

# Ecology Impact Assessment



Homes  
England



# Brislington Meadows, Bristol

## OUTLINE ECOLOGICAL IMPACT ASSESSMENT

[Redacted]

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## 1.0 Executive Summary

- 1.1 An Outline Planning Application with all matters reserved except access is to be submitted for the proposed development at Brislington Meadows. Development proposals are for up to 260 new dwellings with supporting infrastructure and associated greenspace.
- 1.2 An Ecological Impact Assessment (EclA), supported a suite of desk and field based surveys from September 2019 to January 2022, has been completed to support the Outline Planning Application for the proposed development.
- 1.3 This EclA report presents the methods, conclusions and recommendations of the EclA. This EclA is supported by a range of Ecological Technical Appendices (A-J) that present detailed methods and findings from the baseline desk and field surveys. This EclA should be read in conjunction with the Outline Arboricultural Impact Assessment (TEP Ref 7507.21.001) and the Outline Biodiversity Net Gain Assessment (TEP Ref 7507.20.070).
- 1.4 The table below summarises the findings and recommendations of the EclA:

### *Summary of ecological assessment*

Key ecological feature	Status / Value	Commentary
Brislington Meadows SNCI	Bristol Local Plan Policies BSC9, DM19  County importance	Locally designated wildlife site adjacent to the site, designated mainly for grassland habitats. The extent of the SNCI previously included the majority of the site but the allocation of the site (under policy BSA1201 in 2014, for housing) resulted in de-designation of SNCI status for the area within the allocation.  Two small areas of the site remain within the SNCI – the ‘Cycle Link’ in the west where the existing public right of way between the site and School Road is proposed to be upgraded and the ‘Drainage Link’ in the south where a below ground drainage connection between the sustainable drainage system within the site and the existing pipe network is anticipated. Impacts upon the SNCI will be avoided through design of construction methods (avoiding tree loss within the cycle link and applying below-ground construction methods for the drainage link) and through habitat restoration and enhancement.
Local Sites Network	Bristol Local Plan Policies BSC9, DM19  County importance	The Outline design has focussed substantially upon maintaining the site’s strategic corridor function within the local network of wildlife sites. Southern and eastern corridors have been designed to maintain strategic corridor functionality around the site (maintaining connectivity between the three most relevant local wildlife sites at St. Annes Valley, Brislington Meadows and Eastwood Farm Open Space). Ecological corridors through the site are delivered by retention of hedgerows and associated grassland and scrub habitats within greenspace corridors. Mitigation measures, including light mitigation, will be required in the detailed design to ensure these corridors are delivered accordingly and retain appropriate ecological function.

Key ecological feature	Status / Value	Commentary
Irreplaceable habitats	National Planning Policy Framework (NPPF)	The veteran tree T6 has been protected within its current setting by the design process. This includes formally rerouting the public right of way that used to follow the line of the south boundary on which T6 is located and applying below-ground construction methods for the drainage link that will need to cross the tree line in which T6 is located. There are no other irreplaceable habitats within the site and no habitats with very high (or high) distinctiveness.
Hedgerows	Natural Environmental and Rural Communities Act 2006 (NERC), Hedgerow Regulations 1997  Local importance	Although most field boundaries are vegetated, many have outgrown beyond the point of being classed 'hedgerow'. Six hedgerows are present in the site; five on internal boundaries (also very outgrown), the sixth on Broomhill Road. All are native and therefore are Habitat of Principal Importance (HPI) but are species poor. The five internal field boundary hedgerows are assessed as 'important' but only due to the presence of native bluebell. Loss of 525m hedgerow of an existing 710m is estimated initially. New species rich hedgerow planting will be required. This should include a minimum 540m targeting strategic ecological corridors to provide north-south and east-west connectivity. This would result in a net total of 725m in hedgerows within the site (delivering net gain). Capacity for a further 515m planting is anticipated within detailed design (net total extent of hedgerows within the site would be 1,240m and increasing net gain in hedgerows).
Scrub	Bristol local priority habitat  Local importance	Areas of continuous bramble, blackthorn and mixed scrub are present around field edges, originating from existing or former hedgerows. Scrub is of value for invertebrates and some nesting bird species. Loss of 1.66ha of the existing 2.69ha is initially estimated, mainly associated with hedgerow loss, with a net area of 1.17ha retained or created within the site post-development. Retained scrub within the site will be enhanced (species enrichment and structural diversification). Offsetting will be required and should include scrub habitat to address net loss.
Grassland	Local importance	A variety of neutral and modified grasslands are present. The primary ecological value of the grasslands present is providing habitats for the invertebrate assemblage, which in turn supports a range of other wildlife. Temporary and permanent losses of grassland are unavoidable to create the development platform, drainage systems, footpath and cycle network and earthworks for establishing appropriate levels for these areas. Loss of 5.75ha of the existing 6.17ha is estimated, with a net area of 2.88ha retained or created within the site. Retained and created grassland (including the new 'wet meadows') will be designed and managed to achieve a higher ecological value than existing grasslands. Offsetting will be required and should focus upon species rich grasslands to address net loss from within the site.
Woodland	Below local importance	Three small areas of secondary or plantation broadleaf woodland are present at peripheral locations in the south (W1), east (W2) and north (W3). Loss of some woodland is unavoidable to enable access off Broomhill Road. Loss of 0.13ha of the existing 0.5ha is initially estimated, with a net area of 0.44ha retained or created within the site post-development. Enhancement of retained woodland (species enrichment, removal of invasive species and structural diversification) will be implemented in addition to new tree planting.

Key ecological feature	Status / Value	Commentary
Trees	Bristol Local Plan Policy DM17	<p>Trees within the site are entirely contained along field boundaries (within hedgerows and scrub) or within woodland features.</p> <p>Trees are assessed separately in the Outline Arboricultural Impact Assessment (TEP Ref 7507.21.001).</p> <p>New tree planting would be implemented in accordance with Bristol's tree replacement obligations (replacement ratios of between 1:1 and 1:8). New tree planting will also be an important aspect for ecological mitigation, to maintain habitats and habitat links for wildlife. Tree species will be selected for the benefit of invertebrates and which will also deliver climate resilience. A net increase in tree canopy cover is anticipated within the site, which would be confirmed by the detailed design stage.</p>
Amphibians	<p>Wildlife and Countryside Act 1981 (as amended) (WCA), NERC</p> <p>Below local importance</p>	<p>No suitable breeding habitat in or within 250m of site. A small artificial pond in the school north of the site and an ephemeral field pond southwest of the are isolated from each other (&gt;500m apart) both with a 'poor' Habitat Suitability Index for great crested newts (Annex 1) and the few artificial water features noted in allotments west of site are unsuitable for great crested newt breeding. No great crested newt records were identified within 1km of the site. Great crested newts are therefore concluded to be absent. Common frog and common toad were confirmed to be present terrestrially within site (low density) and likely to use water features offsite for breeding, but most of these are sub-optimal and likely to only support low breeding populations in combination.</p>
Reptiles	<p>Wildlife and Countryside Act 1981 (as amended) (WCA), NERC</p> <p>Below local importance</p>	<p>A resident population of slow worm is present that will use grassland, hedge and scrub habitats across the site.</p> <p>The landscape of the proposed development is considered to have capacity to sustain the slow worm population onsite post-development, but the ability to retain the population on site is also dependant on capacity of habitats remaining available during the construction process. While retention on site is preferable, if the construction plans do not retain sufficient suitable habitat for the population, offsite translocation would be required, including identification (and preparation) of a suitable receptor site. The approach for slow worm mitigation (on or offsite) will be confirmed once construction details (including phasing and timescales) are finalised.</p>
Birds	<p>WCA, NERC</p> <p>Below local importance</p>	<p>Ten bird species (four notable) were confirmed to be nesting within the site, with a further nine species (four notable) classed as probable breeders and two (one notable) classed as possible breeders. Nesting habitats are limited to the hedgerows, scrub, trees and woodland. No ground nesting in the grassland was recorded. Peregrine, kestrel, buzzard, tawny owl, little owl and raven were noted in or over the site but were not nesting in the site.</p> <p>Vegetation clearance in advance of development must be planned to avoid the nesting bird season (March to August inclusive). Vegetation clearance should be phased and advance planting should be implemented where ever possible to reduce impacts of habitat loss. A comprehensive scheme of nest box and roost habitat provision is recommended, using both new build and greenspaces. Habitat design and management that will benefit invertebrates will also benefit birds (directly and indirectly by creation of nest habitats and foraging opportunities).</p>

Key ecological feature	Status / Value	Commentary
Invertebrates	NERC Vice-county importance	<p>A total of 365 species were identified including nine species of conservation significance (two Bristol long-list species, one of which is also a Species of Principal Importance) and two of local interest. The assemblage is dependant upon the mix of grassland, hedgerow and scrub habitats present in the site. Some species recorded are more dependant upon single habitat types or even single plant species (specific trees, grasses or wildflowers).</p> <p>The Outline design stages have focussed substantially upon maximising opportunities to retain invertebrates and particularly pollinators within the site. Mitigation measures, including light mitigation will be required in the detailed design. Grassland and scrub habitats would be enhanced to increase botanical diversity for invertebrates (particularly pollinators). New planting would select species of value for invertebrates. Habitat diversification would be introduced for the benefit of invertebrates by design of the sustainable drainage basins as 'green' rather than 'blue' features (the 'wet meadows') which deliver a local mosaic of temporary pools and hummocks that will create habitat features for invertebrates. Apartments would be designed with brown roofs to provide invertebrate habitats and other structures such as sub-stations, pumping stations, bus stops etc. would be considered in detailed design for incorporating brown or living roofs. Other measures such as the inclusion of species rich flowering lawns in recreational areas and creation of invertebrate refuge features throughout the site will be incorporated into detailed. Management of the landscape within the site will be devised to maintain invertebrate populations and diversity. Light mitigation will be required to reduce light disturbance effects.</p>
Badgers	Protection of Badgers Act 1992	Information relating to badgers has been redacted.
Hedgehogs	NERC Bristol Biodiversity Action Plan	<p>The hedgehog is a SPI and is a Bristol priority species with an individual local Species Action Plan (LSAP). Hedgehogs will primarily use hedge and scrub habitats in the site but may range into grasslands for foraging.</p> <p>The proposed development is considered to maintain sufficient suitable habitat for hedgehogs. Construction methods will however need to incorporate measures to avoid entrapment and other risks to hedgehogs. Detailed designs will need to maintain permeability for hedgehogs through the site. This will include provision of access gaps into and between gardens and may need to include provision of safe access across vertical step level changes that may be introduced across the site. Habitat design and management that will benefit invertebrates will also benefit hedgehogs (directly and indirectly by creation of shelter habitats and foraging opportunities). Light mitigation will be required to maintain darkened habitats and habitat corridors around the site.</p>
Bats	Conservation of Habitats and Species Regulations 2017 (as amended) WCA, NERC  City to Local importance	<p>17 trees were identified to provide features suitable to support roosting bats, but no current or recent roosts were identified. Only one of these trees is currently anticipated to require removal. Inspections and appropriate felling of any tree with bat roost suitability will be required and bat boxes should be installed at a ratio of 3:1 for each tree with roost suitability to be removed.</p> <p>At least 12 bat species were recorded within the site. Primary use of the site by bats is for commuting, with key corridors identified along the southwest boundary, crossing the site centrally and continuing east to the woodland. This route avoids habitats in the south and east that subject to</p>

Key ecological feature	Status / Value	Commentary
		substantial light disturbance from Bonville Road and would enable passage of bats between St Anne's Valley in the west, Brislington Meadows in the south and Eastwood Farm Open Space in the northeast. The design and extent of greenspaces, including creation of new wet meadows in the drainage basins, will retain important commuting and foraging habitat for bats. Habitat design and management that will benefit invertebrates will also benefit bats. Light mitigation will be required to maintain darkened habitats and habitat corridors around the site.

1.5 The following, anticipated to be secured by condition, will be produced to support any future Reserved Matters application:

- Updated Ecological Impact Assessment;
- Final Design Stage Biodiversity Net Gain Assessment;
- Detailed Arboricultural Impact Assessment;
- Construction Environmental Management Plan (CEMP);
- Construction ecological mitigation and protection plan (or otherwise incorporation of ecological protection methods during construction will be included in the CEMP);
- Project Implementation Plan (including methods, targets and timescales for habitat enhancement and creation on and offsite);
- Long-term nature conservation and landscape management plan (including roles and responsibilities, habitat descriptions and condition targets, management objectives, monitoring targets and options for remedial measures);
- Biodiversity Net Gain Strategy (including offsetting strategy);
- Lighting Mitigation Strategy (supported by a Lighting Impact Assessment);
- Individual or combined mitigation method statements for:
  - Native bluebell (preservation within the site);
  - Invasive species (prevention of spread);
  - Slow worm (protection of slow worms and mitigation for habitats);
  - Birds (protection of nests and mitigation for nesting habitat);
  - Invertebrates (protection of key habitat features and mitigation for habitats);
  - Hedgehogs and other mammals and terrestrial amphibians (protection of animals and mitigation for habitats, including permeability measures); and
  - Bats (protection of and mitigation for tree roost habitats and commuting/foraging habitat).

## 2.0 Introduction

- 2.1 The Environment Partnership (TEP) was commissioned in July 2020, by Campbell Reith on behalf of Homes England, to complete an Ecological Impact Assessment (EclA) for the site known as Brislington Meadows (hereafter referred to as ‘the site’).
- 2.2 This EclA has been produced to inform an Outline Planning Application (OPA), with all matters reserved apart from access. The ‘proposed development’ comprises development of up to 260 dwellings with pedestrian, cycle and vehicular access, cycle and car parking, public open space and associated infrastructure. All matters except access are reserved.
- 2.3 This EclA report is supported by the following Ecological Technical Appendices, each of which include details of the survey methods employed, any limitations of the surveys undertaken and results with supporting maps:
- Ecological Technical Appendix A: Ecological Desk Study (TEP Ref 7507.20.039)
  - Ecological Technical Appendix B: Target Notes (TEP Ref 7507.20.063)
  - Ecological Technical Appendix C: Hedgerow Assessment (TEP Ref 7507.20.057)
  - Ecological Technical Appendix D: Grassland Assessment (TEP Ref 7507.20.059)
  - Ecological Technical Appendix E: Habitat Condition Assessment (TEP Ref 7507.20.011)
  - Ecological Technical Appendix F: Reptile Survey 2020 (TEP Ref 7507.20.022)
  - Ecological Technical Appendix G: Breeding Bird Survey 2020 (TEP Ref 7507.20.056)
  - Ecological Technical Appendix H: Invertebrate Survey 2021 (TEP Ref 7507.20.062)
  - Ecological Technical Appendix I [Confidential]: Badger Surveys (TEP Ref 7507.20.041)
  - Ecological Technical Appendix J: Bat Surveys (TEP Ref 7507.20.021)
- 2.4 This EclA summarises the ecological features of value identified within the site by these Ecological Technical Appendices and provides an assessment of the potential impacts associated with the development proposals upon these features of value. Requirements for ecological avoidance and mitigation measures and recommendations for compensation and enhancement are also included in this EclA report. This EclA has been undertaken with due consideration for current best practice guidelines (CIEEM 2017a,<sup>1</sup> 2018<sup>2</sup>).

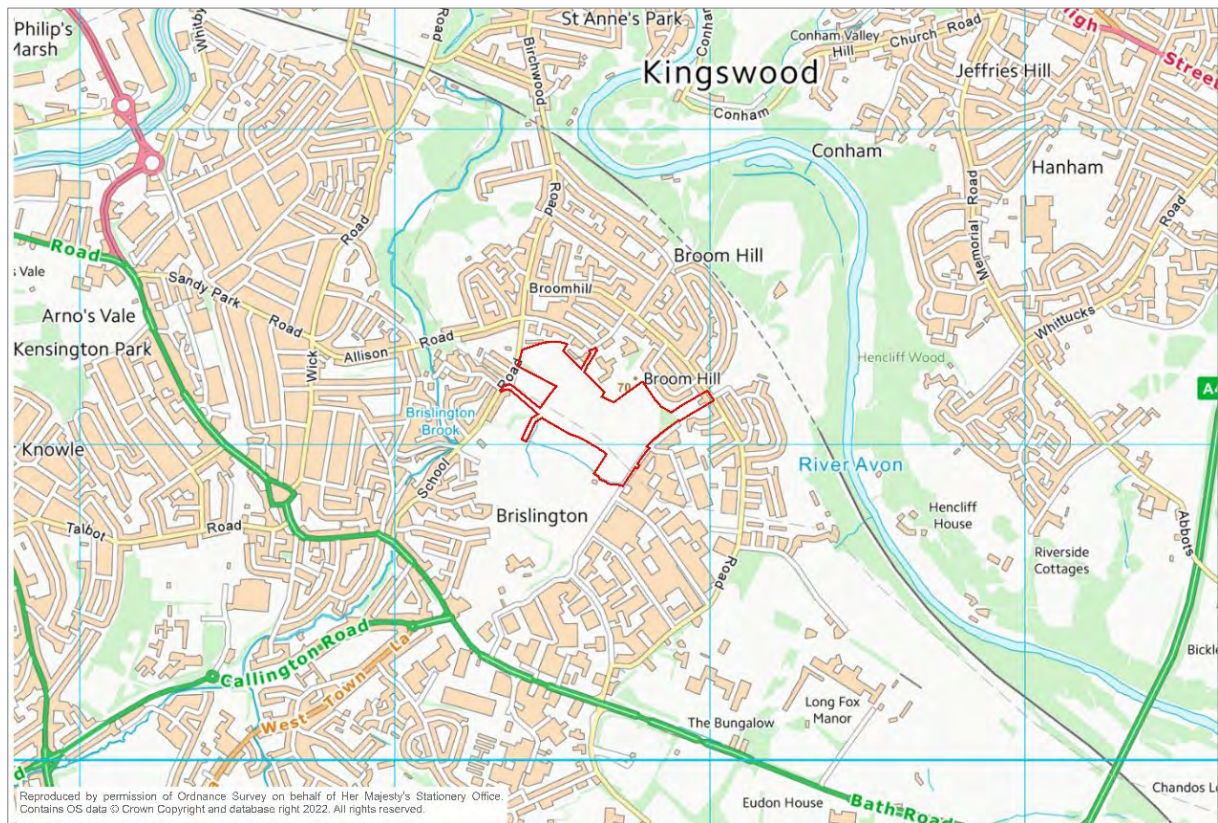
<sup>1</sup> CIEEM (2017a) Guidelines for Ecological Report Writing, 2nd Edition. Chartered Institute of Ecology & Environmental Management

<sup>2</sup> CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd Edition. Chartered Institute of Ecology & Environmental Management

## Site Location

- 2.5 The site is located in Brislington in the southeast of Bristol within the administrative boundary of Bristol City Council (BCC) and the Ward of Brislington East. The central grid reference of the site is approximately ST 626 711. The site measures 9.6 hectares (ha) and comprises an irregular shaped parcel of land illustrated in Figure 1.

Figure 1: Site Location



- 2.6 The site is bordered to the northeast by Broomhill Road and residential properties in Condoval Road. To the north the site is bound by residential dwellings on Belroyal Avenue and an associated rear access lane, Broomhill Junior School and Mama Bear's Day Nursery, and residences accessed off Allison Road. The site is bordered to the east by Bonville Road and the protected employment area comprising the Bonville Trading Estate. To the west of the site is School Road and allotments. To the south lie Victory Park and tenanted horse grazing land which together comprise part of the wider protected open space and the Brislington Meadows Site of Nature Conservation Interest (SNCI).
- 2.7 The site is characterised by a sloping topography from the northern boundary down to the southern boundary, with the gradient reducing towards the east. There are overhead electricity cables and a pylon on the lower slopes towards the southern boundary of the site. A telecommunications mast towards the northeast of the site will be relocated following the grant of planning consent for the proposed development.

- 2.8 There is no public vehicular access into the site at present. There are two public rights of way across the site. One runs east-west along the southern boundary connecting Bonville Road and School Road and other runs north-south between Belroyal Avenue and Bonville Road.

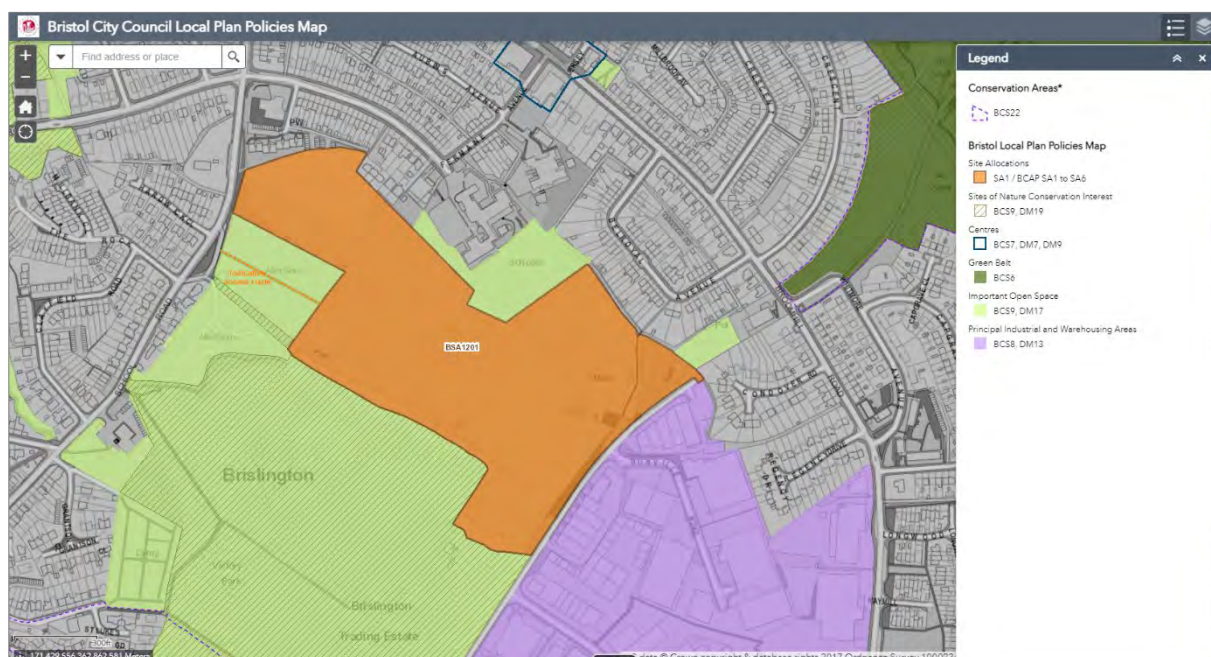
## Relevant Policy and Legislation

- 2.9 The Ecological Desk Study (Ecological Technical Appendix A TEP Ref 7507.20.039) presents details of relevant planning policy, legislation and outcomes from pre-application consultation with Bristol City Council (BCC).

## Planning Background

- 2.10 The site has an allocation for housing development under BCC's Local Plan: Site Allocations and Development Management Policies, adopted July 2014, as Allocation BSA1201 (Land at Broom Hill, Brislington). An extract from BCC's Local Plan Policies Map illustrating the site allocation is presented at Figure 2.

Figure 2: Extract from Bristol City Council Local Plan Policies Map<sup>3</sup>



- 2.11 Prior to allocation in 2014, the site was part of the SNCI known as Brislington Meadows. The allocation part was deregistered as an SNCI to enable allocation for residential development as part of the Local Plan housing review. This was confirmed with BCC's Nature Conservation Officer (Dr. Nick Michael) in August 2020.
- 2.12 The proposed development includes a proposed upgrade to the existing pedestrian link between the site and School Road to the west of the site, between the allotment

<sup>3</sup> <https://maps.bristol.gov.uk/policies/>

gardens. This link is within the current boundary of Brislington Meadows SNCI. There is a requirement to construct a new drainage link from the proposed development's sustainable drainage system to the existing surface water drain network. The link would connect with an existing pipe that runs below ground within the SNCI. The drainage link would be constructed via underground directional drill technique, so with the exception of a small temporary excavation to enable the below ground connection, there would be no impact within the current SNCI boundary. The proposed development otherwise does not impact upon the current SNCI boundary.

- 2.13 Further information relating to this allocation and other relevant local and environmental policies are presented at Ecological Technical Appendix A: Ecological Desk Study (TEP Ref 7507.20.039).

### National Policies

- 2.14 Paragraph 174(d) of the revised NPPF (2021) states that "Planning policies and decisions should contribute to and enhance the natural and local environment by [...] minimising impacts on and providing net gains for biodiversity [...]" The Government 25-year Environment Plan states that government will "[...] embed environmental net gain principle for development".
- 2.15 In July 2019, the government issued revised planning practice guidance (NPPG) with details on how planners can implement "net environmental gain" requirements when assessing development proposals, including new advice on protecting wildlife.
- 2.16 Revised guidance recently published by the government says that net gain in planning describes an approach to development that leaves the natural environment in a measurably better state than it was beforehand. Net gain is an umbrella term for both biodiversity net gain and wider environmental net gain. It states: "Planning conditions or obligations can, in appropriate circumstances, be used to require that a planning permission provides for works that will measurably increase biodiversity".
- 2.17 In terms of measuring net gain, the guidance states that using a metric is a pragmatic way to calculate the impact of a development and the net gain that can be achieved. It goes on to state that "[...] tools such as the Defra biodiversity metric can be used to assess whether a biodiversity net gain outcome is expected to be achieved".
- 2.18 This report details the ecological surveys undertaken to establish a baseline position, and what the anticipated impacts are. Biodiversity Metric 3.0 Metric has been used to inform this biodiversity net gain assessment.
- 2.19 The Environment Act 2021 received Royal Assent on 9th November 2021 and includes a mandatory 10% biodiversity net gain on all Town and Country Planning Act 1990 developments. The 10% requirement will not become mandated across England until statutory instruments and regulations have been agreed and the Town and Country Planning Act 1990 has been amended. Mandatory 10% net gain is currently anticipated to become law in Autumn 2023.

## Local Policies

- 2.20 BCC does not yet have local policy in place relating to BNG. BCC is undertaking a review of the Bristol Local Plan. The draft Local Plan was subject to consultation in March 2019 and additional consultation is currently planned for spring/summer 2022. Publication is anticipated in autumn 2022 with examination in early 2023 and adoption by early 2024.
- 2.21 The site currently remains allocated in the Bristol Local Plan Review . The Allocation Policy for BSA1201 does not include specific reference to BNG but does include a requirement for “[...] compensation for the loss of semi-improved neutral grassland and damp grassland (the site currently has city-wide importance for nature conservation due to the presence and condition of particular species, habitats and / or features)”.
- 2.22 Policy BCS9 - Green Infrastructure set out in the Core Strategy is of greatest relevance to biodiversity and nature conservation, which includes the following requirements regarding biodiversity loss, mitigation and compensation:
- 2.23 “Individual green assets should be retained wherever possible and integrated into new development. Loss of green infrastructure will only be acceptable where it is allowed for as part of an adopted Development Plan Document or is necessary, on balance, to achieve the policy aims of the Core Strategy. Appropriate mitigation of the lost green infrastructure assets will be required;
- 2.24 Development should incorporate new and/or enhanced green infrastructure of an appropriate type, standard and size. Where on-site provision of green infrastructure is not possible, contributions will be sought to make appropriate provision for green infrastructure off site...”.
- 2.25 The Bristol Biodiversity Action Plan (BBAP) should be used to guide decisions on green infrastructure in addition to biological and geological conservation. The BBAP lists 22 Habitats of Principal Importance (HPI) across 15 broad habitat types within the Bristol region. The following habitats are identified with local habitat action plans within the BBAP:
- Species rich grassland;
  - Woodland;
  - Ponds and open water;
  - Reedbeds and sedgebeds;
  - Estuarine habitats;
  - Scrub;
  - Open mosaic habitat; and
  - Rivers and rhines.

- 2.26 Policies set out in the Site Allocations and Development Management Policies document are also of relevance, including:
- Policy DM17 (Development involving existing green infrastructure) includes a requirement that where some loss of trees cannot be avoided, requires their replacement, generally in greater numbers
  - Policy DM19 (Development and Nature Conservation) includes a requirement that development which would be likely to have any impact upon habitat, species or features which contribute to nature conservation in Bristol will be expected to:
    - be informed by an appropriate survey and assessment of impacts; and
    - be designed and sited, in so far as practicably and viably possible, to avoid any harm to identified habitats, species and features of importance; and
    - take opportunities to connect any identified on-site habitats, species or features to nearby corridors in the Wildlife Network.
  - Policy DM19 (Development and Nature Conservation) also includes a requirement that, where loss of nature conservation value would arise, development will be expected to provide mitigation on-site and where this is not possible provide mitigation off-site.
- 2.27 Bristol City declared an ecological emergency in February 2020, in response to the decline in wildlife in Bristol. The Ecological Emergency Strategy for the city was developed in September 2020 and sets out four goals, one of these being for 30% of land in Bristol to be managed for the benefit of wildlife.

## Pre-application Consultation

- 2.28 A previous pre-application consultation (Ref) was supported by a Preliminary Ecological Assessment Report (PEA) produced in September 2019 by WSP on behalf of Homes England. Pre-application consultation response from BCC is detailed in the Ecological Desk Study (Ecological Technical Appendix A TEP Ref 7507.20.039). In brief, this confirmed requirements for further survey to support an Ecological Impact Assessment, required to support a planning application for the site. Further survey requirements included detailed botanical surveys of the grassland and hedgerows within the site in addition to the species surveys recommended by the PEA (bat activity, breeding birds, badger and reptile surveys).
- 2.29 TEP subsequently consulted with BCC Nature Conservation Officer (Dr Nick Michael) in August 2020 to confirm the scope of the additional ecological surveys and again in November 2020 to discuss biodiversity net gain, enhancement opportunities and design considerations. This latter consultation in particular confirmed the allocation policy requirement to deliver a green infrastructure corridor to provide connectivity with Eastwood Farm Open Space should be a minimum 10m wide, preferably wider, and should deliver as much semi-natural habitat as possible, preferably including species rich hedgerow (design of the corridor being as important as the width).

## Proposals

- 2.30 The application is submitted in outline, with all matters reserved apart from access for which is subject to detailed application. A series of Parameter Plans have been prepared by LDA Design which define the proposed extents of development across the site. The outline development parameters include:
- 5.12ha residential development (footprint to include new dwellings, gardens, community spaces, infrastructure)
  - 4.48ha open and green spaces (footprint to include sustainable drainage systems, play spaces, green infrastructure, existing and new trees and hedgerows);
  - Indicative route of Primary Street, accessing off Broomhill Road;
  - Pedestrian and cycle links to Allison Road in the north and School Road in the northwest; and
  - Underground drainage connection to an existing pipe below Victory Park.
- 2.31 The Landscape Parameter Plan (LDA Design Dwg. No. 7456\_102 version 9.0) sets the layout and (minimum) extent of green space within the development. It fixes areas of tree retention and presents indicative layout for the Primary Street and play locations. The Landscape Parameter Plan is the primary layout used to inform this EclA and is presented at Figure 3.

Figure 3: Landscape Parameter Plan (LDA Design DWG. NO 7456\_102 version 9.0)



- 2.32 The Landscape Parameter Plan does not, however, identify the full construction footprint, inclusive of supporting infrastructure. For example, while the Landscape Parameter Plan fixes the extent of greenspace, it does not identify footprints of the sustainable drainage systems that will need to be situated within this greenspaces. Two sustainable drainage basins are required which will be situated within the green space in the south of the site. A below ground attenuation tank is also anticipated to be required in land adjacent to the proposed access off Broomhill Road.
- 2.33 An Illustrative Masterplan has been prepared by LDA Design which shows one way in which the development could come forward within the parameters, including indicative locations of the sustainable drainage basins and other reserved matters of the development such as footpath / cycle routes. While illustrative, this masterplan has been developed during a highly iterative process accounting for geotechnical, ecological, arboricultural, historic and drainage considerations. The Illustrative Masterplan has undergone stringent capacity testing and has been subject to independent review by Design West and confirmed to be a positive response to the combined constraints and development drivers.
- 2.34 It is therefore considered the Illustrative Masterplan is representative and appropriate to inform this EclA. The Capacity Study plan depicting the illustrative masterplan is presented at Figure 4.

Figure 4: Illustrative Masterplan (LDA Design Dwg. No. 7456\_039)



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- 2.35 This EcIA is further informed by the Outline Arboricultural Impact Assessment (TEP Ref 7507.21.001) .

### **Biodiversity Net Gain**

- 2.36 An Outline Biodiversity Net Gain (BNG) assessment has been completed for the proposed development. The Design Stage report for the Outline BNG assessment is reported under separate cover as TEP Ref 7507.20.070.

### **Building with Nature**

- 2.37 In addition to the Illustrative Masterplan undergoing an independent Design Review process with Design West, the proposed development has also been registered with Building with Nature to undergo independent external assessment.
- 2.38 The results of external assessment by Building with Nature are anticipated post-submission of the outline application.

## 3.0 Methods

### Background Data

- 3.1 Prior to TEP's appointment, WSP completed a Preliminary Ecological Appraisal (PEA) in September 2019 for the site on behalf of Homes England to inform a pre-planning application (ref 19/05220/PREAPP). To inform the 2019 PEA, WSP completed an ecological desk-study including a data request with the Bristol Region Environmental Records Centre (BRERC), Phase 1 habitat survey and protected species appraisal of the site in September 2019.
- 3.2 In consideration of the pre-application consultation response received from BCC (Ecological Technical Appendix A), WSP was subsequently instructed in April 2020 by Homes England to complete breeding bird surveys, commence bat activity surveys and undertake further botanical surveys of the grassland and hedgerows. These data were provided to TEP by WSP with permission of Homes England and have been compiled with TEP survey findings and inform this EcIA. Further details of WSP's survey methods and findings are presented in the relevant Ecological Technical Appendices:
- Desk study data request to BRERC – found in Ecological Technical Appendix A: Ecological Desk Study (TEP Ref 7507.20.039);
  - Further botanical surveys 2020 – found in Ecological Technical Appendix D: Grassland Assessment (TEP Ref 7507.20.059);
  - Breeding bird survey 2020 – found in Ecological Technical Appendix G: Breeding Bird Survey 2020 (TEP Ref 7507.20.056); and
  - Initial bat activity surveys (May and June 2020) – found in Ecological Technical Appendix J: Bat Surveys (TEP Ref 7507.20.021).

### Baseline Surveys

- 3.3 Detailed methods applied to baseline habitat, flora and fauna surveys are presented in the suite of Ecological Technical Appendices A to J, listed at paragraph 2.3.
- 3.4 Table 1 summarises the type, method, timing and standard of ecological surveys completed to inform this EcIA. The scope for ecology surveys was confirmed through pre-application consultation with BCC Nature Conservation Officer in November 2019 (Pre-Planning Application Ref 19/05220/PREAPP) and subsequent follow up in August 2020 (Ecological Technical Appendix A: Ecological Desk Study).

Table 1: Summary of baseline surveys 2019 - 2022

Survey	Scope
<b>Desk Study</b> Ecological Technical Appendix A	Review of relevant legislation and policy; Review of Pre-Planning Application Ref 19/05220/PREAPP response and subsequent engagement with BCC Nature Conservation Officer (August 2020); Identification of internationally important sites within 10km, nationally important sites within 5km, regionally important sites within 2km, habitat networks up to 2km, locally important habitats within 1km; Review of previously granted European Protected Species (EPS) licences within 2km ( <a href="http://www.magic.gov.uk">www.magic.gov.uk</a> ); Review of Natural England great crested survey licence return results within 2km ( <a href="http://www.magic.gov.uk">www.magic.gov.uk</a> ); and Review of data provided by Bristol Region Environmental Records Centre (BRERC) for a 2km search radius for terrestrial species records and local wildlife designations.
<b>Habitats and Flora</b> Ecological Technical Appendices B - E	Review of 2019 PEA report and compilation of findings from WSP surveys completed at the site: <ul style="list-style-type: none"> <li>Extended Phase 1 habitat survey - September 2019;</li> <li>Grassland and hedgerow botanical survey - June 2020;</li> </ul> UKHab habitat survey and habitat condition assessment applying Natural England's Biodiversity Metric 3.0 guidance - July 2020, updated throughout other site visits during 2020 to January 2022; Hedgerow Regulations Assessment (wildlife criteria) - May 2021; and Grassland National Vegetation Classification (NVC) survey – July 2021
<b>Reptiles</b> Ecological Technical Appendix F	Review of 2019 PEA report (WSP); Review of pre-existing records provided by BRERC; Habitat suitability assessment July 2020 refreshed July 2021; Presence/absence transect survey comprising direct observation, searches of existing natural refuge features and employing 75 artificial cover objects (ACOs) comprising a mix of corrugated bitumen and roofing felt tiles. Seven survey visits following 'bedding-in' period to inspect mats and determine presence, distribution and abundance of reptiles across the site (August to early October 2020); Incidental observations recorded during other site visits.
<b>Breeding birds</b> Ecological Technical Appendix G	Review of pre-existing records provided by BRERC; Breeding bird survey completed by WSP comprising three visits in April, May and June 2020 to record and map all visual, acoustic and behavioural observations of birds within the site and immediate environs; Incidental observations recorded during other site visits.
<b>Invertebrates</b> Ecological Technical Appendix H	Review of pre-existing records provided by BRERC; Three survey visits May, July and August 2021 to compile species assemblage and distribution of any notable species within the site. Techniques employed a range of visual observation and sampling methods, appropriate to target species groups/habitat, including hand searching and hand netting, pitfall and water traps and night time moth trapping.
<b>Badger</b> Ecological Technical Appendix I CONFIDENTIAL	Information relating to badgers has been redacted.

Survey	Scope
<b>Bats</b> Ecological Technical Appendix J	Review of 2019 PEA report (WSP); Review of pre-existing records provided by BRERC; Monthly transects WSP May and June 2020 and TEP July to October 2020; Monthly static monitoring WSP May and June 2020 and TEP July to October 2020; Ground-based preliminary roost appraisal (PRA) of trees September 2020, refreshed during 2021 up to and including January 2022; Potential roost feature (PRF) inspection, including aerial access of trees to verify presence of PRF and identify the presence of bats or residual evidence of bats October 2020; DNA analysis of potential bat dropping sample collected.

3.5 Table 2 confirms those species to be scoped out of the ecological baseline.

Table 2: Species scoped out of the baseline surveys

Hazel dormouse	Desk Study returned no records within 2km of the site. While the site contains potentially suitable habitats, the site is isolated with limited connectivity in the wider landscape with capacity for supporting hazel dormouse. 2019 PEA scopes out this species and the pre-application consultation response does not counter this approach.
Great crested newts	Desk Study returned no records within 1km of the site. Nearest records originate either east of the River Avon or south of Bath Road at Stockwood Open Space. The site contains no waterbodies. There is one small artificial pond located in the adjacent school grounds north of the site and an ephemeral heavily poached very small field pond located in a pony paddock approximately 300m southwest of the site. Both were assessed to have 'poor' Habitat Suitability Index <sup>4</sup> (Annex 1). Both are isolated from each other, being >500m apart. Terrestrial habitat associated with both ponds is estimated to be limited to 11% of net area within 1km radius of each. No other waterbodies are identified on 1:25,000 or 1:12,500 Ordnance Survey maps within 1km. A couple of very small artificial water features were noted within the allotments north of the site which would not be suitable for great crested newts, but which may be suitable for supporting low populations of other amphibians, for which the site provides suitable terrestrial foraging and shelter habitats. Great crested newts are therefore concluded absent and are scoped out from further assessment, but other amphibians (terrestrial only) remain scoped in.
Otter and water vole	There are no suitable habitats within or near the site that would support or provide supplementary habitat function for otters.

## Biodiversity Change

3.6 The Natural England Biodiversity Metric version 3.0 has been applied to the outline Parameter Plans and Illustrative Masterplan to determine net biodiversity change likely to result as a consequence of the proposed development. The Biodiversity Net Gain (BNG) assessment is reported separately to this EclA process (TEP Ref 7507.20.070). Homes England is committed to delivering a 10% net gain through this development, through a combination of on and off site measures.

<sup>4</sup> Amphibian and Reptile Groups of the United Kingdom (ARG UK) Advice Note 5: Great Crested Newt Habitat Suitability Index. May 2010

## Limitations

- 3.7 Ecological surveys and investigations (both by WSP and by TEP) have been carried out over the period September 2019 to January 2022. All surveys were completed within appropriate seasons over appropriate periods in accordance with industry standards for the specific survey. Nevertheless, the surveys will only identify habitats present at the site at the time of surveys. Additionally, the species investigated are mobile and will move into and out of areas over time. For these reasons a precautionary approach has been taken in the prediction of impacts. Where there is any doubt, except where specifically noted, species are assumed to be present, and the impact assessment assumes a higher level of significance (within the spectrum of possible significance).
- 3.8 Constraints or limitations upon survey methods or interpretation of survey findings are discussed in the relevant Ecological Technical Appendix.

## Assumptions

- 3.9 Information provided by third parties, including publicly available information, is assumed to be correct at the time of publication.
- 3.10 Demolition of the former police station Sinnott House was subject to a separate planning consent process. Bat roost surveys were completed by WSP on behalf of Homes England to support this process. No bat roosts were identified during surveys or subsequent supervision of the demolition works. The habitat baseline presented in this EclA is based post-demolition of this part of the site.
- 3.11 Detailed layout and construction methods are currently unknown, given that all matters are reserved except access for this OPA. Consequently, this EclA has been completed prior to agreement and approval of specific construction programmes and methods. However, where specific characteristics of a likely effect are currently uncertain, this assessment has been completed on the basis of a reasonable worst-case. Likely ecological effects described in this report are based on the development proposals as presented in the Parameter Plans and are further informed by the Illustrative Masterplan and Outline Arboricultural Impact Assessment.
- 3.12 A precautionary approach has been adopted with regards to construction zones as follows:
- all habitats within development parcels as identified on the Parameter Plans are presumed lost, except where existing trees/wooded areas are to be retained within root protection areas as indicated by the Landscape Parameter Plan;
  - all habitats within the indicative footprints of the sustainable drainage basins, other drainage features and footpath/cycle path networks are presumed lost;
  - where habitats are identified within the green spaces of the Landscape Parameter Plan that are associated with indicative areas of play, these habitats are also

presumed lost, except where existing trees/wooded areas are to be retained within root protection areas as indicated by the Landscape Parameter Plan;

- within field F6, it is presumed that habitats south of the development parcel identified on Parameter Plans would be lost to achieve safe gradients. The exception to this is retention of the linear woodland on the north boundary (School Road) and the boundary vegetation in the south corner containing trees where existing trees/wooded areas are to be retained within root protection areas as indicated by the Landscape Parameter Plan.

## 4.0 Results

### Statutory Wildlife Sites

- 4.1 There is one Special Area of Conservation (SAC) located within 10km of Brislington Meadows. Avon Gorge Woodlands SAC is located approximately 6km northwest and is designated for its Tilio-Acerion forests of slopes, screes and ravines (priority feature), semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (important orchid sites). Although not identified as a primary reason for designation, the SAC also supports notable populations of lesser and greater horseshoe bats. The underlying Avon Gorge Site of Special Scientific Interest (SSSI) is designated for its natural cliffs and quarry exposures of Carboniferous limestone (of great geological interest), its mosaic of ancient woodland, scrub, scree and grassland and an exceptional assemblage of nationally rare and scarce plant species.
- 4.2 The SSSI units that underlie the SAC are assessed by Natural England to be in favourable or unfavourable - recovering condition; the latter condition is attributed mainly to scrub encroachment. The SAC Standard Data Form threat assessment includes 'outdoor sports and leisure activities, recreational activities' which is of potential relevance to the proposed residential development. However, the site does not lie within any SSSI Impact Risk Zones (IRZ) which includes residential development. Based on the available evidence, and given the distance of the SAC to the site, it is concluded that the proposed residential development at Brislington Meadows would not result in likely significant effects upon the integrity of the SAC
- 4.3 Bickley Wood SSSI, located 1.1km south and designated for its geological interest. Impacts upon this SSSI are considered unlikely, but geological assessment is beyond the remit of this EclA.
- 4.4 The SSSI Impact Risk Zone (IRZ) in which the site is located does not include risk criteria associated with residential development, either rural or non-rural. The IRZ risk criteria do include discharges of water or liquid waste of more than 20m<sup>3</sup> per day to ground (i.e., soak away) or surface water such as a beck or stream. Guidance relating to the IRZ implies the risk category of discharges relates to foul water, not surface waters. The proposed development will not discharge any foul water to ground or surface waters; all foul water would be discharged to the mains waste network. Surface water discharges, while not relevant to the IRZ risk criteria, may include discharge to surface waters (the unnamed brook south of the site which supplies Brislington Brook to the north) but discharge rates would not exceed existing greenfield rates (agreed with the Environment Agency during pre-application consultation).
- 4.5 Considering distances, qualifying features and lack of relevant risk criteria, impacts upon statutory sites of national or international significance are scoped out from

further assessment. As there is no likelihood of significant effect on these “national sites network” sites, no further Habitats Regulations Assessment is required.

#### 4.6 Other statutorily designated sites of local significance located within 2km of Brislington Meadows were identified as follows:

- Eastwood Farm Local Nature Reserve (LNR), located 0.02km east, immediately east of Broomhill Road, partly overlapping with Eastwood Farm SNCI and including a range of wildlife habitats including broadleaved woodland, wildflower rich meadows, ponds and water meadows;
- Avon Valley LNR, a composite site extending along the River Avon valley located 0.5km east (nearest component), partly overlapping Bickley Wood SSSI and including a range of wildlife habitats including broadleaved woodland, willow scrub and pasture;
- Stockwood Open Space LNR, located 1.2km south and comprising grassland and unploughed meadows on lime-rich clay soils, supporting a range of butterfly species; and
- Callington Road LNR, located 1.3km west of Brislington Meadows and largely overlapping with Callington Road SNCI, comprising former allotments, meadows, scrub and hedgerows;
- Troopers Hill LNR, located 1.6km north of Brislington Meadows and locally managed, including a locally unique area of acid grassland and heathland supporting populations of rare invertebrates such as mining bees, and grassland fungi.

### Non-Statutory Wildlife Sites

4.7 A total of 24 SNCIs (Sites of Nature Conservation Interest) were identified within 2km of Brislington Meadows, of which 15 are located within 1km. Further details of these designations are presented at Ecological Technical Appendix A (Ecological Desk Study). Most notably, Brislington Meadows SNCI is located immediately adjacent to the proposed development site to the southwest and Eastwood Farm SNCI is located on the opposite side of Broomhill Road, approximately 0.02km northeast.

4.8 Land at Broomhill Junior School adjacent to the site in the north, the allotments adjacent to the site in the west, elements of Brislington Meadows SNCI to the southwest of the site, and the small amenity area to the south of Sinnott House are identified as Bristol Wildlife Network Sites (BWNS).

### Habitats and Flora

4.9 Ecological Technical Appendices B to E present the results of habitat and botanical surveys completed at the site in 2020 and 2021. Target Notes, including botanical species lists are compiled in Ecological Technical Appendix B. Hedgerow and grassland assessments are detailed in Ecological Technical Appendices C and D, respectively. Habitat condition assessment, applying Natural England’s Biodiversity Metric 3.0 technical guidance, is detailed at Ecological Technical Appendix. Baseline habitats are illustrated at Drawing G7507.20.011.

4.10 Table 3 summarises the extents of the different habitat types and conditions recorded within the site. General descriptions are provided in the following paragraphs, and detailed results are presented in the relevant Ecological Technical Appendix.

*Table 3: Baseline habitats and condition summary*

UKHAB Type and	Habitat Condition	Areas (ha)*	
		Condition sub-total	Type Sub-total
Grassland – other neutral grasslands	Moderate	3.026	3.026
Grassland – ruderal / ephemeral	Moderate	0.070	0.070
Grassland – tall herb	Poor	0.067	0.067
Grassland – modified grassland	Moderate	2.552	3.006
	Poor	0.454	
Heathland and shrub - blackthorn scrub	Moderate	0.277	0.424
	Poor	0.147	
Heathland and shrub - bramble scrub	Poor	1.719	1.719
Heathland and shrub - mixed scrub	Moderate	0.447	0.542
	Poor	0.095	
Urban - developed land; sealed surface	n/a	0.187	0.187
Urban - vacant/derelict land/ bare ground	n/a	0.067	0.067
Woodland and forest - Other woodland; broadleaved	Moderate	0.473	0.499
	Poor	0.026	
Grand Total		9.605	

## Grasslands

4.11 Most fields were assessed as species poor neutral grassland with best affinity to MG1 Arrhenatheretum elatoris Centaurea nigra sub-communities (e.g., Figure 5). These grasslands were split in UKHAB classifications between g3c5 Arrhenatherum neutral grassland and g4 modified grassland. Habitat condition of the g3c5 grasslands was assessed to be moderate, while g4 grasslands ranged between moderate and poor condition.

Figure 5: Typical summer grassland sward



- 4.12 A small area in the southeast (field F3a) was found to have wetter tendency MG9 (Yorkshire fog -tufted hair-grass) grassland, with fair goodness of fit to the sharp-flowered rush sub-community of soft/sharp-flowered rush *Juncus effusus/acutiflorus* - marsh bedstraw *Galium palustre* rush pasture M23a. Both communities are typical of marshy grassland and are represented in UKHAB as g3c7 *Holcus-Juncus* neutral grassland. This area of grassland was assessed to be in moderate condition.
- 4.13 The northernmost field, referred to as the 'paddocks' (field F6) is understood to have been allotments previously. When grass was short, remains of the plot formations were evident. This field was initially under tenancy for horse grazing when Homes England took possession of the site. Horse grazing was observed to be intensive across the majority of the field area and the grassland was assessed at that time to be in poor condition. Grazing had stripped any potential microhabitat interest in these areas. Tenancy was understood to have been transferred in 2021 and while grazing was continued, the extent much reduced (to field F6a in the south corner) and the horses replaced by mini-Shetland ponies. The visual appearance of the grassland in field F6 was much changed in 2021 (Figure 6) and botanical survey confirmed this field to be of different composition to rest of the site, comprising g3c6 *Lolium-Cynosurus* neutral grassland. There was patchiness in the sward across the field which resulted in mixed affinities to MG5 and MG6 grasslands. The condition was upgraded to moderate. The reduced paddock area (field F6a) was categorised as g4 modified grassland in poor condition.

Figure 6: Change in grassland in field F6 following change to grazing regime



## Trees, Woodland and Scrub

- 4.14 Trees have been subject to separate Arboricultural Survey in accordance with BS5837:2012. Methods, results and assessment are reported separately in the Outline Arboricultural Impact Assessment (AIA). Tree references have been standardised between this EcIA and the AIA as far as possible, but differences in survey and assessment techniques mean that some features, including hedgerows and woodlands, may be classified differently.
- 4.15 Trees are generally distributed across the site along field boundaries and with a concentration on the southern boundary. The value of trees on this site is mainly for their landscape and visual quality, and habitat provision. The AIA divides the majority of canopy cover between moderate (Category B) and low (Category C) quality. These trees are evenly distributed throughout the site with no area dominated by any one category. Ten features comprising seven trees, two groups and one woodland have been categorised as high quality (Category A) due in part to their large size and maturity as well as good structure which gives them considerable landscape, habitat and environmental value that would take several decades to replace. Of particular note is tree T6, a large pedunculate oak on the south boundary considered to be a veteran tree.
- 4.16 There are three woodlands located partly within the site. Woodland W1 is located to the south and is thought to be situated over a former landfill. Only a small portion of the larger woodland is located within the site boundary. The area within the site is very scrubby with an extremely dense bramble understorey that reaches up to 3m high in places.
- 4.17 Woodland W2 is a small area of secondary woodland located in the east of the site, along Bonville Road. It comprises predominantly ash and willow within the upper canopy, hawthorn, hazel and elm as understorey. The ground layer is predominantly bramble but scattered individual specimens of lords and ladies were observed. Ground flora is more diverse in isolated patches along the path, where species such

as white deadnettle were noted. A large stand of Japanese knotweed is present on the east edge, which is currently undergoing treatment. The habitat condition assessment (Ecological Technical Appendix E) determined W1 and W2 to be in moderate condition.

- 4.18 Woodland W3 (identified in the AIA as tree group G41 and tree T29) is a linear screening belt located in the north of the site, on the steep bank along School Road. It has suffered significantly from past grazing pressures and habitat condition assessment concluded this woodland to be in poor condition.
- 4.19 Scrub habitats are associated with the outgrown hedgerows along field and site boundaries. The majority of scrub is either bramble belts or blackthorn thickets. The largest consolidated area of mixed scrub is found in the southeast of the site, associated with the south boundary and woodland W1. Scrub habitats were subject to habitat condition assessment separately to the hedgerows with which the scrub areas were associated. Scrub condition ranged from moderate to poor.

### **Hedgerows**

- 4.20 The majority of field and site boundaries comprise relic outgrown hedgerows. Several have outgrown to the point that these boundaries are no longer classed as hedgerows (Technical Appendix C) and essentially comprise lines of trees within dense scrub belts. Six hedgerows were identified within the site. Six form internal hedgerow boundaries while the seventh is a short section of regularly maintained hedgerow on Broomhill Road.
- 4.21 The most intact hedgerow (with the most continuous canopy) is hedgerow H1. This hedgerow comprises three separate lengths of hedgerow as determined by connection 'nodes' with adjoining hedgerows. Most other hedgerows are developing gaps along the canopies, some significantly so. Bramble and blackthorn scrub growing out from the original hedge line maintains a vegetated boundary.

Figure 7: Hedgerow H1, section between fields F4 and F3



4.22 Hedgerows are species poor. Five of the hedgerows (H1, section H1a only, H2, H3, H4 and H5) were assessed as important under the Hedgerow Regulations 1997, but only by virtue of the presence of the Schedule 8 plant species bluebell, rather than due to woody or ground flora species diversity.

4.23 Table 4 summarises the extent of hedgerows within the site.

Table 4: Baseline hedgerow condition summary

Hedgerow	Condition	Approximate length
H1 (a, b, c)	Good	135m
H2	Moderate	130m
H3	Poor	145m
H4	Poor	190m
H5	Moderate	95m
H6	Poor	15m
<b>Grand Total</b>		<b>715m</b>

## Invasive Species

4.24 Japanese knotweed, listed on Schedule 9 of the WCA, occurs in two locations along the east boundary by Bonville Road. These infestations are undergoing chemical treatment by Homes England's landscape maintenance team in accordance with best practice.

4.25 Wall cotoneaster is present in third party land on the north boundary fence at field F7. Japanese rose is present in scrub on the north edge of field F2/wood W2, close to the point where the public right of way emerges to link with Belroyal Avenue. Both are Schedule 9 species and are presumed to be garden escapes.

- 4.26 Although not listed on Schedule 9, bear's britches *Acanthus mollis* was recorded on the north side of the north boundary of field F4. Garden waste tipping has occurred onto this boundary, presumably from adjacent residences. The presence of this aggressive non-native species is presumed to be a result of this tipping activity.

## Fauna

### Amphibians and Reptiles

- 4.27 There are no waterbodies on site that would support breeding amphibians. Potential amphibian breeding habitat is limited to a small artificial pond present within the school grounds north of the site and a very shallow small heavily poached ephemeral pond located south west of the site. Both offsite ponds are isolated from each other (more than 500m apart) and both were assessed to have 'poor' suitability for great crested newts (findings of the Habitat Suitability Index assessment is presented at Annex 1). A couple of very small (<5m<sup>2</sup>) artificial water features were also noted within the allotments to the west of the site. Given the lack of suitable breeding habitat in combination with a lack of pre-existing records identified from within 1km of the site, great crested newts are considered likely absent and are scoped out from further assessment, as confirmed at Table 2 (Section 3.0). Even in combination, the two offsite ponds and water features are likely to be capable of sustaining only low populations of other breeding amphibians such as common frog or common toad.
- 4.28 An individual terrestrial juvenile common toad and a common frog were found on site during refuge searches. Terrestrial habitats offer localised shelter opportunities, primarily associated with older central hedge lines where some deadwood features occur, ecotones between grassland and scrub and localised debris features. Despite outward appearance, large swathes of the dense bramble and blackthorn scrub offer generally limited shelter for amphibians as below the dense canopies, the ground cover is limited and a litter layer is generally absent.
- 4.29 Detailed reptile survey results are presented in Ecological Technical Appendix F. A resident population of slow worms has been confirmed with one adult female, a number of sub-adults and young recorded from the survey. Presence was not detected in all fields surveyed, but this is attributed to the level of public interference experienced during the survey. Presence was confirmed from fields F4, F1 and F7 and is considered representative of a population across the site. The population on site is likely part of a wider population using adjacent allotments, gardens and parkland around the site to the north, west and south.
- 4.30 The grasslands at the site are of overall high suitability for slow worms considering the sward structure, prevailing aspect and extent. The grasslands provide opportunities for shelter, foraging and breeding (confirmed by the presence of young). Dense scrub, hedgerows and woodland edges peripheral to these grass swards will provide shelter from the weather (wind, rain and hot conditions), overnight and probable winter refuge and may also offer some forage opportunities. A surprising

lack of rabbit evidence (droppings, grazing damage or burrows) was observed at the site (anecdotally attributed to poaching activity some years in the past). Rabbit burrows commonly provide overwintering opportunity for reptiles and other small animals. Anthills were noted in fields F1 and F3 (including F3a). Anthills provide slow worms with overwintering opportunities.

## Nesting birds

- 4.31 A total of 27 bird species were recorded on or over the site during WSP's breeding bird surveys in spring 2020. Ten species were confirmed nesting on site or in close vicinity to the site, a further nine species were classified as probable breeders and two as possible breeders. This included:
- Four notable species confirmed to be breeding: house sparrow (one colony within the site and a further colony in the 100m buffer), song thrush (one confirmed pair within the site), woodpigeon (one confirmed pair within the site) and wren (one confirmed pair within the site).
  - Four notable species assessed as probable breeding: dunnock (three probable pairs within the site), greenfinch (two probable pairs within the site), whitethroat (one probable pair within the site) and willow warbler (two probable pairs within the site); and
  - One notable species possibly breeding within the site or surrounding area: starling.
- 4.32 No Schedule 1 bird species were recorded nesting in the site. Peregrine was noted flying overhead but is not breeding in the site. One tree on the south boundary (T5) has suitable nesting features for barn owls. No evidence of nesting or roosting by barn owls has been recorded during these tree assessments or during any other site visit. Tawny owl and little owl have both been heard offsite to the south. Herring gull was recorded during the breeding bird survey, sparrow hawk was noted incidentally to the phase 1 habitat survey and raven was noted during the grassland botanical survey. None of these species are likely to breed within the site.
- 4.33 Nesting birds will use trees and scrub within the site, but no evidence of ground nesting was recorded. The site is of 'below local' significance for breeding birds.

## Invertebrates

- 4.34 Detailed survey results are presented in Ecological Technical Appendix H. A total of 365 invertebrate species were recorded within the site over the three survey visits in 2021. These included:
- 26 species of Araneae (spiders);
  - 58 species of Coleoptera (beetles);
  - Two species of Dermaptera (earwigs);
  - 99 species of Diptera (flies);
  - one species of Glomerida (pill millipedes);
  - 32 species of Hemiptera (bugs);

- 27 species of Hymenoptera (bees, wasps, ants and sawflies);
- four species of Isopoda (woodlice);
- 104 species of Lepidoptera (butterflies and moth);
- one species of Lithobiomorpha (centipedes);
- one species of Mecoptera (scorpionflies),
- two species of Odonata (dragonflies and damselflies);
- one species of Opiliones (harvestmen);
- six species of Orthoptera (grasshoppers and crickets); and
- one species of Polydesmida (flat-backed millipedes).

- 4.35 No statutorily protected species were recorded. Nine invertebrate species of conservation interest were recorded including two bees, two flies, two butterflies, one moth, one earwig and one rove beetle species. The butterflies were the only species of national or regional conservation priority recorded (small heath Species of Principal Importance (SPI) and Bristol Biodiversity Action Plan (BBAP) long listed priority species) and silver-washed fritillary BBAP long listed priority species). Two species of local interest were also recorded, a micro-moth and a tortrix moth (single specimens in each case).
- 4.36 Hedgerows and grasslands provide forage and shelter. The site is of 'vice-county' importance for invertebrates.

### **Badgers and Hedgehogs**

- 4.37 Information relating to badgers has been redacted.
- 4.38 The grasslands, hedgerows and scrub provide foraging opportunities for hedgehogs and other mammals within the site. The very high level of public use at the site, particularly with dogs and notably with dogs off leads, will reduce suitability of habitats except where dense shelter is available.

### **Bats**

- 4.39 Detailed survey results are presented in Ecological Technical Appendix J. There are no buildings or built structures within the site that provide suitable roosting habitat for bats. In total, 17 trees have been identified with bat roost suitability. One tree (T5) possessed potential roost features (PRF) with high suitability, four trees (T6, G7.1, G14.1, W2.2) had PRF with moderate suitability and 12 trees (T4, T8, T19, T20, T21, T25, T26, T27, G24.1, G33.1, G40.1, W2.1) had PRFs with low suitability.
- 4.40 PRF inspections did not reveal presence of bats or residual evidence of bats that would indicate current or recent roosting within the site. One tree in the south of the site had old droppings present, but the sample was too degraded for successful eDNA analysis. It must also be noted that features were present on other trees that, while not currently offering potential roost habitat, could become suitable PRFs in the short to medium term (e.g., with further animal, rot or storm damage).

- 4.41 The combination of bat activity and static monitoring surveys confirmed at least 12 species of bat use the site: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, noctule, Leisler's bat, serotine, Daubenton's bat, Natterer's bat, Whiskered bat, Brandt's bat, long-eared bat (likely brown long-eared) and lesser horseshoe bat. Bat activity levels were generally low, with an average activity index generated from static survey of just 2.26 bat registrations per hour (bph). Common pipistrelles were by far the most abundant species recorded, accounting for between 81% and 73% of the recorded data from transects and statics respectively. Nathusius' pipistrelle, long-eared and lesser horseshoe bats were only recorded infrequently during the static survey, recording just 40 registrations in total across the entire remote monitoring period (38 nights over 6 months).
- 4.42 General activity patterns indicate the site is used by most species for commuting with foraging occurring opportunistically during passing. Activity levels tended to peak at the beginning and end of nights, suggesting bats were on the move between roost and foraging sites. Species diversity in the site increased towards the middle of the night, reflecting the variation in nocturnal activity periods between different species, influenced by several factors but with light sensitivity playing a key role. More light tolerant species are inclined to leave roosts earlier and return later in the night, but there are fewer light tolerant species than light sensitive species, which tend not to leave roosts until after sunset and return to roost before dawn.
- 4.43 The west and south boundaries and two central and northern internal hedgerows providing connection to the small woodland at Bonville Road provide important foraging and commuting for bats and other mammals, although the woodland itself does not appear be of the same importance, with substantially lower activity recorded in the woodland (average of 0.2bph) than along hedgerows within the site or on the north edge of the site. The southeast of the site is affected by considerable lightspill from Bonville Road. The site is of local importance for foraging bats and up to city importance for commuting bats.

## 5.0 Assessment

### Wildlife Sites

- 5.1 Likely significant effects upon statutory wildlife sites have been scoped out.
- 5.2 The site was formerly designated as part of Brislington Meadows SNCI. The majority of land within the proposed application boundary was deregistered when the site was allocated for housing in 2014 (BSA1201 in the Bristol Local Plan – Site Allocations and Development Management Policies). The allocation of sites and designation or de-designation of SNCIs is undertaken through Local Plan review and is subject to separate consultation and independent examination process. The allocation of the site and subsequent de-designation of the corresponding part of the Brislington Meadows SNCI is therefore not a matter for this EclA. The principle for housing to delivered at this site has been approved through the Local Plan. The drivers for this allocation, principally the sustainable location of the site to provide new housing to meet identified need in Bristol, remain relevant.
- 5.3 However, the site's former designation is a factor in understanding the site's ecological value and function within the context of the remaining SNCI network.
- 5.4 The proposed development and the proposed access off Broomhill Road have the potential to fragment connectivity between Brislington Meadows SNCI and Eastwood Farm LNR/SNCI located north of the site, opposite Broomhill Road at its closest point. The allocation policy for the site (BSA1201) includes a requirement to "*provide a green infrastructure link with Eastwood Farm Open Space to the north-east*". Development design, specifically design of the entrance to the site off Broomhill Road therefore needs to ensure appropriate ecological connectivity is delivered in compliance with the allocation policy.
- 5.5 Pre-application consultation with BCC Nature Conservation Officer (Ecological Technical Appendix A) confirmed a minimum width of 10m would be considered acceptable but that design of the corridor was as important as width. The proposed development provides a substantial green infrastructure corridor along the east boundary from W1 in the south, linking with W2 in the east and continuing north to Broomhill Road. The minimum width of this green infrastructure corridor, set out in the Landscape and Land Use Parameter Plans, is 12m and therefore complies with pre-application advice. The majority of the corridor is wider. Species rich hedgerow planting has been undertaken along the south edge of the footprint of the former police station, following its demolition in autumn 2020. The mature tree line is to be retained in this location. These design aspects are fixed within the Land Use and Landscape Parameter Plans. The proposed development is therefore considered to be policy compliant with regard to provision of the green infrastructure link with Eastwood Farm Open Space. Furthermore, the green infrastructure provision to the east and south of the site will avoid isolation of Brislington Meadows SNCI in the south.

- 5.6 A small area of the application boundary includes land remaining within the SNCI allocation. The public right of way that runs from the southwest corner of the site to School Road in the west (the 'Cycle Link') is within the Brislington Meadows SNCI. Proposals for this part of the site include upgrading the existing bare earth track to create a 5m wide cycle and pedestrian link. Existing habitats within this link are ecologically impoverished, comprising a belt of mixed scrub assessed to be in poor condition that runs parallel to the bare earth track. The track and scrub belt are enclosed along the entire length to north and south by the allotment fencing. The allotments are identified by the Desk Study (Ecological Technical Appendix A) as Bristol Wildlife Network Sites (BWNS).
- 5.7 In isolation, the habitats present in this projection of the site would not merit a wildlife designation. However, the ecological function of this part of the site is to contribute towards ecological connectivity between the Brislington Meadows SNCI and other greenspace in the north of the site, namely St. Annes Valley SNCI. The proposed upgrade of the public right of way along this route to School Road therefore has potential to impact upon the integrity of the Brislington Meadows SNCI and local wildlife site network. It is understood design and construction of the upgraded cycle path (3m width) and pedestrian path (2m width, but variable according to tree constraints) will be able to avoid loss of mature trees along the link. There will be opportunity to enhance remaining scrub through removal of undesirable species and new planting. These measures will maintain the physical integrity of this part of the SNCI. However, it is understood that the cycle link may need to be lit to meet local policy standards. A sensitive lighting scheme will be required to avoid light disturbance impacts along this important corridor that could disturb nocturnal wildlife, particular bat species. Recommendations are discussed in Section 5.0.
- 5.8 A drainage connection is anticipated to be required from a sustainable drainage basin in field F4 to an existing underground pipe located within the Brislington Meadows SNCI to the south. Habitat loss within the SNCI in this location would be largely avoided by adopting below ground construction methods (required to avoid impact upon a veteran tree T6 on the site boundary). Very small scale and temporary habitat impacts would still occur within this location of the SNCI. These would be limited to the receptor pit required to facilitate connection of the new drain to the existing underground network. Habitat losses would also be very short term. No significant effect upon the integrity of the SNCI is likely as a consequence of these works. However, considering the underlying designation of the works area, best practice measures are recommended to minimise habitat loss and maximise speed of habitat reinstatement. Recommendations are discussed in Section 5.0.
- 5.9 Another aspect of the site's former designation as an SNCI is the potential presence of the Habitat of Principle Importance (HPI) 'lowland meadow' within its (former) boundaries. The site information for Brislington Meadows SNCI provided by BRERC lacks assessment detail (assessment is cited as 'pending') and it predates the housing allocation. The brief summary description notes that the 'semi-improved neutral

grasslands'...may include areas of Priority Habitat Lowland Meadow'. A focus of the ecological baseline surveys has therefore been to determine if any of the grasslands within the site qualify as HPI lowland meadow. Habitat condition assessment and NVC survey of the grasslands in 2020 and 2021 have confirmed that none of the grasslands within the site qualify as HPI lowland meadow, nor any other grassland HPI.

## Habitats and Flora

### Habitats

#### Overview

- 5.10 The site comprises a group of neutral grassland fields with outgrown scrubby field and site boundaries and small areas of secondary woodland. Baseline habitats are illustrated at Drawing G7507.20.011.
- 5.11 Construction activities implemented in proximity to retained habitats have the potential to result in root damage, soil compaction, damage to stems or branches of trees, pollution events and other habitat degradation effects. Such effects would be localised across the site and the extent of potential habitat deterioration or damage would also be limited. However, without mitigation, this would result in potential adverse impacts upon retained habitat features.
- 5.12 Dust generated during construction has the potential to adversely impact upon retained and planted habitats and flora within the site as a consequence of smothering the foliage. This risk would be highest during bulk earthworks and would be temporary. Dust generation would be temporary and short-term.
- 5.13 The greatest impacts upon habitats will be habitat loss to facilitate the new development. Table 5 quantifies the extent of anticipated habitat impacts, including both temporary and permanent habitats losses, based upon the outline Parameter Plans and further informed by the Illustrative Masterplan. These potential habitat losses are visualised in Drawing G7507.20.063.
- 5.14 The outline development parameters, namely the locations and extent of development parcels and greenspaces and the route for the indicative primary street, have considered the combined constraints including topography, highways and ecological value.
- 5.15 Table 6 summarises the extent of habitats that would be expected to be present post-development, based on the Illustrative Masterplan. These habitats are visualised in Drawing G7507.20.061 while proposed target habitat conditions are visualised in Drawing G7507.20.062.

Table 5: Quantification of predicted impacts (temporary and permanent) on baseline habitats

Baseline Habitats		Area Impacted (ha)			Grand Total
Habitat	Condition	Retained	Enhanced*	Lost	(ha)
<b>All neutral grassland types (g3)</b>	<b>All conditions</b>	<b>0.02</b>	<b>0.19</b>	<b>2.946</b>	<b>3.162</b>
g3 Neutral grassland	Moderate			0.070	0.070
	Poor		0.046	0.021	0.067
<b>g3c</b> Other neutral grassland	Moderate	0.013			0.013
<b>g3c5</b> Arrhenatherum grassland	Moderate	0.012	0.143	2.099	2.254
<b>g3c6</b> Lolium-Cynosurus grassland	Moderate			0.691	0.691
<b>g3c8</b> Holcus-Juncus grassland	Moderate			0.068	0.068
<b>All modified grassland types (g4)</b>	<b>All conditions</b>	<b>0.074</b>	<b>0.126</b>	<b>2.806</b>	<b>3.006</b>
<b>g4</b> Modified grassland	Moderate	0.072	0.084	2.396	2.552
	Poor	0.002	0.042	0.409	0.444
<b>All dense scrub types (h3)</b>	<b>All conditions</b>	<b>0.066</b>	<b>0.961</b>	<b>1.658</b>	<b>2.685</b>
<b>h3a6</b> Blackthorn scrub	Moderate	0.019	0.087	0.171	0.277
	Poor	0.019	0.004	0.124	0.147
<b>h3d</b> Bramble scrub	Poor	0.025	0.498	1.196	1.719
<b>h3h</b> Mixed scrub	Moderate	0.003	0.319	0.125	0.447
	Poor		0.053	0.042	0.095
<b>All artificial urban types (u1)</b>	<b>All conditions</b>	<b>0</b>	<b>0</b>	<b>0.254</b>	<b>0.254</b>
<b>u1b</b> Developed land, sealed surface	not required			0.169	0.169
<b>u1b5</b> Developed land, buildings	not required			0.018	0.018
<b>u1c</b> Unvegetated unsealed surface	not required			0.066	0.066
<b>All woodland types (w1g)</b>	<b>All conditions</b>	<b>0.114</b>	<b>0.253</b>	<b>0.132</b>	<b>0.499</b>
<b>w1g</b> Other woodland, broadleaved	Moderate	0.114	0.227	0.132	0.473
	Poor		0.026		0.026
<b>Grand Total (ha)</b>		<b>0.278</b>	<b>1.531</b>	<b>7.796</b>	<b>9.605</b>
<b>% Net Site Area</b>		<b>3%</b>	<b>16%</b>	<b>81%</b>	

\* Habitat enhancement may improve habitat condition and/or distinctiveness; the latter may result in the habitat type changing

Table 6: Quantification of proposed habitats post-development

Habitat	Condition	Total (ha)	Net change (ha)
<b>All neutral grassland types (g3)</b>	<b>All conditions</b>	<b>2.317</b>	<b>-0.845</b>
g3 Neutral grassland	Moderate		-0.070
	Poor		-0.067
g3c Other neutral grassland	Good	1.228	+1.228
	Moderate 0.653	0.653	+0.640

Habitat	Condition	Total (ha)	Net change (ha)
g3c5 Arrenhatherum grassland	Moderate		-2.254
g3c6 Lolium-Cynosurus grassland	Moderate		-0.691
g3c8 Holcus-Juncus grassland	Good	0.437	+0.437
	Moderate		-0.068
<b>All modified grassland types (g4)</b>	<b>All conditions</b>	<b>0.565</b>	<b>-2.441</b>
g4 Modified grassland	Moderate	0.546	-2.006
	Poor	0.018	-0.426
<b>All dense scrub types (h3)</b>	<b>All conditions</b>	<b>1.170</b>	<b>-1.515</b>
h3a6 Blackthorn scrub	Moderate		-0.277
	Poor		-0.147
h3d Bramble scrub	Poor		-1.719
h3h Mixed scrub	Good	0.976	+0.976
	Moderate	0.175	-0.272
	Poor	0.019	-0.076
<b>All artificial urban types (u1)</b>	<b>All conditions</b>	<b>5.118</b>	<b>+4.864</b>
u1b Sealed surface	not required	2.949	+2.780
u1b5 Buildings	not required	0.829	+0.811
u1b5 Buildings with brown roofs	Good	0.170	+0.170
u1c Unvegetated unsealed	not required	0.001	-0.065
u1 Vegetated garden	Poor	1.169	+1.169
<b>All woodland types (w1g)</b>	<b>All conditions</b>	<b>0.435</b>	<b>-0.064</b>
w1g Other woodland, broadleaved	Good	0.278	+0.278
	Moderate	0.158	-0.315
	Poor		-0.026
<b>Grand Total (ha)</b>		<b>9.605</b>	<b>0.0</b>

5.16 The Outline BNG Assessment, reported under separate cover to this EclA, predicts a net loss of -27.44% in habitat unit value as a consequence of development of the proposed Illustrative Masterplan, applying the precautionary approach to habitat loss and habitat creation summarised in Table 5 and Table 6. This net loss is attributed to medium (other neutral grasslands g3c types, bramble and blackthorn scrub) and low distinctiveness habitats (modified grassland). No high distinctiveness habitats will be affected. No trading deficit for woodland habitats is identified.

5.17 The above calculations exclude anticipated tree planting. While details of the planting scheme are a Reserved Matter, there is capacity for substantial tree planting within the proposed development. The Illustrative Masterplan focusses tree planting within the eastern green infrastructure corridor, along streets, at site boundaries in the west and north, around play areas and associated with the 'garden corridor' created by the

line of back-to-back private back gardens that runs east-west through the centre of the proposed development. Applying the estimated net canopy extent (0.62ha) for these urban trees, the Outline BNG Assessment is recalculated to predict a net loss of – 24.12% in habitat unit value (a net loss of -14.23 habitat units, resulting in a deficit of 20.14 habitat units required to achieve 10% net gain).

- 5.18 Offsetting will be required to deliver the target 10% biodiversity net gain in habitat unit value. Offsetting requirements are discussed further in the Outline BNG Assessment (TEP Ref 7507.20.070).

### Grasslands

- 5.19 Habitat losses affect grasslands the most. As explained at paragraph 3.12, all habitats located within the residential development parcels identified by the outline Land Use and Landscape Parameter plans are presumed to be lost. Habitats within the indicative location of the sustainable urban drainage basins and the network of cycle and pedestrian routes are presumed to be lost. Habitat loss has also been assumed in locations within the identified extents of greenspace where gradients are likely to require adjustment (i.e., cut and/or fill may be required). These combined assumptions would result in a total anticipated loss (permanent and temporary) of 5.76ha of grassland habitat (2.95ha neutral grasslands and 2.81ha modified grasslands).
- 5.20 The grasslands affected do not qualify as HPI (Ecological Technical Appendix D), although fields F6 and F3a appear closest to qualifying while field F4 was of note for the extensive coverage of native bluebell and pignut in the sward.
- 5.21 Based on the outline Parameter Plans and the Illustrative Masterplan, there is opportunity to retain, restore or create approximately 2.32ha neutral grasslands and 0.56ha modified grasslands. Overall, net loss of approximately 0.84ha neutral grasslands and 2.44ha modified grasslands would be anticipated within the site.
- 5.22 In accordance with the pre-application consultation with BCC, the design of the sustainable urban drainage basins is proposed to deliver 'green' solutions in the form of a 'wet meadow' type of neutral grassland (g3c8 *Holcus-Juncus* grassland). A similar small area of grassland in field F3a is currently present and would be lost to the construction of one the basins. Creating new g3c8 (potentially incorporating an element of turf translocation, if practical within construction timescales) in addition to improving the condition of the new wet grassland to 'good' would result in net gain of this grassland sub-type in the order of 0.44ha. Condition improvement would be achieved in part by designing the basin floor to have varied 'micro-topography' that would function as a draw-down zone following inundation during periods of high flow. This would result in localised pockets of standing water being retained for longer periods, which will diversify habitat structure and composition and would also be of benefit to invertebrates and other wildlife (foraging bats and birds, for example).

### Woodland and Trees

- 5.23 Woodland loss from W2 (w1g) is unavoidable. Broomhill Road presents the only viable means of access into the site. While the allocation indicates site access could be delivered from School Road (through the existing allotments) this has since been demonstrated to be undesirable. An access off School Road through field F6 was tested and was also found to be inappropriate due to ecological and arboricultural impact and from an engineering perspective, as substantial cut and batter would be required to achieve acceptable gradients. This woodland is small and relatively isolated and is of moderate condition. Green infrastructure provision would link this woodland with other woodland habitat to the south (W2) and would strengthen links northwards to Eastwood Farm LNR/SNCI. This improved connectivity would strengthen the ecological function of the small woodland parcel. This increased functional importance would counteract adverse effects arising from the relatively small-scale physical loss that would result from construction of the new access road. No loss of woodland beyond that affecting W2 is anticipated.
- 5.24 Woodland habitat within the site does not qualify as HPI. The single most important habitat feature within the site is tree T6. This is a veteran tree and is therefore 'irreplaceable' habitat in the context of the National Planning Policy Framework (NPPF). Impacts on irreplaceable habitat must be avoided except in 'exceptional circumstances'. The proposed development does not meet the definition of 'exceptional circumstances' set out in NPPF.
- 5.25 Likely tree loss and retention are assessed separately in the Outline Arboricultural Impact Assessment, but tree T6 is located on the south boundary near the west end and is not located within development parcels identified by the outline Parameter Plans.
- 5.26 The Illustrative Masterplan confirms that the sustainable drainage basins required to serve the new housing can be constructed without impinging on the tree root protection zone of this veteran tree. The drainage outfall from the sustainable drainage basin in field F4 will most likely need to connect with an existing underground pipe located to the south of the site within Brislington Meadows SNCI. The route of this drainage pipe crosses the tree root protection zone for the veteran tree T6 and other category A trees in this location. The outline drainage solution confirms that this drainage connection can be achieved by employing below-ground construction measures (e.g., directional drilling) which would ensure the pipe level is at least 600mm below ground when crossing the tree root protection zone. This has been confirmed in the Outline Arboricultural Impact Assessment to satisfactorily avoid risk to the veteran tree T6 and adjacent category A trees.
- 5.27 The proposed new cycle path accessing the site from this southwest corner has sufficient flexibility to avoid the root protection zone. Detailed design will need to accommodate this avoidance measure.

- 5.28 No significant effect upon the veteran tree T6 is therefore anticipated as a result of the proposed development, including infrastructure requirements.
- 5.29 As noted at paragraph 5.17, there is substantial capacity within the proposed development to deliver new tree planting that will address loss of individual or groups of trees within the site.
- 5.30 Tree planting within the scheme design should aim to replace each tree confirmed to require removal with trees of the same species. Additional tree planting should focus on providing nectar, pollen, berry or seed sources that will be of benefit to wildlife and species which would be resilient to climate change. Inclusion on non-invasive non-native species may need to be considered in this latter case.

#### Scrub

- 5.31 Areas of continuous scrub habitats (bramble, blackthorn and mixed) are BBAP as a local priority habitat. The main areas of scrub loss are anticipated to arise in association with loss of hedgerows on internal field boundaries. The majority of the scrub loss is anticipated to affect bramble scrub (1.2ha of a total 1.66ha anticipated permanent and temporary scrub loss). Under current guidance, bramble scrub cannot be assigned a condition better than poor. The remaining areas of blackthorn or mixed scrub to be affected range from poor to moderate condition.
- 5.32 Based on the outline Parameter Plans and the Illustrative Masterplan, there is opportunity to retain, restore or create approximately 1.17ha scrub habitat. There is opportunity to deliver a net gain in mixed scrub through enhancement of retained mixed, bramble and blackthorn scrub and by planting new mixed scrub. Scrub enhancement would be delivered through a combination of supplementary planting and long-term management to diversify woody species and habitat structure. An overall net loss of approximately 1.52ha scrub habitats would result post-development.

#### Hedgerows

- 5.33 Five internal field boundaries were classified to comprise hedgerows, and these qualify as HPI. These hedgerows are also considered to be important under the wildlife and landscape criteria of the Hedgerow Regulations 1997 (Ecological Technical Appendix C), but only by merit of containing native bluebells. All hedgerows are species poor in respect of their woody components.
- 5.34 As noted at paragraph 3.12, habitat loss is assumed to occur not just completely across the residential platforms but also in additional areas along the indicative route of the Primary Street, in areas where regrading is anticipated and where the sustainable drainage basins and cycle/footpath network are proposed. Table 7 summarises anticipated impacts upon existing hedgerows.

- 5.35 The majority of hedgerow losses occur within residential parcels. Loss of hedgerows H2 and H4 and partial loss of H3 (southern end) to deliver new dwellings is considered very likely to be unavoidable. Even if detailed design was able to retain additional lengths of hedgerow within the site, it is likely these would need to be incorporated into private garden boundaries and consequently functional loss would still be presumed.

Table 7: Anticipated impacts on hedgerows

Hedgerow	Condition	Approximate length	Anticipated loss	Anticipated enhancement / gain	Post-Development Length
H1 (a, b, c)	Good	135m	-25m		110m
H2	Moderate	130m	-115m		15m
H3	Poor	145m	-85m		
	Moderate			60m	60m
H4	Poor	190m	-190m		Lost
H5	Moderate	95m	-95m		Lost
H6	Poor	15m	-15m		Lost
New planting	Good			+540m	540m
New planting	Moderate			+515m	515m
<b>Grand Total</b>		<b>710m</b>	<b>-525m</b>	<b>+1055m</b>	<b>1,240m</b>
<b>% Net length change</b>			<b>-74%</b>		<b>+75%</b>

- 5.36 Loss of H6, partial loss of H1 and partial loss of H3 would be required to provide means of access into and through the site. These losses are considered unavoidable as there is no other means to provide access to residential parcels except by crossing hedgerows. The locations of these crossing points target the sections of least value in both hedgerows, where the upper woody canopy has become most fragmented or, in localised sections, has been lost altogether.
- 5.37 Loss of H5 is required in part to provide access and in part to achieve levels for footpath construction through the greenspace through which this hedgerow passes. It should be noted however that trees T25 (south boundary of field F6), T26 and T27 (associated with the line of hedgerow H5) are to be retained. Opportunities may therefore exist to retain sections of these hedgerows, as levels will be fixed around these trees.
- 5.38 Within the Illustrative Masterplan there are opportunities to plant approximately 600m new hedgerows within locations that would be expected to allow hedgerows to reach good condition. A further 450m new hedgerow planting could be implemented within locations where hedgerows would be expected to reach at least moderate condition. All these locations are within the public realm and are visualised indicatively on Drawing G7507.20.061 (Proposed Habitats). Potential for an additional 115m hedgerow planting might also be offered in parallel with the cycle link upgrade. As

this planting would be within the SNCI, agreement should be sought with BCC to determine if hedgerow planting would be appropriate in this location.

- 5.39 Based on the hedgerow losses estimated from the outline Parameter Plans and Illustrative Masterplan and accounting for the enhancement and planting opportunities presented by the Illustrative Masterplan, a net gain of up to 530m hedgerows should be achievable within the site. The Outline BNG assessment calculates a +132.12% net gain in hedgerow unit value (an estimated gain of 5.84 hedgerow units) could be delivered within the site (Drawing G7507.20.062). In the event only the more ecologically strategic hedgerow planting (good condition native species rich hedgerows totalling 540m) was to be implemented, the net gain reduces to +51.73% net gain in hedgerow unit value (an estimated gain of 2.29 hedgerow units).

### **Protected Plants**

- 5.40 Native bluebell is present in several field boundaries, including hedgerows H1 to H5. Native bluebell is also present extensively across field F4. Although the legal protection surrounding this species is not intended to protect against development impacts, best practice would require measures be implemented to minimise losses of this notable native plant species.

### **Non-Native Invasive Plants**

- 5.41 Japanese knotweed along Bonville Road is currently undergoing treatment. Chemical treatment of Japanese knotweed can take several years to eradicate an infestation. There will likely be implications to construction, landscaping and, potentially, landscape management operations until such time as the Japanese knotweed has been successfully eradicated from the site.
- 5.42 There would be similar implications for construction with regards to the presence of wall cotoneaster and Japanese rose, should these species be within influence of construction activities.

## **Fauna**

### **Amphibians and Reptiles**

- 5.43 Habitats within the site are likely to support low densities of terrestrial amphibian such as common frog and common toad. A resident population of slow worm is also present on site. Habitats offsite (gardens, allotments and the adjacent Brislington Meadows SNCI) are also likely to be supporting slow worms and amphibians.
- 5.44 Construction activities could put slow worms and terrestrial amphibians at risk of killing and injuring. Legal protection afforded to slow worm under the WCA protects this species against intentional or reckless killing and injury. Therefore, mitigation measures are required to ensure legal compliance and to ensure slow worms are protected throughout the construction period.

## Nesting Birds

- 5.45 The WCA makes it an offence to take, damage or destroy the nest of any wild bird whilst it is in use or being built.
- 5.46 The grassland habitats on site provide limited suitability for ground-nesting bird species owing to the height and density of the sward and the visual and physical disturbance experienced from dog walkers.
- 5.47 The trees, dense scrub, woodland and hedgerows support nesting birds. The breeding bird survey estimated the following notable species breeding within the site or within the immediate environs around site:
- three pairs of dunnocks;
  - two pairs of willow warblers;
  - one pair of song thrushes;
  - two colonies of house sparrows (offsite but adjacent);
  - two pairs of greenfinches;
  - one pair (potentially up to 6 pairs) of wrens;
  - one pair of woodpigeons; and
  - one pair of whitethroats.
- 5.48 In addition to the above notable species, other species (and estimated number of pairs) confirmed or concluded likely to be nesting in the site included: blackbird (3), blackcap (5), blue tit (2), carrion crow (1), chiffchaff (5), collared dove (1), goldfinch (2), great tit (3), long-tailed tit (1), magpie (2) and robin (7).
- 5.49 Construction activities will result in noise and visual disturbance effects and loss of nest and foraging habitats that, in combination, are likely to result in the local exclusion of nesting birds from the site at least until construction completes. The majority of species using the site are likely to become habituated to construction activities and while there may be some displacement, it is unlikely that this will lead to a significant effect on their breeding success.
- 5.50 Habitats created within the site will require an establishment period prior to achieving suitable capacity to support foraging and nesting birds. The range of habitats to be retained and created within the proposed development would be suitable for supporting the range of species currently identified as utilising the site for nesting, including the notable species. Reduced carrying capacities of certain species, such as willow warbler or whitethroat may potentially result from the reduced habitat footprints that will be present within the site. However, these species were confirmed nesting only at low densities (2 and 1 pairs respectively) and the effective of habitat squeeze is unlikely to be significant upon the local population.

- 5.51 The abundance of new garden habitat is likely to be beneficial to a range of species recorded on site, including notable species dunnock, house sparrow, greenfinch and wren.
- 5.52 There will be impacts upon nesting birds if vegetation clearance works are undertaken within the nesting bird season (March to August inclusive, potential February and September subject to prevailing).
- 5.53 Mitigation measures will be required to avoid impacts upon nesting birds and to maintain nesting and foraging habitats. Mitigation is discussed further Section 6.0.

### **Invertebrates**

- 5.54 The site was assessed to be of vice-county importance for invertebrates. Although no statutorily protected invertebrates were recorded, two species national or regional biodiversity conservation priority (small heath SPI/BBAP and silver washed fritillary BBAP) were recorded within the site (two individuals and a single specimen, respectively). A further seven species of conservation significance were also recorded including one moth species, two flies, two bees, one rove beetle and one earwig, and two species of local interest were recorded. Unsurprisingly, the key habitats for invertebrates on site are the grassland habitats and the outgrown hedgerows and field boundaries.
- 5.55 The most significant impact from the proposed development is likely to be a reduction in diversity and abundance of invertebrates as a result of habitat loss and, potentially, light pollution. The majority of the grassland habitat within the site will be lost and what remains will, in comparison to the extents currently present, become fragmented by foot and cycle paths.
- 5.56 Mitigation measures will be required to retain and create new habitat opportunities for a range of invertebrate groups. Landscaping measures (planting schemes and future management regimes) should accommodate features to encourage invertebrate diversity and sustain invertebrate communities through the year. In particular, landscaping and management should provide for the specific habitat requirements of the small heath (SPI, Bristol BAP) and silver-washed fritillary (Bristol BAP) recorded at the site and should cater for the other notable species recorded as far as possible within the new development.
- 5.57 The National Pollinator Strategy<sup>5</sup> for bees and other pollinators in England sets out a ten year plan to help pollinating insects survive and thrive. DEFRA's vision is to see pollinators thrive, so they can carry out their essential service to people of pollinating flowers and crops, while providing other benefits for our native plants, the wider

<sup>5</sup> *The National Pollinator Strategy: for bees and other pollinators in England* ([publishing.service.gov.uk](https://publishing.service.gov.uk))

environment, food production and all of us. The actions in this Plan come under five key themes:

- Supporting pollinators on farmland;
- Supporting pollinators across towns, cities and the countryside;
- Enhancing the response to pest and disease risks;
- Raising awareness of what pollinators need to survive and thrive; and
- Improving evidence on the status of pollinators and the service they provide.

5.58 Bristol's Ecological Emergency also includes objectives for pollinators, including by 2030 to have at least 30% of land in Bristol under management for the benefit wildlife and to reduce the use of pesticides in Bristol by at least 50%.

5.59 The invertebrate species and communities supported at least in part by the habitats within the site will also provide ecological services for offsite features, notably the two areas of allotments located to the north of the site. Retention of sustainable populations of pollinator species will be important to maintain benefit for these wider ecosystem services. Recommendations are discussed in Section 5.0.

### **Badgers and Hedgehogs**

5.60 Information relating to badgers has been redacted.

5.61 The hedgehog is a SPI under the requirements of Section 41 of the Natural Environment and Rural Communities Act 2006.

5.62 Construction activities would put hedgehogs and other small mammals at risk of killing, injury or entrapment.

5.63 The scrub belts north of field F4 and along the south boundary will be retained and will continue to provide sheltered foraging opportunities for hedgehogs and other mammals. The proposed development has the potential to increase forage opportunities for hedgehogs provided the landscape and infrastructure maintains permeability for this species.

### **Bats**

5.64 Only one tree currently identified to have potential bat roost features (PRF) is anticipated to require removal to facilitate development. Tree G24.1 is a dead elm located at the northern end of hedgerow H1, which requires removal to provide access for the Primary Street. This tree has PRFs identified with low roost suitability.

5.65 Trees T26 and T27 are located along hedgerow H5 (between fields F5 and F6). Trees T20 and T21 are located approximately centrally to hedgerow H3. All four trees support PRFs identified with low roost suitability. These trees will be retained. The Illustrative Masterplan sets these trees within public open spaces. However, it is considered very likely that the hedgerow vegetation associated with these trees would

be removed, either to accommodate levels, new footpath routes or ensure appropriate safeguarding for the open space within the new landscape.

- 5.66 Distances between the trees and between T26 and retained boundary vegetation exceed 10m and therefore vegetation clearance around these trees has the potential to isolate them in the landscape. T20 and T21 are adjacent but they may become isolated from the retained western section of hedgerow H3 and would become isolated from the woodland W2 in the east.
- 5.67 The primary bat commuting route within the site, identified by hotspot mapping from bat activity surveys (Ecological Technical Appendix J) comprises the southern boundary of field F4, hedgerow H1, hedgerow H3 and the woodland W2 (edge, as the interior of the woodland was found to support substantially lower activity levels). This route links Eastwood Farm Open Space (north of Broomhill Road) through the site to the Cycle Link (providing connectivity with the wider landscape north to St Annes Valley) and to the adjacent Brislington Meadows SNCI in the south. It is thought the field edges of field F3, including hedgerow H4, sustain lower activity levels as a consequence of the substantial light spill into this part of the site from lighting along Bonville Road.
- 5.68 The proposed development will result in partial loss of hedgerow H3 (the eastern section) and the Primary Street would also need to sever hedgerow H1. The Landscape and Land Use Parameter Plans fix the route of the Primary Street at the north end of H1, which will reduce this severance effects. However, other fragmentation effects would occur along H3. Additionally new artificial lighting introduced from streetlights and also along the Cycle Link has the potential to significantly disturb foraging and commuting bats and disrupt or further fragment commuting routes.

## 6.0 Mitigation and Enhancement

### Wildlife Sites

- 6.1 A method statement outlining measures to avoid and reduce damage within Brislington Meadows SNCI during construction works will be produced to inform any future Reserved Matters application. This is anticipated to be secured by condition. The method statement should include detailed methods and timings for:
- Drainage connection works within SNCI south of site; and
  - Maintaining and enhancing functionality through the cycle/pedestrian link as it traverses part of the SNCI;
- 6.2 It is anticipated habitat loss within the SNCI during the drainage connection will be avoided by the use of underground construction methods and by lifting and replacing turfs within the small-scale pit excavations required to connect the drain to the existing network. The method statement should include details for turf recovery, storage and maintenance during works.
- 6.3 It is anticipated that habitat loss within the SNCI will be minimised by varying the width (or line) of the pedestrian part of the upgraded route. Scrub to be lost is of poor condition and contains a number of undesirable species. Landscaping in association with these works provides substantial opportunity for enhancement by increasing species diversity, improving scrub structure, establishing a ground flora layer and removing undesirable species.
- 6.4 Additional habitat protection measures for offsite habitats (Brislington Meadows SNCI and the adjacent BWNS) will be incorporated into a construction ecological mitigation and protection management plan or the Construction Environmental Management Plan, which will be produced to inform any future Reserved Matters application. Further discussion is provided in the following section.

### Habitats

- 6.5 Table 5 quantifies the habitat impacts and Table 7 quantifies the impacts upon hedgerows estimated to arise as a reasonable worst case, including both temporary and permanent impacts, based on outline Parameter Plans and the Illustrative Masterplan. Detailed design should seek to reduce these habitat losses, both temporary and permanent, within and outside of development parcels.
- 6.6 Compensation for loss of hedgerow, scrub, tree, woodland and grassland habitats will be required. This will need a combined approach of habitat creation or enhancement both on and offsite.
- 6.7 BCC does not yet have an offsetting or habitat bank process to support developments requiring offsetting. Pre-application consultation has indicated that financial

contribution towards habitat enhancement is unlikely to be considered an acceptable approach, as this would no longer be compliant with NPPF which requires development to deliver 'measurable' net gain. Habitat creation in suitable location(s) offsite will be required. Offsetting requirements will be subject to further discussion and agreement with BCC and relevant stakeholders, as described in the separate Outline BNG Assessment (TEP 7507.20.070). Homes England has started conversations in principle with Avon Wildlife Trust and Bristol Parks Department. The detailed offsetting package will, however, be resolved post-consent of the outline planning permission.

- 6.8 Grassland and scrub offsetting will be required to deliver the target 10% biodiversity net gain for habitat units. Offsetting should target grassland habitats (primarily g3c neutral grassland types) and scrub (bramble and blackthorn) as these are the habitat types that would result in net losses (habitat unit values) within the site. Offsetting requirements are discussed further in the Outline BNG Assessment (TEP Ref 7507.20.070). Opportunities exist within the site to compensate for anticipated losses of trees and woodland and to deliver at least 46% net gain in hedgerow units.
- 6.9 The detailed design, once fixed, will be subject to an updated BNG Assessment to inform any future Reserved Matters application. This should include all onsite habitats and any offsite offsetting site(s) identified through the BNG Assessment to be required to deliver the target 10% uplift. It is anticipated this will be secured by condition.
- 6.10 A long-term nature conservation and landscape management plan will be produced for on and offsite habitats which addresses:
- features of interest within the site / offsetting site(s);
  - management objectives;
  - management compartments and prescriptions;
  - a work schedule including a thirty-year annual work plan;
  - resourcing including a financial budget; and
  - a programme of ecological monitoring, setting out key performance indicators for each feature of interest covered by the plan against which monitoring results should be reviewed.
- 6.11 This management plan should cover a 30-year period and should be subject to at least five yearly reviews. It is anticipated this will be secured by condition.

### **General Habitat Protection Measures**

- 6.12 An ecological mitigation and protection management plan (EMP) will be produced to detail measures to protect wildlife and their habitats prior to and during construction. This will either be a standalone document, or otherwise will be incorporated into the Construction Environmental Management Plan (CEMP).

- 6.13 Species specific precautionary working measures to protect wildlife are discussed in subsequent sections (paragraphs 6.45 to 6.86). The following paragraphs outline precautionary working measures of relevance to habitat protection.
- 6.14 Measures will be detailed within the EMP or CEMP to avoid pollution incidents which may indirectly affect terrestrial or aquatic habitats. These measures should include, but may not be limited to, the following:
- Arrive at the site with clean footwear;
  - Ensure footwear is visually clean from soil and debris before leaving the site;
  - Ensure vehicles are kept clean. Remove any accumulated mud before leaving the site using a stiff-haired brush. Cleaning should be carried out over a root barrier membrane or hard surface that can contain and collect any contaminated material that has been washed off the vehicle;
  - Make use of facilities on site to clean footwear and equipment;
  - Keep vehicles to established tracks and park vehicles on hardstanding;
  - Any works carried out by contractors should be accompanied by a Risk Assessment Method Statement (RAMS). The RAMS should detail appropriate biosecurity measures to be observed during the duration of the works and outline the scope of the works and any ongoing monitoring/works required;
  - Refuelling stations for any powered equipment will be located more than 15m from any off-site aquatic habitat (to the south, within Brislington Meadows SNCI) or any completed onsite aquatic habitat (e.g., within sustainable drainage designs) to avoid run-off of pollutants into these features;
  - Fuel, oil and chemical storage will be sited on an impervious base within a bund and secured. The base and bund will be impermeable to the material stored and of adequate capacity;
  - All powered equipment operated within 15m of any off-site watercourse (to the south, within Brislington Meadows SNCI) or new aquatic or wetland habitat created within the site will use biodegradable chain oil;
  - Any fuel spillages within the site or within close proximity of the site will be reported to the site environmental manager;
  - Water containing silt will not be pumped or allowed to flow into any off-site watercourse (to the south, within Brislington Meadows SNCI) or any other valued terrestrial habitat;
  - Where possible, water will be prevented from entering excavations.
- 6.15 Dust management measures will be implemented during construction, including monitoring. Management measures will be set out within the CEMP.
- 6.16 Tree protection measures will be implemented in accordance with British Standards BS5837:2012.
- 6.17 An ecological clerk of works (ECOW) will be appointed prior to the onset of construction. All method statements and construction phase management plans will

be provided to the ECOW prior to the onset of construction. The role of the ECOW will be set out in the EMP/CEMP and should include:

- Ensuring the construction (including site clearance, construction and landscaping works) comply with the site protocols regarding ecological receptors and are completed following best practice guidelines in relation to ecology;
- Delivering toolbox talks and on-site supervision where necessary;
- Answering questions as they arise and to advise accordingly;
- Carrying out an Ecological Watching Brief (EWB) throughout the construction period;
- Raising Quality Alerts for any non-compliance with the ecological protocols;
- Reporting any changes to the site and compliance concerns to the Site Environmental Manager. If insufficient action is taken, stopping the works and reporting to Homes England;
- Liaise with the Site Environmental Manager and Homes and keep a site log. The site log will contain a log of daily activities, details of any recommendations made, details of any further actions required and with whom the responsibility for those action lies; and
- Provide periodic reports to Homes England and BCC with respect to the progress of works.

6.18 It is anticipated the production of the EMP (or inclusion of the EMP measures into the CEMP) will be secured by condition.

6.19 The ECOW or otherwise an experienced botanist should assess planting schemes before the designs are finalised to ensure appropriateness of species in respect to ecological objectives for habitat types, habitat conditions and species requirements, particular invertebrates.

## Grasslands

6.20 Retained and enhanced and newly created 'meadow' grasslands within the southern and eastern greenspace corridors should be designed and managed to maximise flora diversity and to maximise value to invertebrates. The long-term management plan to be produced in accordance with paragraph 6.10 will include a detailed enhancement strategy for retained grasslands and creation methods for new grasslands.

6.21 'Dry' meadow grasslands on the slopes of the drainage basins and around the drainage basins and 'wet meadows' should achieve a good target condition in accordance with the Biodiversity Metric 3 habitat condition assessment criteria:

- A minimum average of 9 species per square metre to be established and maintained (long-term targets should aim to achieve a species diversity mix at least equivalent to that present in field F6 with an average of at least 12 species per square metre);
- The appearance and composition of the vegetation closely matches characteristics of the specific grassland habitat type – 'other neutral grassland' g3c:

- Dry meadows to achieve g3c6 *Lolium-Cynosurus* neutral grassland “neutral grassland with a mixture of grass species including palatable grasses such as perennial rye grass and other grasses such as crested dog’s-tail and sweet vernal grass”;
  - Wet meadows to achieve g3c8 *Holcus-Juncus* neutral grassland “neutral grassland with Yorkshire fog and rushes dominant”;
  - Varied sward height (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) to create microclimates which provide opportunities for insects, birds and small mammals to live and breed;
  - Cover of bare ground not to exceed 5% including localised areas (note that invertebrate habitat features
- 6.22 The grassland habitat types recommended will comply with the assumptions made in the BNG Assessment (reported under separate cover) and will encourage a diversity of finer grasses that will deliver greater benefit for invertebrates.
- 6.23 Within the dry meadows, palatable species (rye grasses *Lolium* spp., white clover *Trifolium repens* or Timothy *Phleum pratense* should in combination be below 40% of the mix) with other grasses more prominent including crested dog’s-tail *Cynosurus cristatus*, meadow grasses *Poa* spp., common bent *Agrostis capillaris*, yellow oat-grass *Trisetum flavescens*, soft brome *Bromus hordeaceus* and sweet vernal *Anthoxanthum odoratum*. Total grass cover should be between 50% to 75%. Forbs associated with less fertile soils should be evident.
- 6.24 There should be natural transition on the slopes of the basin between the dry and wet meadows with a gradual increase in rushes *Juncus* spp., floating sweet-grass *Glyceria fluitans* and creeping bent *Agrostis stolonifera*.
- 6.25 Within the wet meadows there should be frequent to dominant cover of rushes *Juncus* spp, including soft *Juncus effusus*, hard *Juncus inflexus*, jointed rush *Juncus articulatus* and sharp flowered *Juncus acutiflorus*. Yorkshire fog *Holcus lanatus* should be evident and creeping bent and creeping buttercup *Ranunculus repens* are generally constant (although noting that creeping buttercup is identified as an ‘undesirable’ species in the Biodiversity Metric 3 habitat condition guidelines for ‘other neutral grasslands’).
- 6.26 Wet meadows in the basin floors should be designed with a varied ‘hummocky’ topography that will diversify habitat composition and structure. The design should include multiple small pools within each basin (at least 2 square metres) that would retain at least 10cm depth water on initial draw down following inundation and which would sustain standing water for longer periods. Relatively inconspicuous but ecologically valuable aquatic grasses, especially creeping bent and the sweetgrasses (*Glyceria* species) which provide good invertebrate habitats.
- 6.27 Landscaping in and around the drainage basins should avoid the use of nutrient rich topsoils and should avoid the use of fertilisers or biocides.

- 6.28 During establishment, controls of run-off from bare soils will be required. Base of slope drains should be incorporated to intercept run-off from the slopes.

### Trees and Woodland

- 6.29 Any impact upon veteran T6, located on the south edge of field F4, must be avoided. Potential risks include construction of a sustainable urban drainage basin, connection of this basin to the existing pipe network and construction of the proposed new cycle path. Detailed design stages must confirm layout and construction methods avoid impacts upon tree T6 and adjacent category A trees.
- 6.30 A detailed Arboricultural Impact Assessment (AIA) will be required at the detailed design stage to confirm appropriate avoidance and tree protection measures.
- 6.31 Appropriate tree protection measures will be implemented in accordance with current standards (BS 5837:2012) as recommended by the detailed AIA for all retained woodland, trees and hedgerows to avoid risk of incidental damage and disturbance to the habitats and the species they support during site clearance and construction.
- 6.32 The long-term management plan to be produced in accordance with paragraph 6.10 will include a detailed enhancement strategy for woodlands (and other areas of tall woody scrub if appropriate). This should be developed according to specialist arboricultural advice but should include measures to address the following ecological objectives to ensure 'good' condition in accordance with the Biodiversity Metric 3 habitat condition assessment criteria:
- Diversification of woodland structure – to maintain at least two and promote establishment of three classes (generally young (0-20 years), intermediate (21-150 years) and old (>150 years);
  - To maintain more than 80% native tree cover
  - Removal of invasive species
  - To promote natural woodland regeneration (seedlings, saplings and young trees 4-7cm diameter or advanced coppice regrowth);
  - To promote tree health (tree mortality <10%, no pests, diseases or crown die back);
  - To enhance ground flora to encourage persistence to ancient woodland indicator species and generate a recognisable woodland ground flora community;
  - Diversification of vertical structure to create at least three woodland storeys (e.g., ground flora, shrub layer and upper canopy);
  - To increase standing and ground dead wood through implementation of a dead wood management strategy.
- 6.33 Species diversification in the woodlands would ideally be promoted. Species with particular value to invertebrates and birds such as pedunculate oak *Quercus robur*, field maple *Acer campestre*, elm species *Ulmus* spp., willow species *Salix* spp., blackthorn *Prunus spinosa*, hawthorn *Crataegus monogyna* and hazel *Corylus avellana* should be considered.

- 6.34 Planting schemes should also consider, where appropriate, the inclusion of non-invasive non-native tree species that would contribute towards climate resilience and support for pollinators. This is likely to be more appropriate within the general landscape scheme and individual tree planting through the green infrastructure, rather than inclusion in enhancement strategies for woodlands (or gap planting or other enhancement measures for hedgerows).

### Hedgerows and Scrub

- 6.35 New hedgerow planting should seek to replace and maintain local ecological connectivity within and through the site. Hedgerow planting to maintain local ecological corridors should target:
- connection from the retained vegetation on the north boundary of field F4 to link towards the 'School Link'
  - connection between woodland W2 and the retained section of hedgerow H3
  - connections the east boundary of the site (from woodland W1 to Broomhill Road); and
  - any additional east-west connectivity that can be created, for example along the base of the retaining wall north of the western drainage basin.
- 6.36 Retained hedgerows and new hedgerows planted in ecological corridors should be retained and managed with a minimum 2m buffer to the hedgerow bases within which no development should occur.
- 6.37 New hedgerow planting in more formal settings, for example around play areas and open spaces, screening utility buildings/structures, screening car parks etc, should provide as great a buffer at the hedgerow base as possible. Ideally to both sides of the hedge but if constrained, maximising the buffer to one side of the hedge would, in most circumstances, provide greater benefit than small buffers to both sides.
- 6.38 These hedgerow buffers should comprise existing grassland and scrub habitats. Where compatible with adjacent land uses hedgerow buffers should be enhanced with wildflower and/or scrub planting and incorporation of dead wood features, butterfly/bee banks or other wildlife refuge feature to provide foraging opportunities for invertebrates and in turn provides food for bats, birds and other wildlife.
- 6.39 The species composition of the new hedgerows should be similar to that currently present, namely comprise a 'core' of blackthorn *Prunus spinosa*, hawthorn *Crataegus monogyna* and hazel *Corylus avellana*. All new hedgerows should also incorporate additional native woody species such that they would all be considered species rich (a minimum of 5 woody species within an average 30m length). Any gap planting or supplementary planting to retained hedgerows (subject to arboricultural advice) should also aim to increase woody species diversity).
- 6.40 Retained and new hedgerows should be enhanced with or planted to include species such as honeysuckle *Lonicera periclymenum*, old man's beard *Clematis vitalba*, dog

violet *Viola riviniana* elm *Ulmus* spp. and field maple *Acer campestre* to enhance foraging opportunities for invertebrate and bird species.

## Protected Plants

- 6.41 A method statement to identify measures to be implemented to minimise the loss of bluebells within the site will be produced to inform any future Reserved Matters application. Options may include, for example:
- translocation of hedgerow specimens or sections of hedgerow requiring removal, incorporating all basal vegetation, to suitable alternative locations (incorporated into new hedgerow planting or as part of woodland or scrub enhancements). Hedgerow translocation would include timings, appropriate methods of excavation, appropriate preparation of receptor locations and aftercare;
  - turf translocation from meadow areas affected by construction (notably field F4) to reuse in new landscaping, including slopes of the drainage basins. Turf translocation would include timings, appropriate means of recovering and, if required, storing turves, relaying turfs and appropriate aftercare;
  - translocation of individual specimens on a more localised basis;
  - bulb planting within the new landscape scheme, ensuring appropriately sourced native bulbs from sustainable sources.
- 6.42 It is also noted that one of the enhancement objectives for the woodlands is to improve ground flora communities. Translocation of bluebells into the woodlands would contribute towards this objective.
- 6.43 The long-term management plan to be produced for the site in accordance with paragraph 6.10 will ensure that grassland, woodland and hedgerow habitats supporting bluebells are managed appropriately to protect and maintain the integrity of the population.

## Non-Native Invasive Plants

- 6.44 Monitoring and treatment of invasive flora at the site will be ongoing in accordance with best practice as part of site maintenance operations. Subject to condition and extent at the time a planning application is to be made, an invasive species method statement will be produced that will detail further appropriate control or removal measures to be taken forward during development of the site.

## Fauna

### Amphibians and Reptiles

- 6.45 Phasing and construction programmes are currently unknown and therefore the options for slow worm protection cannot be confirmed at this Outline stage.
- 6.46 The landscape of the proposed development is considered to have capacity to sustain the onsite slow worm population. However, construction activities will put slow worms

at risk of killing and injury and therefore need to be removed from the construction footprint prior to works commencing. Slow worms excluded from the construction footprint would require suitable habitats to sustain the population until such time recolonisation into the new landscape is possible.

- 6.47 Preferably, slow worms will be retained on site if phasing of construction enables sufficient retained habitat to provide for the population at appropriate carrying capacity. For example, if construction and landscaping of the drainage basins is delivered in advance of the residential development and/or if phasing construction east to west enables a phased partial exclusion of slow worms to be implemented, allowing recolonisation into the landscape of a completed area of the site before exclusion from the next phase of development.
- 6.48 In the event that sufficient retained habitat capable of supporting the retained population in situ is unlikely to be available throughout the construction period, an offsite translocation scheme would be required. A suitable receptor site would be identified, with any habitat and reptile surveys completed as necessary to confirm suitability. As this is a legal compliance matter, these measures will be set out a method statement. The method statement shall include:
- identification of the receptor site(s) (on site and/or offsite) and confirmation of suitability to receive the slow worm population;
  - identification of any habitat enhancement or creation measures required at the receptor site(s) in advance of translocation;
  - programme for translocation, include any habitat establishment period that may be required to ensure appropriate carrying capacity;
  - identification of any exclusion measures either at the site or, potentially, at receptor sites to retain the population within target habitats until successful residency is confirmed;
  - programme for capture and release of slow worms, including methods of capture, means of determining appropriate point to cease captures, methods of transportation and release locations;
  - habitat management measures for on/offsite receptor habitats (including sensitive habitat management of greenspaces within the site)
  - programme for monitoring the translocated population to determine if translocation has been successful.
- 6.49 In addition, vegetation removal within the site should be timed to avoid the winter period when amphibians and reptiles will be unable to respond to danger. Vegetation removal that should avoid winter periods include dense scrub and trees and hedgerows, namely root balls.
- 6.50 To be compatible with measures to avoid disturbance of nesting birds (detailed below), it may be necessary to phase vegetation removal to remove all canopy vegetation capable of supporting nesting birds during the winter period and to remove all ground based vegetation and below ground features during late spring or summer.

- 6.51 Where ground vegetation obscures the ground, such that as yet undiscovered wildlife refuge features may be present, vegetation should be topped to 300mm to enable a search of the ground before completion of vegetation removal. A thorough hand search will be carried out by the environmental champion and if appropriate, subject to the nature of any wildlife refuge features identified, these should be dismantled and translocated to an undisturbed area of retained vegetation. Any animals found during this process should also be relocated.
- 6.52 Habitat design and long-term management should provide for slow worm, whether retained within the site during construction or allowed to recolonise from adjacent habitats. The new meadows created in the south of the site will provide ideal foraging opportunities for slow worm. A variety of other habitats including scrub, hedgerow bases, woodland edge, tussocky grassland will also be important for slow worms and enhancement of these features should be incorporated into the green infrastructure across the site. South facing hedgerows and other habitat features in particular should incorporate refuge opportunities (loggeries or rock piles, for example). Permeability measures to allow slow worms to take advantage of new gardens should also be implemented (as described for hedgehogs, below).
- 6.53 The slow worm mitigation and management method statement (for on and/or offsite mitigation) will be produced to inform any future Reserved Matters application. It is anticipated this will be secured by condition.
- 6.54 Measures to address protection of slow worm are anticipated to be appropriate to protect any terrestrial amphibians that may be presented within the site.

### **Breeding Birds**

- 6.55 The outgrown hedgerows and woodland habitats that would require removal to facilitate development present complex habitat which would not be effectively searched to check for the presence of nesting birds. Vegetation clearance in advance of development must be planned to avoid the nesting bird season (March to August inclusive).
- 6.56 Ideally, subject to build programmes and phasing, vegetation removal should be implemented in sequential winter periods in a staged manner that lessens the impact of habitat losses. Advanced planting should be implemented where possible to further reduce this effect. Planting should generally be planned for the earliest appropriate season within development areas as soon as infrastructure allows i.e., planting should not be left as a last measure but should be integrated into the new build as soon as possible with appropriate monitoring and aftercare.
- 6.57 In the event localised small scale vegetation requires removal which cannot avoid the nesting season, the vegetation must be subject to a nesting bird check prior to works commencing:

- The nesting feature will be checked by a suitability qualified ecologist no more than 24 hours prior to any clearance works;
  - If nests are identified, works must cease in that area and an appropriate buffer zone established around the nest until the young have fledged. The extent of the exclusion zone will depend upon the bird species present and will be advised by the ecologist. This will require monitoring of the active nest by an ecologist who will advise when works within the buffer zone can proceed;
  - If no active bird nests are found, vegetation clearance within the affected area must take place within 24 hours of completion of the nesting bird check. This will ensure that no bird nests are built within the intervening period between the nesting bird check and vegetation removal. If works are not completed within the 24-hour period, repeat nest checks will be required following the above protocol.
- 6.58 The landscape scheme should introduce a range of structure and forage availability for birds. Fruit and berry producing species (trees and scrub) will provide direct forage sources. Pollen and nectar producing species will attract invertebrates that will provide forage sources for birds, particularly during the nesting season. Seed producing species, from trees to grass, will provide further foraging opportunities.
- 6.59 The floors of the drainage basins should be designed with a varied topography, creating hummocks and pools that will function as a larger draw-down zone that will retain areas of standing water for longer periods. This will provide water sources for birds, provide sources of nesting material for some species and also will attract invertebrates which will create additional forage resources.
- 6.60 The new development should be provided with at least one of the following per new residential unit:
- Swift nest terrace – to be sited into (if integrated model) or onto the walls of new build apartments (or other suitably high build), preferably at or near the eaves and at least 5m above ground with a clear flight path;
  - House martin nest – to be sited directly under the eaves at a minimum height of 2m;
  - Swallow nest - to be sited under the eaves (leaving sufficient space for swallows to access the nest bowl) at a minimum height of 2m, preferably 3m;
  - House sparrow terrace or tower – to be sited into (if integrated model) or onto the wall of a building at a height between 2-5m;
  - ‘Open-front’ nest box suitable for wren (also robin and wagtails), either integrated or attached models, for either buildings (installed into new build) or trees (installed into suitable retained trees/mature hedgerows across the site);
  - Cavity nest box with either a 25mm entrance hole, 28mm entrance hole or 32mm entrance hole. An even mix in entrance hole dimensions should be achieved and should be suitable for either buildings (installed into new build) or trees (installed into suitable retained trees/mature hedgerows across the site).
- 6.61 In addition to the above nest box provisions:
- two owl nest boxes should be installed into suitable retained trees. At least one should be suitable for tawny owl, the second either tawny owl or little owl. Owl boxes

should be sited at least 4m above ground, with the entrance facing away from prevailing winds. The southern boundary presents greatest opportunity. Arboricultural advice should be sought with regards installation to avoid adverse impact upon the integrity of the tree;

- hedgerows and vegetated boundaries to the west, south and east of the site should include roost features to encourage bird nesting or provide winter roost opportunities, for example brushwood style roosting pockets or hangers. Ecological advice should be sought regarding model/design prior to purchase. An average of three roost features should be provided per hedgerow / field edge and for the Cycle Link (i.e., a total of at least 36 roost features);
- brash piles and grass piles using arisings generated initially from site clearance activities and then from ongoing landscape management should be created in discrete areas across the site to provide sources of nesting materials, as well as creating wildlife shelters for invertebrates and small mammals;
- every new residence should be provided with either (a) 'seedballs' or a 'seedbomb' from a sustainable source (UK origin) to promote inclusion of wildflowers in private gardens suitable for butterflies, bees or birds; or (b) a bird feeder (filled with feed), either sunflower or niger seed, peanut or suet (fat ball/cake) variety. This should be accompanied by an advisory leaflet with hints and tips on how to provide forage and nesting resources for wild birds. Ideally, this scheme would also be extended to immediate neighbours around the site (those with gardens adjacent).

6.62 Models of nest boxes made from sustainable materials that provide extended lifespan should be selected. Nest box models should be verified by an ecologist to ensure the model has appropriate dimensions, access holes and other suitable specification to maximise likelihood of attracting the target species. Nest boxes should ideally have access panels to allow cleaning. Nest boxes should preferably be sited to avoiding areas that are exposed to strong sunlight or prevailing winds.

6.63 A mitigation and management method statement, including details confirming numbers, models, installation methods and locations of the above measures will be produced to inform any Reserved Matters application. It is anticipated this will be secured by condition.

## **Invertebrates**

6.64 To address the effects of habitat loss for invertebrates, the following recommendations are made:

- As the amount of habitat lost under the proposals is considerable, biodiversity off-setting should form a major part of the mitigation package.
- Retain hedgerows and mature trees as far as is possible within the site and leave a margin of 3m where possible (2m minimum), which should be mown annually with the cut grass removed. Any south-facing hedgerows are particularly important for invertebrates. Hedges should be cut on a three-year rotation, cutting only one side of a hedge in a single season (or both sides but no more than one third of the hedge) to allow recolonisation by invertebrates. Hedge cutting should take place in late winter.

- Encourage planting of blackthorn *Prunus spinosa*, hawthorn and willow *Salix* spp. as part of any tree/hedgerow planting programmes, in order to provide sources of early blossom for pollinators. Field maple *Acer campestre* should also be included in the planting scheme.
- Hedge and woodland groundflora should include dog-violet *Viola riviniana* within sheltered and semi-shaded areas at hedgerow bases and within woodlands W2 and W3.
- Habitat connectivity should be a major consideration in the design, linking areas of similar habitat across the site to allow the spread of insects and reduce any negative effects of local extinctions on overall populations.
- Increase the structure and substrate diversity within green spaces:
  - Increase the amount of bare ground and short areas of vegetation within the site, including exposed banks and stony ground;
  - create banks next to footpaths and, where appropriate, next to hedgerows and scrub banks;
  - include traditional stone and earth walls within the development where possible, e.g., along roads, particularly in south-facing aspects, and plant with low-growing nectar sources.
- Areas of retained meadowland should be cut no earlier than September and on rotation, cutting every two or three years but never all areas in one season, in order to ensure survival of species that overwinter in dead flowerheads. A mosaic of sward heights should be maintained, including 5-15cm and more than 15cm. Cutting on rotation will help to maintain variance in sward height.
- Soil trampling, compaction and erosion will occur within the site as a result of increased recreational pressure, which may result in changes to soil invertebrate communities and overall reduction in abundance/diversity of such. This may be minimised through the use of footpaths, tracks and fence lines to channel access, as well as using natural barriers such as scrub/hedgerows to limit human access to key habitat areas;
- Standing and fallen deadwood is an important resource for invertebrates and should be maintained within the development as much as possible by leaving dead branches on trees and not removing old tree trunks or stumps. Deadwood piles should be created from any scrub that is removed. These should be created in partial shade to provide optimal conditions for invertebrates;
- There is growing concern about the impacts of artificial light upon invertebrate communities and increasing evidence of negative effects from such light sources. The ways in which light may impact upon invertebrates are varied, including mortality through impact with the light source itself, increased predation by bats of insects attracted to light, changes in behaviour of adults or night-feeding larvae, which in turn may impact upon breeding success, etc. Light pollution within the development has the potential to have a significant impact upon the insect population. The impact can be reduced by minimising lighting within the development, minimising the number and wattage of bulbs, avoiding lights with a high UV component, not allowing light to be emitted at angles greater than 70°, and use of time switches to introduce lighting curfews, as well as designating dark sky areas where no lighting is included. Recent research has demonstrated that abundance of moth caterpillars in hedgerows under

LED streetlamps was 52% lower than in unlit areas, compared to 41% lower in hedgerows lit by sodium lighting; in grass margins caterpillar numbers were a third lower in LED lit areas than in unlit areas (Boyes et al., 2021). The authors suggest dimming and filtering of blue wavelengths of light to reduce impacts;

- In areas of newly planted grassland use commercial or locally appropriate bespoke seed mixes contains species that are particularly attractive to pollinators, as well as some of those identified as being of particular importance for some of the more significant species recorded during the survey programme. One such suggested commercially available mix includes:

<https://www.bostonseeds.com/products/wildflowers-seed/wildflower-seed-mixtures-20/bsbm-butterfly-bee-wildflower-seeds.html>

- Encourage the presence of ragwort within the site and do not carry out control of this species as it is a valuable nectar source for insects;
- Design all but the most formal open spaces to maximise floral diversity for pollinators – introduce ‘flowering lawns’ to play areas and open spaces, which have high species diversity (averaging at least 9 per square metre) that tolerate regular mowing (to 40cm). Introduce beneficial management practices to these spaces such as ‘no mow May’, which could be on rotation through the site, to maintain foraging resources;
- Avoid planting of buddleia species as whilst it provides a short-term nectar source it can be invasive, and it offers little value for invertebrates when not in flower;
- Provision of new waterbodies in the form of ponds, ideally a complex of ponds, of varying size and depths with shallow sloping sides leading to deeper areas. The floors of the drainage basins create a good opportunity to create a range of shallow water areas by introducing a hummocky profile that will create draw-down zones with some areas retaining water for longer periods;
- The provision of brown roofs on buildings to help compensate for habitat loss. Design should follow that of Buglife:
 

[https://cdn.buglife.org.uk/2019/07/Creating-Green-Roofs-for-Invertebrates\\_Best-practice-guidance.pdf](https://cdn.buglife.org.uk/2019/07/Creating-Green-Roofs-for-Invertebrates_Best-practice-guidance.pdf)
- The translocation of meadow ant nests should be considered. Translocation to suitable retained greenspace in the south of the site would be preferable. However, in the event an offsite slow worm translocation scheme is required, translocation of the ant nests to the slow worm receptor site could be a consideration, as this will also provide over-winter habitat opportunities for slow worms.

- 6.65 A mitigation method statement, including landscaping details confirming numbers, models, installation methods and locations of the above measures will be produced to inform any Reserved Matters application. It is anticipated this will be secured by condition.

## Badgers and Hedgehogs

- 6.66 Information relating to badgers has been redacted.
- 6.67 A mitigation and management method statement will be produced that identifies measures to protect hedgehogs and other mammals during construction. This

method statement will be produced to inform any future Reserved Matters application. This is anticipated to be secured through planning condition.

- 6.68 During construction, trenches and other excavations will be covered at the end of each working day, or they will include a means of escape for any animal falling in. This will comprise secured wooden boards or an earth ramp no steeper than a 40° angle. Excavations will be checked at the end of each working day to ensure either excavations are covered, or that this provision is made for animals to escape. Excavations will be checked each morning to ensure no wildlife has become trapped within.
- 6.69 Measures described at paragraphs 6.49 to 6.51 (timing ground clearance to avoid winter) will also protect hedgehogs from killing or injury during winter periods, when hedgehogs will be hibernating and therefore unable to respond to danger.
- 6.70 Hedgehogs need easy and safe access over a large area, but fences, walls and other barriers reduce the habitat available to them and force them into dangerous situations such as crossing roads. Linking open spaces with access gaps provides valuable habitat links for hedgehogs.
- 6.71 All garden perimeters, if fenced or walled, should provide permeability for hedgehogs. All fences should include 13cm diameter holes in the bottom of fences (at ground level) to allow hedgehogs and other small mammals to pass freely through the completed development.
- 6.72 Any vertical step changes within the site (retaining walls) that represent a significant barrier to hedgehog movements from one area of the site to another should ideally have wildlife ramps or other means of safe wildlife access integrated into their design. Preferably, all retaining walls, certainly those within/facing public realm, should be designed as living walls to provide wildlife cover. This would also offer additional forage resources for invertebrates and, potentially, additional nesting resources for birds. Living walls may be created either as a living façade or by planting climbers and other appropriate spreading vegetation at the base of the wall.
- 6.73 Boxes for hedgehogs could also be provided within the bases of suitably located hedgerows and, potentially, provided in private gardens to create safe refuge and potential hibernation sites.

## **Bats**

- 6.74 All trees within the site confirmed to require removal at the detailed design stage will be subject to repeat inspection by a licensed bat ecologist to determine suitability for roosting bats.
- 6.75 Prior to removal of tree G24.1, and any other tree identified pre-construction to possess PRF and for which removal may be unavoidable, the tree will be inspected by a licensed bat ecologist. An appropriate felling strategy will be proposed according

to the findings of the inspection. During the felling process, any sections of the tree with PRF should be carefully lowered to the ground using ropes. The section of the tree should be laid on the ground with the potential roost feature facing upwards for at least 24 hours, to give chance for any bats that may have remained undiscovered by the PRF inspection to safely vacate the tree. In the unlikely event a bat roost is confirmed by the inspection and alternative measures to retain the tree in situ remain unavailable, a licence from Natural England would be obtained to permit removal of the tree supporting the bat roost.

- 6.76 Any pruning or other tree works with potential to disturb or remove PRF on retained trees will be subject to these same measures described for G24.1. Cutting through PRFs should be avoided during the pruning process.
- 6.77 For each tree to be removed and which possesses PRF, three bat boxes will be installed onto suitable retained trees prior to tree felling commencing. The three bat boxes will be installed onto one or at most two trees, at least 3m above ground and facing different aspects (south-west, south-east and north). The models of the bat boxes will be suitable for pipistrelle bats, natterer's or Daubenton's bats and noctule or serotine bats. The same model should not be sited with the same orientation, in the event multiple trees are selected for bat box installation.
- 6.78 Fragmentation effects of the primary bat commuting corridor should be minimised by a combination of minimising the break required through hedgerows to carry the Primary Street (e.g., minimising carriageway width, separation of footpaths from the carriageway etc) and ensuring landscape designs maintain or replace canopy connectivity in these locations. Ground based shrub or scrub vegetation should also be continued as close to the road edge as possible.
- 6.79 While indicative, the Illustrative Masterplan incorporates an apartment block with a brown roof adjacent to a new species hedgerow to the east of woodland W2 and west of trees T20/T21. These measure or similar would help to reduce fragmentation effects for bats, creating a corridor between the hedgerow and apartment block and stepping stone habitat around trees T20/T21 to link with the retained section of hedgerow H3, in addition to providing habitats attractive to invertebrates to promote prey availability for bat foraging. Detailed landscape design should replicate this layout or provide suitable alternatives to ensure dark habitat linkages are provided between woodland W2 and the retained section of hedgerow H3.
- 6.80 Light mitigation measures will be required within the new development. Details of such measures will be set out in a Lighting Mitigation Strategy to inform any future Reserved Matters application. This is anticipated to be secured by condition.
- 6.81 The light mitigation measures will need be informed by a Lighting Impact Assessment (requiring a baseline light survey and the detailed lighting scheme). At this Outline

stage, it is anticipated the following light mitigation measures are likely to be appropriate:

- No new artificial lighting should be introduced within the southern greenspaces of the site, including the wet meadows within the sustainable drainage basins and the retained hedgerows and vegetation along the southern boundaries;
- No lighting should be implemented along paths through the Cycle Link or through the southern or eastern greenspace corridors. In the event lighting cannot be avoided in the Cycle Link (to comply with BCC standards), lighting should be designed with motion sensors and timers to limit the duration and extent of lighting to the immediate need of the user;
- New hedge and tree planting along the east boundary should be implemented to increase habitat connectivity and deliver light screening for the habitats within the site from existing lighting on Bonville Road;
- New street trees should be positioned in locations that assist screening of important bat commuting routes or foraging habitat from light disturbance effects.

6.82 Sensitive lighting design will also be required as part of the Lighting Mitigation Strategy to avoid indirect impacts of lighting on nocturnal and crepuscular species within the completed development. There are four key lighting design principles:

- Spatial spread of lighting – the horizontal and vertical spread of artificial light will be minimised and will take into account both primary and reflected light sources.
- Directional lighting should be designed into the luminaire and specifically angle and orientation of beam – while mitigation can be achieved by use of a retro-fitted cowl, louvre or other light shield, or a combination of these, these latter measures are considered ‘last resort’ only where integral design measures remain insufficient to adequately mitigate impacts;
- Timing and duration of lighting – timers and bespoke dimming regimes may be used to ensure that luminaires are reduced at times of predicted low use. These can be set to change with the seasons and therefore reflect the shifting time of dusk and dawn throughout the year. Motion sensors provide further control to ensure that areas are illuminated only when required. In particular, use of motion sensors and timers are recommended for the Cycle Link (located within Brislington Meadows SNCI) in the event that lighting of this route cannot be avoided.
- Intensity and colour of lighting – light intensity will be as low as possible whilst meeting the objectives of the intended function. The colour of lighting will need to take into account the sensitivity of the ecological receptors on site. Light sources selected should emit zero ultra-violet light wherever possible. Guidance from the Institute of Lighting Professionals and the Bat Conservation Trust (2018)<sup>6</sup> recommends that white and blue spectrum light should be avoided or, where white lights are required, these should be of warm/neutral colour (below 3000K, preferably 2700K) and have a peak wavelength above 550 nanometres. Narrow spectrum light sources should be used (to lower the range of species affected by lighting).

<sup>6</sup> ILP and BCT (2018) Guidance Note 08/18 Bats and artificial lighting in the UK Bats and the Built Environment series. Institution of Lighting Professionals, Warwickshire

- 
- 6.83 Ideally, the lighting along Bonville Road adjacent to the site would be subject to review as part of the Lighting Mitigation Strategy and remedial design measures (or replacements) proposed to further reduce light disturbance on the eastern greenspace corridor and habitats in the southeast of the site.
- 6.84 Providing continuous habitat linkages are maintained and appropriate lighting mitigation is implemented to avoid disturbance or fragmentation of foraging habitats and commuting routes, the habitat measures described in the preceding sections for grassland, hedgerows and invertebrates would sustain the local bat populations currently utilising the site.
- 6.85 Installation of bat boxes on buildings and retained trees is also recommended to enhance the roost opportunities available to bats. For every two residential units, one bat box suitable for either pipistrelles, Myotis species or large bat species (noctule, Leisler's or serotine) should be incorporated into the new build or landscape. Bat boxes should be installed ideally at 3m above ground level and should provide a variety of aspects. If installed on trees, two or three may be installed per tree. Arboricultural advice should be sought for selecting and installing bat boxes into trees.



## Annex 1

### Great Crested Newt Habitat Suitability Index Assessment

## BRISLINGTON MEADOWS: GREAT CRESTED NEWT HABITAT SUITABILITY INDEX ASSESSMENT

### Pond 1: Broomhill Junior School (OSGR ST62667115)

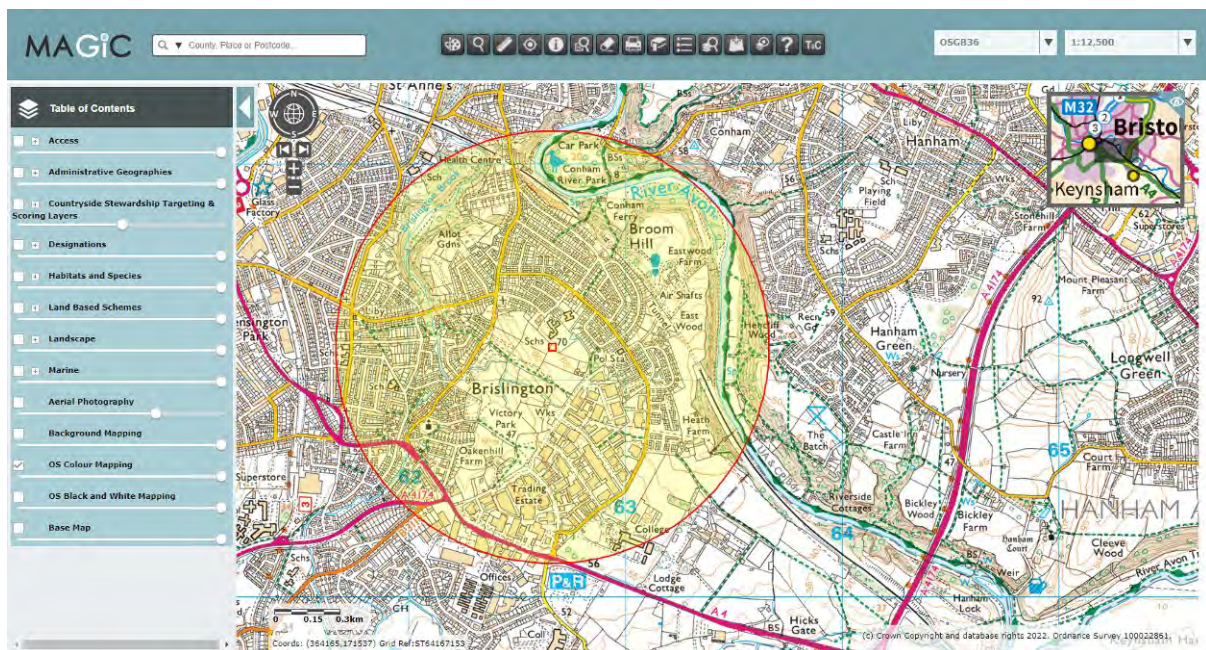
#### Pond Description

Not directly accessible for survey as located within school grounds. Viewed from boundary with field F5 within the site.

Small artificially lined (butyl liner) pond located in area formerly comprising scrub. Appears to be a relatively young pond, used for education purposes. Approximately 8m x 3m. Limited mix of emergent, floating, submerged aquatic vegetation but in combination likely to average around 70% of pond area. Vegetation could overtake the small pond, although pond dipping activities are likely to maintain a small area of open water. Flagstones at one end provide a dipping/viewing platform. Pond is shaded by surrounding trees along school boundary and hedgerow planting which screens the pond from the adjacent school playing fields.



## Pond Location and 1km Radius



## Habitat Suitability Index Calculation

SI Ref	Description of Index	Measure	SI Score
SI1	Geographic Location	A	1.00
SI2	Pond Area	<50m <sup>2</sup>	0.05
SI3	Pond permanence	Never dries (artificially lined with butyl)	0.90
SI4	Water quality	Moderate	0.67
SI5	Shading	Pond situated in tree lined enclosure with 1-2m margin to hedge/tree perimeter of enclosure. Shading 100%	0.20
SI6	Presence of waterfowl	Absent (too small)	1.00
SI7	Presence of fish	Absent (artificially lined, no hydrological linkages, unlikely to have been stocked by school)	1.00
SI8	Pond Density in area	One other pond (also poor) located in pony paddock at Oakenhall Farm	0.38
SI9	Terrestrial Habitat Quality	Poor = estimated 35ha (11%) terrestrial habitat (excluding gardens) within 1km without barriers	0.33
SI10	Macrophyte cover in pond	70% (likely to be higher when plants fully established, if not controlled in such a small pond)	1.00
	Overall HSI for pond	Poor	0.49

## Pond 2 – Oakenhill Farm Pond (OSGR ST62497064)

### Pond Description

Not directly accessible for survey as located on third party land but viewed from public footpath.

Very small heavily poached pond located in field edge within pony grazed paddock. Very shallow water present in early spring but pond will dry out every year. Unlikely to support amphibian breeding except potentially common frog and even then tadpole development and juvenile recruitment are unlikely to be successful. Very shallow. No emergent, floating or marginal vegetation present. Standing water area at time of assessment (April) approximately 2m x 3m.



## Pond Location and 1km Radius



## Habitat Suitability Index Calculation

SI Ref	Description of Index	Measure	SI Score
SI1	Geographic Location	A	1.00
SI2	Pond Area	<50m <sup>2</sup> (estimated 6m <sup>2</sup> )	0.05
SI3	Pond permanence	Annually dries (heavily poached)	0.10
SI4	Water quality	Poor (heavily poached)	0.33
SI5	Shading	Pond situated in field corner under scrub and tree line. Not visible on aerials. Shading likely averages 90% depending on time of day	0.40
SI6	Presence of waterfowl	Absent (too poached & shallow)	1.00
SI7	Presence of fish	Absent (too poached & shallow)	1.00
SI8	Pond density in area	One other pond (also poor) located in pony paddock at Broomhill Junior School	0.38
SI9	Terrestrial Habitat Quality	Poor = estimated 35ha (11%) terrestrial habitat (excluding gardens) within 1km without barriers	0.67
SI10	Macrophyte cover in pond	0% (heavily poached)	0.30
	Overall HSI for pond	Poor	0.35

### Other Water Features: Allotments off School Road (Not Suitable for HSI)



## Drawings

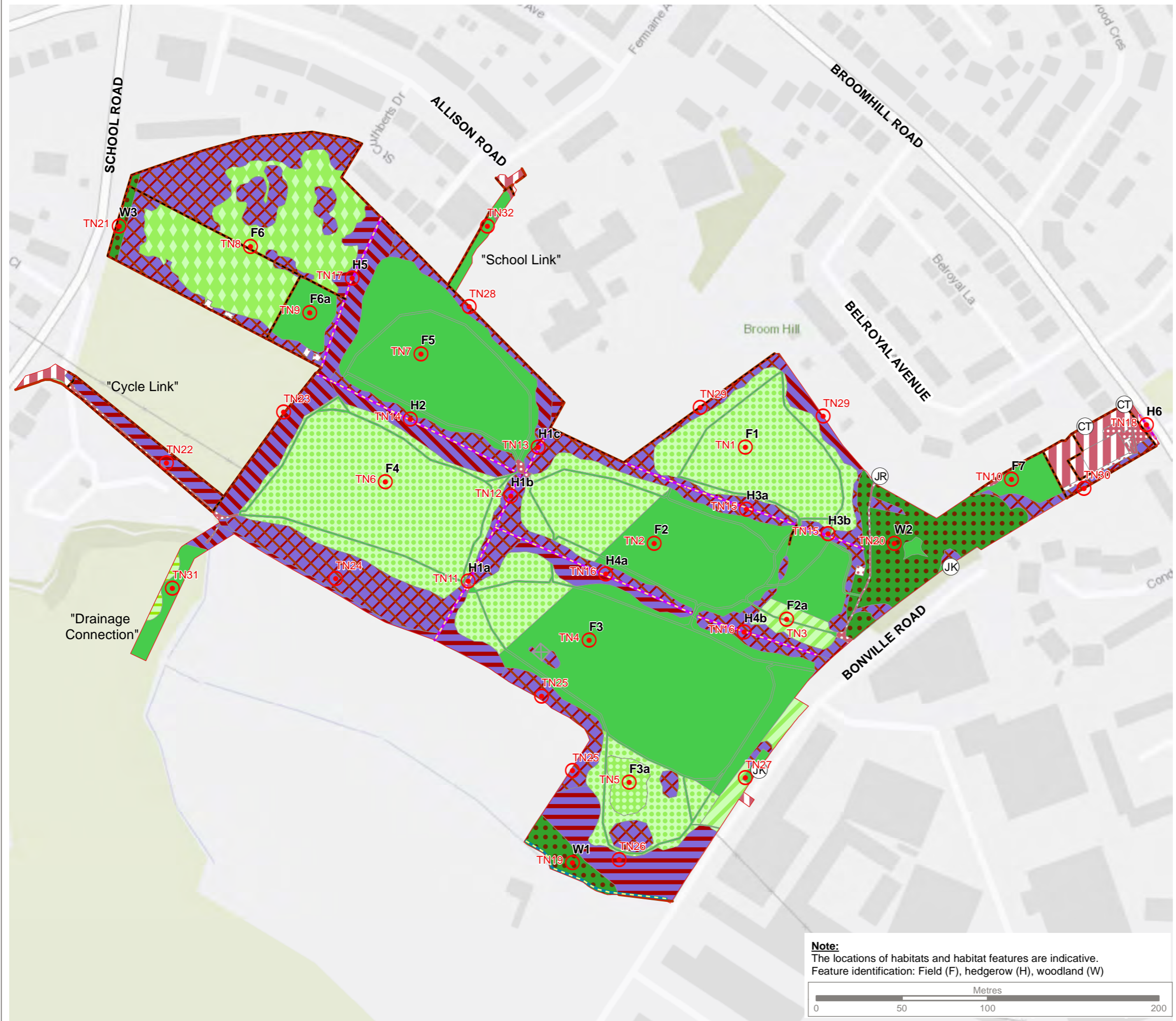
G7507.20.011 Baseline Habitats

G7507.20.012 Baseline Habitat Condition

G7507.20.061 Proposed Habitats

G7507.20.062 Proposed Habitat Condition

G7507.20.063 Predicted Habitat Impacts



**KEY**

- Site boundary
- Target Note (TN)
- Schedule 9 Non-native Invasive Plants**
  - Cotoneaster (*C. horizontalis*)
  - Japanese knotweed (*Fallopia japonica*)
  - Japanese rose (*Rosa rugosa*)
- Habitat Survey (UKHab)**
  - h2a - Hedgerow (priority habitat)
  - r2b - Other rivers and streams
  - u1e(68) - Urban linear feature - wall
  - u1e(69) - Urban linear feature - fence
  - g3 - neutral grassland
  - g3c - Other neutral grassland
  - g3c5 - Arrhenatherum neutral
  - g3c6 - Lolium-Cynosurus neutral grassland
  - g3c8 - Holcus-Juncus neutral grassland
  - g4 - Modified grassland
  - h3a6 - Other blackthorn scrub
  - h3d - Bramble scrub
  - h3h - Mixed scrub
  - u1b - Developed land, sealed surface
  - u1b5 - Buildings
  - u1c - Artificial unvegetated unsealed
  - w1g - Other woodland, broadleaved

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Rev	Description	Drawn	Approved	Date



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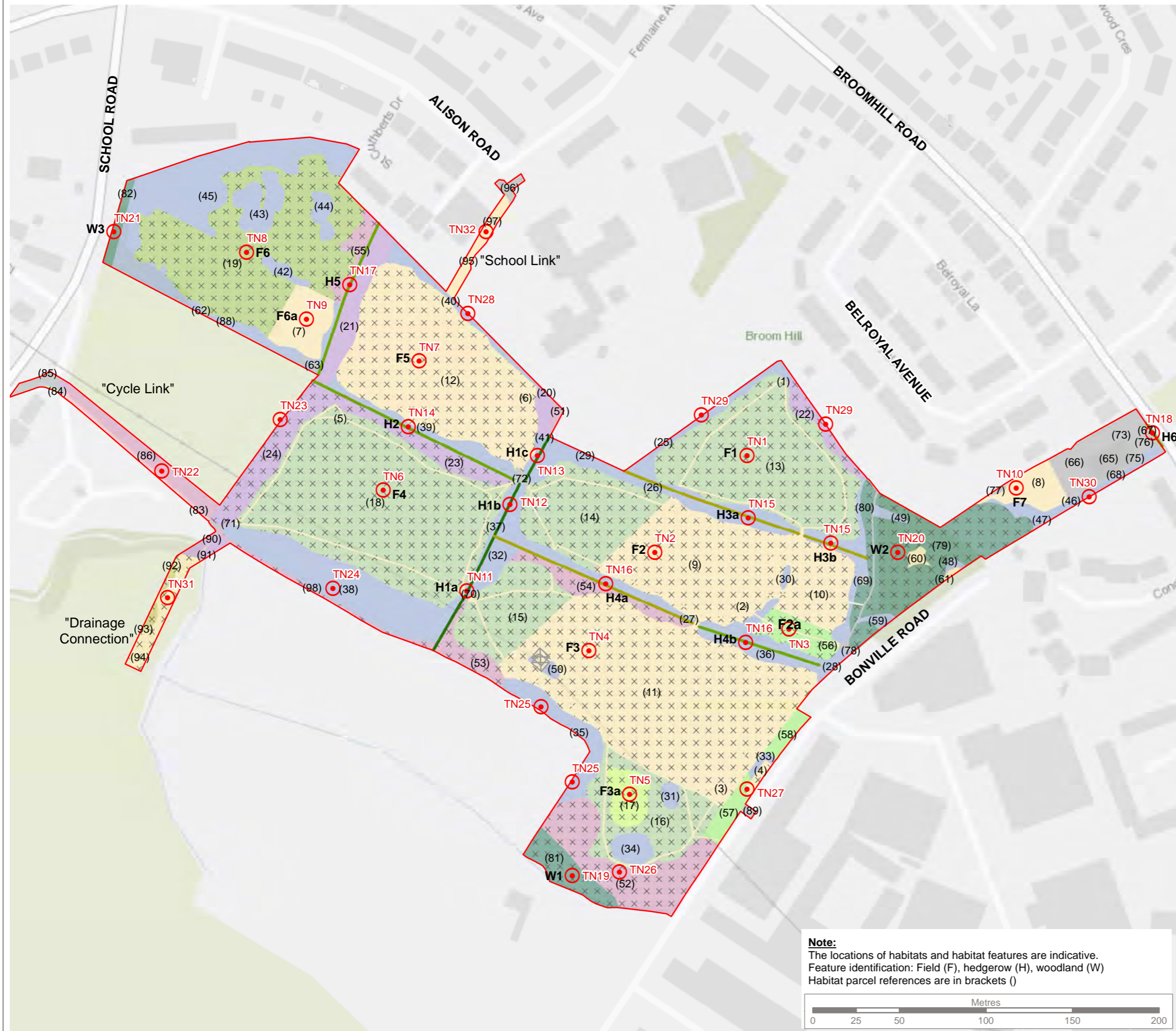
Genesis Centre, Birchwood Science Park, Warrington WA3 7BH  
Tel 01925 844004 e-mail tep@tep.uk.com www.tep.uk.com

Project  
Brislington Meadows

Title  
Habitats Baseline

Drawing Number  
G7507.20.011

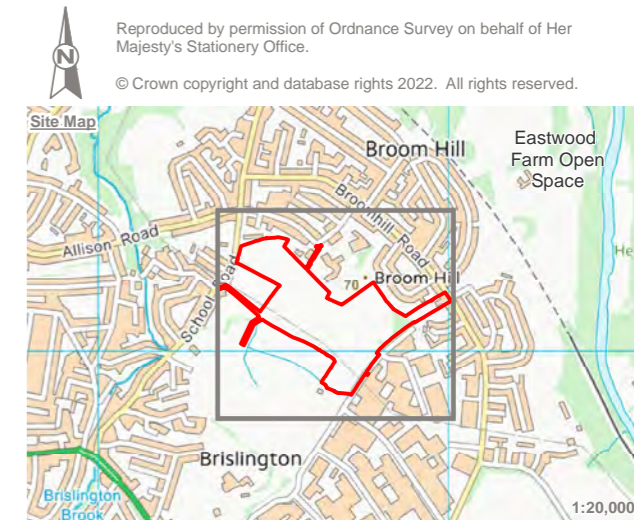
Drawn	Checked	Approved	Scale	Date
RR	CB	VG	1:2,250 @ A3	22/02/2022



**Note:**  
The locations of habitats and habitat features are indicative.  
Feature identification: Field (F), hedgerow (H), woodland (W)  
Habitat parcel references are in brackets ( )

**KEY**

- Site boundary
- Target Note (TN)
- h2a - Hedgerow (priority habitat)**
  - Good condition
  - Moderate condition
  - Poor condition
- g3 Grassland - neutral grassland (ephemeral, tall ruderal, non-native)**
  - Moderate condition
  - Poor condition
- g3c Grassland - other neutral grassland**
  - Moderate condition
- g3c5 Grassland - Arrhenatherum neutral grassland**
  - Moderate condition
- g3c6 Grassland - Lolium-Cynosurus neutral grassland**
  - Moderate condition
- g3c8 Grassland - Holcus - Juncus neutral grassland**
  - Moderate condition
- g4 Grassland - modified grassland**
  - Moderate condition
  - Poor condition
- h3a6 Heathland and scrub - other blackthorn scrub**
  - Moderate condition
  - Poor condition
- h3d Heathland and scrub - bramble scrub**
  - Poor condition
- h3h Heathland and scrub - mixed scrub**
  - Moderate condition
  - Poor condition
- w1g Woodland and forest - other broadleaved woodland**
  - Moderate condition
  - Poor condition
- u1c Urban - artificial unvegetated unsealed surface**
  - Poor condition
- u Urban (other types)**
  - no assessment required



Rev	Description	Drawn	Approved	Date



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Tel 01925 844004 e-mail tep@tep.uk.com www.tep.uk.com

Project  
**Brislington Meadows**

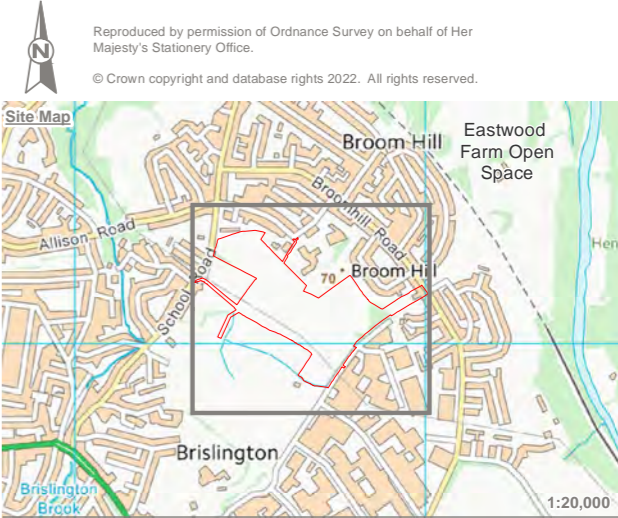
Title Habitat Condition Assessment (applying Natural England Biodiversity Metric 3.0 Technical Guidance)				
Drawing Number G7507.20.012				
Drawn RR	Checked CB	Approved VG	Scale 1:2,250 @ A3	Date 22/02/2022



**KEY**

- Site boundary
- Extent of residential development (circa 5.12ha) and indicative routes for primary street (from Land Use Parameter Plan LDA Dwg No 7456\_103 v7)
- Proposed Habitats (UKHab)**
  - g3c - Other neutral grassland
  - g3c8 - Holcus-Juncus neutral grassland (boardwalk oversailing)
  - g3c8 - Holcus-Juncus neutral grassland
  - g4 - Modified grassland
  - h3h - Mixed scrub
  - u1 - built-up areas and gardens
  - u1b - Developed land, sealed surface
  - u1b5 - Buildings
  - u1b5 - Buildings with brown roofs
  - u1c - Artificial unvegetated unsealed surface
  - w1g - Other woodland, broadleaved
  - h2a - Native hedgerow (priority habitat)
  - Indicative new tree planting (urban trees)

**Note:**  
The locations of habitats and habitat features are indicative. Individual tree retention is not identified on this plan - refer to Outline Arboricultural Impact Assessment (TEP Ref 7507.21.001) and Landscape Parameter Plan (LDA Design Dwg No 7456\_102v7)



Rev	Description	Drawn	Approved	Date



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Genesis Centre, Birchwood Science Park, Warrington WA3 7BH  
Tel 01925 844004 e-mail tep@tep.uk.com www.tep.uk.com

Project  
Brislington Meadows

Title  
Proposed Development (7456\_017ZA\_Capacity Study\_Ecology Markup ZA) - Proposed Habitats

Drawing Number  
G7507.20.061

Drawn	Checked	Approved	Scale	Date
SA	RAR	FBH	1:2,250 @ A3	02/03/22



**KEY**  

Site boundary

**g3c Grassland - other neutral grassland**  
 Good condition  

×

 Moderate condition

**g3c8 Grassland - Holcus - Juncus neutral grassland**  
 Good condition

**g4 Grassland - modified grassland**  

×

 Moderate condition  
 Poor condition

**h3h Heathland and scrub - mixed scrub**  
 Good condition  

×

 Moderate condition  
 Poor condition

**w1g Woodland and forest - other broadleaved woodland**  
 Good condition  

×

 Moderate condition

Extent of residential development (circa 5.12ha) and indicative routes for primary street (from Land Use Parameter Plan LDA Dwg No 7456\_103 v7)

**u Urban (other types)**  
 Artificial surfaces (sealed / unsealed)  
 Vegetated garden (poor condition)

**u1b Urban - buildings**  
 Brown roof (moderate condition)  
 Other buildings

**h2 Hedgerows**  
 Good condition (retained and proposed)  
 Moderate condition (retained, enhanced and proposed)  
 Poor condition (retained)

**Note:**  
The locations of habitats and habitat features are indicative. Individual tree retention is not identified on this plan - refer to Outline Arboricultural Impact Assessment (TEP Ref 7507.21.001) and Landscape Parameter Plan (LDA Design Dwg No 7456\_102v7)

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Rev	Description	Drawn	Approved	Date

TEP

THE ENVIRONMENT PARTNERSHIP

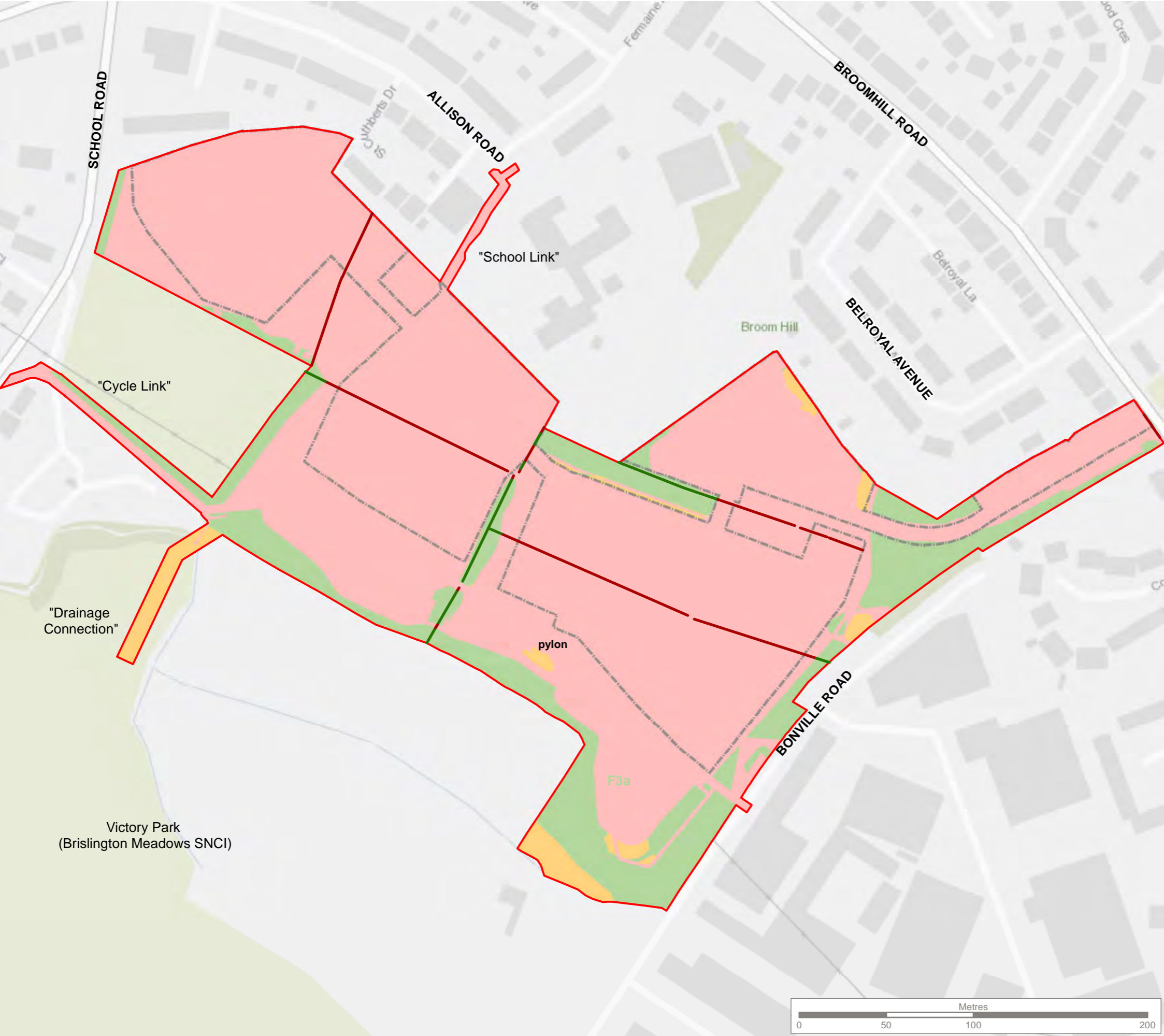
Genesis Centre, Birchwood Science Park, Warrington WA3 7BH  
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Project  
Brislington Meadows

Title  
Proposed Development (7456\_017ZA\_Capacity Study\_Ecology Markup ZA) - Predicted Habitat Condition

Drawing Number  
G7507.20.062

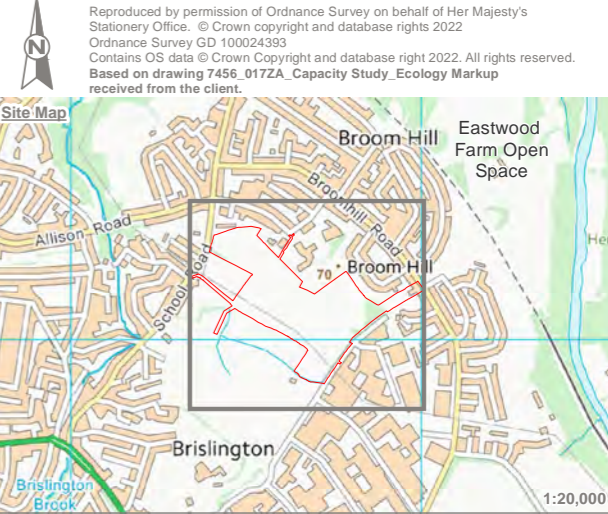
Drawn	Checked	Approved	Scale	Date
RAR	CB	FBH	1:2,250 @ A3	02/03/2022



**KEY**

- Site boundary
- Extent of residential development (circa 5.12ha) and indicative routes for primary street (from Land Use Parameter Plan LDA Dwg No 7456\_103 v7)
- Predicated Habitat Impact**
  - Temporary & Permanent Loss - 7.8ha (81%)
  - Habitats retained - 0.28ha (3%)
  - Retained habitats enhanced - 1.53ha (16%)
- Native hedgerow to be removed - 525m (74%)
- Native hedgerow to be retained/enhanced - 185m (26%)

**Note:**  
The locations of habitats and habitat features are indicative. Individual tree retention is not identified on this plan - refer to Outline Arboricultural Impact Assessment (TEP Ref 7507.21.001) and Landscape Parameter Plan (LDA Design Dwg No 7456\_102v7)



Rev	Description	Drawn	Approved	Date



**THE ENVIRONMENT PARTNERSHIP**  
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Project Brislington Meadows				
Title Proposed Development (7456_017ZA_Capacity Study_Ecology Markup ZA) - Predicted Temporary and Permanent Habitat Loss				
Drawing Number G7507.20.063				
Drawn RAR	Checked CB	Approved FBH	Scale 1:2,250 @ A3	Date 02/03/2022



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