionary assessment based on the potential for the new hedgerow to fail condition assessment criteria B1, C1, C2 and E1. These relate to gaps at the base of hedgerows, nutrient enriched vegetation, disturbed perennial vegetation and maturity of the newly planted trees.



### Residual Effects

- 3.6.18 Providing the measures outline above are put in place there will be no residual adverse effects in relation to hedgerows. The measures proposed will have a significant beneficial impact on hedgerow habitats both within the Site and the local area.

### **Mature Trees**

- 3.6.19 The Site had a small number of mature trees at the edges of the ditches on site these included two mature oaks a semi mature oak and a mature ash tree. All of the oaks have significant wildlife and aesthetic value within the Site. The ash within the fields is in poor condition and may require removal.

### Potential Impacts

- 3.6.20 The development will require the removal of two ash trees present along D8 in In Field 7 due to ash dieback, all other mature trees identified in the ecological report and arboricultural constraints report will be retained.
- 3.6.21 Other potential impacts to mature trees could result from construction activities. These have the potential to occur through compaction of roots or damage to the structure of mature trees by construction plant or indirect impacts such as dust deposition and pollution including runoff.

### Mitigation, Compensation, Enhancement and Monitoring

- 3.6.22 To ensure all mature trees marked for retention are protected from construction based impacts the production of a CEMP will be required. This document will outline the measures required to retain and safeguard habitats including mature trees and hedgerow trees. The LEMP will include details for the ongoing management retained mature trees to manage their health biodiversity value and longevity.
- 3.6.23 The development will plant approximately 185 small urban trees and 30 medium sized urban trees within the formal landscaping and ecological mitigation areas of the development. Further tree planting will also take place to establish the linear woodland feature on the western boundary and to plant the traditional orchard. Further tree planting will take place in the buffers to the rhynes and within the newly planted native hedgerows. In the long term (up to 30 years) the development will provide a significant number of additional mature trees as part of the proposed landscaping.

### Residual Effects

- 3.6.24 The proposals will result in the loss of two mature ash trees in poor health which will result in a temporary residual effect from the loss of a proportion of the mature trees within the plot. In the long term the landscaping proposals and protection measures outlined will ensure that this is fully mitigated resulting in an enhancement in terms of the number of mature trees present within the Site. These measures will ensure significant beneficial residual effect in relation to mature trees will occur in the long term.

### **Ditches**

- 3.6.25 31 stretches of drainage ditch or (rhynes) are present within and bounding the Site. These are of varying depth, width and ecological quality. Currently these features are in poor condition due to agricultural pressures. Issues including heavy poaching, overshading and pollution were also noted throughout the Site.

### Potential Impacts

- 3.6.26 Approximately 104m of ditch habitat will be culverted to allow the construction of the key access roads and doctors surgery. Culverting was required for most crossings due to the need to run services under the main spine road into the different parcels of the development. Impacts to D25, D24, D21, and D7 are anticipated with a 9m section requiring culverting for both D21 and D7 where there is an existing 5m farm gate entrance present. A 15m section requires culverting for D25 and a 38m section from D24. Sections of ditch associated with hedgerows also require culverting to create the road accesses including H2/D2, H6/D10 and H16/D29. H2/D2 will require a 9m section to be culverted, H6/D10 will require a 9m section (reduced due to the existing field gate) and H16/D29 will require a 15m section. Culverting the sections to create roads has the potential to isolate sections of ditch from the ditch network and potentially restrict access for a range of wildlife. It will reduce the quality of the drainage features at the locations culverted.



- 3.6.27 Other impacts from the proposals include impacts from construction activities particularly runoff. Operational impacts include disturbance, lighting of these key wildlife features, impacts from surface water runoff and pollution from household chemical products.
- 3.6.28 Adverse impacts to the existing rhynes and ditches would also have consequential adverse effects to those species reliant on the habitat, such as aquatic invertebrates and species such as water vole and water shrew (if present).
- 3.6.29 It is however noted that the existing Site is already subject to fertiliser and chemical pressures which, combined with the very watercourse margins, is likely to result in high nutrient or silt run off loads at specific times of the year. As such removal of these pressures would likely result in beneficial impacts to the rhyne network.

#### Mitigation, Compensation, Enhancement and Monitoring

- 3.6.30 Proposals have been designed in consultation with numerous technical specialists including landscaping, drainage and ecology. These consultations have resulted in the retention of the majority of the rhyne and ditch network within the proposals, as well as inclusion of a naturally vegetated buffer to these features with a 9m or 6m buffer applied to each ditch to allow ongoing management where necessary by the Internal Drainage Board (IDB). In addition, changes in levels for the developed parcel has required a further offset of around 3m in addition to the offset provided for management.
- 3.6.31 The cumulative removal of 104 linear meters of ditch from seven locations represents just 3% of the total length of ditches within the Site (or 7% of the currently open ditches not associated with hedgerows). Reduction in the length of ditch habitat through the creation of culverted sections will be mitigated as far as possible through enhancement of the retained ditches. This will be achieved through the cessation of agricultural management of the surrounding fields which will remove grazing and agricultural runoff impacts.
- 3.6.32 Improvements through removal of agricultural, as well as sensitive operational management will seek to enhance the rhyne bankside vegetation density and reduce eutrophication impacts. This will help to improve the water quality of the ditch networks locally reducing the inputs of agricultural runoff. Additional enhancements in terms of marginal planting will be undertaken to introduce key native marginal plants and emergent plant species including reed sweet-grass, branched burr reed, flag iris, water plantain and watermint.
- 3.6.33 Hedgerows, tree and scattered scrub will be planted along the thinner 6m buffer to a number of the interior ditches to provide additional hedgerows within the Site and improve the use of the ditches by species including foraging bats and nesting birds. Planting will be concentrated on the northern banks of such ditches to prevent shading of these features. Where hedgerow need to be situated to the south, they are positioned away from the ditches to prevent shading.
- 3.6.34 Providing the ditches within the centre of the Site can be managed to have a fringe of vegetation along 70% of their length, be free from significant shading with improved water quality and an increased diversity of aquatic vegetation it is anticipated the condition of the ditches can be elevated substantially. It is not anticipated the ditches within the Site can be elevated from 'Poor' condition to 'Moderate' condition using the BNG condition assessment criteria due to the potential for eutrophication to still occur from the ditch network to the west which connects with the Site however it is anticipated the ditches will pass between 5 and 7 of the 8 condition assessment criteria and as such the BNG has been adjusted to 'Fairly poor' condition to account for this. This will mitigate for the minor loss of ditch extent as a result of the proposals and result in a 19.51% increase in river units.
- 3.6.35 To ensure protected species including bats, otter and water vole can continue to cross under the roads where the two key central ditches are culverted with large square ditch culverts will be specified to provide at least 1m of clearance above water levels when the ditches are at average depth. This will reduce the potential for drowning of species such as otter trying to pass through round fully immersed culverts. Along the two central ditches these are engineered to be at least 1.5mx1.5m to allow bats to fly under road crossings providing lighting is adequately controlled at the crossing points. Culverts of this nature are proposed at the culverted sections identified to ensure buffer habitats to the ditches remain accessible. The locations of the two enlarged culverts are provided in figure 16 on the dark corridor plan in the bats section.



### Residual Effects

- 3.6.36 Providing the measures outlined above are put in place there should be no adverse residual effects in relation to ditches. The enhancement of the ditches will in the long-term result in a non-significant beneficial effect on the quality of ditches locally.

## **3.7 Protected Species and Species of Conservation Concern**

### **Badgers**

- 3.7.1 No setts or sightings of badger were recorded within the Site, but a known sett and a single badger was recorded outside of the Site within 100m of the red line boundary during one of the bat activity transects.

### Potential Impacts

- 3.7.2 Potential impacts to badger include reduction in grassland area, increased mortality due to road collisions and impacts to badgers as a result of construction activities. Connectivity of the western side of the Site has the potential to be reduced as a result of the construction of the new dwellings.

### Mitigation, Compensation, Enhancement and Monitoring

- 3.7.3 Impacts to foraging habitat will be mitigated by the enhancement of grassland habitats and the establishment of woodland, hedgerows and scattered scrub. Impacts to setts are very unlikely as none have been identified within the Site. A pre-commencement walkover survey will search for newly created setts to ensure these are not impacted by the proposals.
- 3.7.4 Current connectivity will be maintained by provision of wide buffers to the ditches and hedgerows although grassland to the east of the main road will require badgers to cross the main access road. Due to the low speed of this road and the low current levels of use this is not considered to be significant risk to badgers that currently use the Site. Construction based impacts such as badgers becoming trapped in excavations will be managed through good construction practices as outlined in the CEMP produced for the proposals.

### Residual Effects

- 3.7.5 Providing the measures outlined above are implemented there are no significant residual effects anticipated in relation to badgers

### **Bats**

- 3.7.6 The Site supports a population of bats of regional importance providing commuting and foraging habitat for a range of species including light averse species such as long-eared and horseshoe bats. The Site falls within band B of the North Somerset and Mendip Bat SAC consultation zone.

### Potential Impacts

#### *Roosting*

- 3.7.7 It is considered unlikely the proposals will affect roosting bats due to the lack of suitable roost features identified in the mature trees to be removed and the lack of buildings within the plot. If present in the retained trees with low potential to support roosts there is some potential for these features to be impacted by lighting from the proposals.

#### *Commuting*

- 3.7.8 The introduction of street lighting for access roads, security lighting and lighting transmitted from within the proposed dwellings could result in light spill onto retained and newly created habitats within and adjacent to the Site. The majority of bat species, particularly horseshoe, long-eared and Myotis species, will actively avoid lit areas due to the increased risk of predation.
- 3.7.9 Artificial light can create a physical barrier to bat movement within the landscape which, in this location, may have significant consequences given the connectivity of the Site's hedgerows to those associated with the Kings Wood and Urchin Wood Component of the SAC. Several species including common pipistrelle, soprano pipistrelle, serotine, noctule and Leisler's, however, will forage for insects attracted to





streetlamps. This is often to the detriment of other light sensitive bat species as insect food becomes scarcer in surrounding darker areas as a result.

- 3.7.10 Light pollution can result in a significant change in how bats utilise a landscape. If, for example, a flight path between a roost and foraging habitat is affected by light pollution, a roost may be abandoned if it is no longer energetically viable for the bats to remain there (i.e. they would need to fly for longer to reach seasonal foraging habitat). Light pollution can, therefore, have a significant detrimental impact on individual bats and potentially colonies.
- 3.7.11 Excessive artificial lighting of retained habitats therefore has the potential to decrease bats' ability to commute/forage or prevent rarer, light-averse species such as horseshoe bats from using habitats including the retained hedgerows. Mitigation through design has aimed to retain those habitats and naturally vegetated boundary features where bats were most frequently recorded, including the western and northern boundaries.
- 3.7.12 The proposed development is likely to degrade the quality of eastern hedgerows and ditches by sandwiching H5 and H16 between the gardens of the new dwellings and those of the existing adjacent properties. An approximately 4m maintenance corridor for the hedgerow and bat flyway will be maintained but it is likely that this thin feature may not be used by bats due to lighting impacts and the slim width of the corridor. A small section of hedgerow proposed for removal from H6 also has the potential to minorly fragment a poorly used commuting route. This eastern section of the Site is considered to be unavailable to horseshoe bats as indicated Figure 16.
- 3.7.13 Culverting of ditches to allow the construction of the road crossings and services will result in fragmentation of existing potential commuting routes in the centre of the Site running from east to west. It should be noted no significant commuting by bats was recorded along these features.

#### *Foraging*

- 3.7.14 In the absence of mitigation the development will reduce the availability of foraging habitat for a range of bat species including greater and lesser horseshoe bats. Specifically, the proposals will result in the removal of around 5.35ha of poor-quality grassland within the Site for the provision of housing, gardens and other infrastructure. The proposals will also result in the removal of 104 linear meters of ditch habitat, 34m of hedgerow and has the potential to fragment an additional 1ha of grassland, 285 linear meters of ditch habitat and 245 linear meters of hedgerow and associated ditch to the east of the proposed access road.
- 3.7.15 Introduction of artificial lighting could prevent bats from accessing habitats for foraging. Removal of grassland habitat currently used by foraging horseshoe bats could have a detrimental impact on bats associated with the North Somerset and Mendip Bat SAC if not adequately mitigated.

#### *Disturbance and predation*

- 3.7.16 There is some potential for bats to be disturbed through construction activities such as temporary lighting or the storage of materials in key habitats. There is also potential for the increased number of domestic cats to predate bats associated with the Site.

#### Mitigation, Compensation, Enhancement and Monitoring

#### *Roosting*

- 3.7.17 No roosting bats were identified during the walkover, or subsequent bat activity surveys. A night roost structure is present just outside of the Site on the eastern boundary to the north of the Titan Ladders development but survey work to date suggests this feature is not currently used by night roosting bats. To ensure its continued functionality an unlit habitat corridor of 3-6m will be provided to allow bats to access this feature is proposed although modelling of the ditch crossings to provide a fly under linkage indicates this unused feature is likely to be unavailable to horseshoe bats. To address this a night roost structure will be created adjacent to the linear woodland habitat along the eastern boundary of the Site to provide an alternative night roosting opportunity for lesser and greater horseshoe bats. The exact location of this feature is yet to be determined.
- 3.7.18 To ensure that horseshoe bats are not subject to additional on-site interspecific competition no bat boxes for crevice roosting bats are proposed within the new dwellings or retained habitats. This will help to



prevent additional competition for prey with species including soprano pipistrelle which are thought to directly compete for certain prey items with lesser horseshoe bats.

- 3.7.19 The proposals will not result in the removal of trees with significant bat roosting features. Two mature ash alongside D8 will require removal due to ash dieback disease, however it is considered unlikely these trees contain bat roosts due to their lack of suitable features other than peeling bark (of Low potential). As a precautionary measure these trees will be removed during the winter months to reduce the potential for bats opportunistically roosting under suboptimal surface features such as peeling bark or a dense covering of ivy, which would be detailed within a CEMP method statement.

#### *Commuting*

- 3.7.20 To ensure the development does not reduce connectivity for bats locally the scheme has been designed to retain all of the boundary hedgerows and ditches. Those which have previously been degraded or contain gaps will receive infill planting details of which will be provided in the LEMP.
- 3.7.21 The eastern hedgerows (H5 and H16) which are poor in structure and not particularly well used by foraging or commuting bats will be situated close to new dwellings and gardens. It is noted that these hedgerows currently form the curtilage of other properties and are therefore already subject to a level of disturbance/security lighting pollution. As a result, they will be sandwiched between back gardens of existing properties and the new development with a 4-9m buffer to allow maintenance and continued access to commuting bats. These hedgerows could continue to be used by bats but due to the lighting of the main access roads horseshoe bats are unlikely to be able to access these features.
- 3.7.22 The proposals will not result in the severance of commuting potential for this species due to the retention and enhancement of hedgerows on the western boundary, providing alternative commuting links for bats to reach foraging habitat to the north and west. H14 and H15 on the northern boundary will also have a 10m habitat corridor between the retained hedgerows and a private road. The lux contour plans produced for the proposals indicate this hedgerow and buffer of grassland will remain unlit and accessible to commuting bats.
- 3.7.23 The hedgerows which are considered to be the most valuable for commuting bats are those which form the western boundary adjoining the Biddle Street SSSI; these will be provided with a 80-120m buffer from the built form of the development. Hedgerows surrounding Field 1 are also considered important commuting features. The proposals have allowed a minimum 10m offset from the edge of the ditch of H4/D4 to allow this hedgerow to continue to function as a commuting route. The only exception to this is the creation of a narrow road access to service the allotments from the Biddle Street track which will require a 9m gap to be created in H2. This road access will be unlit and the parallel hedgerows will reduce potential for fragmentation to occur for bats moving from north to south. It is anticipated these will continue to allow bats including horseshoe bats to forage and commute through the Site to pasture to the north and west and preserve the connectivity to off-site habitats to the Strawberry Line LNR which is an important commuting feature for wildlife locally.
- 3.7.24 Ditches also provide valuable commuting routes for a range of bats and these will be retained across the Site with 104 linear meters in total requiring culverting which will isolate stretches of ditch to the east of road crossings primarily through lighting impacts. Measures to implement wide, tall square culverts with a minimum diameter of 1500mm are proposed to allow bats including horseshoe bats to cross under and through the two central culverts have been attempted with mitigation applied to the culverts in the form of screening to attempt to ensure the habitat surrounding the potential culvert crossings remain below 0.5lux. Radiotracking studies in Cheddar illustrate greater horseshoes will fly through suitable culverts while commuting to avoid lighting associated with local roads and studies suggest a 1500mm or larger culvert will channel between 44-88% of commuting greater horseshoe bats under a road crossing rather than crossing lit sections<sup>20</sup>. As such, appropriately designed culverting of the small section of ditch has the potential to mitigate the potential loss of connectivity to the east throughout provision of viable flyways under the roads. Despite the lighting mitigation applied, the entrances to the culverts remain lit to between 0.5-1lux. As such it is considered that they will not currently function as intended and will not allow horseshoe bats to

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<sup>20</sup> Effectiveness of mitigation of the impacts of a new road on horseshoe bats *Rhinolophus ferrumequinum* in Wales, UK Jonathan G. Davies 1\* 1 Arcadis Consulting (UK) Ltd. The Mill, Brimscombe Port, Brimscombe, Stroud, GL5 2QG, UK



fly under the road crossings. Further mitigation will be applied to attempt to allow these crossings to function but as a precaution all habitats to the east of the main access have been excluded from horseshoe bat mitigation habitats.

- 3.7.25 Additional sections of hedgerow will be planted alongside many of the internal ditches along with linear woodland which will ensure connectivity is maintained and enhanced within the red line boundary. Commuting routes allowing bats to navigate around the development to the east and west are maintained along the northern hedgerow. The additional linear features proposed are also considered to improve connectivity north to south for a range of bat species.
- 3.7.26 Due to the high levels of bat use noted on Site bat monitoring will be required during construction and once operational to ensure that the mitigation measures are effective at maintaining the baseline levels of bats identified on Site. Monitoring requirements will be outlined within both the CEMP and LEMP, and are anticipated to focus on seasonal surveys in years 5, 10 and 15 following construction.

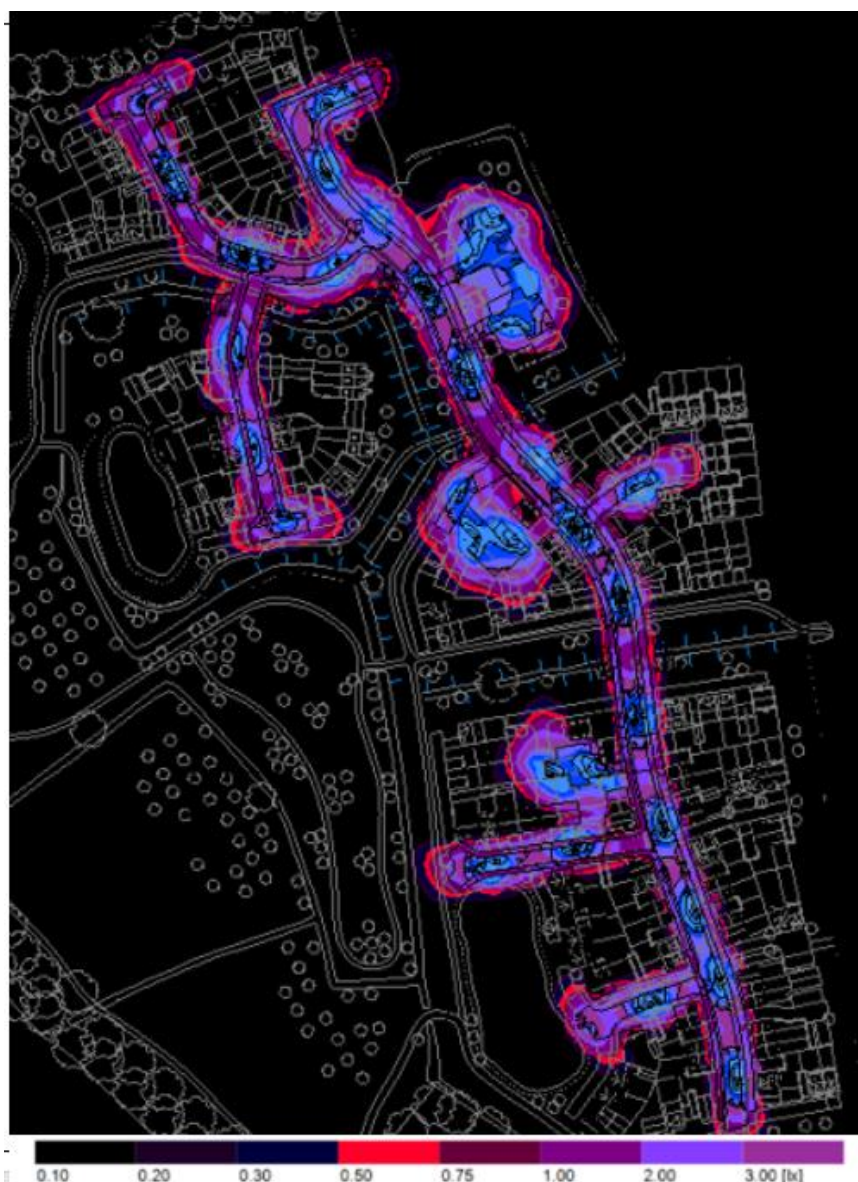
#### *Foraging*

- 3.7.27 Mitigation for foraging bats has been focused on horseshoe bats and quantified using the Habitat Evaluation Procedure contained in the North Somerset and Mendip Bat SAC Supplementary Guidance for Development. Within the red line boundary for the Site approximately 4.34ha of suitable available grassland habitat for horseshoe bats will be established including scattered scrub in addition 0.73ha of traditional orchard. 0.77 hectares of broadleaved woodland will also be planted along with 858 linear meters of native hedgerow (579 meters of which are fully available to horseshoe bats). 0.67ha of naturalised SUDS basins are proposed (0.66ha of which are available to horseshoe bats), designed to hold water throughout the year and planted with a fringe of native emergent vegetation. The removal of grazing from the Site will reduce potential for dung beetles to be present which will reduce this potential foraging resource for horseshoe bats. However, the grassland proposed will be managed to promote macro moths favoured by both lesser and greater horseshoes bats which should reduce this impact as far as possible.
- 3.7.28 The majority of the foraging habitat provision for horseshoe bats is delivered on-site. Including the retained hedgerows this totals a minimum of 7.37ha of suitable, connected, unlit foraging habitat of varying quality. This provides over 90.84% of the value required in equivalent hectares under the HEP calculations to satisfy the foraging requirements of greater horseshoe bats and 121.34% of the foraging habitat required for lesser horseshoe bats.
- 3.7.29 In order to ensure that greater horseshoe bats particularly have enough equivalent foraging habitat locally the development is proposing to offset this remaining habitat required using off-site land which is situated to the northwest. This land also sits within Band B of the bat consultation zone for greater horseshoe bats. At present this land is modified, species-poor pasture forming part of the Congresbury Yeo SNCI and sitting within the Biddle Street SSSI Rhyne network. It is proposed that 2.9ha of this land is restored to a species rich neutral grassland through conservation grazing and cessation of high intensity agricultural inputs. In addition, hedgerow or scrub belts are proposed along the western edge of the fields to increase shelter and improve foraging potential for horseshoe bats. The existing value of the additional improved grassland habitat is taken into account which has resulted in a larger area of mitigation habitat being proposed given the relatively high value of grazed pasture to horseshoe bats. Detailed habitat survey notes of the mitigation land are provided in Appendix F along with the HEP calculations used to calculate the foraging habitat required for both greater and lesser horseshoe bats.
- 3.7.30 In total approximately 10.27ha of suitable unlit and accessible habitat is being provided (including the off-site land) and managed to offset the development of approximately 6.59ha of housing, roads, gardens, infrastructure and habitats unavailable to horseshoe bats.
- 3.7.31 To enhance the Site for horseshoe bats an open night roost structure will be provided within the ecological mitigation habitat adjoining the linear woodland habitat provided to the east of the Strawberry Line. This feature should be a minimum of 1.5m x 2m x 1.8m and can be constructed of wood with a suitable feeding perch provided. This feature should be situated in a sheltered area of the Site to allow horseshoe bats to use this feature as a feeding perch during foraging activity.



### Lighting

- 3.7.32 A sensitive artificial lighting scheme has been designed in conjunction with a suitably qualified lighting engineer to ensure that the mitigation habitats proposed remain unlit, the lux contour plan for the external lighting is provided below in Figure 15. These are provided in full in the *Lighting Assessment Report* by e3 consulting engineers, document reference: 4790 REP01 24<sup>th</sup> of March 2023 submitted in support of the proposals. These calculations have allowed the assessment to accurately calculate the lighting impacts of the scheme and provide surety about the foraging habitat mitigation proposed in relation to horseshoe bats. The lighting scheme has been designed with reference to the Institute of lighting professionals, Guidance Note 8 Bats and Artificial lighting.
- 3.7.33 Lighting levels within the Sensitive Lighting Zone as indicated in blue in Figure 16 below (resulting from the external street lighting modelled) will not exceed 0.5 Lux. Areas adjacent to lit roads where the lux contour plan indicates levels are likely to be higher are excluded from bat mitigation habitats included in the HEP calculation totals. Figure 15 below shows the results of lux contour plan modelling of the street lighting from the adopted roads which has allowed the exclusion of lit grassland areas from the horseshoe bat HEP calculations as a result of these being lit to over 0.5lux. A total of 0.97ha has been excluded from the grassland totals due to the lighting impacting a fringe of grassland surrounding roads and dwellings and lighting of the culverts preventing horseshoe bats from crossing under the roads. In addition, hedgerows and ditches to the east of the access road and some new hedgerows adjacent to the roads and housing have also been excluded from the HEP calculations, these are detailed in Table 16 above and clearly shown as excluded or lit in red text in the HEP calculations provided in the appendices. It is considered that the areas surrounding the retained rhynes to the west of the main road will be kept predominantly free from light to allow horseshoe bats to forage within these areas. The areas which are calculated as remaining unlit are indicated in dark blue and the areas which are excluded from calculations but which may through design and modelling remain available are indicated in orange in Figure 16 below.
- 3.7.34 The specification for the street lighting and modelling undertaken are provided in the Lighting Strategy Report Land at Rectory Farm, Lighting Scheme and Assessment, e3 consulting engineers, document reference 4790 REP01, 24<sup>th</sup> of March 2023 submitted as part of the proposals.
- 3.7.35 Private roads will remain unlit but security lighting controlled with a PIR sensor is included for the dwellings to discourage home owners installing additional lighting in the future.



**Figure 15: External Lighting (lux contour plan) from Lighting Assessment Report by e3 consulting engineers, document reference: 4790 REP01**

#### Horseshoe bats

- 3.7.36 The initial assessment of the proposals and their impacts on horseshoe bats indicate that commuting potential of the Site will be maintained. Taking into account the provision of 2.9ha of off-site compensation land located in two fields adjacent the red line boundary that will be enhanced the foraging potential for both lesser and greater horseshoe bats can be maintained within the local area and direct impacts to these species will be avoided.
- 3.7.37 A Shadow Habitat Regulations Assessment will be prepared and submitted alongside this EIA. This document will include an assessment of commuting and foraging for both species to include HEP calculations. In addition, an assessment of the cumulative impacts of the proposals with other local developments will be made to allow North Somerset to make an appropriate assessment in relation to the proposals. It will be necessary to provide update information to inform any reserved matters applications.





**Figure 16: Dark corridor plan**

Residual Effects

3.7.38 Providing the lighting assessment recommendations are followed and local development as a whole does not result in unforeseen cumulative impacts, the scheme will not result in residual effect in relation to bats, including horseshoe bats associated with the SAC. The provision of foraging habitat proposed will result in a significant enhancement of foraging habitat for both greater and lesser horseshoe bats present in the local area.

**Otter**

3.7.39 Otter are present in the local area and field signs within the Site indicate this species uses the central ditches on an occasional basis for foraging commuting and potentially sheltering.

Potential Impacts

- 3.7.40 The culverting of 104 linear meters of ditch habitat has the potential to reduce the extent of available ditch habitat within the red line boundary. Use of small apertures over long sections of culverts increases the risks to species such as otter passing through and in some instances can result in drowning. Introduction of bridges and roads could result in otters having to cross roads and be at risk of traffic accidents, especially where poorly designed with small gaps and no ledges or bank habitat is provided underneath.
- 3.7.41 Construction operations have the potential to cause habitat damage and/or degradation of watercourses through dust deposition or accidental discharge of contaminants.
- 3.7.42 Use of artificial lighting cast significantly onto the ditches could result in disturbance to this species, which are typically nocturnal in riparian landscapes within the UK.
- 3.7.43 management of the ditches by the Internal Drainage Board (IDB) will be undertaken of the key rhynes periodically which may remove habitat of value to otter.



#### Mitigation, Compensation, Enhancement and Monitoring

- 3.7.44 The ditches will have between a 6 and 9m buffer to allow routine maintenance on both sides of the retained ditches in addition in most instances a further 3-4m is provided to address level changes associated with the development parcels. This will provide a substantial buffer from the built form to the retained ditches.
- 3.7.45 The general ditch enhancements outlined in the ditch section will aim to benefit foraging otter by increasing the foraging quality of the retained ditches. This will result in increased availability of prey species and potentially make the Site more valuable for foraging otter. In addition, providing that large square culverts are put in place (with a minimum of 1m clearance from regular water levels) this species will be able to safely pass under the roads proposed and reach ditches to the east of the main access road. It may be necessary to incorporate otter ledges internally to ensure that otters do not need to cross any roads and be exposed to potential mortality from oncoming traffic.
- 3.7.46 Vegetation to be planted surrounding the ditches including trees, scrub and hedgerows will provide additional sheltering habitat for otter within the red line boundary.
- 3.7.47 As detailed within 'bats' above, sensitive lighting measures will be essential to ensure that the rhyme and river habitats remain unlit.
- 3.7.48 Creation of any outfall or crossing points will require update inspections prior to any works by an ECoW and where evidence of otter holts (considered unlikely) or water voles is identified licensing will be required. A precautionary approach to works will be detailed within a method statement provided in the site-specific CEMP.
- 3.7.49 Impacts resulting from disturbance of otters from the introduction of domestic pets are difficult to fully mitigate; however, provision of wide buffers to watercourses, which include sections of hedgerow and dense marginal vegetation will help to dissuade entry by some cats and dogs. Provision of large networks of footpaths and open space will ensure that dog walkers are not restricted to single areas, to dilute impacts over the wider Site. Over time it is known that otter can habituate to presence of humans.

#### Residual Effects

- 3.7.50 Providing the measures above are put in place there should be no residual effects in relation to otter.

#### **Water vole**

- 3.7.51 Water vole are known to be present locally within 800m of the Site and the ditches within the red line boundary offer suitability for this species. Results of a detailed water vole survey indicate this species is currently absent within the red line boundary.

#### Potential Impacts

- 3.7.52 The culverting of 104 linear meters of ditch habitat has the potential unless carefully managed to result in ditches to the east of the main access road being unavailable to water vole. If present construction impacts within 5m of the bank tops of ditches has the potential to disturb, injure or kill individual water vole.
- 3.7.53 Impacts from occupation of the development on water voles includes impacts such as predation of water vole by domestic pets and increased disturbance.

#### Mitigation, Compensation, Enhancement and Monitoring

- 3.7.54 Given the likely absence of water vole within the red line boundary impacts to the tops of banks within 5m is not considered a limitation at this stage. The design of the scheme generally provides a minimum 6m offset to all ditches as a minimum to allow maintenance of these features by the IDB. This built in buffer will greatly reduce the potential for impacts to water vole if present.
- 3.7.55 If development of the Site starts more than 1 year from the publication of this report a brief update survey for water vole presence should be undertaken as a precaution to ensure direct impacts to this species from construction do not occur. This will be outlined in a method statement in the CEMP produced for the proposals. If water vole or signs of water vole are encountered a protected species mitigation licence may be required from Natural England.



- 3.7.56 The general enhancement measures proposed in relation to the ditch habitats will serve to enhance these features for water voles in the local area. The diversification of flora, removal of grazing and farming impacts as well as improvements to water quality will all benefit this species in terms of foraging and burrowing. Overall, the proposals are considered to increase the potential for the Site to be colonised by water vole in the future.
- 3.7.57 The plans to culvert the ditches will provide large square culverted sections up to 15m in length which should be easily accessed by water vole and allow this species to reach sections of retained ditch beyond and ensure significant habitat loss does not occur. Evidence extracted from the Water Vole Handbook<sup>21</sup> notes the following culverts have been known to be used by water voles; *Over-sized box culverts up to 30–35m in length, with ≥ 1m of headroom above normal water levels; Ledges immediately above water level on either side of the channel within the culvert are likely to be used by water voles, particularly where these are formed from earth/silt and/or Circular culverts of 1200mm diameter, up to 10m in length, with ≥ 300mm of headroom above normal water levels.*
- 3.7.58 The creation of two large SuDs which will be engineered to hold water throughout the year have the potential to increase foraging and potentially burrowing habitat for this species. Particularly if the slope of at least one bank of each of the SuDs is cut to an angle steeper than 45° which is considered the optimum bank slope type for water vole burrow creation.
- 3.7.59 Operational impacts such as predation by household pets or accidental mortality as a result of ditch management is harder to control. In terms of predation by domestic pets encouraging a dense fringe of marginal vegetation and fencing of any ditches within the development area will reduce the potential for predation to occur. If water vole colonise the Site in the coming years the IDB should be informed and a bespoke habitat management proposed to decrease the potential for ditch management to impact water vole in the future.
- 3.7.60 As detailed within 'bats' above, sensitive lighting measures will be essential to ensure that the ditch habitats remain unlit. Current modelling shows very small areas will be lit surrounding road crossings but the majority of the retained lengths will remain dark.
- 3.7.61 Impacts resulting from introduction of domestic predators are difficult to fully mitigate; however, provision of wide buffers to watercourses, which include sections of hedgerow and dense fringe planting will help to dissuade entry by some cats and dogs. Provision of large networks of footpaths and open space will ensure that dog walkers are not restricted to single areas, to dilute impacts over the wider Site. Over time it is known that water vole can habituate to presence of humans.

#### Residual Effects

- 3.7.62 Providing the measures proposed above are put in place there are no adverse residual effects anticipated in relation to water vole. Measures to enhance the ditches will result in significant beneficial effects if water vole colonise the Site in the future.

#### **Dormice**

- 3.7.63 Dormice are considered likely to be absent within the red line boundary due to a lack of records within 1km of the Site and the reasonably low suitability of habitats present within and surrounding the Site.

#### Potential Impacts

- 3.7.64 Although considered likely absent, in the absence of data there remains some limited (albeit highly unlikely) potential for dormice to be impacted as part of the proposals with incidental disturbance, injury or death whilst removing the cumulative loss of 33m of sparse hedgerows. Further potential impacts if dormice were to present within and surrounding the Site include minor loss of connectivity and increased predation by household pets.

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<sup>21</sup> Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds Fiona Mathews and Paul Chanin. The Mammal Society, London



#### Mitigation, Compensation, Enhancement and Monitoring

- 3.7.65 In the highly unlikely event that dormice may be encountered the removal of small sections of sparse hedgerow from H2, H5, H16 and H7 will be managed under a non-licensed Risk Avoidance method Statement (RAMS) for dormice, to be outlined in the CEMP. This will include a pre-removal check of any habitat by a licenced or accredited dormouse ecologist. A non-licenced method statement is considered appropriate in this instance due to the very small lengths of hedgerow to be removed and the relatively likelihood of encountering dormice in the local area.
- 3.7.66 Impacts from connectivity on local dormice are considered to be low from the removal of small sections of boundary hedgerow. The key potential commuting features adjacent to the strawberry line will be maintained and enhanced. The planting of additional hedgerows and linear woodland are considered to enhance the Site for commuting and foraging dormice both within the Site and the local area.

#### Residual Effects

- 3.7.67 Providing the measures above are put in place no residual effects are anticipated in relation to dormice.

#### **Reptiles and Widespread Amphibians**

- 3.7.68 A low population of slow-worm and grass snake were recorded during the reptile surveys undertaken. These species appear to be confined to a limited area on the eastern boundary of the Site adjacent a ditch and rough ground surrounding residential gardens. It is likely that grass snake also utilise the ditch network for foraging and commuting. A small number of toads were encountered during the reptile survey which could be impacted by the construction of the proposals.

#### Potential Impacts

- 3.7.69 Without careful consideration habitat removal and construction on the eastern side of the Site has the potential to result in the disturbance, injury or death of a limited number of reptiles and widespread amphibians. The removal of habitats within the red line boundary has the potential to reduce the availability of suitable habitat for reptiles locally.
- 3.7.70 During operation reptile populations may be at risk of habitat fragmentation through creation of hardstanding, being at risk of predation by domestic pets (cats and dogs), disturbance by people and killing or injury through insensitive habitat management.
- 3.7.71 Use of pesticides on reptile (specifically slow-worm) prey items during operation may result in killing or injury of animals. It is however noted that the level of pesticide use on the existing farmland is unknown.

#### Mitigation, Compensation, Enhancement and Monitoring

- 3.7.72 The population of reptiles and amphibian recorded were limited to the eastern portion of the Site around the shared boundary with existing properties to the east of the red line boundary. It is considered that the rest of the Site is currently of suboptimal value for amphibians and reptiles due to the short grassland within the fields and grazing pressure on the banks of the ditches. Reptiles are considered absent from other areas due to habitat management.
- 3.7.73 To ensure the low numbers of reptiles recorded on the eastern Site boundary are not impacted by the removal of habitats a translocation followed by a destructive search of the habitats must be undertaken. This translocation will last for at least 15 days with translocation continuing until 5 days without reptile captures during suitable weather conditions occurs.
- 3.7.74 Prior to translocation the receptor area must be landscaped to provide suitable reptile habitat (featuring foraging areas, shelter and hibernation features) prior to the translocation starting. It is also recommended that any area subject to trapping is fenced off to prevent colonisation by off-site reptiles during the works.
- 3.7.75 The proposals for habitat provision particularly the provision of a tall rank grassland habitat will ensure habitat loss for reptiles will be mitigated by the provision of better-quality habitats. The proposals will significantly enhance both the area of suitable habitat but also connectivity for reptiles maintaining ecologically valuable offsets from the ditches and increasing the provision of scrub and hedgerow features.
- 3.7.76 As a further enhancement 3 hibernaculum will be provided at the fringes of the ecological areas and the green corridors. These will be a minimum of 2m long, 1m wide and 1m deep and feature buried rubble and



stone to a minimum depth of 0.4m to provide a thermally stable location for hibernating reptiles. These features should be constructed in the areas least likely to be flooded.

- 3.7.77 Fragmentation of the created habitats to the east of the main road are likely to occur from the main habitat mitigation area provided to the west. This will likely result in connectivity impacts for terrestrial species including slow-worm. Given the existing population is assumed to be linked to suitable garden habitats to the east recolonisation of these areas is considered likely to occur. Species including grass snake and toads are more able to cross the roads or move through the culverts proposed as such fragmentation issues are unlikely to occur in relation to these species.
- 3.7.78 All mitigation habitats will be covered under a LEMP to include sensitive management and timescales, to optimise and benefit reptiles.
- 3.7.79 It is not possible to fully mitigate against the introduction of domestic pets to reptiles; however, the extensive provision of new habitats, with new features of shelter and refuge will go some way to offset any mortalities.
- 3.7.80 Use of gully pots will be avoided on Site to help prevent any accidental deaths to herptiles crossing roads. The final road layout design will include use of dropped kerbs at any strategic crossing locations to ensure that any animals which may cross roads can exit easily.

#### Residual Effects

- 3.7.81 Providing the measures above are put in place there are no anticipated significant adverse residual effects in relation to reptiles. Connectivity east to west may be compromised for slow-worm but given the population do not use the western portion of the red line boundary currently it is not considered significant. The habitat creation measures are considered to result in a significant beneficial residual effect for both reptiles and widespread amphibians.

#### **Birds**

- 3.7.82 The scoping survey for breeding bird found a good assemblage of common garden and farmland birds using the Site although none likely to be particularly vulnerable to effects associated with development and few species of particular conservation concern. It was noted that nesting opportunities were limited to the boundary hedgerows and no opportunities for nesting within buildings were available.

#### Potential Impacts

- 3.7.83 The removal of small sections of hedgerow will minorly reduce nesting potential within the plot in the short term. Removal of the hedgerow section has the potential to result in impacts to nesting birds if undertaken during the nesting season (March- August inclusive).
- 3.7.84 Removal of hedgerow sections, large areas of modified grassland and the culverting of short sections of ditch will reduce the availability of foraging habitats for a range of birds.

#### Mitigation, Compensation, Enhancement and Monitoring

- 3.7.85 Measures to ensure nesting birds will not be impacted by the removal of small sections of hedgerow will be included in the CEMP produced for the Site. This will outline the need to undertake any hedgerow outside of the nesting bird season (September- February inclusive) if this is not possible pre-removal checks which must take place if removal of the hedgerows takes place within the nesting bird season.
- 3.7.86 Provision of additional hedgerows, woodland and the enhancement of ditches and retained grassland will ensure the development proposals result in enhancements for nesting and foraging birds. These measures will increase foraging potential of the grasslands and ditches by reducing damaging management and agricultural impacts. This will increase the availability of invertebrates from the grassland and ditches. Additional hedgerow planting and management to enhance the retained hedgerows will result in additional foraging resources including additional winter fruit and in time provide enhanced nesting opportunities for a range of species.
- 3.7.87 As an enhancement for nesting birds provision of nesting features should be included within the buildings at a rate of one per two dwellings in line with the British Standard. This should be integrated or affixed to the new dwellings or garages and include specific provision for house sparrow and swift *Apus apus*. Details of the specification and location will be provided in the LEMP produced for the proposals. In addition to





these a further 20 general purpose bird boxes will be provided in the retained hedgerows and trees to enhance the provision of nesting opportunities for a range of common garden bird species. These should include 10 Schwegler 1b type or similar, 5 open fronted boxes and a mix of 5 other larger boxes including some suitable for larger birds such as starling. As a further enhancement a barn owl box should be considered in the off-site land provided for bat mitigation. This could be mounted on a 3m wooden pole set within the open grassland.

#### Residual Effects

- 3.7.88 Provided the measures outline above are put in place the proposals are not anticipated to result in residual effects in relation to birds.

#### ***Invasive non-natives***

- 3.7.89 No invasive non-native species were recorded within the Site during the walkover survey although invasive aquatic plants including water fern were recorded within 250m of the red line boundary.

#### Potential Impacts

- 3.7.90 The proposals have the potential to introduce invasive plant species to the ditches and new habitats if careful controls and monitoring are not put in place. The presence of invasive species such as water fern in the ditches or SuDs could lead to a loss of biodiversity where these species outcompete native aquatic plants.

#### Mitigation, Compensation, Enhancement and Monitoring

- 3.7.91 Construction measures including the use of clean uncontaminated soils will help to reduce the potential for new invasive plant species to establish on the Site. There is some potential for invasives such as water fern to find their way into the ditches on Site through introduction from waterfowl or contamination from dredging equipment. This is difficult to prevent due to the mobile nature of waterfowl.
- 3.7.92 To reduce the potential for invasive species to spread throughout the habitats and ditches monitoring of the ditches and retained habitats, as part of the CEMP and LEMP, should take place by an ecologist to ensure invasive species are not introduced. If species such as water fern or New Zealand pygmy-weed are recorded during the monitoring, measures will need to be put in place to eradicate or control the spread of such species to ensure they do not spread to off-site habitats or degrade the mitigation habitats proposed.

#### Residual Effects

- 3.7.93 Providing the measures above are put in place there should be no residual effects in relation to invasive non-natives.

### **3.8 Summary of Assessment of Effects**

- 3.8.1 The assessment of effects is summarised in Table 17 overleaf, which also outlines the proposed method to secure any relevant mitigation associated with reducing impacts.



**Table 17: Summary of Assessment of Effects**

Feature	Importance	Mitigation/Compensation Proposed	Residual Effect and Significance	Proposed Mechanism to Secure	Monitoring Required?
Designated Sites					
North Somerset and Mendip Bats Special Area of Conservation (SAC)	International	<p>General measures outlined in the CEMP will ensure no direct impacts to this site occur.</p> <p>Measures outlined in the bats section will ensure horseshoe bats associated with this designated site will not be negatively impacted by the proposals</p>	Neutral. No residual impact.	<p>CEMP</p> <p>LEMP/Lighting plan</p>	N/A
Biddle Street, Yatton SSSI	National	<p>General measures outlined in the CEMP will ensure no direct impacts to this site occurs through construction impacts.</p> <p>A range of measures are also proposed to reduce the potential for additional recreational impacts to impact this adjacent designated site. These include provision of bins at the junction to the Strawberry Line LNR and the funding of refuse collection and litter picking along the Strawberry Line LNR path locally.</p>	Positive residual effect (not significant)	<p>CEMP</p> <p>Section 106</p> <p>LEMP</p>	N/A
Kings Wood and Urchin Wood SSSI	National	<p>General measures outlined in the CEMP will ensure no direct impacts to this site occurs through construction impacts.</p> <p>Specific impacts on horseshoe bats associated with this site are included in the bat section below.</p>	Neutral. No residual impact.	CEMP	N/A
Congresbury Yeo, adjacent land and rhynes SSSI	Local	<p>General measures outlined in the CEMP will ensure no direct impacts to this site occurs through construction impacts.</p> <p>A range of measures are also proposed to reduce the potential for additional recreational impacts to impact this adjacent designated site. These include provision of bins at the junction to the Strawberry Line LNR and the funding of refuse collection and litter picking along the Strawberry Line LNR path locally.</p>	Positive residual effect (not significant)	<p>CEMP</p> <p>Section 106</p>	N/A



Feature	Importance	Mitigation/Compensation Proposed	Residual Effect and Significance	Proposed Mechanism to Secure	Monitoring Required?
		Management of the fields of the off-site land as valuable foraging habitat for horseshoe bats will enhance the value of the habitats contained in this designated site.			
Cheddar Valley Railway Walk LNR/ Strawberry Line LNR	Local	<p>General measures outlined in the CEMP will ensure no direct impacts to this site occurs through construction impacts.</p> <p>A range of measures are also proposed to reduce the potential for additional recreational impacts to impact this adjacent designated site. These include provision of bins at the junction to the Strawberry Line LNR and the funding of refuse collection and litter picking along the Strawberry Line LNR path locally. It is considered these measures will alleviate some of the current recreational pressure recorded.</p>	Positive residual effect (not significant)	CEMP Section 106	N/A
Habitats					
Hedgerows	Local	<p>The retained hedgerows will be protected using tree protection fencing the location of which will be detailed in the CEMP.</p> <p>Mitigation for small extents of hedgerow loss will be mitigated by the planting of additional hedgerows alongside a number of the central ditches. Further enhancement of four retained hedgerow will provide additional habitat value.</p>	The proposals will result in a significant enhancement of hedgerows locally.	CEMP LEMP	Yes- in line with requirements of the LEMP
Mature trees	Local	<p>All healthy mature trees will be retained and protected by tree protection fencing throughout construction the location of which will be outlined in the CEMP.</p> <p>A large number of trees will be planted as part of the proposals which in time will mitigate for the loss of 2 diseased mature trees removed to facilitate the proposals.</p>	The proposals will result in a significant beneficial residual effect in relation mature trees within the Site in the long term.	CEMP LEMP	Yes, in line with requirements of the LEMP



Feature	Importance	Mitigation/Compensation Proposed	Residual Effect and Significance	Proposed Mechanism to Secure	Monitoring Required?
Ditches	Local	<p>General measures laid out in the CEMP will ensure these features are not damaged or polluted by construction activities.</p> <p>Several sections of ditch will be culverted totalling 104 linear meters. This will be mitigated by enhancement of the retained ditches quality. Measures to ensure ditch connectivity is maintained for a range of species are also proposed.</p>	The proposals will result in a minor positive residual effect in relation to the ditches due to the increases in ditch quality proposed through sensitive management. This is not considered to be a significant effect.	CEMP LEMP	Yes quarterly inspections for invasive species during construction and monitoring in line with the LEMP thereafter.
Species					
Bats	Regional	<p>Maintenance of commuting habitats surrounding the Site.</p> <p>Maintenance and enhancement of foraging habitat value in line with the guidance provided in the North Somerset and Mendip Bat SAC guidance on development. Including the provision and maintenance of off-site compensation habitat to ensure foraging habitat equivalence for greater horseshoe bats.</p> <p>Control of lighting to ensure foraging and commuting habitats remain available and accessible to horseshoe bats.</p> <p>Appropriate assessment of the impacts of the proposals on the North Somerset and Mendip Bat SAC</p>	The proposals have the potential to result in a significant positive residual effect in terms of the habitats available for bats including horseshoe bats locally.	CEMP/LEMP Section 106 agreement  Lux contour plan (to include internal lighting from houses and security lighting)	Yes – Monitoring of lighting levels post occupation.  Monitoring of use of the mitigation habitat by horseshoe bats in years 5, 10 and 15.
Otter	Local	<p>Measures to protect otter habitats will be outlined in the CEMP</p> <p>Measures to enhance the ditches will result in improvements to habitat quality for this species.</p>	The proposals will result in a positive residual effect in relation to otters. This is not considered significant.	CEMP LEMP	N/A
Water vole	Site (if present)	<p>Measures to protect potential water vole habitats will be outlined in the CEMP</p> <p>Measures to enhance the ditches will result in improvements to habitat quality for this species and may</p>	The proposals will result in a significant positive residual effect for water voles.	CEMP LEMP	N/A



Feature	Importance	Mitigation/Compensation Proposed	Residual Effect and Significance	Proposed Mechanism to Secure	Monitoring Required?
		allow it to colonise the Site in the future.			
Dormice	Local (if present)	<p>Precautionary measures for habitat clearance in relation to dormice will be provided in the CEMP.</p> <p>Measures to enhance hedgerows will increase the value of the Site for dormice.</p>	The proposals will result in a positive residual effect for dormice within the Site. The level of effect is not considered to be significant.	CEMP LEMP	N/A
Reptiles and widespread amphibians	Local	<p>Depending on recent habitat management the presence of a low population of both slow-worm and grass snake on the eastern boundary will be mitigated through habitat manipulation and fencing or a translocation (lasting a minimum of 15 visits) to ensure no reptiles are harmed by Site clearance.</p> <p>Habitat enhancement measures proposed including the grassland and ditch management will ensure the Site will be of greater value to a range of reptile species.</p>	The proposals will result in a significant positive residual effect in relation to reptiles and widespread amphibians due to the enhanced provision of suitable foraging and sheltering habitats,	CEMP LEMP	Monitoring of the success of the translocation exercise and upkeep of reptile fencing during construction will be required.
Birds	Local	<p>Measures to protect nesting birds during habitat clearance activities will be outlined in the CEMP.</p> <p>The planting of hedgerows, trees and woodland within the red line boundary along with the provision of additional bird boxes will enhance the Site for nesting birds.</p> <p>Habitat enhancement across the Site will provide additional foraging opportunities for birds locally.</p>	Significant positive residual effect for nesting and foraging birds within the Site	CEMP LEMP	N/A
Invasive non-natives	Negligible	Monitoring of the ditches and other habitats of the Site will be undertaken on a quarterly basis during the construction phase to check for the continued absence of invasive plant species. Further longer-term habitat monitoring will be outlined in the LEMP to ensure invasive species are identified and adequately controlled.	N/A by monitoring the continued absence of invasive species it is hoped significant negative residual effects from colonisation of such species can be avoided.	CEMP LEMP	Yes – in line with stipulations in the CEMP and LEMP





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## 4 CONCLUSIONS

- 4.1.1 In the absence of mitigation, the proposed development will result in **adverse impacts** upon a number of ecological features ranging from **International to Site** importance. These include the potential to affect bats associated with the North Somerset and Mendip Bat Special Area of Conservation.
- 4.1.2 Avoidance and mitigation measures have been proposed to ensure that these adverse impacts are reduced as far as possible. These include protection of the off-site statutory and non-statutory designated sites by the implementation of pollution prevention controls. The avoidance of detrimental impacts to ditches and hedgerows both within and surround the Site and the enhancement of these features wherever possible. Protected species mitigation measures include measures to protect and retain reptiles and nesting bird checks. The proposals include bespoke horseshoe mitigation by securing, through a section 106 agreement, the enhancement and long-term management of up to 2.9ha of off-site habitat. This will ensure the equivalent area of foraging habitat is provided locally for this species in line with the North Somerset and Mendip Bat SAC guidance on development as demonstrated by the HEP calculations. This mitigation habitat along the lux contour plan to be produced for the scheme detailing external street light sources and post construction monitoring of bat activity levels will secure the future use of the Site and local area for horseshoe bats.
- 4.1.3 Assuming the successful implementation of the measures described above the proposed development is in line with planning policies CS4 and DM8 contained in the North Somerset Local Plan Core Strategy and the North Somerset Development Management Sites and Policies Plan Part 1. These policies seek to ensure that new development is designed to maximise benefits to biodiversity, incorporating, safeguarding and enhancing natural habitats and features and adding to them where possible. In addition, they require the protection and enhancement of biodiversity, planting of trees and provision of strategically important green spaces. The scheme also contributes to the promotion of the Congresbury Yeo, as a local corridor for biodiversity and landscape enhancement. The scheme also aids in the local development of water bodies, paths and cycleways in and surrounding urban areas, and recognises the value of sustainable drainage systems for green infrastructure.



## APPENDIX A: WILDLIFE LEGISLATION & SPECIES INFORMATION

### BADGER

Badgers and their setts are protected under the Protection of Badgers Act 1992 (as amended) against damage or destruction of a sett, or disturbance, death or injury to the badgers. The Act defines a sett as "any structure or place which displays signs indicating current use by a badger". The definition of current use is subject to considerable debate. Natural England have produced guidance on the definition of current use. (*Badgers and Development – A guide to best practice and development*. Natural England 2011). Given the ambiguity surrounding the definition in all circumstances we would recommend an assessment of current use is always undertaken by a qualified ecologist. Natural Resources Wales (NRW) have a slightly different definition of current use. Please see the NRW website for further information. Penalties for offences against badgers or their setts include fines of up to £5,000 and/or up to six months in prison.

Disturbance of badgers could be caused by any digging activity or scrub clearance within 30 metres of an occupied sett and therefore every case needs to be assessed individually. Felling of trees close to a badger sett may also cause disturbance in some situations. Some activities such as pile driving may cause disturbance at even greater distances, and should be discussed with Natural England or NRW.

Licences are issued by Natural England (or NRW in Wales) to allow the disturbance of badgers, and the destruction of their setts in certain circumstances, in relation to development. Full planning permission must be obtained before a licence application will be considered. Although licences can be applied for at any time of year, disturbance of badgers or exclusion of badgers from a sett can only take place between 1 July and 30 November, to avoid the breeding season when dependant young may be underground. This restriction may be relaxed in some cases where a sett is seasonal and badgers can be shown to be absent from a sett at that time of year.

This report contains information of a confidential nature relating to the location of badger setts. Public access to this data should be restricted to those who have a legitimate need to assess the information and to know the exact situation of the setts rather than simply that badgers are present.

### BATS

All 17 species of bat known to breed in England and Wales, and their roost sites, are protected under the Conservation of Habitats and Species Regulations 2017, known as the 'Habitats Regulations'. This makes it an offence to deliberately kill or injure a bat, or to deliberately disturb a bat such that its ability to hibernate, breed or rear young, or such that the species' distribution, were significantly affected. It is also an offence to damage or destroy any breeding site or resting place. Intentional or reckless disturbance of bats in their resting places, and damage to or obstruction of resting places are also offences under the Wildlife and Countryside Act 1981 (as amended). Under UK law a bat roost is "any structure or place which any wild [bat]...uses for shelter or protection". As bats tend to reuse the same roosts, legal opinion is that the roost is protected whether or not the bats are present at the time. Penalties for offences against bats or their roosts include fines of up to £5,000 and/or up to six months in prison.

As a result, development works which are likely to involve the loss of or alteration to roost sites, or which could result in killing of or injury to bats, need to take place under licence. Works which could disturb bats may also be licensable, though this needs to be assessed on a case by case basis, as bats' sensitivity to disturbance varies depending on normal background levels, and the definition of disturbance offences under the Habitats Regulations is complex. In practice this means that works involving modification or loss of roosts (typically in buildings, trees or underground sites) or significant disturbance to bats in roosts are likely to be licensable.

Licences can be obtained from Natural England or the Welsh Government to permit works that would otherwise be illegal, provided it can be demonstrated that the proposed works are needed to protect public health or safety, or for other reasons of overriding public interest including social and economic reasons. It is also necessary to demonstrate that there is no satisfactory alternative to the proposed works, and that the conservation status of bats in the area will be maintained. Appropriate mitigation and post-construction monitoring are therefore a requirement of all licences.

### DORMOUSE

Dormice and their nests are protected in England and Wales under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, known as the 'Habitats Regulations'. This makes it an offence to deliberately kill or injure a dormouse, or to deliberately disturb a dormouse such that its ability to hibernate, breed or rear young, or such that the species' distribution, were significantly affected. It is also an offence to damage or destroy any breeding site or resting place. Intentional or reckless disturbance of dormice in their nests, and damage to or obstruction of nests are also offences under the Wildlife and Countryside Act 1981 (as amended). Penalties for offences against dormice or their nests include fines of up to £5,000 and/or up to six months in prison.

As a result, development works which are likely to involve the loss of nest sites, or which could result in killing of or injury to dormice, need to take place under licence. Works which could disturb dormice may also be licensable, though this is rarely the case unless loss of dormouse habitat is also proposed and should be assessed on a case by case basis. In practice this means that works involving any removal of habitat (typically woodland, hedgerows, and scrub) supporting dormice are likely to be licensable.



Licences can be obtained from Natural England or the Welsh Government to permit works that would otherwise be illegal, provided it can be demonstrated that the proposed works are needed to protect public health or safety, or for other reasons of overriding public interest including social and economic reasons. It is also necessary to demonstrate that there is no satisfactory alternative to the proposed works, and that the conservation status of dormice in the area will be maintained. Appropriate mitigation and post-construction monitoring are therefore a requirement of all licences.

## AMPHIBIANS

Great Britain supports seven native amphibian species. The four most widespread species; smooth and palmate newts, common frog, and common toad, receive partial protection under the Wildlife and Countryside Act 1981 (as amended) which prohibits sale, barter, exchange, transporting for sale and advertising to sell or to buy. The great crested newt, pool frog and natterjack toad are also fully protected in England and Wales under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Penalties for offences against amphibian species include fines of up to £5,000 and/or up to six months in prison.

Four amphibian species (great crested newt, pool frog, common toad, natterjack toad) are listed as priority species under the UK Biodiversity Action Plan, and are therefore considered to be Species of Principal Importance in England and Wales (excluding the pool frog, which does not occur in Wales) under the Natural Environment and Rural Communities (NERC) Act 2006. All public bodies including local and regional authorities have a duty under this legislation to have regard for the conservation of biodiversity.

## GREAT CRESTED NEWT

Great crested newts are protected in England and Wales under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, known as the 'Habitats Regulations'. This makes it an offence to deliberately kill or injure a great crested newt, or to deliberately disturb a great crested newt such that its ability to hibernate, breed or rear young, or such that the species' distribution, were significantly affected. It is also an offence to damage or destroy any breeding site or resting place for great crested newts. Intentional or reckless disturbance of great crested newts in places of shelter (ponds or terrestrial refuges), and damage to or obstruction of places of shelter are also offences under the Wildlife and Countryside Act 1981 (as amended). Penalties for offences against great crested newts include fines of up to £5,000 and/or up to six months in prison.

As a result, development works which are likely to involve the loss of ponds or terrestrial habitat, or which could result in killing of or injury to great crested newts, need to take place under licence. Works which could disturb great crested newts may also be licensable, though this is rarely the case unless loss of great crested newt habitat is also proposed, and should be assessed on a case by case basis. In practice this means that works involving any removal of or significant modification to ponds or terrestrial habitats (typically rough grassland, scrub, hedgerow bases and woodland) supporting great crested newts are likely to be licensable.

Licences can be obtained from Natural England or the Welsh Government to permit works that would otherwise be illegal, provided it can be demonstrated that the proposed works are needed to protect public health or safety, or for other reasons of overriding public interest including social and economic reasons. It is also necessary to demonstrate that there is no satisfactory alternative to the proposed works, and that the conservation status of great crested newts in the area will be maintained. Appropriate mitigation and post-construction monitoring are therefore a requirement of all licences.

## REPTILES

All six native reptile species receive protection under the Wildlife and Countryside Act 1981 (as amended). The four more common species (common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, adder *Vipera berus* and grass snake *Natrix natrix*) receive partial protection which makes it an offence to intentionally kill or injure a reptile. The two other reptile species (smooth snake *Coronella austriaca* and sand lizard *Lacerta agilis*), both of which are rare with very restricted UK ranges receive full protection under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Penalties for offences against reptile species include fines of up to £5,000 and/or up to six months in prison.

Works such as site clearance or topsoil stripping which could result in killing or injury of reptiles could be considered result in an offence unless measures are taken to minimise the risk of this occurring. Any inadvertent impacts on common reptile species despite these mitigation measures being in place would be considered an 'incidental result of an otherwise lawful operation' which 'could not reasonably have been avoided' and therefore not an offence. Works which could affect smooth snakes or sand lizards, or their habitats, would need to take place under licence from Natural England or Natural Resources Wales. However sites supporting smooth snakes or sand lizards are very rarely affected by development proposals.

In practice, mitigation for impacts of development on common reptiles generally comprise one or more of the following techniques: displacement, in which reptiles are encouraged to move to suitable retained habitat by changing the management of areas affected by development; exclusion, where reptile-resistant fencing is provided between a development site and suitable retained habitat allowing reptiles to be trapped from the development footprint and released elsewhere on the site; and translocation, where animals are trapped from a development site and released on another suitable site nearby. Reptile mitigation proposals, particularly those involving translocation of animals, should be agreed in advance with the local planning authority.



## BIRDS

All British birds, their nests and eggs (with certain exceptions) are protected under the Wildlife & Countryside Act 1981 (as amended) which makes it an offence to: intentionally kill, injure or take a wild bird; intentionally take, damage or destroy nests which are in use or being built; intentionally take or destroy birds' eggs; or possess live or dead wild birds or eggs. A number of species receive additional protection through inclusion on Schedule 1 of the Wildlife and Countryside Act; for these it is also an offence to intentionally or recklessly disturb birds while nest building, or at a nest containing eggs or young, or to disturb the dependant young of such a bird. Penalties for offences against bird species include fines of up to £5,000 and/or up to six months in prison.

General licences for control of some bird species are issued by Natural England and Natural Resources Wales in order to prevent damage or disease, or to preserve public health or public safety, but it is not possible to obtain a licence for control of birds or removal of eggs/nests for development purposes. Consequently if nesting birds are present on a development site when works are programmed to start it is usually necessary to delay works, at least in the areas supporting nests, until any chicks have fledged and left the nest. It is usually possible, once chicks have hatched, for an experienced ecologist to predict approximately when they are likely to fledge, in order to inform programming of works on site.

## OTTER

Otters and their holts are protected in England and Wales under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, known as the 'Habitats Regulations'. This makes it an offence to deliberately kill or injure an otter, or to deliberately disturb an otter such that its ability to breed or rear young, or such that the species' distribution, were significantly affected. It is also an offence to damage or destroy any breeding site or resting place. Intentional or reckless disturbance of otters in their holts, and damage to or obstruction of holts are also offences under the Wildlife and Countryside Act 1981 (as amended). Penalties for offences against otters or their holts include fines of up to £5,000 and/or up to six months in prison.

Any development works which are likely to involve the loss of holts, or which could result in killing of or injury to otters (which are only likely to occur extremely rarely), need to take place under licence. Works which could disturb otters may also be licensable, though this is also rarely the case as the majority of developments on watercourses and coastal areas where otters are present can be carried out in a way which avoids significant disturbance.

Where it is necessary, licences can be obtained from Natural England or the Welsh Government to permit works that would otherwise be illegal, provided it can be demonstrated that the proposed works are needed to protect public health or safety, or for other reasons of overriding public interest including social and economic reasons. It is also necessary to demonstrate that there is no satisfactory alternative to the proposed works, and that the conservation status of otters in the area will be maintained. Appropriate mitigation and post-construction monitoring are therefore a requirement of all licences.

## WATER VOLE

Water voles *Arvicola amphibius* receive protection under the Wildlife and Countryside Act 1981 (as amended), which makes it an offence to: intentionally kill, injure, or take a water vole; intentionally or recklessly disturb a water vole whilst in its place of shelter; intentionally or recklessly damage, obstruct or destroy a water vole's place of shelter; or intentionally or recklessly obstruct access to a place of shelter. Penalties for offences against water voles include fines of up to £5,000 and/or up to six months in prison.

Works such as watercourse re-profiling, installing culverts, or topsoil stripping close to watercourses and ponds which could result in destruction or obstruction of burrows could be considered reckless, and/or could be considered intentional if water voles are killed or injured, unless measures are taken to minimise the risk of this occurring. Any inadvertent impacts on water voles despite these mitigation measures being in place would be considered an 'incidental result of an otherwise lawful operation' which 'could not reasonably have been avoided' and therefore not an offence.

In practice, mitigation for impacts of development on water voles generally comprise one or more of the following techniques: displacement, in which water voles are encouraged to move to suitable retained habitat by changing the management of areas affected by development; exclusion, where water vole-resistant fencing is provided between a development site and suitable retained habitat allowing animals to be trapped from the development footprint and released elsewhere on the site; and translocation, where animals are trapped from a development site and released on another suitable site nearby. Water vole mitigation proposals, particularly those involving translocation of animals, should be agreed in advance with Natural England or Natural Resources Wales.

## PLANNING POLICY IN RELATION TO BIODIVERSITY - ENGLAND

The National Planning Policy Framework (NPPF), was published in March 2012 and revised in July 2021. Additional guidance can be found online at <http://planningguidance.planningportal.gov.uk/blog/guidance/>. The NPPF simplifies and collates a number of previous planning documents and outlines the government's objective towards biodiversity.

The NPPF identifies ways in which the planning system should contribute to and enhance the natural and local environment (Paragraph 174), including:



- (a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
- (b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
- (d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
- (e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and
- (f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate. protecting and enhancing valued landscapes, geological conservation interests and soils;

It also emphasises the importance of conserving biodiversity and areas covered by landscape designations (Paragraph 176):

Great weight should be given to conserving landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to landscape and scenic beauty. The conservation of wildlife and cultural heritage are important considerations in all these areas, and should be given great weight in National Parks and the Broads. The scale and extent of development within all these designated areas should be limited, while development within their setting should be sensitively located and designed to avoid or minimise adverse impacts on the designated areas.

When determining planning applications, the NPPF states that local planning authorities should aim to conserve and enhance biodiversity (Paragraph 175) by applying principles including:

- (a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- (b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
- (c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons<sup>6</sup> and a suitable compensation strategy exists; and
- (d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate..

The following should be given the same protection as habitats sites:

- (a) potential Special Protection Areas and possible Special Areas of Conservation;
- (b) listed or proposed Ramsar sites<sup>7</sup>; and
- (c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

There is a general presumption in favour of sustainable development within the NPPF. It is noted in Paragraph 182 that this presumption does not apply where the plan or project is likely to have a significant effect on a habitat site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.

The Natural Environment and Rural Communities Act (2006) states that a public authority must, "in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity; Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat". DEFRA issued further guidance on implementation of this act in the document; Guidance for Local Authorities on Implementing the Biodiversity Duty (May 2007), which notes that "Conserving biodiversity includes restoring and enhancing species populations and habitats, as well as protecting them".

The Environment Act (2021) was passed into law in November 2021. This Act is comprised of 8 Parts and sets out targets for conservation and environmental betterment along with a system for their implementation, including the creation of a new Office for Environmental Protection (OEP). Of particular pertinence to Ecology is Part 6 – Nature and biodiversity, which includes a mandatory requirement for developments to deliver a minimum 10% biodiversity net gain (as quantified through an approved metric such as the Defra 3.0 metric). Such gains must be secured for a minimum of 30 years post-completion of development.

For most schemes, Net Gain shall be secured through an amendment to the Town and Country Planning Act, which is likely to be passed into law in 2023. Nationally Significant Infrastructure Projects (NSIPs) will also be subject to this requirement, but this will be secured through the Planning Act 2008, which means that for NSIPs the mandatory net gain requirement will not be in place until 2025. Certain small schemes are exempt from the requirement for delivering net gain.

It is important to note that in the meantime, Local Planning Authorities across the country have already adopted their own, differing policies regarding net gain. Several stipulate no net loss as a minimum, whilst others have 10% or even 20% requirements.





## ECOLOGICAL ENHANCEMENTS

The Natural Environment and Rural Communities Act (2006) states that a public authority must, "in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity; Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat". DEFRA issued further guidance on implementation of this act in the document; Guidance for Local Authorities on Implementing the Biodiversity Duty (May 2007), which notes that "Conserving biodiversity can include restoring or enhancing a population or habitat".

In England, the National Planning Policy Framework (NPPF), issued in July 2021, states that the planning system should contribute to "minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures; It also states that "opportunities to incorporate biodiversity in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity".

## UK BIODIVERSITY ACTION PLANS

The UK Biodiversity Action Plan (UK BAP) 2011 is a policy first published in 1994 to protect biodiversity and stems from the 1992 Rio Biodiversity Earth Summit. The policy is continuously revised to combine new and existing conservation initiatives to conserve and enhance species and habitats, promote public awareness and contribute to international conservation efforts. Each plan details the status, threats and unique conservation strategies for the species or habitat concerned, to encourage spread and promote population numbers.

Species or habitats identified as priorities under the UK Biodiversity Action Plan receive some status in the planning process through their identification as Species/Habitats of Principal Importance in England and Wales, under the Natural Environment and Rural Communities (NERC) Act 2006 (as amended).

Current planning guidance in England, the National Planning Policy Framework, does not specifically refer to Species or Habitats of Principal Importance, though it includes guidance for conservation of biodiversity in general. Supplementary guidance is available online at <http://planningguidance.planningportal.gov.uk/blog/guidance/> and this guidance indicates that it is 'useful to consider' the potential effects of a development on the habitats or species on the Natural Environment and Rural Communities Act 2006 section 41 list.

## THE HEDGEROWS REGULATIONS

In England and Wales the Hedgerows Regulations (1997) as amended confer a level of protection on hedgerows (though hedgerows within or bordering domestic gardens are excluded), particularly those hedgerows classified as 'Important' under the legislation. The Regulations require those wishing to remove hedgerows to submit a Hedgerow Removal Notice to the Local Planning Authority (LPA), which will then determine whether the hedgerow affected is classified as 'Important' under the Regulations. If it is, the LPA will either approve the proposed hedgerow removal, or issue a retention notice. It is an offence to remove or destroy a hedgerow which is subject to a retention notice, or to remove one without a removal notice.

Routine management of hedgerows, removal of hedgerows for development which has been granted planning consent, and certain other situations are allowed under the Regulations, which also specifically exclude hedgerows within or bordering domestic gardens. Determination of whether a hedgerow should be classified as 'Important' is based on a number of criteria including assessment of its likely historic value (e.g. old parish boundary or part of an ancient monument), ecological value (e.g. presence of protected species, and/or diversity of tree/shrub species in the hedgerow), and landscape value (e.g. associated with a public footpath, or being associated with hedgebanks, ditches, hedgerow trees etc).

Ancient and species-rich hedgerows are listed as a priority habitat in the UK Biodiversity Action Plan (2011)

## APPENDIX B: PHOTOGRAPHS OF SITE FEATURES



Figure C1: View from field 2 to the north including poached drainage ditch and existing edge of Yatton.



Figure C2: Ditch 30 taken from low on the bank during the water vole survey. Note level of duckweed and turbidity along with low diversity of aquatic vegetation and impacts from livestock.





**Figure C3: View across western fields to hedgerows which form the western boundary (these sit above and shade out the Biddle Steet SSSI ditches which form the western Site boundary).**



**FIGURE C4: View across Field 1 (horse poached with high burden of injurious weeds)**



## APPENDIX C: BRERC INVERTEBRATE RECORDS

Scientific Name	Common Name	Grid Ref	Place	Date of Record	Sex/ Stage	Record Type	BRERC Area Status	Taxa group
<i>Brachytron pratense</i>	Hairy Dragonfly	ST423659	Strawberry Line, Yatton, approximate site grid refence	18/04/2014	adult female	field record and photographed	Rare	dragonfly, hawker or damselfly
<i>Hydaticus transversalis</i>	a water beetle	ST42316464	Ditch north of New Rhyne, near Congresbury, site central transect point	21/07/2011	adult	field record	Frequent	beetle
<i>Odontomyia ornata</i>	Ornate Brigadier	ST42316464	Ditch north of New Rhyne, near Congresbury, site central transect point	21/07/2011	larva	field record	Som. Levels	true fly - soldier or snipe fly
<i>Berosus (Berosus) affinis</i>	a scavenger water beetle	ST42446469	Ditch north of New Rhyne, near Congresbury, site central transect point	21/07/2011	adult	field record	Proposed BRERC Notable 2004 as nationally notable	beetle
<i>Coenagrion pulchellum</i>	Variable Damselfly	ST42486499	Ditch north Binhay Rhyne, central transect point	18/06/2012	Adult	field record	Rare	dragonfly, hawker or damselfly
<i>Peltodytes caesus</i>	a crawling water beetle	ST42486499	Ditch north Binhay Rhyne, central transect point	18/06/2012	adult	field record	Frequent	beetle
<i>Diarsia rubi</i>	Small Square-spot	ST42596510	within parish or ward of Yatton	10/09/2015	adult	field record	Proposed BRERC Notable 2008 as UK BAP listed	moth or butterfly - macro moth
<i>Thymelicus lineola</i>	Essex Skipper	ST42626453	New Croft, Congresbury Moor	01/07/2015	adult	netted	Local	moth or butterfly - butterfly
<i>Hydrophilus piceus</i>	Great Silver Water Beetle	ST42676603	High Street, Yatton	16/11/2018	dead (unknown sex/stage)	field record	Frequent	beetle
<i>Laccobius sinuatus</i>	a scavenger water beetle	ST42796502	Ditch North-East of Strawberry line, Yatton, site central transect point	20/07/2011	adult	field record	Proposed BRERC Notable 2009 as nationally notable	beetle



Scientific Name	Common Name	Grid Ref	Place	Date of Record	Sex/ Stage	Record Type	BRERC Area Status	Taxa group
<i>Cercyon convexiusculus</i> (Cercyon)	a scavenger water beetle	ST42856429	Ditch north of River Yeo, south of New Rhyne, central transect point	18/06/2012	adult	field record	Proposed BRERC Notable 2004 as nationally notable	beetle
<i>Odontomyia tigrina</i>	Black Colonel	ST42856429	Ditch north of River Yeo, south of New Rhyne, central transect point	18/06/2012	larva	field record	Som. coastal marsh	true fly - soldier or snipe fly
<i>Harmonia axyridis</i>	Harlequin Ladybird	ST42906565	Yatton	06/08/2015	present	field record	BRERC Notable invasive species	beetle
<i>Plodia interpunctella</i>	Indian Meal Moth	ST42966530	Court Avenue, Yatton, Bristol, BS49 4EP in the house	01/10/2017	adult	field record	Rare	moth or butterfly - micro moth
<i>Potamopyrgus antipodarum</i>	Jenkins' Spire Snail	ST43106478	Yatton, West of Land Farm, East of Strawberry Line, site central transect point	19/07/2011	adult	field record	BRERC Notable invasive species	mollusc
<i>Cymbiodyta marginellus</i>	a scavenger water beetle	ST43146466	Ditch south of Land Farm; North-east of Strawberry line, south of Yatton, site central transect point	15/07/2011	adult	field record	Widespread	beetle
<i>Acronicta psi</i>	Grey Dagger	ST4320665795	Stowey Road, Yatton, rear garden	31/08/2013	adult	photographed	Proposed BRERC Notable 2008 as UK BAP listed	moth or butterfly - macro moth
<i>Acronicta rumicis</i>	Knot Grass (moth)	ST4320665795	Stowey Road, Yatton, rear garden	20/07/2013	adult	photographed	Proposed BRERC Notable 2008 as UK BAP listed	moth or butterfly - macro moth
<i>Aethalura punctulata</i>	Grey Birch	ST4320665795	Stowey Road, Yatton	26/06/2014	adult	photographed	Local	moth or butterfly - macro moth
<i>Agriphila selasella</i>	a pyralid moth	ST4320665795	Stowey Road, Yatton, rear garden	30/07/2013	adult	photographed	Local	moth or butterfly - micro moth
<i>Agrochola lychnidis</i>	Beaded Chestnut	ST4320665795	Stowey Road, Yatton, garden	02/10/2016	present	photographed	Proposed BRERC Notable 2008 as UK BAP listed	moth or butterfly - macro moth
<i>Cetonia aurata</i>	Rose Chafer	ST4320665795	Stowey Road, Yatton, garden	29/07/2016	present	photographed	Local	beetle
<i>Chilodes maritima</i>	Silky Wainscot	ST4320665795	Stowey Road, Yatton	18/07/2015	adult	photographed	Rare	moth or butterfly - macro moth





Scientific Name	Common Name	Grid Ref	Place	Date of Record	Sex/ Stage	Record Type	BRERC Area Status	Taxa group
<i>Cirrhia icteritia</i>	Sallow (moth)	ST4320665795	Stowey Road, Yatton, garden	02/10/2016	present	photographed	Proposed BRERC Notable 2008 as UK BAP listed	moth or butterfly - macro moth
<i>Conistra ligula</i>	Dark Chestnut	ST4320665795	Stowey Road, Yatton, rear garden	25/10/2013	adult	photographed	Local	moth or butterfly - macro moth
<i>Dolichovespula (Dolichovespula) media</i>	Median Wasp	ST4320665795	Stowey Road, Yatton	22/04/2015	present	photographed	Proposed BRERC Notable 2004 as nationally notable	ant, bee, wasp, sawfly or ichneumon (and others)
<i>Ennomos fuscantaria</i>	Dusky Thorn	ST4320665795	Stowey Road, Yatton, rear garden	31/08/2013	adult	photographed	Proposed BRERC Notable 2008 as UK BAP listed	moth or butterfly - macro moth
<i>Euxoa obelisca</i>	Square-spot Dart	ST4320665795	Stowey Road, Yatton	05/08/2014	adult	photographed	Rare	moth or butterfly - moth (macro or micro not listed) moth
<i>Hepialus humuli</i>	Ghost Moth	ST4320665795	Stowey Road, Yatton	20/06/2015	adult female	photographed	Proposed BRERC Notable 2008 as UK BAP listed	moth or butterfly - macro moth
<i>Hoplodrina blanda</i>	Rustic	ST4320665795	Stowey Road, Yatton, rear garden	31/08/2013	adult	photographed	Proposed BRERC Notable 2008 as UK BAP listed	moth or butterfly - macro moth
<i>Hydraecia micacea</i>	Rosy Rustic	ST4320665795	Stowey Road, Yatton, rear garden	31/08/2013	adult	photographed	Proposed BRERC Notable 2008 as UK BAP listed	moth or butterfly - macro moth
<i>Orsodacne cerasi</i>	a leaf beetle	ST4320665795	Stowey Road, Yatton, garden	26/08/2016	present	photographed	Rare	beetle
<i>Parapoynx stratiotata</i>	Ringed China-mark	ST4320665795	Stowey Road, Yatton	25/07/2014	adult	photographed	Rare	moth or butterfly - micro moth
<i>Plusia festucae</i>	Gold Spot	ST4320665795	Stowey Road, Yatton, rear garden	31/08/2013	adult	photographed	Local	moth or butterfly - macro moth
<i>Scopula marginepunctata</i>	Mullein Wave	ST4320665795	Stowey Road, Yatton	18/07/2015	adult	photographed	Rare	moth or butterfly - macro moth
<i>Spilosoma lubricipeda</i>	White Ermine	ST4320665795	Stowey Road, Yatton, rear garden	14/07/2013	adult	photographed	Proposed BRERC Notable 2008 as UK BAP listed	moth or butterfly - macro moth
<i>Tyria jacobaeae</i>	Cinnabar	ST4320665795	Stowey Road, Yatton, garden	03/06/2016	present	photographed	Proposed BRERC Notable 2008 as UK BAP listed	moth or butterfly - macro moth



Scientific Name	Common Name	Grid Ref	Place	Date of Record	Sex/ Stage	Record Type	BRERC Area Status	Taxa group
<i>Libellula fulva</i>	Scarce Chaser	ST4121865944	Yatton area	22/06/2018	present	field record	Rare	dragonfly, hawkler or damselfly
<i>Vespa crabro</i>	Hornet	ST424652	Strawberry Line, Congresbury	06/05/2019	present	field record	Local	ant, bee, wasp, sawfly or ichneumon (and others)
<i>Nomada lathburiana</i>	a nomad or mason bee	ST42546608	Yatton railway station garden	15/04/2019	present	field record	unknown	ant, bee, wasp, sawfly or ichneumon (and others)
<i>Hydrophilus piceus</i>	Great Silver Water Beetle	ST42676603	High Street, Yatton	16/11/2018	1	field record	Frequent	beetle
<i>Atylotus rusticus</i>	a horse fly	ST427645	Congresbury Moor, North Somerset	27/06/2019	present	field record	Proposed BRERC Notable 2004 as nationally notable	true fly - horse fly
<i>Roeseliana roeselii</i>	Roesel's Bush-cricket	ST427645	Congresbury Moor, North Somerset	27/06/2019	1	photographed	Proposed BRERC Notable 2004 as nationally notable	grasshopper, cricket or true cricket
<i>Libellula fulva</i>	Scarce Chaser	ST428664	YACWAG Kenn Moor Reserve	06/06/2021	1	field record and photographed	Rare	dragonfly, hawkler or damselfly
<i>Aeshna grandis</i>	Brown Hawker	ST42856445	Congresbury Moor, New Cut rhyne	21/07/2020	2	field record	Local	dragonfly, hawkler or damselfly
<i>Asaphidion curtum</i>	a ground beetle	ST430644	Strawberry Line, Yatton, North Somerset	01/06/2019	1	Photograph	Local	beetle
<i>Harmonia axyridis</i>	Harlequin Ladybird	ST430644	Strawberry Line, Yatton, North Somerset	01/06/2019	1	Photograph	BRERC Notable invasive species	beetle
<i>Macropis europaea</i>	a solitary bee	ST431662	YACWAG Stowey Reserve Yatton	29/07/2020	1	field record	Rare and scarce species (not based on IUCN criteria) - Nationally Notable A	ant, bee, wasp, sawfly or ichneumon (and others)
<i>Panemeria tenebrata</i>	Small Yellow Underwing	ST431662	Yatton and Congresbury Wildlife Action Group, Stowey reserve	06/05/2019	present	field record	Local	moth or butterfly - macro moth
<i>Tenthredo omissa</i> (Tenthredo)	sawfly	ST43136625	YACWAG Stowey Reserve	09/08/2020	2	field record	Proposed BRERC Notable 2004 as nationally notable	ant, bee, wasp, sawfly or ichneumon (and others)



## APPENDIX D: DETAILED BAT DETECTOR RECORDS

**Table D1: April Static detector records summary**

Location/Species	Barbastelle	Serotine	Myotis Sp.	Nyctalus Sp.	Noctule	Leisler's	Nathusius pipistrelle	Common pipistrelle	Soprano pipistrelle	Long-eared Sp	Lesser horseshoe	Greater horseshoe	Total per location
Location 1	0	0	11	0	6	0	0	3967	129	0	52	6	4171
Location 2	0	0	3	0	2	0	3	141	13	0	2	1	165
Location 3	0	0	1	0	6	0	0	874	193	1	6	2	1083
Location 4	0	5	9	0	13	0	0	2497	4046	1	6	2	6579
Location 5	0	1	6	0	1	0	0	1616	5892	10	0	0	7526
Location 6	0	1	6	0	12	0	0	881	166	1	6	2	1075
Location 7	0	2	76	0	2	0	0	2010	4091	7	6	2	6196
Location 8	0	15	6	0	9	0	0	893	48	0	13	3	987
Location A	0	1	22	0	2	0	0	1094	128	6	111	8	1372
Location B	0	0	42	0	9	0	0	193	128	0	3	4	379
Total per species	0	25	182	0	62	0	3	14166	14834	26	205	30	29533

**Table D2: May Static detector records summary**

Location/Species	Barbastelle	Serotine	Myotis Sp.	Nyctalus Sp.	Noctule	Leisler's	Nathusius pipistrelle	Common pipistrelle	Soprano pipistrelle	Long-eared Sp	Lesser horseshoe	Greater horseshoe	Total per location
Location 1	0	4	6	2	13	0	0	3317	4471	7	131	13	7964
Location 2	0	1	7	3	4	0	0	1666	4124	5	116	11	5937
Location 3	0	6	19	0	6	0	0	497	190	4	44	7	773
Location 4	0	2	12	2	33	0	0	567	230	1	8	4	859
Location 5	0	11	32	0	3	0	0	972	2023	0	0	1	3042
Location 6	0	11	1	0	27	0	0	331	11	10	6	2	399
Location 7	0	0	2	0	9	0	0	298	13	12	1	0	335
Location 8	0	15	4	0	13	0	0	885	69	5	3	5	999
Location A	0	0	23	0	20	0	0	723	90	14	36	7	913
Location B	0	0	5	0	15	0	0	145	25	2	0	2	194
Total per species	0	50	111	7	143	0	0	9401	11246	60	345	52	21415



**Table D3: June Static detector records summary**

Location/Species	Barbastelle	Serotine	Myotis Sp.	Nyctalus Sp.	Noctule	Leisler's	Nathusius pipistrelle	Common pipistrelle	Soprano pipistrelle	Long-eared Sp	Lesser horseshoe	Greater horseshoe	Total per location
Location 1	0	18	12	0	11	0	0	1524	212	12	27	19	1835
Location 2	0	92	7	0	10	0	0	362	105	9	0	8	593
Location 3	0	9	0	0	1	0	0	1229	5	21	0	4	1269
Location 4	0	9	1	0	2	0	0	643	18	9	1	11	694
Location 5	0	0	21	18	0	9	0	840	455	103	7	2	1455
Location 6	0	10	6	0	3	0	2	650	157	4	1	1	834
Location 7	0	8	100	0	32	0	6	4070	711	14	0	0	4941
Location 8	0	54	32	0	10	0	2	2315	176	7	102	35	2733
Location A	0	9	4	0	0	0	0	63	19	1	0	1	97
Location B	0	108	2	0	1	0	0	287	14	7	1	25	445
Total per species	0	317	185	18	70	9	10	11983	1872	187	139	106	14896

**Table D4: July Static detector records summary**

Location/Species	Barbastelle	Serotine	Myotis Sp.	Nyctalus Sp.	Noctule	Leisler's	Nathusius pipistrelle	Common pipistrelle	Soprano pipistrelle	Long-eared Sp	Lesser horseshoe	Greater horseshoe	Total per location
Location 1	0	79	17	0	81	0	0	510	135	35	4	8	869
Location 2	0	31	0	11	8	0	2	578	86	2	0	3	721
Location 3	0	113	60	0	91	0	0	463	825	29	57	21	1659
Location 4	2	179	13	29	46	0	0	741	240	9	7	22	1288
Location 5	0	68	9	6	12	0	0	879	2460	14	1	2	3451
Location 6	0	101	12	0	96	0	0	1437	110	16	1	8	1781
Location 7	0	36	14	0	32	0	0	445	44	8	0	3	582
Location 8	0	193	11	0	62	0	0	256	58	18	6	36	640
Location A	0	145	16	0	34	0	0	1761	200	33	14	18	2221
Location B	0	37	8	0	68	0	0	527	137	15	0	2	794
Total per species	2	982	160	46	530	0	2	7597	4295	179	90	123	14006



**Table D5: August Static detector records summary**

Location/Species	Barbastelle	Serotine	Myotis Sp.	Nyctalus Sp.	Noctule	Leisler's	Nathusius pipistrelle	Common pipistrelle	Soprano pipistrelle	Long-eared Sp	Lesser horseshoe	Greater horseshoe	Total per location
Location 1	0	47	8	27	52	0	0	43	17	6	1	0	201
Location 2	0	10	4	7	15	0	0	50	40	9	0	1	136
Location 3	0	25	155	17	20	0	0	416	1003	18	111	13	1778
Location 4	0	32	34	0	41	0	0	77	12	0	1	0	197
Location 5	0	8	32	0	13	0	0	427	1999	4	2	0	2485
Location 6	0	49	14	0	51	0	0	2836	79	32	0	1	3062
Location 7	0	15	5	0	31	2	1	610	90	10	4	3	771
Location 8	0	34	22	0	37	0	0	271	78	23	28	4	497
Location A	0	0	0	0	0	0	0	856	168	24	46	12	1106
Location B	0	6	0	0	23	0	0	62	25	2	0	0	118
Total per species	0	226	274	51	283	2	1	5648	3511	128	193	34	10351

**Table D6: September Static detector records summary**

Location/Species	Barbastelle	Serotine	Myotis Sp.	Nyctalus Sp.	Noctule	Leisler's	Nathusius pipistrelle	Common pipistrelle	Soprano pipistrelle	Long-eared Sp	Lesser horseshoe	Greater horseshoe	Total per location
Location 1	0	12	10	0	19	0	0	240	94	12	26	0	413
Location 2	0	6	5	0	16	0	0	61	22	17	32	6	165
Location 3	0	7	127	0	28	0	0	219	667	37	251	13	1349
Location 4	0	6	61	0	25	0	3	1265	333	44	300	2	2039
Location 5	0	2	3302	0	25	0	0	1243	1173	28	113	3	5889
Location 6	0	9	5	0	18	0	0	254	38	26	71	1	422
Location 7	0	6	65	0	14	0	0	128	19	16	2	20	270
Location 8	0	14	47	0	24	0	0	37	5	3	4	1	135
Location A	0	16	25	0	25	0	0	466	9	3	3	0	547
Location B	0	11	9	0	47	0	0	105	35	23	14	6	250
Total per species	0	89	3656	0	241	0	3	4018	2395	209	816	52	11479





**Table D7: October Static detector records summary**

Location/Species	Barbastelle	Serotine	Myotis Sp.	Nyctalus Sp.	Noctule	Leisler's	Nathusius pipistrelle	Common pipistrelle	Soprano pipistrelle	Long-eared Sp	Lesser horseshoe	Greater horseshoe	Total per location
Location 1	0	5	6	0	11	0	0	56	30	3	56	1	168
Location 2	0	1	1	0	10	0	0	39	7	4	164	1	227
Location 3	0	4	171	0	4	0	0	689	1067	29	1095	7	3066
Location 4	0	1	7	0	18	8	1	290	49	19	58	1	452
Location 5	0	1	1	0	3	0	0	78	177	0	0	0	260
Location 6	0	2	2	0	16	0	2	1403	45	0	39	0	1509
Location 7	0	2	2	0	5	0	0	183	22	3	15	0	232
Location 8	0	2	11	0	5	0	0	34	0	1	0	0	53
Location A	0	2	94	5	8	0	0	38	8	1	23	2	181
Location B	0	2	3	0	17	0	0	4538	1515	8	2	0	6085
Total per species	0	22	298	5	97	8	3	7348	2920	68	1452	12	12233



## APPENDIX E: HABITAT EVALUATION PROCEDURE CALCULATIONS

An assessment of the current and post development habitat value for their value to foraging greater and lesser horseshoe bats. This was made in line with the North Somerset and Mendip Bat SAC Guidance on development: Supplementary Planning Document. The predevelopment value of the Site to foraging horseshoe bats was calculated using the Habitat Evaluation Procedure calculator. It is noted that the Site is located within the consultation zone band (B) for greater horseshoes only, however calculations have been provided for both species, as lesser horseshoes were recorded on Site which are also likely to be associated with SAC populations. Hedgerows, ditches, grassland and developed habitats within the red line boundary were all inputted to produce a baseline score for each species which is provided below in Figures E1 and E2 along with the HEP totals associated with the proposals. The density band score for the habitats was uplifted for both species based on the initial survey results which indicated both species foraged within the red line boundary.

Field No	Habitat	Primary Habitat		Matrix		Formation		Management / Land use		HSI Score	Density Band Score	Hectares	Habitat Units
		Code	Score	Code	Score	Code	Score	Code	Score				
	Modified Grassland (Grazed by sheep)	GUI	3		0		1.00	GM12	0.75	2.25	2.5	9.54	53.66
	Modified grassland (Grazed by horses)	GUI	3		0		1.00	GM13	0.80	2.40	2.5	3.68	22.08
	Track and turkey structures	UR0	1		0		1.00	UA1	0.10	0.10	2.5	0.21	0.05
H1		LF11	6		0		1.00	LM1	0.30	1.80	2.5	0.014	0.06
H2		LF11	6		0		1.00	LM31	1.00	6.00	2.5	0.012	0.18
H3		LF11	6		0		1.00	LM31	1.00	6.00	2.5	0.016	0.24
H4		LF11	6		0		1.00	LM31	1.00	6.00	2.5	0.014	0.21
H5		LF111	6		0		1.00	LM31	1.00	6.00	2.5	0.038	0.57
H6		LF11	6		0		1.00	LM31	1.00	6.00	2.5	0.012	0.18
H7		LF11	6		0		1.00	LM31	1.00	6.00	2.5	0.008	0.12
H8		LF11	6		0		1.00	LM3	1.00	6.00	2.5	0.026	0.39
H9		LF11	6		0		1.00	LM3	1.00	6.00	2.5	0.016	0.24
H10		LF11	6		0		1.00	LM3	1.00	6.00	2.5	0.023	0.35
H11		LF11	6		0		1.00	LM3	1.00	6.00	2.5	0.018	0.27
H12		LF11	6		0		1.00	LM3	1.00	6.00	2.5	0.026	0.39
H13		LF111	6		0		1.00	LM2	0.90	5.40	2.5	0.016	0.22
H14		LF11	6		0		1.00	LM3	1.00	6.00	2.5	0.006	0.09
H15		LF11	6		0		1.00	LM3	1.00	6.00	2.5	0.026	0.39
H16		LF11	6		0		1.00	LM1	0.30	1.80	2.5	0.012	0.05
D1		AS0	4		0	AC11	1.00	LT12	1.00	4.00	2.5	0.007	0.07
D2		AS0	4		0	AC11	1.00	LT12	1.00	4.00	2.5	0.012	0.12
D3		AS0	4		0	AC11	1.00	LT12	1.00	4.00	2.5	0.008	0.08
D4		AS0	4		0	AC11	1.00	LT12	1.00	4.00	2.5	0.007	0.07
D5		AS0	4		0	AC11	1.00	LT15	0.50	2.00	2.5	0.008	0.04
D6		AS0	4		0	AC11	1.00	LT15	0.50	2.00	2.5	0.02	0.10
D7		AS0	4		0	AC11	1.00	LT15	0.50	2.00	2.5	0.007	0.04
D8		AS0	4		0	AC11	1.00	LT15	0.50	2.00	2.5	0.02	0.10
D9		AS0	4		0	AC11	1.00	LT12	1.00	4.00	2.5	0.038	0.38
D10		AS0	4		0	AC11	1.00	LT12	1.00	4.00	2.5	0.006	0.06
D11		AS0	4		0	AC11	1.00	LT12	1.00	4.00	2.5	0.004	0.04
D12		AS0	4		0	AC11	1.00	LT12	1.00	4.00	2.5	0.0426	0.43
D13		AS0	4		0	AC11	1.00	LT15	0.50	2.00	2.5	0.02	0.10
D14		AS0	4		0	AC11	1.00	LT15	0.50	2.00	2.5	0.012	0.06
D15		AS0	4		0	AC11	1.00	LT15	0.50	2.00	2.5	0.022	0.11
D16		AS0	4		0	AC11	1.00	LT15	0.50	2.00	2.5	0.022	0.11
D17		AS0	4		0	AC11	1.00	LT15	0.50	2.00	2.5	0.017	0.09
D18		AS0	4		0	AC11	1.00	LT15	0.50	2.00	2.5	0.013	0.07
D19		AS0	4		0	AC11	1.00	LT15	0.50	2.00	2.5	0.018	0.09
D20		AS0	4		0	AC11	1.00	LT15	0.50	2.00	2.5	0.011	0.06
D21		AS0	4		0	AC11	1.00	LT15	0.50	2.00	2.5	0.015	0.08
D22		AS0	4		0	AC11	1.00	LT15	0.50	2.00	2.5	0.01	0.05
D23		AS0	4		0	AC11	1.00	LT15	0.50	2.00	2.5	0.01	0.05
D24		AS0	4		0	AC11	1.00	LT15	0.50	2.00	2.5	0.011	0.06
D25		AS0	4		0	AC11	1.00	LT15	0.50	2.00	2.5	0.026	0.13
D26		AS0	4		0	AC11	1.00	LT12	1.00	4.00	2.5	0.013	0.13
D27		AS0	4		0	AC11	1.00	LT12	1.00	4.00	2.5	0.0081	0.08
D28		AS0	4		0	AC11	1.00	LT12	1.00	4.00	2.5	0.0138	0.14
D29		AS0	4		0	AC11	1.00	LT12	1.00	4.00	2.5	0.0068	0.07
D30		AS0	4		0	AC11	1.00	LT15	0.50	2.00	2.5	0.0084	0.04
D31		AS0	4		0	AC11	1.00	LT15	0.50	2.00	2.5	0.0098	0.05
												14.160	
												Habitat Units	82.81
												Hectares Required	4.60
Value from 'Replacement Habitat' worksheet										Equivalent Hectares Provided		5.76	
If required, Value from Receptor Habitat Worksheet										Equivalent Hectares of Existing Habitat on Receptor		1.09	
												Gain/ Deficit	0.07

Figure E1: Greater Horseshoe HEP spreadsheet (pre-development score and HEP totals)



Field No	Habitat	Primary Habitat		Matrix		Formation		Management / Land use		HSI Score	Density Band Score	Hectares	Habitat Units	
		Code	Score	Code	Score	Code	Score	Code	Score					
	Modified Grassland (Grazed by sheep)	GU1	2		0		1.00	GM12	0.75	1.50	2.5	9.54	35.78	
	Modified grassland (Grazed by horses)	GU1	2		0		1.00	GM13	0.80	1.60	2.5	3.68	14.72	
	Track and turkey structures	URO	1		0		1.00	UA1	0.10	0.10	2.5	0.21	0.05	
	H1	LF11	6		0		1.00	LM1	0.30	1.80	2.5	0.014	0.06	
	H2	LF11	6		0		1.00	LM31	1.00	6.00	2.5	0.012	0.18	
	H3	LF11	6		0		1.00	LM31	1.00	6.00	2.5	0.016	0.24	
	H4	LF11	6		0		1.00	LM31	1.00	6.00	2.5	0.014	0.21	
	H5	LF111	6		0		1.00	LM31	1.00	6.00	2.5	0.038	0.57	
	H6	LF11	6		0		1.00	LM31	1.00	6.00	2.5	0.012	0.18	
	H7	LF11	6		0		1.00	LM31	1.00	6.00	2.5	0.008	0.12	
	H8	LF11	6		0		1.00	LM3	1.00	6.00	2.5	0.026	0.39	
	H9	LF11	6		0		1.00	LM3	1.00	6.00	2.5	0.016	0.24	
	H10	LF11	6		0		1.00	LM3	1.00	6.00	2.5	0.023	0.35	
	H11	LF11	6		0		1.00	LM3	1.00	6.00	2.5	0.018	0.27	
	H12	LF11	6		0		1.00	LM3	1.00	6.00	2.5	0.026	0.39	
	H13	LF111	6		0		1.00	LM2	0.90	5.40	2.5	0.016	0.22	
	H14	LF11	6		0		1.00	LM3	1.00	6.00	2.5	0.006	0.09	
	H15	LF11	6		0		1.00	LM3	1.00	6.00	2.5	0.026	0.39	
	H16	LF11	6		0		1.00	LM1	0.30	1.80	2.5	0.012	0.05	
	D1	AS0	6		0	AC11	1.00	LT12	1.00	6.00	2.5	0.007	0.11	
	D2	AS0	6		0	AC11	1.00	LT12	1.00	6.00	2.5	0.012	0.18	
	D3	AS0	6		0	AC11	1.00	LT12	1.00	6.00	2.5	0.008	0.12	
	D4	AS0	6		0	AC11	1.00	LT12	1.00	6.00	2.5	0.007	0.11	
	D5	AS0	6		0	AC11	1.00	LT15	0.50	3.00	2.5	0.008	0.06	
	D6	AS0	6		0	AC11	1.00	LT15	0.50	3.00	2.5	0.02	0.15	
	D7	AS0	6		0	AC11	1.00	LT15	0.50	3.00	2.5	0.007	0.05	
	D8	AS0	6		0	AC11	1.00	LT15	0.50	3.00	2.5	0.02	0.15	
	D9	AS0	6		0	AC11	1.00	LT12	1.00	6.00	2.5	0.038	0.57	
	D10	AS0	6		0	AC11	1.00	LT12	1.00	6.00	2.5	0.006	0.09	
	D11	AS0	6		0	AC11	1.00	LT12	1.00	6.00	2.5	0.004	0.06	
	D12	AS0	6		0	AC11	1.00	LT12	1.00	6.00	2.5	0.0426	0.64	
	D13	AS0	6		0	AC11	1.00	LT15	0.50	3.00	2.5	0.02	0.15	
	D14	AS0	6		0	AC11	1.00	LT15	0.50	3.00	2.5	0.012	0.09	
	D15	AS0	6		0	AC11	1.00	LT15	0.50	3.00	2.5	0.022	0.17	
	D16	AS0	6		0	AC11	1.00	LT15	0.50	3.00	2.5	0.022	0.17	
	D17	AS0	6		0	AC11	1.00	LT15	0.50	3.00	2.5	0.017	0.13	
	D18	AS0	6		0	AC11	1.00	LT15	0.50	3.00	2.5	0.013	0.10	
	D19	AS0	6		0	AC11	1.00	LT15	0.50	3.00	2.5	0.018	0.14	
	D20	AS0	6		0	AC11	1.00	LT15	0.50	3.00	2.5	0.011	0.08	
	D21	AS0	6		0	AC11	1.00	LT15	0.50	3.00	2.5	0.015	0.11	
	D22	AS0	6		0	AC11	1.00	LT15	0.50	3.00	2.5	0.01	0.08	
	D23	AS0	6		0	AC11	1.00	LT15	0.50	3.00	2.5	0.01	0.08	
	D24	AS0	6		0	AC11	1.00	LT15	0.50	3.00	2.5	0.011	0.08	
	D25	AS0	6		0	AC11	1.00	LT15	0.50	3.00	2.5	0.026	0.20	
	D26	AS0	6		0	AC11	1.00	LT12	1.00	6.00	2.5	0.013	0.20	
	D27	AS0	6		0	AC11	1.00	LT12	1.00	6.00	2.5	0.0081	0.12	
	D28	AS0	6		0	AC11	1.00	LT12	1.00	6.00	2.5	0.0138	0.21	
	D29	AS0	6		0	AC11	1.00	LT12	1.00	6.00	2.5	0.0068	0.10	
	D30	AS0	6		0	AC11	1.00	LT15	0.50	3.00	2.5	0.0084	0.06	
	D31	AS0	6		0	AC11	1.00	LT15	0.50	3.00	2.5	0.0098	0.07	
												14.160		
												Habitat Units	59.09	
												<b>Hectares Required</b>	<b>3.28</b>	
												Value from 'Replacement Habitat' worksheet	<b>Equivalent Hectares Provided</b>	<b>5.12</b>
												If required, Value from Receptor Habitat Worksheet	<b>Equivalent Hectares of Existing Habitat on Receptor</b>	<b>0.73</b>
												<b>Gain/ Deficit</b>	<b>1.11</b>	

**Figure E2: Lesser Horseshoe HEP spreadsheet (pre-development score and HEP totals)**

Once the baseline habitat value was derived the proposals were assessed for their suitability to support lesser and greater horseshoe bats based on the proposed habitats within the landscaping. The external lighting assessment allowed the calculations to factor in land which is likely to be too well lit or inaccessible to horseshoe bats to ensure a precautionary assessment was undertaken. The HEP replacement habitat calculations indicated the landscaping and bat mitigation habitats proposed within the red line boundary would not fully mitigate for the foraging impacts to horseshoe bats. Lesser horseshoe bats were subject to approximately 21.34% increase in optimum habitat and greater horseshoe were subject to around a 0.55 hectare deficit in optimum habitat. To address this 2.9 additional hectares of land from two off-site fields (one of which has been surveyed for bat activity) will be used to provide additional compensation habitat for foraging horseshoe bats. The replacement habitat worksheets are reproduced below in Figures A3 and A4. These include the value of the enhanced off-site compensation habitat proposed.

As can be seen from the Gain/Deficit output of the two calculations the combined mitigation and compensation for greater horseshoe bats results in a gain of 0.07 equivalent hectares or a 1.5% increase in the overall value of habitat provided in comparison to the baseline score. For lesser horseshoes the proposals will result in a gain of 1.11 equivalent hectares or 33% increase in the overall value of habitat provided in comparison to the baseline score. In both instances the provision of replacement habitat is in line with the guidance set out in the North Somerset and Mendip Bat SAC guidance on development. The differences in the scores for the species is due to differences in habitat value attributed in the guidance to the two species. In



general grasslands are more valuable for greater horseshoe bats with lesser horseshoes deriving additional points from woodland and water related features such as the ditches and SUDs.

It should be noted all text highlighted red denotes a habitat feature which is retained but is either lit by street lighting or inaccessible due to the introduction of lighting creating a barrier to horseshoe bat dispersal. Totals of habitat areas differ slightly from those included in the BNG assessment due to the way BNG is calculated which maps all linear features such as hedgerows and ditches in linear meters. The HEP calculations require these features in hectares. As such the width of hedgerows and ditches have been subtracted from both the pre-development and post development field areas reducing the area of grassland from that in the BNG calculations. Due to the width of boundary hedgerows calculated the total area of the Site is estimated as slightly over the 13,7ha of the BNG calculations due to the inclusion of the hedgerow width half of which sits outside of the red line. The total baseline area and on-site replacement habitat areas match exactly although the replacement habitat area includes 2.9ha of off-site compensation land the total area in hectares displayed. The existing value of this land is discounted from the total using the receptor habitat spreadsheet as detailed below.

Habitat	Primary Habitat		Matrix		Formation		Management /		HSI Score	Hectares	Delivery Risk	Temporal Risk	Spatial Risk		Equivalent Hectares		
	IHS Code	Score	Code	Score	Code	Score	Code	Score					Development Site Band Score	Replacement Site Band Score			
ONG/ Semi improved + scattered scrub (retained/enhanced)	GU0	4	sc21	1			1.00	GL211	1.00	5.00	2.334	1.00	0.83	2.5	2.5	9.69	
Allotments	UR0	1		0			1.00	UA33	0.00	0.00	0.15	1.00	1.00	2.5	2.5	0.00	
H1	LF11	6		0			1.00	LM2	0.90	5.40	0.014	1.00	1.00	2.5	2.5	0.05	
H2	LF11	6		0			1.00	LM31	1.00	6.00	0.011	1.00	1.00	2.5	2.5	0.07	
H3	LF11	6		0			1.00	LM31	1.00	6.00	0.016	1.00	1.00	2.5	2.5	0.10	
H4	LF11	6		0			1.00	LM31	1.00	6.00	0.014	1.00	1.00	2.5	2.5	0.08	
H5	LF11	6		0			1.00	INAC	0.00	0.00	0.0375	1.00	1.00	2.5	2.5	0.00	
H6	LF11	6		0			1.00	INAC	0.00	0.00	0.03	1.00	1.00	2.5	2.5	0.00	
H7	LF11	6		0			1.00	LM2	0.90	5.40	0.008	1.00	0.71	2.5	2.5	0.03	
H8	LF11	6		0			1.00	LM3	1.00	6.00	0.026	1.00	1.00	2.5	2.5	0.16	
H9	LF11	6		0			1.00	LM3	1.00	6.00	0.016	1.00	1.00	2.5	2.5	0.10	
H10	LF11	6		0			1.00	LM3	1.00	6.00	0.023	1.00	1.00	2.5	2.5	0.14	
H11	LF11	6		0			1.00	LM3	1.00	6.00	0.018	1.00	1.00	2.5	2.5	0.11	
H12	LF11	6		0			1.00	LM3	1.00	6.00	0.026	1.00	1.00	2.5	2.5	0.16	
H13	LF11	6		0			1.00	LM2	0.90	5.40	0.016	1.00	1.00	2.5	2.5	0.09	
H14	LF11	6		0			1.00	LM3	1.00	6.00	0.006	1.00	1.00	2.5	2.5	0.04	
H15	LF11	6		0			1.00	LM3	1.00	6.00	0.026	1.00	1.00	2.5	2.5	0.16	
H16	LF11	6		0			1.00	LIT	0.00	0.00	0.01	1.00	1.00	2.5	2.5	0.00	
D1	AS0	4		0			AC11	1.00	LT12	1.00	4.00	0.007	1.00	1.00	2.5	2.5	0.03
D2	AS0	4		0			AC11	1.00	LT12	1.00	4.00	0.012	1.00	1.00	2.5	2.5	0.05
D3	AS0	4		0			AC11	1.00	LT12	1.00	4.00	0.008	1.00	1.00	2.5	2.5	0.03
D4	AS0	4		0			AC11	1.00	LT12	1.00	4.00	0.0061	1.00	1.00	2.5	2.5	0.02
D5	AS0	4		0			AC11	1.00	LT13	1.00	4.00	0.008	1.00	1.00	2.5	2.5	0.03
D6	AS0	4		0			AC11	1.00	LT13	1.00	4.00	0.02	1.00	1.00	2.5	2.5	0.08
D7	AS0	4		0			AC11	1.00	INAC	0.00	0.00	0.0061	1.00	1.00	2.5	2.5	0.00
D8	AS0	4		0			AC11	1.00	INAC	0.00	0.00	0.02	1.00	1.00	2.5	2.5	0.00
D9	AS0	4		0			AC11	1.00	LIT	0.00	0.00	0.038	1.00	1.00	2.5	2.5	0.00
D10	AS0	4		0			AC11	1.00	LIT	0.00	0.00	0.005	1.00	1.00	2.5	2.5	0.00
D11	AS0	4		0			AC11	1.00	LT12	1.00	4.00	0.004	1.00	1.00	2.5	2.5	0.02
D12	AS0	4		0			AC11	1.00	LT12	1.00	4.00	0.0426	1.00	1.00	2.5	2.5	0.17
D13	AS0	4		0			AC11	1.00	LT13	1.00	4.00	0.02	1.00	1.00	2.5	2.5	0.08
D14	AS0	4		0			AC11	1.00	LT13	1.00	4.00	0.012	1.00	1.00	2.5	2.5	0.05
D15	AS0	4		0			AC11	1.00	LT13	1.00	4.00	0.022	1.00	1.00	2.5	2.5	0.09
D16	AS0	4		0			AC11	1.00	LT13	1.00	4.00	0.022	1.00	1.00	2.5	2.5	0.09
D17	AS0	4		0			AC11	1.00	LT13	1.00	4.00	0.017	1.00	1.00	2.5	2.5	0.07
D18	AS0	4		0			AC11	1.00	LT13	1.00	4.00	0.013	1.00	1.00	2.5	2.5	0.05
D19	AS0	4		0			AC11	1.00	LT13	1.00	4.00	0.018	1.00	1.00	2.5	2.5	0.07
D20	AS0	4		0			AC11	1.00	LT15	0.50	2.00	0.011	1.00	1.00	2.5	2.5	0.02
D21	AS0	4		0			AC11	1.00	INAC	0.00	0.00	0.01	1.00	1.00	2.5	2.5	0.00
D22	AS0	4		0			AC11	1.00	DIS	0.00	0.00	0.01	1.00	1.00	2.5	2.5	0.00
D23	AS0	4		0			AC11	1.00	LT15	0.50	2.00	0.01	1.00	1.00	2.5	2.5	0.02
D24	AS0	4		0			AC11	1.00	LIT	0.00	0.00	0.0072	1.00	1.00	2.5	2.5	0.00
D25	AS0	4		0			AC11	1.00	LIT	0.00	0.00	0.024	1.00	1.00	2.5	2.5	0.00
D26	AS0	4		0			AC11	1.00	LT12	1.00	4.00	0.013	1.00	1.00	2.5	2.5	0.05
D27	AS0	4		0			AC11	1.00	LT12	1.00	4.00	0.0081	1.00	1.00	2.5	2.5	0.03
D28	AS0	4		0			AC11	1.00	LT12	1.00	4.00	0.0138	1.00	1.00	2.5	2.5	0.06
D29	AS0	4		0			AC11	1.00	LIT	0.00	0.00	0.0053	1.00	1.00	2.5	2.5	0.00
D30	AS0	4		0			AC11	1.00	LIT	0.00	0.00	0.0084	1.00	1.00	2.5	2.5	0.00
D31	AS0	4		0			AC11	1.00	LIT	0.00	0.00	0.0098	1.00	1.00	2.5	2.5	0.00
ONG/ Semi improved + scattered scrub (Created)	GU0	4	sc21	1			1.00		1.00	5.00	2	1.00	0.71	2.5	2.5	7.10	
ONG/ Semi improved + scattered scrub (inaccessible or degraded)	GU0	4		0			1.00	LIT	0.00	0.00	0.97	1.00	0.71	2.5	2.5	0.00	
Traditional orchards	GU0	4		0			1.00	CL31	1.00	4.00	0.73	1.00	0.71	2.5	2.5	2.07	
SUDS (Lit portion)	AS0	4		0			A01	0.25	LIT	0.00	0.00	0.01	1.00	0.83	2.5	2.5	0.00
SUDS	AS0	4		0			A01	0.25	1.00	1.00	0.68	1.00	0.83	2.5	2.5	0.56	
New linear woodland	WB0	6		0			WF2	0.75	WMZ	1.00	4.50	0.77	1.00	0.59	2.5	2.5	2.04
New hedgerows unavailable to bats	LF11	6		0			1.00	Exclud	0.00	0.00	0.058	1.00	0.71	2.5	2.5	0.00	
New hedgerows	LF11	6		0			1.00	LM21	0.80	4.80	0.115	1.00	0.71	2.5	2.5	0.39	
Modified grasslands	GI0	3		0			1.00	GL1	0.10	0.30	0.26	1.00	0.89	2.5	2.5	0.07	
Modified grasslands unavailable to bats	GI0	3		0			1.00	LIT	0.00	0.00	0.51	1.00	1.00	2.5	2.5	0.00	
Vegetated gardens	UR0	1		0			1.00	UA32	0.00	0.00	1.09	1.00	1.00	2.5	2.5	0.00	
Developable areas sealed surfaces	UR0	1		0			1.00	UA3	0.00	0.00	3.23	1.00	1.00	2.5	2.5	0.00	
Paths and active travel areas	UR0	1		0			1.00	UA2	0.00	0.00	0.52	1.00	1.00	2.5	2.5	0.00	
Neutral grassland (Compensation habitat)	GN0	6	sc21	1			1.00	GL211	1.00	6.00	2.900	1.00	0.59	2.5	2.5	10.27	
										17.06							
																5.761	

Figure E3: Greater Horseshoe Bat HEP replacement habitat spreadsheet



Habitat	Primary Habitat		Matrix		Formation		Management /		HSI Score	Hectares	Delivery Risk	Temporal Risk	Spatial Risk		Equivalent Hectares
	IHS Code	Score	Code	Score	Code	Score	Code	Score					Development Site Band Score	Replacement Site Band Score	
ONG/ Semi improved + scattered scrub (retained/ea	GU0	3	sc21	1	1.00	GL211	1.00	4.00	2.334	1.00	1.00	0.83	2.5	2.5	7.75
Allotments	UR0	1		0	1.00	UA33	0.10	0.10	0.15	1.00	1.00	1.00	2.5	2.5	0.02
H1	LF11	6		0	1.00	LM2	0.90	5.40	0.014	1.00	1.00	0.71	2.5	2.5	0.05
H2	LF11	6		0	1.00	LM31	1.00	6.00	0.011	1.00	1.00	1.00	2.5	2.5	0.07
H3	LF11	6		0	1.00	LM31	1.00	6.00	0.016	1.00	1.00	1.00	2.5	2.5	0.10
H4	LF11	6		0	1.00	LM31	1.00	6.00	0.014	1.00	1.00	1.00	2.5	2.5	0.08
H5	LF11	6		0	1.00	INAC	0.00	0.00	0.0375	1.00	1.00	1.00	2.5	2.5	0.00
H6	LF11	6		0	1.00	INAC	0.00	0.00	0.03	1.00	1.00	1.00	2.5	2.5	0.00
H7	LF11	6		0	1.00	LM2	0.90	5.40	0.008	1.00	1.00	0.71	2.5	2.5	0.03
H8	LF11	6		0	1.00	LM3	1.00	6.00	0.026	1.00	1.00	1.00	2.5	2.5	0.16
H9	LF11	6		0	1.00	LM3	1.00	6.00	0.016	1.00	1.00	1.00	2.5	2.5	0.10
H10	LF11	6		0	1.00	LM3	1.00	6.00	0.023	1.00	1.00	1.00	2.5	2.5	0.14
H11	LF11	6		0	1.00	LM3	1.00	6.00	0.018	1.00	1.00	1.00	2.5	2.5	0.11
H12	LF11	6		0	1.00	LM3	1.00	6.00	0.026	1.00	1.00	1.00	2.5	2.5	0.16
H13	LF11	6		0	1.00	LM2	0.90	5.40	0.016	1.00	1.00	1.00	2.5	2.5	0.09
H14	LF11	6		0	1.00	LM3	1.00	6.00	0.006	1.00	1.00	1.00	2.5	2.5	0.04
H15	LF11	6		0	1.00	LM3	1.00	6.00	0.026	1.00	1.00	1.00	2.5	2.5	0.16
H16	LF11	6		0	1.00	LIT	0.00	0.00	0.01	1.00	1.00	1.00	2.5	2.5	0.00
D1	AS0	6		0	AC11	1.00	LT12	1.00	6.00	0.007	1.00	1.00	2.5	2.5	0.04
D2	AS0	6		0	AC11	1.00	LT12	1.00	6.00	0.012	1.00	1.00	2.5	2.5	0.07
D3	AS0	6		0	AC11	1.00	LT12	1.00	6.00	0.008	1.00	1.00	2.5	2.5	0.05
D4	AS0	6		0	AC11	1.00	LT12	1.00	6.00	0.0061	1.00	1.00	2.5	2.5	0.04
D5	AS0	6		0	AC11	1.00	LT13	1.00	6.00	0.008	1.00	1.00	2.5	2.5	0.05
D6	AS0	6		0	AC11	1.00	LT13	1.00	6.00	0.02	1.00	1.00	2.5	2.5	0.12
D7	AS0	6		0	AC11	1.00	INAC	0.00	0.00	0.0061	1.00	1.00	2.5	2.5	0.00
D8	AS0	6		0	AC11	1.00	INAC	0.00	0.00	0.02	1.00	1.00	2.5	2.5	0.00
D9	AS0	6		0	AC11	1.00	LIT	0.00	0.00	0.038	1.00	1.00	2.5	2.5	0.00
D10	AS0	6		0	AC11	1.00	LIT	0.00	0.00	0.005	1.00	1.00	2.5	2.5	0.00
D11	AS0	6		0	AC11	1.00	LT12	1.00	6.00	0.004	1.00	1.00	2.5	2.5	0.02
D12	AS0	6		0	AC11	1.00	LT12	1.00	6.00	0.0426	1.00	1.00	2.5	2.5	0.26
D13	AS0	6		0	AC11	1.00	LT13	1.00	6.00	0.02	1.00	1.00	2.5	2.5	0.12
D14	AS0	6		0	AC11	1.00	LT13	1.00	6.00	0.012	1.00	1.00	2.5	2.5	0.07
D15	AS0	6		0	AC11	1.00	LT13	1.00	6.00	0.022	1.00	1.00	2.5	2.5	0.13
D16	AS0	6		0	AC11	1.00	LT13	1.00	6.00	0.022	1.00	1.00	2.5	2.5	0.13
D17	AS0	6		0	AC11	1.00	LT13	1.00	6.00	0.017	1.00	1.00	2.5	2.5	0.10
D18	AS0	6		0	AC11	1.00	LT13	1.00	6.00	0.013	1.00	1.00	2.5	2.5	0.08
D19	AS0	6		0	AC11	1.00	LT13	1.00	6.00	0.018	1.00	1.00	2.5	2.5	0.11
D20	AS0	6		0	AC11	1.00	LT15	0.50	3.00	0.011	1.00	1.00	2.5	2.5	0.03
D21	AS0	6		0	AC11	1.00	LIT	0.00	0.00	0.01	1.00	1.00	2.5	2.5	0.00
D22	AS0	6		0	AC11	1.00	LT13	1.00	6.00	0.01	1.00	1.00	2.5	2.5	0.06
D23	AS0	6		0	AC11	1.00	LT15	0.50	3.00	0.01	1.00	1.00	2.5	2.5	0.03
D24	AS0	6		0	AC11	1.00	LIT	0.00	0.00	0.0072	1.00	1.00	2.5	2.5	0.00
D25	AS0	6		0	AC11	1.00	LIT	0.00	0.00	0.024	1.00	1.00	2.5	2.5	0.00
D26	AS0	6		0	AC11	1.00	LT12	1.00	6.00	0.013	1.00	1.00	2.5	2.5	0.08
D27	AS0	6		0	AC11	1.00	LT12	1.00	6.00	0.0081	1.00	1.00	2.5	2.5	0.05
D28	AS0	6		0	AC11	1.00	LT12	1.00	6.00	0.0138	1.00	1.00	2.5	2.5	0.08
D29	AS0	6		0	AC11	1.00	LIT	0.00	0.00	0.0053	1.00	1.00	2.5	2.5	0.00
D30	AS0	6		0	AC11	1.00	LIT	0.00	0.00	0.0084	1.00	1.00	2.5	2.5	0.00
D31	AS0	6		0	AC11	1.00	LIT	0.00	0.00	0.0098	1.00	1.00	2.5	2.5	0.00
ONG/ Semi improved + scattered scrub (Created)	GU0	3	SC21	1	1.00		1.00	4.00	2	1.00	0.71	2.5	2.5	5.68	
ONG/ Semi improved + scattered scrub (inaccessib)	GU0	3	SC21	1	1.00	LIT	0.00	0.00	0.97	1.00	0.71	2.5	2.5	0.00	
Traditional orchards	GU0	3		0	1.00	CL31	1.00	3.00	0.73	1.00	0.71	2.5	2.5	1.55	
SUDS (Lit portion)	AS1	6		0	A01	0.75	LIT	0.00	0.01	1.00	0.83	2.5	2.5	0.00	
SUDS	AS0	6		0	A01	0.75		1.00	4.50	0.68	1.00	0.83	2.5	2.5	2.54
New linear woodland	LF10	6		0	1.00	LM21	0.80	4.80	0.058	1.00	0.59	2.5	2.5	0.16	
New hedgerows unavailable to bats	LF11	6		0	1.00	LM21	0.80	4.80	0.115	1.00	0.71	2.5	2.5	0.39	
New hedgerows	WB0	6		0	WF2	0.80	WMZ	1.00	4.80	0.77	1.00	0.71	2.5	2.5	2.62
Modified grasslands	GI0	2		0	1.00	GL11	0.10	0.20	0.26	1.00	0.89	2.5	2.5	0.05	
Modified grasslands unavailable to bats	GI0	2		0	1.00	GL11	0.10	0.20	0.51	1.00	1.00	2.5	2.5	0.10	
Vegetated gardens	UR0	1		0	1.00	LIT	0.00	0.00	1.09	1.00	1.00	2.5	2.5	0.00	
Developable areas sealed surfaces	UR0	1		0		UA3	0.00	0.00	3.23	1.00	1.00	2.5	2.5	0.00	
Paths and active travel areas	UR0	1		0	1.00	UA2	0.00	0.00	0.52	1.00	1.00	2.5	2.5	0.00	
Neutral grassland (Compensation habitat)	GN0	3	sc21	1	1.00	GL211	1.00	4.00	2.900	1.00	0.59	2.5	2.5	6.84	
									17.06						
															5.116

Figure E4: Lesser Horseshoe Bat HEP replacement habitat spreadsheet





The existing habitat value of this off-site compensation land is taken into account within the HEP calculations and deducted from the total mitigation provided. Habitat used for compensation will be enhanced significantly through reseeded and low intensity grazing. Scattered scrub will also be established to provide additional shelter features for foraging horseshoe bats. The baseline value of the off-site compensation land is illustrated in the receptor habitat work sheet in Figure E5 and E6 below.

Habitat	Primary Habitat		Matrix		Formation		Management / Land use		HSI Score	Development site	Receptor Site	Hectares	Equivalent Hectares
	IHS Code	Score	Code	Score	Code	Score	Code	Score		Density Band Score	Density Band Score		
Improved grassland Int	GU1	3				1.00	GM12	0.75	2.25	2.50	2.50	2.900	1.09
		0		0		1.00		1.00	0.00	2.50	2.50	0.000	0.00
		0		0		1.00		1.00	0.00	2.50	2.50	0.000	0.00
		0		0		1.00		1.00	0.00	2.50	2.50	0.000	0.00
<b>Equivalent Value of Habitat on Receptor Site</b>												<b>1.09</b>	

Figure E5: Greater Horseshoe Bat HEP receptor habitat spreadsheet

Habitat	Primary Habitat		Matrix		Formation		Management / Land use		HSI Score	Development site	Receptor Site	Hectares	Equivalent Hectares
	IHS Code	Score	Code	Score	Code	Score	Code	Score		Density Band Score	Density Band Score		
Improved grassland Int	GU1	2				1.00	GM12	0.75	1.50	2.50	2.50	2.900	0.73
		0		0		1.00		1.00	0.00	2.50	2.50	0.000	0.00
		0		0		1.00		1.00	0.00	2.50	2.50	0.000	0.00
		0		0		1.00		1.00	0.00	2.50	2.50	0.000	0.00
<b>Equivalent Value of Habitat on Receptor Site</b>												<b>0.73</b>	

Figure E5: Lesser Horseshoe Bat HEP receptor habitat spreadsheet



## APPENDIX F: HABITAT SURVEY RESULTS OFF-SITE LAND

The area of off-site mitigation land proposed to compensate for the 23% deficit of foraging habitat not provided on site (for greater horseshoe bats) was subject to a baseline habitat survey. The area surveyed included part of two fields to the west of the strawberry line adjacent the red line boundary.. The off-site land is located approximately 20m from the Site to the west beyond the Strawberry Line at its closest point. As shown in Figure F1 below.

The closest field (F1) of the off-site land was initially surveyed on the 3<sup>rd</sup> of November 2021 by Henry Sturges BSc MCIEEM. This assessment was updated in the Spring and Summer of 2022. The second off-site field (F2) was surveyed on the 6<sup>th</sup> December 2022. Although this is outside the optimal time to undertake a UKHab survey it is not considered to have reduced the surveys effectiveness due to the grassland on Site being of low ecological value and therefore a confident assessment of habitat type can be made. The hedgerows and ditches bounding the field were also surveyed and a brief assessment on the potential of this land to support protected species has been undertaken. The assessment is not as detailed as that for the main development site as the proposed habitat mitigation will enhance the field for wildlife and it is considered the proposals are unlikely to have any significant detrimental effects on local wildlife.

### Modified species-poor grassland

Both of the fields included in the off-site land were modified pasture which contained a very high proportion of perennial rye grass indicating it is regularly improved and sown with this species. Other species recorded in the grassland included creeping buttercup *Ranunculus repens*, common sorrel *Rumex acetosa*, common nettle, Yorkshire fog, cocks-foot grass and rough-stalked meadow grass *Poa trivialis*. Communication with the farmer regarding the management of the field also confirmed the field is cut intermittently for silage production. Given the regular improvement and overgrazing of the ditches bankside vegetation the current management of this habitat is considered to be having a detrimental impact on the adjacent habitats particularly the ditches. Overall this grassland was of low ecological value being closely sheep grazed and regularly improved.

### Ditches

Both fields were surrounded by ditches of varying quality. Some of these had recently been dredged. Due to the season in which the survey was undertaken the value of the emergent and bankside vegetation is likely to have been undervalued. A brief description of the ditches is given in the table below.

Ditch reference	Description
D1	Running the length of the eastern boundary separating the field from adjacent land and the Strawberry Line. This ditch contained a limited variety of aquatic vegetation including common duckweed <i>Lemna minor</i> , yellow flag iris <i>Iris pseudoacorus</i> , common reed <i>Phragmites australis</i> , reedmace <i>Typha latifolia</i> and hard rush <i>Juncus inflexus</i> . This ditch contained the invasive non- native species water fern which was forming a covering of part of the ditch. This ditch was open to the north and runs to the west of H1 where it bounds two thin adjacent fields. It does this before running through the centre of woody vegetation associated with H1 towards the south of the Site. In this section it is far more enclosed and as such contains less aquatic vegetation. The ditch varied in width from around 2m to the north to just over 1m to the south. Depth of this feature also looked variable with a much shallower choked ditch being present towards the south of the Site. There was some potential for this ditch to be used by species such as water vole to the north being well vegetated and with a good bank structure it lacked suitable vegetation to the south and where accessible no signs of use by this species was observed. Condition assessment 1.Y 2.N 3.N 4.N 5.N 6.N 7.N 8.N (1/8) Poor
D2	The southern ditch was predominantly clear of vegetation but supported a series of mature oaks on the far bank. Vegetation recorded included common duckweed, lesser water parsnip <i>Berula erecta</i> and some soft rush <i>Juncus effusus</i> to the west of this feature. This feature was approximately 1.75m wide and appeared to be deep. It was fully inspected for signs of protected species including water vole and none were observed. Condition assessment 1.Y 2.N 3.N 4.N 5.N 6.Y 7.N 8.Y (3/8) Poor
D3	A severely poached ditch with signs of bank collapse along its length on the near bank. The structure on this bank was very shallow due to the poaching. Where this feature turns the corner before meeting D4 there is some woody vegetation present on the far bank including dogrose, bramble and hawthorn. Aquatic vegetation included hard rush, common reed, lesser water parsnip, gypsywort <i>Lycopus europaeus</i> , common duckweed, flag iris, hemlock water dropwort <i>Oenanthe crocata</i> , dovesfoot cranesbill <i>Geranium Mole</i> . This ditch was approximately 2m wide along its length and had been recently dredged. Condition assessment 1.N 2.N 3.N 4.Y 5.N 6.Y 7.Y 8.Y (4/8) Poor
D4	A continuation of D3 in terms of its structure. The far bank contained a fringe of woody vegetation with dog rose, bramble and hawthorn recorded. Aquatic vegetation included branched bur-reed <i>Sparganium erectum</i> , lesser water parsnip, ivy leaved duckweed <i>Lemna trisulca</i> , and common reed. . This ditch contained the invasive non- native species water fern which is dominant in sections of this ditch. A farm gate was observed spanning this feature to the north approximately 10m south of its connection with D5. Condition assessment 1.N 2.N 3.N 4.Y 5.N 6.Y 7.N 8.N (2/8) Poor
D5	This ditch known as the Branch Rhyne was the most substantial recorded being in excess of 3m in width and appearing to be a very deep channel. It had recently been dredged likely reducing the visible vegetation. This included common star-wort <i>Callitriche stagnalis</i> , reed sweet grass <i>Glyceria maxima</i> , common reed, branched bur reed, hard rush and nettle. It had very steep banks which are suboptimal for species such as water vole. Overall this ditch appeared to be an ecologically important feature. 1.Y 2.N 3.N 4.N 5.N 6.Y 7.Y 8.Y (4/8) Poor



Ditch reference	Description
D6	This ditch forms the northern boundary of the second off-site field and is an unfenced ditch with a shallow bank structure which is approximately 2m deep and 3m wide. It contained a fringe of vegetation along most of its length and several snipe were flushed foraging in the channel. Vegetation included soft rush, jointed rush, reed mace, and foals water cress. The ditch featured shallow water levels at the time of survey. Condition assessment passes 1.Y 2.N 3.Y 4.N 5.N 6.Y 7.Y 8.Y (5/8) Poor
D7	This ditch forms the southern boundary of the off-site field and is known locally as the Biddle Street Rhyne. At the time of survey it had recently been dredged and featured a very low cover of aquatic or marginal vegetation. It has a good structure with a width of 2m a water depth of 0.5 m and a bankfull depth of around 1.5m. it contained approximately 20% cover of duckweed and other aquatic plants recorded included starwort and lesser water parsnip. Impacts from livestock poaching were significant. Carp scales were recorded on the bankside indicating the ditch is used by foraging otter. Condition assessment passes 1.N 2.N 3.N 4.Y 5.N 6.Y 7.N 8.Y (3/8) Poor
D8	A hedgerow lined ditch to that forms the eastern boundary of the second off-site field. This relatively narrow ditch had a gentle bank structure featuring a covering of duckweed and a fringe of soft rush and reed mace along a portion of the bank. The far bank comprised a tall but sparse hedgerow containing oak, blackthorn, hawthorn, dogrose and goat willow. This feature is overgrown and defunct in places shading out a large proportion of the adjacent ditch Ditch condition assessment: 1.N 2.N 3.N 4.N 5.N 6.Y 7.N 8.Y (2/8) Poor Hedgerow condition assessment: A1.Y A2.Y B1.N B2.N C1.N C2.Y D1.Y D2.N E1.N E2.Y (5/10) Moderate

Water quality in all of the ditches surveyed appeared poor with a strong covering of duckweed and filamentous algae in places. The banks were all subject to poaching and trampling by livestock. The diversity of aquatic plants was also considered to be reasonably low, although given the time of year the survey was undertaken certain species may have been missed. Undertaking a condition assessment using the BNG technical supplements all of the ditches within the off-site land are considered to be in poor condition failing condition assessment criteria 3 and 5 which relate to duckweed cover and bankside poaching in every instance. All of the ditches also fail one or more of the other condition assessment criteria most commonly conditions 1, 2, 4, 6 or 7

The ditches themselves form part of the Biddle Street SSSI designation as previously described in this report. They form part of the SSSI designation and are likely to contain a wide array of invertebrates in addition to the wide variety of aquatic vegetation.

In common with other parts of the Levels and Moors, Biddle Street is drained by a network of rhyes and ditches. In many areas these act as 'wet fences' and provide water for the livestock that graze over the area during the summer months. The combination of past/present management practices and the variation in the soils has resulted in the watercourses supporting a wide range of aquatic plant communities, many of which are of considerable nature conservation interest. Where open water occurs plants such as Common Water-starwort *Callitriche stagnalis*, Frogbit *Hydrocharis morsusranae*, Fan-leaved Water-crowfoot *Ranunculus circinatus*, Nuttall's Waterweed *Elodea nuttallii*, Lesser Pondweed *Potamogeton pusillus*, Whorled Water-milfoil *Myriophyllum verticillatum* and Stonewort *Chara sp.* are found, the latter two species indicative of the calcareous influence of the underlying Compton soils. Also present are the nationally scarce Rootless Duckweed *Wolffia 109rhizal* and Hairlike Pondweed *Potamogeton trichoides*. Many of the field ditches also support a high diversity of emergent species. Branched Bur-reed *Sparganium erectum*, Lesser Water-parsnip *Berula erecta*, Water Horsetail *Equisetum fluviatile*, Tubular Water-dropwort *Oenanthe fistulosa* and Water-plantain *Alisma plantago-aquatica* are all common. Reed Sweet-grass *Glyceria maxima*, Reed Canary-grass *Phalaris arundinacea* and Common Reed *Phragmites australis* also occur and dominate some of the less frequently managed field ditches. A number of ditches support a diverse bank flora. Ragged-Robin *Lychnis flos-cuculi*, Brookweed *Samolus valerandi*, Brooklime *Veronica beccabunga*, Water Mint *Mentha aquatica*, Marsh Bedstraw *Galium palustre* and Meadowsweet *Filipendula ulmaria* have all been recorded. A rich invertebrate fauna is also associated with the rhyes and ditches. Good numbers of aquatic beetles *Coleoptera* are present including populations of two nationally rare species, *Hydacticus transversalis* and Britain's largest water beetle, the Great Silver Water Beetle *Hydrophilus piceus*, the latter being largely confined to grazing marshes of Southern Britain. A number of dragonflies and damselflies are known to breed in the watercourses including Southern Hawker *Aeshna cyanea*, Blue-tailed Damselfly *Ischnura elegans* and the nationally scarce Variable Damselfly *Coenagrion pulchellum*. Aquatic molluscs are also well-represented. Strong populations of the Common Freshwater Mussel occur as does the nationally rare Pea Mussel *Pisidium pseudosphaerium* (Natural England citation: <https://designatedsites.naturalengland.org.uk/PDFsForWeb/Citation/1006788.pdf>).

Overall the ditches are considered to be of **National** importance but are in unfavourable condition currently

## Hedgerows

Three hedgerows were recorded within the survey area.

H1 was effectively a fringe of irregularly managed woody vegetation or scrub containing the following woody species Hawthorn blackthorn, dog rose, goat willow, osier, pedunculated oak, wild privet, spindle and bramble. It is considered species rich and important although it is defunct in places and partially fenced. It varied in height from 3- 8m in height. This feature is adjacent D1 on its western bank in the north of the Site but towards the mid and south is present either side of D1 essentially forming a young wooded feature either side of this and adjoining the strawberry line. This hedgerow is categorised as a native species rich hedgerow with trees associated with a bank.

H2 was a line of mature pedunculate oak approximately 16-20m tall. It was defunct with large gaps present along its length. The following other species were recorded: hawthorn, blackthorn, dog rose and bramble. This hedgerow is not species rich and is not considered important under the hedgerow regulations. This feature is categorised as a line of trees associated with a ditch.



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H3 to the east of the eastern ditch of the second off-site field was overgrown and defunct containing the following species: oak, blackthorn, hawthorn, dogrose and goat willow. Four mature or semi-mature oaks were present within this feature. In places this hedgerow was defunct and areas of the boundary had little to no hedgerow present. This hedgerow is categorised as a native hedgerow with trees associated with a ditch.

#### *Protected species concerns*

The walkover revealed some signs of foraging otter from swan muscle shells observed on the western banks of D5. There were also signs of mammals crossing D1 to the north of the field entrance into the field. No signs of water vole were encountered in any of the ditches, although specific water vole surveys were not undertaken. The north of D1 presented suitable habitat for this species. The pasture itself is considered to be suitable to support foraging horseshoe bats and the hedgerows and ditches are likely to support a range of common bat species. Suitability for reptiles and amphibians was considered to be low no signs of badger were encountered during the walkover survey.



Figure F1: Off-site habitat mapping



## APPENDIX G: DETAILED BREEDING BIRD SCOPING SURVEY DATA

Table G1: Detailed Breeding Bird Scoping Survey Summary. Bird Species	Latin Name	Number	Boundarys	Open fields	Flying over	Outside site	Ditches	Breeding
Blue tit	Cyanistes caeruleus	1	1					Pr
Great tit	Parus major	1	1					Pr
Goldfinch	Carduelis carduelis	11	7		5		1	Y
Greenfinch	Chloris chloris	2	2					Po
Chaffinch	Fringilla coelebs	2	2					Po
Chiff chaff	Phylloscopus collybita	2	2					Po
Reed warbler	Acrocephalus scirpaceus	3	1				2	Po
Reed bunting	Emberiza schoeniclus	1					1	Po
Black cap	Sylvia atricapilla	2	2					Pr
Dunnock	Prunella modularis	4	3	1				Y
Blackbird	Turdus merula	4	2	2				Y
Song Thrush	Turdus philomelos	1				1		N
Robin	Erithacus rubecula	7	5	2				Y
House sparrow	Passer domesticus	28	26			2		N
Wren	Troglodytes troglodytes	6	4			2		Pr
Wood pigeon	Columba palumbus	8	2	6				Pr
Collared Dove	Streptopelia decaocto	4	1	1		2		N
Magpie	Pica pica	9	6	3				Po
Carrion Crow	Corvus corone	6	1	4		1		N
Rook	Corvus frugilegus	1	1					N
Jackdaw	Corvus monedula	2			2			N
Starling	Sturnus vulgaris	174	63	10	100	1		N
Herring Gull	Larus argentatus	1			1			N
Lesser black-	Larus fuscus	3			3			N



backed gull								
Moorhen	Gallinula chloropus	2					2	Y
Mallard	Anas platyrhynchos	2			2			Po
Sparrowhawk	Accipiter nisus	1				1		N
		287	132	29	113	9	6	

## APPENDIX H: BNG ASSESSMENT

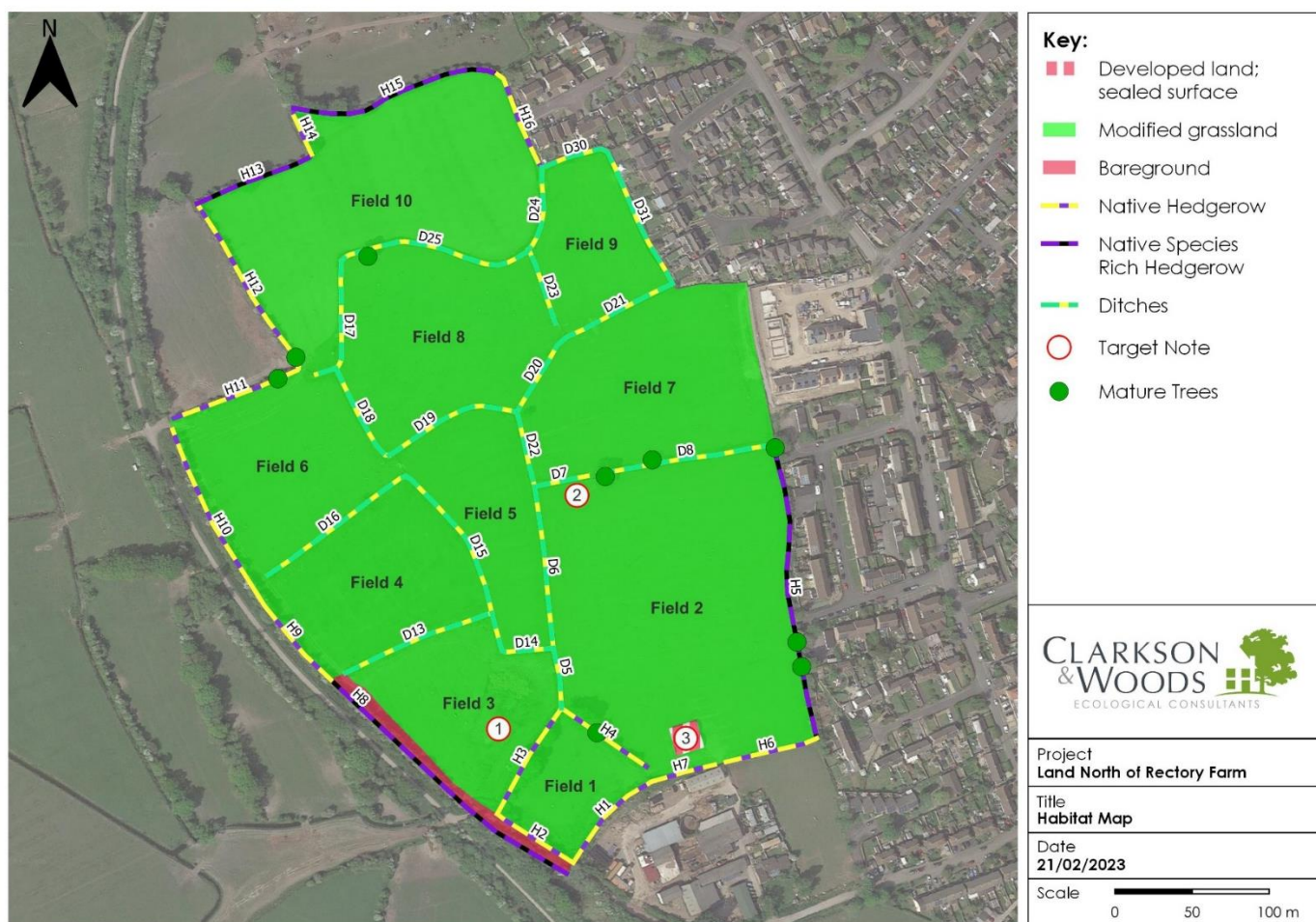
The following section provides the condition assessments for each of the baseline habitats recorded. It then provides the targeted conditions to be passed for the proposed habitats to justify the conditions proposed in the BNG 3.1 Calculator.

This appendix also briefly outlines how the retained and created habitats have been decided upon in the metric and provides an output of the mapping created to provide the measurements used to inform the BNG assessment.

The appendices also offers a reasoned statement to illustrate how the ten BNG principles have been followed by this biodiversity net gain assessment

### Baseline habitat condition assessments

The baseline habitat BNG calculations were derived from the initial UKHab mapping and condition assessments undertaken, This figure is reproduced below. The GIS shapefiles for baseline and proposed habitats are available for Clarkson and Woods Ltd upon request. This appendix is primarily to provide clarity on the BNG calculations undertaken in terms of habitat values.



Baseline UKHab mapping used to derive baseline BNG habitat areas



### Grassland - Modified Grassland (MG)

The baseline conditions assessments listed below relate to the modified agricultural grassland within fields 1-10.

BNG Condition Assessment Criterion Achieved (Y/N)		Field Numbers									
		1	2	3	4	5	6	7	8	9	10
1	There must be 6-8 species per m <sup>2</sup> . If a grassland has 9 or more species per m <sup>2</sup> it should be classified as a medium distinctiveness grassland habitat type. <b>NB- this criterion is essential for achieving Moderate condition.</b>	N	N	N	N	N	N	N	N	N	N
2	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.	N	N	N	N	N	N	N	N	N	N
3	Some scattered scrub (including bramble) may be present, but scrub accounts for less than 20% of total grassland area. Note-patches of shrubs with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4	Physical damage is evident in less than 5% of total grassland area. Examples of physical damage include excessive poaching, damage from machinery use or storage, erosion cause by high levels of access, or any other damaging management activities.	N	Y	N	N	Y	N	N	N	Y	Y
5	Cover of bare ground between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens).	N	Y	N	Y	Y	Y	Y	Y	Y	Y
6	Cover of bracken less than 20%	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
7	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981).	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<b>Condition</b>		<b>Poor</b>	<b>Poor</b>	<b>Poor</b>	<b>Poor</b>	<b>Poor</b>	<b>Poor</b>	<b>Poor</b>	<b>Poor</b>	<b>Poor</b>	<b>Poor</b>

Condition Assessment Result	Condition Assessment Score
Passes 6 or 7 criteria including passing essential criterion 1	Good (3)
Passes 4 or 5 of 7 criteria; OR Passes 4 or 5 of 7 criteria including passing essential criterion 1	Moderate (3)
Passes 0, 1, 2 or 3 of 7 criteria; OR 4, 5 or 6 criteria but failing criterion 1	Poor (1)



### Urban - Urban tree (UT)

The baseline condition assessments relating to urban trees below are provided to account for the value of mature trees present within the fields as shown in the baseline habitat mapping.

BNG Condition Assessment		Urban Trees 1	Urban Trees 2
Criterion Achieved (Y/N)			
1	The tree is a native species (or more than 70% within the block are native species).	Y	Y
2	The tree canopy is predominantly continuous, with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide (individual trees automatically pass this criterion).	Y	Y
3	The tree is mature <sup>2</sup> or veteran <sup>3</sup> (or more than 50% within the block are mature <sup>2</sup> or veteran <sup>3</sup> ).	Y	N
4	There is little or no evidence of an adverse impact on tree health by anthropogenic activities such as vandalism or herbicide use. There is no current regular pruning regime, so the trees retain >75% of expected canopy for their age range and height.	Y	N
5	Micro-habitats for birds, mammals and insects are present e.g. presence of deadwood, cavities, ivy or loose bark	Y	Y
6	More than 20% of the tree canopy area is oversailing vegetation beneath.	Y	Y
<b>Condition</b>		<b>Good (6/6)</b>	<b>Moderate (4/6)</b>

Condition Assessment Result	Condition Assessment Score
Passes 5 or 6 of 6 criteria	Good (3)
Passes 3 or 4 of 6 criteria	Moderate (2)
Passes 0, 1 or 2 of 6 criteria	Poor (1)





### Rivers and streams - Ditches

The combined baseline condition assessment is provided as a summary of all of the open ditches which were surveyed as part of the baseline survey. It should be noted each of the individual ditches (19 in total) were subject to individual condition assessments as part of the UKHab survey. None of them passed more than 4 criteria. Ditches which scored 4 condition passes also passed on condition 4 in relation to a fringe of marginal vegetation along 75% of the ditch.

BNG Condition Assessment Criterion Achieved (Y/N)		Condition assessment of all open ditches (combined indicative)
1	The ditch is of Good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.	N
2	A range of emergent, submerged or floating leaved plants are present. As a guide >10 species of emergent, floating or submerged plants in a 20m ditch length.	N
3	There is less than 10% cover of filamentous algae and/or duckweed (these are signs of eutrophication).	N
4	A fringe of marginal vegetation is present along more than 75% of the ditch.	N
5	Physical damage evident along less than 5% of the ditch, such as excessive poaching, damage from machinery use or storage, or any other damaging management activities.	N
6	Sufficient water levels are maintain; as a guide a minimum summer depth of approximately 50cm in minor ditches and 1m in main drains.	Y
7	Less than 10% of the ditch is heavily shaded.	Y
8	There is an absence of invasive non-native plant and animal species.	Y
<b>Ditch Condition</b>		<b>Poor (3/8)</b>

Condition Assessment Result	Condition Assessment Score
Passes 8 of 8 criteria	Good (3)
Passes 6 or 7 of 8 criteria	Moderate (2)
Passes 0, 1, 2, 3, 4 or 5 of 8 criteria	Poor (1)



## Hedgerows

The baseline condition assessment scores for hedgerows are broken down into their hedgerow type for the baseline condition assessments displayed below. The four different hedgerow types are assessed separately. Those with hedgerow trees are subject to two additional condition assessment criteria.

### Native hedgerow with trees - associated with bank or ditch

Attributes and functional groupings (A, B, C, D & E)		Criteria (the minimum requirements for 'favourable condition'	H1	H2	H3	H4	H6	H14
<b>Core groups - applicable to all hedgerow types</b>								
A1.	Height	>1.5 m average along length	Y	Y	Y	Y	Y	Y
A2.	Width	>1.5 m average along length	Y	Y	Y	Y	N	Y
B1.	Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length (unless 'line of trees')	N	N	N	N	N	N
B2.	Gap - hedge canopy continuity	Gaps make up <10% of total length and No canopy gaps >5 m	N	N	N	Y	N	Y
C1.	Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length: - measured from outer edge of hedgerow, and - is present on one side of the hedge (at least)	Y	N	N	N	N	N
C2.	Undesirable perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground	N	N	N	N	N	N
D1.	Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native and neophyte species	Y	Y	Y	Y	Y	Y
D2.	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities	N	Y	Y	Y	N	Y
E1.	Tree age	At least one mature tree per 30m stretch of hedgerow. A mature tree is one that is at least 2/3 expected fully mature height for the species.	N	Y	Y	Y	N	N
E2.	Tree health	At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	N	Y	N	Y	N	Y
<b>Hedgerow With Trees Condition</b>			<b>Poor</b>	<b>Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>Poor</b>	<b>Moderate</b>



**Native species rich hedgerow with trees - associated with bank or ditch.**

Attributes and functional groupings (A, B, C, D & E)		Criteria (the minimum requirements for 'favourable condition')	H5	H13	H15
<b>Core groups - applicable to all hedgerow types</b>					
A1.	Height	>1.5 m average along length	Y	Y	Y
A2.	Width	>1.5 m average along length	Y	Y	Y
B1.	Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length (unless 'line of trees')	N	Y	N
B2.	Gap - hedge canopy continuity	Gaps make up <10% of total length and No canopy gaps >5 m	N	Y	Y
C1.	Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length: - measured from outer edge of hedgerow, and - is present on one side of the hedge (at least)	N	N	N
C2.	Undesirable perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground	N	N	N
D1.	Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native and neophyte species	Y	Y	Y
D2.	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities	Y	Y	Y
E1.	Tree age	At least one mature tree per 30m stretch of hedgerow. A mature tree is one that is at least 2/3 expected fully mature height for the species.	Y	N	N
E2.	Tree health	At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	Y	Y	Y
<b>Hedgerow With Trees Condition</b>			<b>Poor</b>	<b>Moderate</b>	<b>Moderate</b>



**Native hedgerow - associated with bank or ditch.**

Attributes and functional groupings (A, B, C, D & E)		Criteria (the minimum requirements for 'favourable condition')	H6	H7	H9	H10	H11	H12
<b>Core groups - applicable to all hedgerow types</b>								
A1.	Height	>1.5 m average along length	Y	Y	Y	Y	Y	Y
A2.	Width	>1.5 m average along length	N	Y	Y	Y	Y	Y
B1.	Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length (unless 'line of trees')	N	N	Y	N	Y	N
B2.	Gap - hedge canopy continuity	Gaps make up <10% of total length and No canopy gaps >5 m	N	N-	Y	Y	Y	Y
C1.	Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length: - measured from outer edge of hedgerow, and - is present on one side of the hedge (at least)	N	N	N	N	N	N
C2.	Undesirable perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground	N	N	N	N	Y	N
D1.	Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native and neophyte species	Y	Y	Y	Y	Y	Y
D2.	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities	N	N	Y	Y	Y	Y
<b>Hedgerow Condition</b>			<b>Poor</b>	<b>Poor</b>	<b>Moderate</b>	<b>Moderate</b>	<b>Good</b>	<b>Moderate</b>



**Native species rich hedgerow with trees - associated with bank or ditch.**

Attributes and functional groupings (A, B, C, D & E)		Criteria (the minimum requirements for 'favourable condition')	H8
<b>Core groups - applicable to all hedgerow types</b>			
A1.	Height	>1.5 m average along length	Y
A2.	Width	>1.5 m average along length	Y
B1.	Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length (unless 'line of trees')	Y
B2.	Gap - hedge canopy continuity	Gaps make up <10% of total length and No canopy gaps >5 m	Y
C1.	Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length: - measured from outer edge of hedgerow, and - is present on one side of the hedge (at least)	N
C2.	Undesirable perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground	N
D1.	Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native and neophyte species	Y
D2.	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities	N
<b>Hedgerow Condition</b>			<b>Moderate</b>

<b>Condition Categories for Hedgerows without Trees</b>	
Maximum number of attributes that can fail to meet 'favourable condition' criteria	Metric Score
No more than 2 failures in total; AND no more than 1 in any functional group	3
No more than 4 failures in total; AND Does not fail both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 & C1 = Moderate condition)	2
Fails a total of more than 4 attributes; OR Fails both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 & B2 = Poor condition)	1
<b>Condition Categories for Hedgerows with Trees</b>	
Maximum number of attributes that can fail to meet 'favourable condition' criteria	Metric Score
No more than 2 failures in total; AND No more than 1 in any functional group	3
No more than 5 failures in total; AND Does not fail both attributes in more than one functional group (e.g. fails attributes A1, A2, B1, C1 & E1 = Moderate condition)	2
Fails a total of more than 5 attributes; OR Fails both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 & B2 = Poor condition)	1

### Post Development BNG Conditions targeted.

The post development BNG calculations are based on the BNG habitat mapping reproduced below. This allowed calculation of the areas of each habitat proposed. This is based on the illustrative landscaping masterplan which was used to ascertain the location and size of each element. The GIS shapefiles for this mapping are available from Clarkson and Woods Ltd upon request. Below this are the targeted condition assessment criteria for each of the relevant proposed habitat types.



Post development BNG mapping

### Habitat Enhancement

A limited number of habitats are targeted for retention and enhancement as part of the development proposals. These include areas of modified grassland within fields 1, 3, 4 and 6. Modified grassland within fields 3, 4 and 6 will be enhanced to an other neutral sward. The grassland in field 1 will be enhanced to a traditional orchard habitat (see the relevant table in habitat creation for targeted conditions). These areas can be retained due to the low level of material which will need to be brought onto Site to address the levels. These grasslands can be enhanced through scarification, overseeding and subsequent management. Grassland to be established surrounding the other fields and buffers to the ditches is considered likely to be subject to soil disturbance and possibly removal and as such this grassland is set within the metric to be created.





## Grassland - Other Neutral Grassland

BNG Condition Assessment		Target Conditions	Justification of condition pass/fail
Criterion Achieved (Y/N)			
1	The appearance and composition of the vegetation closely matches characteristics of the specific grassland habitat type (see UKHab definition). sedges and indicator species for the specific grassland habitat type are very clearly and easily visible throughout the sward. NB - <b>This criterion is essential for achieving Moderate condition for non-acid grassland types only.</b>	Y	The grassland to be enhanced from the modified sward will target the MG1 grassland type dominated by false oat grass and cocks-foot grass with a range of herbs typical of this assemblage
2	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.	Y	The sward will be maintained as a tall rough grassland with areas surrounding pathways mown more regularly allowing a range of sward heights. –
3	Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.	Y	Bare ground will be created by use of the open spaces by the public. Measures will be put in place if over 5% of the total area fails to establish or is maintained as bare ground through public recreational pressure
4	Cover of bracken less than 20% and cover of scrub (including bramble) less than 5%.	N	Up to 5% of the grassland will feature areas of scattered native scrub for the benefit of foraging bats.
5	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981). Combined cover of species indicative of sub-optimal condition and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area.	Y	The grassland will be managed to suppress common weeds indicative of suboptimal grass condition and invasive species (if they establish) will be controlled or removed.
6	There are greater than 9 species per metre squared. NB - <b>This criterion is essential for achieving Good condition (non-acid grassland types only).</b>	N	It is considered due to the grassland type that there is a strong possibility species richness will be at 9 species or fewer per m2 on average across the grassland to be enhanced.
<b>Condition</b>		<b>Poor (3/6)</b>	<b>Grassland condition is set to poor over the potential for the grassland to have an average of less than 9 species per m2.</b>

Condition Assessment Result	Condition Assessment Score
Passes 5 or 6 criteria, including essential criteria 1 and 6	Good (3)
Passes 3 or 4 criteria, including essential criterion 1	Moderate (2)
Passes 0, 1 or 2 of 6 criteria; OR Passes 3 or 4 criteria excluding criteria 1 and 6	Poor (1)



## Hedgerow Enhancement

Hedgerows H1, H6, H7 and H11 are to be enhanced through additional planting and management. All other hedgerow conditions will be maintained. All of the hedgerows listed above will be subject to planting to augment their hedgerow type from species-poor to species-rich through the planting of additional native woody species to fill hedgerow gaps.

Attributes and functional groupings (A, B, C, D & E)		Criteria (the minimum requirements for 'favourable condition')	Poor Baseline Hedgerows H1, H6 and H7	H11 – good baseline condition	Justification of condition
<b>Core groups - applicable to all hedgerow types</b>					
A1.	Height	>1.5 m average along length	Y	Y	Hedgerows will be maintained at over 2m in height
A2.	Width	>1.5 m average along length	Y	Y	Hedgerows will be maintained at over 2m in width
B1.	Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length (unless 'line of trees')	N	Y	Hedgerows will be gapped up where defunct at the base. There is potential for this not to establish if the hedgerow is mature and overgrown
B2.	Gap - hedge canopy continuity	Gaps make up <10% of total length and No canopy gaps >5 m	Y	Y	The canopy continuity will be maintained through careful management.
C1.	Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length: - measured from outer edge of hedgerow, and - is present on one side of the hedge (at least)	N	N	There is some potential as these hedgerows are in the public open spaces for the margins of these hedgerows to be regularly disturbed.
C2.	Undesirable perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground	Y	Y	Management will remove species such as nettles where they establish. Long-term lowering of agricultural inputs will lessen this issue over time.
D1.	Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native and neophyte species	Y	Y	Hedgerows will be kept free of non-native invasive species and neophytes – only native cultivars will be planted as part of hedgerow restoration.
D2.	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities	N	Y	Current damage will be mitigated as far as possible through management and protection of the hedgerows during the construction phase. There remains a possibility that damage will occur through recreational pressure
E1.	Tree age	At least one mature tree per 30m stretch of hedgerow. A mature tree is one that is at least 2/3 expected fully mature height for the species.	N	Y	It is unlikely that suitably mature trees will be established in the next 30 years. Hedgerows which pass these criteria currently will have mature trees maintained through suitable management
E2.	Tree health	At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or	Y	Y	Tree health will be monitored and where necessary diseased trees will be removed and replaced.



		wild animals, pests or diseases, or human activity.			
<b>Hedgerow With Trees Condition</b>			<b>Moderate</b>	<b>Good</b>	

<b>Condition Categories for Hedgerows without Trees</b>	
<b>Maximum number of attributes that can fail to meet 'favourable condition' criteria</b>	<b>Metric Score</b>
No more than 2 failures in total; AND No more than 1 in any functional group	3
No more than 4 failures in total; AND Does not fail both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 & C1 = Moderate condition)	2
Fails a total of more than 4 attributes; OR Fails both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 & B2 = Poor condition)	1
<b>Condition Categories for Hedgerows with Trees</b>	
<b>Maximum number of attributes that can fail to meet 'favourable condition' criteria</b>	<b>Metric Score</b>
No more than 2 failures in total; AND No more than 1 in any functional group	3
No more than 5 failures in total; AND Does not fail both attributes in more than one functional group (e.g. fails attributes A1, A2, B1, C1 & E1 = Moderate condition)	2
Fails a total of more than 5 attributes; OR Fails both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 & B2 = Poor condition)	1



## River enhancement

All ditches except D7, D8 D20 and D21 will be enhanced through management. The four ditches excluded from enhancement have been selected on the basis hedgerow to the south of their location may reduce the potential to restore the ditches due to shading effects.

### Rivers and streams - Ditches

BNG Condition Assessment Criterion Achieved (Y/N)		Combined open ditch targeted conditions	Justification
1	The ditch is of Good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.	N/Y	The cessation of fertiliser inputs will reduce eutrophication within the ditches but due to their connection with the wide ditch network introduces uncertainty about water quality
2	A range of emergent, submerged or floating leaved plants are present. As a guide >10 species of emergent, floating or submerged plants in a 20m ditch length.	Y/N	The ditches will be planted and managed sympathetically to encourage emergent submerged and marginal plant diversity. Management by the IDB increases the risk ditches will periodically be cleared of in channel vegetation.
3	There is less than 10% cover of filamentous algae and/or duckweed (these are signs of eutrophication).	Y/N	The cessation of fertiliser inputs will reduce eutrophication within the ditches but due to their connection with the wide ditch network introduces uncertainty about water quality The planting of additional marginal plants will help to reduce water nutrient levels within the enhanced ditches.
4	A fringe of marginal vegetation is present along more than 75% of the ditch.	Y	A fringe of marginal vegetation will be maintained along one face of the ditch at all times.
5	Physical damage evident along less than 5% of the ditch, such as excessive poaching, damage from machinery use or storage, or any other damaging management activities.	Y	The removal of grazing livestock will reduce poaching and trampling of the banks which is currently a serious issue reducing the ditches quality
6	Sufficient water levels are maintain; as a guide a minimum summer depth of approximately 50cm in minor ditches and 1m in main drains.	Y	Generally, the water levels are at 0.5m in the ditches throughout the summer months. This is over 1m from the tops of the banks for most ditches having been deepened by the resident farmer in recent years.
7	Less than 10% of the ditch is heavily shaded.	Y	efforts through careful design will allow the ditches targeted for enhancement to be kept free of shading.
8	There is an absence of invasive non-native plant and animal species.	Y	The ditches will be monitored for the presence of non-native invasive species and any which establish will be controlled and removed.
<b>Ditch Condition</b>		<b>Fairly Poor 5-8 out of 8</b>	<b>The condition of Fairly poor has been applied at the assessors discretion as the ditches will aim to pass 5 conditions with additional 3 conditions which are targeted may or may not be passed based on general catchment water quality and management by the IDB</b>



Condition Assessment Result	Condition Assessment Score
Passes 8 of 8 criteria	Good (3)
Passes 6 or 7 of 8 criteria	Moderate (2)
Passes 0, 1, 2, 3, 4 or 5 of 8 criteria	Poor (1)



## Habitat Creation

The target condition assessments are provided for the retained enhanced habitats below.

### Grassland - Other Neutral Grassland

These target conditions apply to the created other neutral grassland surrounding the retained ditches in fields 2, 5, 7, 8, 9 and 10. This will be seeded after works to address levels are undertaken. A fringe of grassland surrounding the ditches will be protected as far as possible from construction impacts but it is anticipated these will be reseeded if reprofiling occurs.

BNG Condition Assessment		Target Conditions	Justification of condition pass/fail
Criterion Achieved (Y/N)			
1	The appearance and composition of the vegetation closely matches characteristics of the specific grassland habitat type (see UKHab definition). sedges and indicator species for the specific grassland habitat type are very clearly and easily visible throughout the sward. NB - <b>This criterion is essential for achieving Moderate condition for non-acid grassland types only.</b>	Y	The grassland to be created will target the MG1 grassland type dominated by false oat grass and cocks-foot grass with a range of herbs typical of this assemblage Patches of wildflower rich grassland will also be created
2	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.	Y	The sward will be maintained as a tall rough grassland with areas surrounding pathways mown more regularly allowing a range of sward heights. –
3	Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.	Y	Bare ground will be created by use of the open spaces by the public. Measures will be put in place if over 5% of the total area fails to establish or is maintained as bare ground through public recreational pressure
4	Cover of bracken less than 20% and cover of scrub (including bramble) less than 5%.	N	Up to 5% of the grassland will feature areas of scattered native scrub for the benefit of foraging bats.
5	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981). Combined cover of species indicative of sub-optimal condition and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area.	Y	The grassland will be managed to suppress common weeds indicative of suboptimal grass condition and invasive species (if they establish) will be controlled or removed.
6	There are greater than 9 species per metre squared. NB - <b>This criterion is essential for achieving Good condition (non-acid grassland types only).</b>	N	It is considered due to the grassland type that there is a strong possibility species richness will be at 9 species or fewer per m2 on average across the grassland to be enhanced.
<b>Condition</b>		<b>Poor (3/6)</b>	<b>Grassland condition is set to poor over the potential for the grassland to have an average of less than 9 species per m2.</b>

Condition Assessment Result	Condition Assessment Score
Passes 5 or 6 criteria, including essential criteria 1 and 6	Good (3)
Passes 3 or 4 criteria, including essential criterion 1	Moderate (2)
Passes 0, 1 or 2 of 6 criteria; OR Passes 3 or 4 criteria excluding criteria 1 and 6	Poor (1)





### Grassland - Modified Grassland (MG)

BNG Condition Assessment Criterion Achieved (Y/N)		Amenity areas within developed space 0.51ha	Modified grassland areas in field 5 and under trim trails 0.263ha	
1	There must be 6-8 species per m <sup>2</sup> . If a grassland has 9 or more species per m <sup>2</sup> it should be classified as a medium distinctiveness grassland habitat type.  <b>NB- this criterion is essential for achieving Moderate condition.</b>	N	N	Areas of modified grassland within the developed area will be mown short and managed primarily for amenity. Those within field 5 will be less regularly managed and it is considered possible to maintain 6 species per m <sup>2</sup> in these areas but uncertainty remains so set to fail this criteria
2	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.	N	N	Sward height is considered to be determined by regular mowing management and is likely to be uniform
3	Some scattered scrub (including bramble) may be present, but scrub accounts for less than 20% of total grassland area. Note- patches of shrubs with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.	Y	Y	Amenity grassland areas will be kept free of scrub. Although scattered urban trees will be planted in some areas.
4	Physical damage is evident in less than 5% of total grassland area. Examples of physical damage include excessive poaching, damage from machinery use or storage, erosion cause by high levels of access, or any other damaging management activities.	N	N	Due to their use as publicly accessible spaces damage through recreational pressure is likely to occur.
5	Cover of bare ground between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens).	N	N	Potential for bare ground areas to develop from damaging levels of public access.
6	Cover of bracken less than 20%	Y	Y	No bracken present within the Site unlikely to establish in formal areas.
7	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981).	Y	Y	The grasslands will be maintained to be free from invasive non-native species
<b>Condition</b>		<b>Poor</b>	<b>Poor</b>	<b>The modified swards will both be in poor condition due primarily to management and public access along with anticipated average species diversity.</b>

Condition Assessment Result	Condition Assessment Score
Passes 6 or 7 criteria including passing essential criterion 1	Good (3)
Passes 4 or 5 of 7 criteria; OR Passes 4 or 5 of 7 criteria including passing essential criterion 1	Moderate (3)
Passes 0, 1, 2 or 3 of 7 criteria; OR 4, 5 or 6 criteria but failing criterion 1	Poor (1)



## Woodland and forest - Other woodland; broadleaved

BNG Condition Assessment					Target Conditions for Broadleaved woodland	
Indicator	Good (3 points)	Moderate (2 points)	Poor (1 point)			
1	<b>Age Distribution</b>	3 age classes present	2 age classes present	1 age class present	2	Aim for semi-mature and young tees within 15 years of planting
2	<b>Herbivore Damage</b>	No significant browsing damage evident	Evidence of significant browsing pressure in 40% or less of whole woodland	Evidence of significant browsing pressure in 40% or more of whole woodland	3	None anticipated – low levels noted on Site currently
3	<b>Invasive Species</b>	No invasive plant species	Rhododendron & laurel not present, other invasive species cover <10%	Rhododendron or laurel present, or other invasive species cover >10%	3	This woodland will be managed to be free of invasive species
4	<b>No. of Native Tree Species</b>	5 or more native tree/shrub species present	3-4 native tree/shrub species present	0-2 native tree or shrub species present	3	Initial planting will include over 5 species of native locally appropriate tree and shrub species
5	<b>Cover of Native Species</b>	>80% of canopy & understory shrubs are native	50-80% of canopy & understory shrubs are native	<50% canopy & understory shrubs are native	3	All species to be planted are native
6	<b>Open Space</b>	0-20% woodland has temporary areas of open space	21-40% woodland has temporary areas of open space	>40% woodland has temporary areas of open space	3	The woodland will be primarily close planted and contain no intentional gaps in the canopy structure
7	<b>Regeneration</b>	All 3 classes present	1 or 2 classes present	No classes or coppice regrowth present	2	It is anticipated the woodland will have seedlings and young trees within 15 years.
8	<b>Tree Health</b>	Tree mortality <10%	11-25% tree mortality	>25% tree mortality and any high risk pest/disease	2	Allowance for initial mortality of 10-15%
9	<b>Vegetation &amp; Ground Flora</b>	Ancient woodland indicators present	Recognisable NVC community present	No recognisable NVC community	1	Ground flora will take time to establish likely around 30 years
10	<b>Vertical Structure</b>	3 or more storeys across all survey plots	2 storeys across all survey plots	1 or less storeys across all survey plots	1	Initially one storey will be established within 30 years and understory should begin to develop. Scores 1 point as a precaution.
11	<b>Veteran Trees</b>	2 or more veteran trees/ha	1 veteran tree/ha	No veteran trees present	1	No veteran trees will be present in the first 100-150 years.
12	<b>Deadwood</b>	50% survey plots have deadwood	25-50% survey plots have deadwood	<25% survey plots have deadwood	1	Deadwood will take time to accumulate. It will be left in place as part of management operations but it is anticipated to take a number of years to develop
13	<b>Disturbance</b>	No nutrient enrichment or	<20% damaged ground and/or <1ha	>20% damaged ground and/or >1ha	1	Due to current soil conditions which are nutrient rich it is



		damaged ground	nutrient enrichment	nutrient enrichment		anticipated the patches to be planted will be rich in nutrients at least initially.
<b>Woodland Condition</b>					<b>Moderate (26/ 39)</b>	<b>Moderate as scores 26 points in total</b>

<b>Condition Assessment Result</b>	<b>Condition Assessment Score</b>
Total score >32 (33 to 39)	Good (3)
Total score 26 to 32	Moderate (2)
Total score <26 (13 to 25)	Poor (1)



## Traditional Orchard

Patches of traditional orchard to be established in fields 3,4 and 6. Also target conditions for traditional orchard to be created through enhancement of areas in field 1

BNG Condition Assessment		Target BNG
Criterion Achieved (Y/N)		
1	Presence of ancient and / or veteran trees. <b>NB - this criterion is essential for achieving good condition.</b>	N
2	Less than 5% of fruit trees are smothered by scrub. Small patches of dense scrub and/or scattered scrub growing between trees can be beneficial to biodiversity, however these should occupy less than 10% of ground cover.	Y
3	There is evidence of formative and/or restorative pruning to maintain longevity of trees.	Y
4	Presence of standing and/or fallen dead wood: all mature trees have standing or fallen branches, stems and stumps greater than 10 cm diameter associated with them.	N
5	At least 95% of the trees are free from damage caused by humans or animals e.g. browsing, bark stripping or rubbing on non-adjusted ties.	Y
6	Sward height is varied (between 5 cm and 30 cm) and small patches of bare ground are present creating structural diversity. Up to 10% cover of patches of tall herb vegetation may be present.	Y
7	Species richness of the grassland is equivalent to a medium, high, or very high distinctiveness grassland.	Y
8	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and species indicative of sub-optimal condition <sup>3</sup> make up less than 10% of ground cover.	Y
<b>Condition</b>		<b>Moderate (6/7 excluding essential criterion 1)</b>

Condition Assessment Result	Condition Assessment Score
Passes 6 or 7 Of of 8 criteria; including essential criteria 1	Good (3)
Passes 4 or 5 Of of 8 criteria; or passes 6 or 7 excluding essential criteria 1	Moderate (2)
Passes 0, to 1, 2 of 3 criteria	Poor (1)



### Urban – SUDs

BNG Condition Assessment Criterion Achieved (Y/N)		SUDS to be created targeted conditions	Justification of target condition
1	Vegetation structure is varied, providing opportunities for insects, birds and bats to live and breed. A single ecotone (i.e. scrub, grassland, herbs) should not account for more than 80% of the total habitat area.	Y	Suds will be planted with a range of marginal emergent and submerged native plants
2	There is a diverse range of flowering plant species, providing nectar sources for insects. These species may be either native, or non-native but beneficial to wildlife. NB - To achieve GOOD condition, criterion 2 must be satisfied by native species only (rather than non-natives beneficial to wildlife). Note that Biodiverse green roofs are exempt from this requirement, and can include non-native sedums, as set out in footnote 1.	Y	The fringe of plants proposed along with the aquatic plants to be established will provide nectare sources of benefit to local wildlife
3	Invasive non-native species (Schedule 9 of WCA) cover less than 5% of total vegetated area. NB - To achieve GOOD condition, criterion 3 must be satisfied by a complete absence of invasive non-native species (rather than <5% cover).	Y	The SUDs will be monitored regularly and kept free of invasive species
4 b	The water table is at or near the surface throughout the year. This could be open water or saturation of soil at the surface.	Y	SUDS will be engineered to hold a shallow volume of water throughout the year
<b>Condition</b>		<b>Good</b>	<b>Passes all applicable criteria</b>

Condition Assessment Result	Condition Assessment Score
Passes 3 of 3 core criteria; AND Meets the requirements for good condition within criteria 2 and 3 (also passing additional SUDs criteria)	Good (3)
Passes 2 of 3 core criteria: OR Passes 3 of 3 core criteria but does not meet the requirements for good condition within criteria 2 and 3	Moderate (2)
Passes 0 or 1 of 3 criteria	Poor (1)



### Urban - Urban tree (UT)

BNG Condition Assessment Criterion Achieved (Y/N)		Small trees (0.4761 ha)	Small urban trees (0.2767)	Medium urban trees (1.09ha)	Justification
1	The tree is a native species (or more than 70% within the block are native species).	Y	Y	Y	All urban trees will be native or native cultivars
2	The tree canopy is predominantly continuous, with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide (individual trees automatically pass this criterion).	Y	N	Y	Trees in formal areas are primarily individuals. Small urban trees in wildlife areas will be planted in clumps but some will be at too large a spacing to pass this criteria
3	The tree is mature <sup>2</sup> or veteran <sup>3</sup> (or more than 50% within the block are mature <sup>2</sup> or veteran <sup>3</sup> ).	N	N	N	No veteran trees are anticipated initially.
4	There is little or no evidence of an adverse impact on tree health by anthropogenic activities such as vandalism or herbicide use. There is no current regular pruning regime so the trees retain >75% of expected canopy for their age range and height.	N	Y/N	Y/N	There is a risk of pruning, vandalism or damage by public access.
5	Micro-habitats for birds, mammals and insects are present e.g. presence of deadwood, cavities, ivy or loose bark	N	Y	Y	Trees in the wildlife areas are to be managed to provide wildlife value. Those which are street trees will be regularly pruned reducing potential for deadwood or cavities.
6	More than 20% of the tree canopy area is oversailing vegetation beneath.	N	Y	Y	Some trees in the formal street tree landscaping will sit in tree pits predominantly oversailing developed areas. Those in the wildlife mitigation areas will pass this criteria
<b>Condition</b>		<b>Poor (2/6)</b>	<b>Moderate (3-4/6)</b>	<b>Moderate (4-5/6)</b>	<b>In each instance a precautionary assessment has been made,</b>

Condition Assessment Result	Condition Assessment Score
Passes 5 or 6 of 6 criteria	Good (3)
Passes 3 or 4 of 6 criteria	Moderate (2)
Passes 0, 1 or 2 of 6 criteria	Poor (1)





## Hedgerow Creation

The target condition of the Native species rich hedgerows with trees and the Native species rich hedgerows with trees associated with banks are provided below.

Attributes and functional groupings (A, B, C, D & E)		Criteria (the minimum requirements for 'favourable condition')	Native species rich hedgerow with trees	Native species rich hedgerow with trees associated with a ditch or a bank	Justification of condition score
<b>Core groups - applicable to all hedgerow types</b>					
A1.	Height	>1.5 m average along length	Y	Y	Hedgerows will be maintained to a minimum of 2m in height with trees every 30m to be managed to their natural height
A2.	Width	>1.5 m average along length	Y	Y	Hedgerows maintained to 2m in width as a minimum
B1.	Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length (unless 'line of trees')	N	N	Potential to have gappiness at base particularly during establishment
B2.	Gap - hedge canopy continuity	Gaps make up <10% of total length and No canopy gaps >5 m	Y	Y	A good canopy will be maintained for the core hedgerow at 2m. Any gaps will be remediated.
C1.	Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length: - measured from outer edge of hedgerow, and - is present on one side of the hedge (at least)	N	Y	Hedgerows immediately adjacent ditches will have undisturbed perennial vegetation surrounding them. Those set back near paths may lack undisturbed ground within 1m
C2.	Undesirable perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground	Y	Y	Management will control species such as nettle. Long term cessation of fertilisation will reduce likelihood of problematic species such as nettle.
m	Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native and neophyte species	Y	Y	The margins and hedgerows themselves will be kept free of invasives and neophytes.
D2.	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities	Y/N	Y/N	Potential for damage through vandalism. This condition will likely be passed but failed as a precautionary measure due to proximity of many hedgerows to the developed areas.
E1.	Tree age	At least one mature tree per 30m stretch of hedgerow. A mature tree is one that is at least 2/3 expected fully mature height for the species.	N	N	Unlikely the newly planted hedgerows will support mature trees in the first 30 years.



E2.	Tree health	At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	Y	Y	All trees will be managed for good health. Dead or diseased trees will be removed and replaced where necessary.
<b>Hedgerow With Trees Condition</b>			<b>Moderate up to 5 failures</b>	<b>Moderate up to 3 failures</b>	<b>Precautionary valuation of moderate condition for all newly established hedgerows.</b>

<b>Condition Categories for Hedgerows without Trees</b>	
<b>Maximum number of attributes that can fail to meet 'favourable condition' criteria</b>	<b>Metric Score</b>
No more than 2 failures in total; AND No more than 1 in any functional group	3
No more than 4 failures in total; AND Does not fail both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 & C1 = Moderate condition)	2
Fails a total of more than 4 attributes; OR Fails both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 & B2 = Poor condition)	1
<b>Condition Categories for Hedgerows with Trees</b>	
<b>Maximum number of attributes that can fail to meet 'favourable condition' criteria</b>	<b>Metric Score</b>
No more than 2 failures in total; AND No more than 1 in any functional group	3
No more than 5 failures in total; AND Does not fail both attributes in more than one functional group (e.g. fails attributes A1, A2, B1, C1 & E1 = Moderate condition)	2
Fails a total of more than 5 attributes; OR Fails both attributes in more than one functional group (e.g. fails attributes A1, A2, B1 & B2 = Poor condition)	1

<b>BNG Principle</b>	<b>Justifications</b>
Principle 1. Apply the Mitigation Hierarchy	<p>Measures to avoid and minimise biodiversity loss and to rehabilitate/restore biodiversity affected by the project are: 1) defined and documented, 2) implemented and monitored; and 3) managed for the duration of the project's impacts.</p> <p>The retention and enhancement of grassland is undertaken where possible and avoidance of impacts to adjacent designated sites are built into the design from the initial project stages. Avoidance of impacts to horseshoe bats was applied as far as possible by retention of the most valuable habitats. Where the proposals were thought to result in a loss of foraging value mitigation to keep as much valuable grassland, hedgerow and ditch habitat available to horseshoe bats was applied including attempts to allow bats to cross under the road via unlit culverts. Where mitigation could not fully address habitat losses compensation in the form of the use of off-site land has been applied.</p> <p>Measures to avoid and minimise biodiversity loss and to rehabilitate/restore biodiversity affected by the project are defined and documented within the PEA and subsequent EclA. Their implementation, management and monitoring requirements are detailed within body of the EclA and the LEMP to be produced for the proposals.</p>
Principle 2. Avoid losing biodiversity that cannot be offset by gains elsewhere	The project avoids impacts to the most valuable habitats including the ditches and hedgerows as far as possible with only small lengths removed to create the accesses required. No habitats of principle importance have been significantly impacted by the proposals. Valuable habitats such



BNG Principle	Justifications
	<p>as ditches and hedgerows are enhanced where possible to mitigate for small losses of extent.</p> <p>All losses are offset by gains within the landscaping proposed.</p>
<p>Principle 3. Be inclusive and equitable</p>	<p>Evidence of input from and consultation with nature conservation bodies, the local community, the local planning authority and other relevant stakeholders. (NB: For smaller scale projects, this may be part of the planning consultation process). Terms of Reference for any Stakeholder Partnerships are agreed and published, with the roles and responsibilities of members clearly defined.</p> <p>There has been history of stakeholder engagement which has included (but is not limited to) consultation with:</p> <ul style="list-style-type: none"> <li>• YAKWAG (communication with Tony Moulin chair of the Yatton and Congresbury Wildlife Action Group)</li> <li>• Natural England consultation over the previous development in terms of the suitability of off-site land provision.</li> <li>• North Somerset Local Planning Authority - BNG reporting provided to the LPA to enable officers to adequately determine whether BNG will be achieved as part of the project.'</li> </ul>
<p>Principle 4. Address risks</p>	<p>Evidence that BNG has been achieved within the project. Sources of risk and uncertainty in design and implementation of mitigation are documented. Identify risks that may present themselves during the 30-year management period and how these should be dealt with.</p> <p>The BNG condition assessments for post development habitats take into account risks associated with landscaping provision and have sought to build in realism in terms of habitat quality. Including risks from public recreational pressure, damage to habitats from management, potential for colonisation of invasive species and inherent risks of establishing or enhancing new habitats.</p> <p>The level of retention of the grassland habitat has been informed by the need to address levels within the developable areas which has resulted in the grasslands within fields 2,7,8, 9 and 10 being indicated as created rather than enhanced.</p> <p>The LEMP has identified risks which may occur during the 30-year management period such as failure of habitats to establish and monitoring of these newly established habitats and amendments to the LEMP if necessary will ensure they reach their target condition</p>
<p>Principle 5. Make measurable Net Gain</p>	<p>The BNG metric is used for all habitat impacts quantified relative to the 'pre-project' condition of each habitat. Gains anticipated from habitat creation, enhancement and positive management are quantified relative to the predicted condition. The proposals have also adjusted for the potential for additionality as a result of providing mitigation habitat for horseshoe bats. As a result the contribution to net gain attributed to habitats used for horseshoe bat mitigation (as listed in the HEP calculations) are capped to 100% of the baseline value with any uplift above this provided by habitats which are not accessible to horseshoe bats.</p> <p>The overall level of net gain anticipated without accounting for additionality as the following.</p> <p>The BNG assessment determined a quantitative:</p> <ul style="list-style-type: none"> <li>• 50.84% net gain in Habitat Units</li> <li>• 74.25% net gain in Hedgerow Units</li> <li>• 19.51% net gain in River Units</li> </ul> <p>With additionality of mitigation habitats available to horseshoe bats is taken into account the net gain achieved is calculated to be the following</p> <p>BNG assessment determined a quantitative:</p>



BNG Principle	Justifications
	<ul style="list-style-type: none"> <li>• 27.31% net gain in Habitat Units</li> <li>• 47.84% net gain in Hedgerow Units</li> <li>• 19.51% net gain in River Units</li> </ul>
<p>Principle 6. Achieve the best outcomes for biodiversity</p>	<p>The BNG design has considered local conservation priorities (species and habitats). This includes the North Somerset Biodiversity Action Plan (BAP) as well as policies within the North Somerset Local Plan. The presence of locally and nationally designated sites for nature conservation have also been considered along with opportunities to enhance or extend these features.</p> <p>In particular the BNG design has considered to contribute to supporting the following priority species populations and priority habitats:</p> <ul style="list-style-type: none"> <li>• Hedgerows and Hedgerow Trees</li> <li>• Woodland</li> <li>• Ditches (including enhancement of ditches associated with the Biddle Street SSSI)</li> <li>• Water vole and otter</li> <li>• Horseshoe Bats</li> <li>• Enhancement of fields associated with the Congresbury Yeo SNCI</li> </ul> <p>Details are provided within the LEMP.</p>
<p>Principle 7. Be additional</p>	<p>Evidence is provided that the conservation gains were caused by project activities and would not have occurred in other circumstances.</p> <p>The project will enhance the provision of rough grassland, hedgerows and habitats of greater suitability for a range of species including reptiles, horseshoe bats, otter and water vole which would not have been possible under normal agricultural management which is prevalent locally.</p> <p>The cessation of agricultural inputs to the fields as part of the ongoing grassland management will enhance the quality of the ditches both within and adjoining the red line boundary in terms of water quality.</p> <p>Provision of measures to safeguard the adjacent Strawberry Line LNR and Biddle Street SSSI will ensure these designated sites are protected and enhanced.</p> <p>The BNG proposals will result in a net gain beyond that which is required by policy even when accounting for additionality as a result of species-specific mitigation for all biodiversity units.</p>
<p>Principle 8. Create a Net Gain legacy</p>	<p>The proposals will result not only in a biodiversity net gain within the red line boundary but will also enhance 2.9ha of habitat to the west of the proposals for compensation for horseshoe bats. The management and restoration of the grassland will have long term benefits for the local area and enhance the management of the adjacent ditches which form the Biddle Street SSSI. The management of this will be secured through a section 106 agreement to fund the enhancement and maintenance for at least 30 years.</p> <p>Additional areas of legacy creation include.</p> <p>Stakeholders have been engaged from an early stage of the project.</p> <p>The Site design has taken into account climate change resilience through additional planting of species which will withstand flooding and climate.</p> <p>Minimum professional and technical requirements for those responsible for the delivery of the LEMP and BNG-related habitat management are specified in the LEMP.</p> <p>The LEMP will contains a draft Financial Table which sets out the estimated costs of the prescriptions.</p> <p>Monitoring of the BNG habitats is proposed to ensure they reach the stated target conditions for all enhanced and created habitats. The LEMP aims can be adjusted to account for any failures to</p>



BNG Principle	Justifications
	<p>deliver the habitat quality proposed.</p>
<p>Principle 9. Optimise sustainability</p>	<p>The project puts sustainability at its core encouraging use of public transport, providing enhanced access to cycle routes and public footpaths. New pedestrian accesses will allow the public to reach the Strawberry Line from the southern fringe of existing development increasing connectivity for walkers, cyclists and runners.</p> <p>The SUDs proposed will ensure surface water runoff is managed responsibly whilst providing opportunities for a range of species which either currently use the Site or may use the Site in the future.</p> <p>The drainage strategy accounts for future potential for flooding by increasing the height of the developed areas by up to 3m to ensure resilience to future climate events.</p> <p>Woodland, tree and hedgerow planting are proposed to enhance carbon sequestration and coarse other neutral grassland will be established to provide habitats of value to invertebrates, reptiles, small mammals, birds and bats.</p> <p>Local contractors will be used as much as possible for the delivery of the proposals and the ongoing maintenance of habitats to be established.</p>
<p>Principle 10. Be transparent</p>	<p>The commitment to BNG is stated by the project developer within this publicly available document. The condition assessments, GIS mapping and BNG spreadsheet are all to be submitted as part of the proposals with the GIS shapefiles for the mapping undertaken available upon request from Clarkson and Woods Ltd.</p> <p>The LEMP and section 6 of this report contain a reporting commitment at key project milestones as a result of scheduled monitoring of habitat establishment and quality.</p> <p>Part of the LEMP's monitoring and reporting commitment will include the submission of all pertinent findings to the Local Environmental Records Centres.</p> <p>The design of the BNG has followed the mitigation hierarchy but has been precautionary in its valuation of retained and created habitats. The habitats proposed support local conservation priorities as identified in the North Somerset Biodiversity Action Plan and designed specifically to enhance the Site for a range of protected and notable species.</p> <p>Areas of retention, enhancement and habitat creation are clearly stated in the EclA with justification of the contributing factors which have necessitated certain decisions regarding management.</p> <p>The BNG habitats proposed are realistic and achievable with justification given for each habitats target condition. Where uncertainty about achieving a condition was encountered a precautionary approach has been applied allowing a transparent review of the processes which lead to the BNG outcomes reported.</p>

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