

8

Ecology and Biodiversity



Broadnook Garden Suburb

Environmental Statement

8.0 Ecology and Biodiversity

8.1 Introduction

- 8.1.1 This chapter has been produced by WYG. It assesses the effect of the proposed development on the existing ecology and nature conservation at the application site. It should be read in conjunction with the drainage and flood risk chapter and the separate document “Green Infrastructure Strategy”.
- 8.1.2 The site is currently predominantly intensively farmed: mainly arable with some species-poor sown grassland, three blocks of mature plantation woodland of which the largest is Broadnook Spinney, eight waterbodies and small areas of ruderal and ephemeral vegetation. The fields are divided by hedgerows of which three have been assessed as species-rich.
- 8.1.3 A desk study comprising a search for existing flora and fauna data records via consultation with statutory and non-statutory nature conservation organisations is incorporated into the appraisal.
- 8.1.4 The assessment is based on a series of field-based surveys carried out during 2013, some of which were subsequently updated in 2015, and supplemented in 2016 to assess the habitats present and to obtain faunal data. The range and extent of survey has been agreed with the Borough Council as part of the Environmental Statement (ES) Scoping process. Surveys include;
- extended Phase 1 Habitat Survey including hedgerow survey
 - great crested newt survey
 - bat activity surveys
 - badger survey
 - reptile presence/absence survey
 - breeding bird surveys
 - two wintering bird surveys
- 8.1.5 The surveys covered the area within the red line application boundary together with some additional areas beyond that, to the east of the A6 north and south of the A46. This assessment has considered the potential effects of the proposed development on the existing habitats and species which are present or known to utilise the application site and wider study area for foraging, dispersal or shelter; and any effects on any statutory and non-statutory designated sites.
- 8.1.6 The surveys have been utilised positively as part of an iterative design process to inform decisions on the development extent and structure in order to safeguard and enhance biodiversity and nature conservation interest wherever possible. The Masterplan has been reviewed and revised in response to dialogue and discussion – for example a significant area of land is identified within the proposed development area for nature conservation priorities and at a landscape scale to provide new and enhanced habitat and for connectivity. Our initial Ecological Constraints and Opportunities Plan (ECOP) and our updated ‘Informed’ ECOP are discussed in Section 8.6 and both included in **Appendix 8.3** to illustrate how these factors have informed the layout of the development.

8.1.7 Mitigation measures are identified as appropriate as well as ecological enhancement proposals to ensure a nett gain in green infrastructure and biodiversity. The Garden Suburb character of the proposal by its very nature incorporates very extensive areas of green space and planting providing excellent potential for habitat creation and significantly enhanced biodiversity.

8.2 Planning Policy Context

National Planning Policy Framework 2012 (“The Framework”)

8.2.1 The National Planning Policy Framework (NPPF or “The Framework”) sets out the government’s requirements and guidance on nature conservation under Section 11 “Conserving and Enhancing the Natural Environment”. It provides guidance on protection, through the planning system, of statutory and non-statutory sites of biodiversity value, as well as biodiversity conservation of the wider environment. NPPF replaces previous national planning policy including Planning Policy Statement PPS9 “Biodiversity and Geological Conservation”. However, Government Circular ODPM 06/2005 “Biodiversity and Geological Conservation – Impact within the Planning System” (a guidance document that accompanied PPS9) has not been withdrawn and, where more detailed guidance is required than is given in NPPF local planning authorities will continue to rely on ODPM 06/2005.

8.2.2 The Framework establishes a presumption in favour of sustainable development and defines 12 “core land-use planning principles” that underpin both plan-making and decision-taking. These include:

“conserving and enhancing the natural environment” and

“promoting mixed-use development and encouraging multiple benefits from the use of land in urban areas, recognising that some open land can perform many functions (such as for wildlife, recreation, flood risk mitigation, carbon storage, or food production”

8.2.3 The Framework advises that local planning authorities should set out a strategic approach in their Local Plans, planning positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure. Additional emphasis is given to the creation of ecological networks and a nett gain for biodiversity.

8.2.4 Paras 117-118 of the Framework establish the priorities:

“117. To minimise impacts on biodiversity and geodiversity, planning policies should:

- plan for biodiversity at a landscape-scale across local authority boundaries;*
- identify and map components of the local ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them and areas identified by local partnerships for habitat restoration or creation;*

- *promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations, linked to national and local targets, and identify suitable indicators for monitoring biodiversity in the plan;*
- *aim to prevent harm to geological conservation interests; and*
- *where Nature Improvement Areas are identified in Local Plans, consider specifying the types of development that may be appropriate in these Areas.*

118. *When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles;*

- *if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigate, or, as a last resort, compensated for, then planning permission should be refused;*
- *proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest;*
- *development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;*
- *opportunities to incorporate biodiversity in and around developments should be encouraged;*
- *planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss; and*
- *the following wildlife sites should be given the same protection as European sites;*
 - *potential Special Protection Areas and possible Special Areas of Conservation;*
 - *listed or proposed Ramsar sites;*
 - *sites identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites"*

Local Policy

Borough of Charnwood Local Plan 2004

- 8.2.5 Limited elements of this document continue to form part of the development plan for the area albeit its plan period is 1991-2006 and it does not deal with development requirements beyond that date. At adoption the Local Plan included seven policies related to nature conservation interests. However in a general review of Local Plan documents in 2007 the Secretary of State “saved” some policies but others were replaced by national guidance – for nature conservation issues this was in the form of PPS9 “Biodiversity and Geological Conservation” (itself now cancelled). Two Charnwood Local Plan 2004 policies were saved at that time and considered in the evolution of Broadnook proposals:

EV/22 “Sites of Regional, County and District Level Ecological or Geological Importance”

and

EV/23 “Sites of Parish Level Ecological or Geological Importance”

- 8.2.6 These policies safeguarded sites of ecological interest in accordance with their significance and require appropriate mitigation measures if necessary where development proposals are brought forward. They have been superseded following the adoption of the Charnwood Local Plan Core Strategy in November 2015. The policy priorities are sustained by Core Strategy Policy CS13.

Charnwood Local Plan 2011 – 2028 Core Strategy

- 8.2.7 In October 2013 the Borough Council approved a Submission Draft Core Strategy and submitted it to the Secretary of State for Examination. The Examination Hearings have concluded, the Inspector has presented his final report and Main Modifications and the Core Strategy adopted accordingly.
- 8.2.8 As part of its evidence base for the new Local Plan the Borough Council commissioned two Phase 1 Habitat Surveys for key areas of development potential in the Borough and to inform its progress towards defining, in the plan-making process, its strategic priorities.
- 8.2.9 The Borough-wide Habitat Surveys contribute to an understanding of baseline conditions for the North of Birstall location (both include wider areas of interest in this location than the application site itself).
- 8.2.10 In 2008 a desk top study of protected species and Biodiversity Action Plan species was undertaken by the Borough Council together with a Phase 1 Survey commissioned from WYG (the “**Species Report**”).
- 8.2.11 The 2008 Phase 1 Habitat Survey concluded that the study area at North of Birstall is dominated by intensively managed agricultural land. The remaining grassland is predominantly species-poor semi-improved grassland and except for two sections of species-rich hedgerows the majority of the hedgerows are species poor and intensively managed (i.e. regularly trimmed or flailed). Several areas of plantation woodland including Broadnook Spinney are positively notable. Extracts from the 2008 “Species Report” are attached at **Appendix 8.10**.

- 8.2.12 The Species Report recommended that if development proposals are brought forward for this area the following should be highlighted for consideration/ inclusion;
- (vi) bat, birds, badger and great crested newt surveys should be carried out;
 - (vi) retention and enhancement of wooded landscape including a network of hedgerows and mature/veteran trees for foraging areas and “*commuting*” routes for wildlife should be encouraged;
 - (vi) restoration, enhancement and/or replacement of “*gappy*” hedgerows/ links at “*strategic*” locations to reinstate/improve connectivity between important habitats;
 - (vi) “*sufficient buffer zones between development and areas which are known to support wildlife*”;
 - (vi) protection of water flow and quality of Rothley Brook in devising sustainable drainage proposals.
- 8.2.13 In 2012 the Borough Council updated its evidence base on ecology by commissioning EMEC Ecology to carry out a further Charnwood Borough Wide Phase 1 Habitat Survey (excluding badger data) and to advise on wildlife corridors.
- 8.2.14 For the application area the 2012 Survey confirmed the 2008 Survey conclusions. Of the habitats surveyed, the Study concluded that none were considered to be of high ecological value at the national level and there are no designated sites of ecological value within or immediately adjacent to the application site. The intensively managed land has overall low ecological value with relatively poor species composition.
- 8.2.15 During the course of 2013 additional survey work was carried out on behalf of the applicants to update the earlier 2008 and 2012 Local Plan studies. It followed the recommendations made by the 2008 Survey as set out at 8.2.12 above. Further update surveys have been completed during 2015 and 2016.
- 8.2.16 The Borough Council’s work in proceeding to its Core Strategy conclusions also involved a number of Background Papers in addition to the evidence base. These papers identified a range of objectives and priorities which have informed the survey work at and around the application site and the formulation of masterplan proposals. The Borough Council’s principles and recommendations include, for example;

1 green infrastructure

- deal with green infrastructure in a more holistic way;
- ensure an integrated approach to green infrastructure encompassing biodiversity, leisure and recreation, settlement identity, countryside and landscape character;
- the overall aim is to develop a comprehensive network of multi-functional green space across Charnwood to ensure a hierarchy of green spaces for people and for wildlife.

2 biodiversity

- Charnwood Borough Council in partnership with Leicestershire and Rutland Wildlife Trust and Natural England will look to secure a nett gain in biodiversity;
- make biodiversity a priority in a broader strategic approach towards green infrastructure on a landscape scale;
- develop connected green spaces for wildlife and ensure appropriate long term management.

3 countryside and landscape character

- character assessment will inform more detailed master-planning and management guidelines for the long term;
- integrate countryside and landscape character within an overall approach to green infrastructure.

8.2.17 Mindful of these priorities and its evidence base the Borough Council has framed its Core Strategy approach and bespoke policy for this key topic under the heading “*Biodiversity and Geodiversity*”. The Core Strategy notes that Charnwood Borough enjoys significant areas of ecological interest compared to other parts of Leicestershire and the East Midlands as a whole;

“Very few places are fortunate enough to have resources like the Charnwood Forest and the river valleys of the Soar and the Wreake” and

“We must manage our ecological resource to prevent damage and habitat fragmentation. Our Habitat Survey has mapped our local ecological network and, with our partners, we have identified our priorities for habitat restoration and creation through our Leicester, Leicestershire and Rutland Biodiversity Action Plan”.

“We will continue to monitor biodiversity to check whether priority habitats and species are being lost and to measure progress on those habitats that are being restored or created through development. Our overall aim is to achieve a nett gain in the resource for our community”

(Core Strategy paras 7.32-7.36)

8.2.18 **Policy CS13** of the Core Strategy “**Biodiversity and Geodiversity**” therefore establishes the formal position. The policy confirms;

“We will conserve and enhance our natural environment for its own value and the contribution it makes to our community and economy. We will do this by;

Supporting developments that protect biodiversity and geodiversity and those that enhance, restore or re-create biodiversity. We will expect development proposals to consider and take account of the impacts on biodiversity and geodiversity, particularly with regard to;

- *Sites of Special Scientific Interest;*
- *Local Wildlife Sites;*

- *Regionally Important Geological Sites;*
- *UK and Local Biodiversity Action Plans priority habitats and species;*
- *Protected Species; and*
- *Ecological networks.*

We will only support development that results in the loss of ecological or geological features in exceptional circumstances where the benefit of development clearly outweighs the impact on ecology and geodiversity.

Where there are impacts on biodiversity we will require adequate mitigation; or as a last resort, compensation which results in replacement provision that is of equal or greater value and potential than that which will be lost and is likely to result in a nett gain in biodiversity.

We will consider this by requiring development proposals to be accompanied by ecological surveys and an assessment of the impacts on biodiversity and geodiversity.

We will also work with our partners to secure long-term management and investment plans for biodiversity and geodiversity”

- 8.2.19 As integral parts of its analysis of environmental issues the Core Strategy also addresses **“Strategic Green Infrastructure”** and **“Urban Fringe Areas”**. There are of course significant ecological and biodiversity dimensions to both of these areas of interest in bringing forward landscape-scale proposals for the North of Birstall area.
- 8.2.20 In terms of strategic green infrastructure (GI) the Borough Council has participated in and supported a GI Strategy for what is known as the **“6C’s area”** – the Counties of Leicestershire, Derbyshire and Nottinghamshire and the Cities of Leicester, Derby and Nottingham. The Strategy identifies priorities and potential – including the importance of enhanced connectivity via *“green corridors”* for both people and wildlife, and establishes the notion of **Urban Fringe Green Infrastructure Enhancement Zones**. (see **Appendix 8.11**)
- 8.2.21 Strategically important areas in the green infrastructure network in Charnwood Borough include Charnwood Forest, the River Soar Corridor and the *“edge of Leicester Urban Fringe”*. The Broadnook location is at the confluence of these areas and prospectively can make an important contribution to both policy and practical objectives. (see **Appendix 8.12**)
- 8.2.22 In terms of the **“Urban Fringe Areas”** the Core Strategy explains the Borough Council’s position;

“7.29 Our Green Infrastructure Strategy also identifies the fringe around urban areas as particularly important to the wider network of green infrastructure. These are the network of existing green spaces on the edge of towns and villages that can connect communities to each other and the countryside. They also provide an opportunity to connect the existing community with people who live and work in our new strategic developments”

- 8.2.23 Core Strategy **Policy CS12 “Green Infrastructure”** therefore supports proposals that protect and enhance green infrastructure assets – *“for their community, economic and environmental values”*, and proposals that provide high quality walking and cycling links with the River Soar and Grand Union Canal Corridor. The policy also emphasises;

“We will protect and enhance our Urban Fringe Green Infrastructure Enhancement Areas by;

- *enhancing our network of green infrastructure assets through strategic developments in accordance with Policies .. CS20...*
- *addressing the identified needs in open space provision...*”

- 8.2.24 The generic approach of Policies CS13 (to biodiversity) and CS12 (to green infrastructure) are given location-specific application in **Policy CS20 “North of Birstall Direction of Growth”** and its explanatory supporting text. Under *“Environment”* it is recognised that;

“The sustainable urban extension will provide a garden suburb, a high quality environment, respecting and responding to the landscape, ecology and heritage in this area. The site of the sustainable urban extension is currently farmed. There are however two important wildlife corridors associated with the Broadnook Spinney and the Great Central Railway which have the most biodiversity value in the area. The development will be expected to respect and enhance these wildlife corridors and, where appropriate, create new wildlife networks. This includes considering opportunities to create a network across the landscape along the north-south and east-west axes to help enhance connections to the River Soar. In particular, activities that have the potential to disrupt wildlife should be focussed elsewhere in the site.

We want the sustainable urban extension to be designed so that it is resistant to climate change. We expect the development to maintain a greenfield run-off rate and protect and enhance water quality.

We want to see the sustainable urban extension provide good access to open spaces, sport and recreational facilities to benefit both new and existing residents... Green infrastructure will be a fundamental prerequisite in establishing the garden suburb style and character.

The sustainable urban extension is well related to the River Soar and the Watermead Regeneration Corridor. We want the development to complement and maximise the opportunity for access to this wider Green Infrastructure Network for recreation and leisure to the benefit of the existing and new communities.

We expect biodiversity, open space and climate change to be considered and planned in an integrated manner.”

8.3 Key Legislation

8.3.1 The following legislation has been taken into account. Further explanation of the content of the identified legislation in relation to designated sites, habitats and fauna is provided in **Appendices 8.1 to 8.7** and the Confidential Badger Survey Report (WYG 2013 updated 2015). Additionally, the Appendices contain detailed information on the baseline studies and surveys undertaken to inform this assessment.

The Habitats Directive (Council Directive 92/43/EEC 1992)

8.3.2 The Directive covers the conservation of natural habitats and wild flora and fauna. It protects over 1,000 animal and plant species and over 200 “habitat types” which are of European importance.

The Birds Directive (Council Directive 2009/147/EC 2009)

8.3.3 On the conservation of wild birds. The directive is a comprehensive scheme of protection for all wild bird species occurring in the European Union, many of which are migratory throughout the member States.

The Conservation of Habitats and Species Regulations 2010 (as amended)

8.3.4 Providing for the designation and protection of ‘European sites’, the protection of ‘European Protected Species’, and the adaptation of planning and other controls for the protection of European Sites in England and Wales.

The Wildlife and Countryside Act 1981 (as amended)

8.3.5 The principle mechanism for the protection of wildlife in Great Britain. This legislation is the means by which the Convention on the Conservation of European Wildlife and Natural Habitats (the ‘Bern Convention’) and the European Union Directives on the Conservation of Wild Birds (2009/147/EC) and Natural Habitats and Wild Fauna and Flora (92/43/EEC) are implemented in Great Britain. Part I of the Act provides for the protection of birds, other wild animals and specified plants. It also makes it an offence to plant or cause to grow non-native invasive plant species. Schedule 8 of the Act was amended in 1998 to protect bluebells from commercial exploitation. Schedule 5 of the Act was amended in 1989 to protect various invertebrates, including some butterflies and moths, from commercial exploitation.

The Countryside and Rights of Way (CRoW) Act 2000

8.3.6 Covers access to open country, public rights of way, the designation of Areas of Outstanding Natural Beauty (AONB) and nature conservation, by strengthening the protection given to Sites of Special Scientific Interest (SSSI) and threatened species.

The Protection of Badgers Act 1992

8.3.7 Providing special measures for protection of badgers and their setts in Great Britain.

Hedgerows Regulations 1997

- 8.3.8 Under the regulations it is against the law to remove or destroy certain hedgerows without permission from the local planning authority.

The Natural Environment and Rural Communities (NERC) Act 2006

- 8.3.9 Defines a list of species of flora and fauna and habitats of principal importance for the purpose of conserving biodiversity, ('UK Biodiversity Priority Habitats and Species'). The act provides that any public body or statutory undertaker in England and Wales must have regard to the purpose of conservation of biological diversity in the exercise of their functions with regard to the species and habitats on this list.

Leicestershire & Rutland Local Biodiversity Action Plan (LBAP)

- 8.3.10 Includes a list of national and local priority habitats and species which are present in the counties. The LBAP outlines biodiversity objectives, key issues, opportunities and current projects for each habitat type and species. This was updated in 2011 with the sub-title "Space for Nature".

8.4 Methodology and Scope

8.4.1 In February 2014 a request for a formal Scoping Opinion under Regulation 13 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 was made to Charnwood Borough Council. The Borough Council issued its Opinion on 3 April 2014. It endorses the approach set out in the submitted Scoping Report (copies of both documents are included with the application – see **Appendix 2.1** and **2.2**). In addition a number of office and site-based meetings have been held with officers of the Borough Council and a representative of the Leicestershire and Rutland Wildlife Trust. The extent and level of survey work carried out to inform this Ecological Impact Assessment accords with the views expressed and the content of the Scoping Report/Opinion. The points raised have been fully taken into account within the assessment of the proposed development as set out within the following sections.

Assessment Methodology

8.4.2 This EclA was drafted and consulted upon, in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment (2006). Whilst the second edition of these has subsequently been issued, the format and methodology has been retained for this application for consistency and has involved;

- Identification of ecological resources and features to be assessed and establishment of their value (the baseline environment);
- Identification of the biophysical changes likely to affect valued ecological resources and features and an assessment of whether these biophysical changes are likely to give rise to ecological effects (the Impacts and Significance);
- Identification of appropriate ecological mitigation, compensation and/or enhancement measures to avoid, reduce or compensate for potentially adverse impacts; and
- A description of effects and their significance, taking proposed mitigation into account.

8.4.3 CIEEM has identified various characteristics that can be used to identify ecological features and resources likely to be important in terms of biodiversity. These include;

- animal or plant species that are rare or uncommon, either internationally, nationally or more locally;
- ecosystems and their component parts, which provide the habitats required by the above species, populations and/or assemblages;
- endemic species or locally distinct sub-populations of a species;
- habitat diversity, connectivity and/or synergistic association (e.g. networks of hedgerows and areas of species-rich pasture that provide important feeding habitat for a rare species);
- notably large populations of animals or concentrations of animals considered uncommon or threatened in a wider context;

- plant communities (and their associated animals) that are considered to be typical valued natural/semi-natural vegetation types – including examples of natural species-poor communities;
- species on the edge of their range, especially where their distribution is changing as a result of global trends and climate change;
- species-rich assemblages of plants and animals;
- The significance of impacts are considered in terms of their geographic scale of reference as below (para 8.4.5).

8.4.4. The assessment will account for both the construction and operational stages of the proposed development and will address and evaluate both prospective positive and negative impacts. It will also consider the significance of any predicted effects.

Determining Biodiversity Value

8.4.5. The CIEEM guidelines recommend that the value of ecological receptors or features is determined based on a geographic frame of reference that includes the following levels;

- **International** – Special Protection Areas (SPA), Special Areas of Conservation (SAC), Ramsar sites, a regularly occurring, nationally significant population/ number of any internationally important species;
- **National** – Sites designated at UK level, e.g. a Site of Special Scientific Interest (SSSI) or a feature identified as of critical importance at the UK level;
- **Regional** – Habitats or populations of species of value at a regional (i.e. East Midlands) level, sites which exceed the county-level designation but fall short of e.g. SSSI selection guidelines;
- **County** – Designated sites, such as Wildlife Sites or habitats/species populations of value at a county (i.e. Leicestershire & Rutland) level, a viable area of habitat identified in the LBAP;
- **District** – Habitats or species populations of value at a Borough level (i.e. Charnwood). Local Nature Reserves designated by the Borough Council using ecological criteria or species which may be widespread in the county but which are considered rare or scarce in Charnwood;
- **Local** – Habitats or species populations of value in a local (i.e. within 5km of the site) context. Areas of habitat considered to appreciably enrich the habitat resource within the context of a parish or neighbourhood;
- **Site level only** – Habitats or species populations which are of value only within the immediate zone of influence of the proposed development. No definitive published information is available on the exact influence on the surrounding biodiversity; therefore for this development a buffer of 2km has been applied.

Valuing Habitats

- 8.4.6 In accordance with the CIEEM guidelines, the value of habitats is measured against published selection criteria where available. Reference is also made to UK and local Habitat Action Plans (HAPs), although as the guidelines note, the presence of a HAP reflects the fact that the habitat concerned is in a sub-optimal state (and hence that action is required) and does not necessarily imply any specific level of importance for the habitat. In accordance with the guidance, the assessor can assign certain features a greater value if there is a reasonable chance that they can be restored to a higher value in the future.

Valuing Species

- 8.4.7 In accordance with the CIEEM guidelines, when assigning a level of value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records. Rarity is an important consideration because of its relationship with threat and vulnerability although since some species are inherently rare, it is necessary to look at rarity in the context of status. A species that is rare and declining should be assigned a higher level of importance than one that is rare but known to be stable.
- 8.4.8 Reference is also made to UK List of Priority Habitats and Species and Leicestershire & Rutland Species Action Plans (SAPs) although, as with HAPs, the presence of a BAP-listed species reflects the fact that the population is in a sub-optimal state.

Potential and Predicted Impacts

- 8.4.9 Impacts related to loss, fragmentation or degradation of habitats, death or disturbance of animals and potential changes in species range have been defined and described taking into account;
- Magnitude – the size of an impact in quantitative terms where possible;
 - Extent – the area over which an impact may occur;
 - Duration – the time for which an impact is expected to last; prior to recovery or replacement of the resource or feature;
 - Reversibility – a permanent impact is one that is irreversible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it. A temporary impact is one from which short-term recovery is possible;
 - Timing and frequency – whether impacts are constant, ongoing, separated but recurrent or single events and whether they occur during critical seasons or life-stages of habitats and fauna;
 - Positive or negative – whether the impact has a positive or negative effect.

Direct and Indirect Ecological Impacts

- 8.4.10 Both direct and indirect impacts are considered within this assessment. A direct impact is directly attributable to a defined action such as the physical loss of a habitat or the immediate mortality of an individual of a particular species. Indirect impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process or receptor. An example of an indirect effect would be the loss of an important prey species for a predator.

Determining Significant Impacts

- 8.4.11 In accordance with the CIEEM guidelines, a significant impact, in ecological terms, is defined as an impact (either adverse or positive) on the integrity of a defined site or ecosystem(s) and/or the conservation status of habitats or species within a given geographical area, including cumulative impacts.
- 8.4.12 In accordance with CIEEM guidelines, the approach adopted here aims to determine if an impact is significant or not on the basis of a discussion of the factors which characterise it, i.e. the ecological significance of an impact is not dependent solely upon the value of the feature in question. The value of any feature that will be significantly affected is used to determine the geographical scale at which the impact is significant. For example, an ecologically significant impact on a feature of value at county level is regarded as a significant impact at county level. This in turn is used to determine the implications in terms of legislation, policy and/or development control.
- 8.4.13 As noted above, impacts are only assessed in detail for receptors of sufficient detail that impacts upon them may be significant (in terms of legislation or policy). **Therefore for the purposes of this assessment, impacts are assessed in detail only for those receptors that are of at least local value, or are subject to some form of legal protection.**
- 8.4.14 Where likely significant impacts have been identified, mitigation measures have been included as part of the proposed scheme to ensure legal compliance relative to designated sites and protected species and to reduce or compensate the potential significance of impacts and their effects upon relevant receptors.
- 8.4.15 Any significant impacts remaining after mitigation (the residual impacts), together with an assessment of the likelihood of success in the mitigation, are the factors to be considered against legislation, policy and development control in determining the application.

Probability

- 8.4.16 In addition to significance, the probability that the impact will occur has been defined in accordance with CIEEM guidelines and as indicated below;
- Certain/near certain – probability estimated at 95% chance or higher;
 - Probable – probability estimated above 50% but below 95%;
 - Unlikely – probability estimated above 5% but below 50%; and
 - Extremely unlikely – probability estimated at less than 5%

Embedded Mitigation

- 8.4.17 With regard to assessing significance and residual impacts, it is important to note that mitigation measures have already been designed into the scheme as an integral part of an iterative process which has informed the Broadnook Masterplan. Measures have been proposed from the outset as alternative layouts and designs have been considered and refined. The Masterplan has been adapted and modified to take into account constraints and opportunities which will enhance the proposals to provide benefits and to enable the development to be assimilated effectively into the surrounding environment (see **Figures 8.3a** and **8.3b** at **Appendix 6** for the initial and informed Ecology Constraints and Opportunities Plans). Such inherent measures are considered to be part of the development proposals and are therefore assessed as such.
- 8.4.18 For example earlier drafts of the Masterplan included built development and road infrastructure east of the A6. The final Core Strategy policy and the corresponding Masterplan forming the basis of the application no longer do – with now only greenspace land-uses easts of the A6.
- 8.4.19 Following the assessment, which takes account of these iterative revisions and inherent mitigation measures, any ecological residual effects have then been identified.
- 8.4.20 The ecological assessment has assessed the development proposals as defined in ES Chapter 6 and as portrayed on the Broadnook Development Framework Plan and Parameter Plans included in that Chapter and its Appendix.

Limitations of the Assessment

- 8.4.21 There are no significant overall limitations that are considered to compromise the validity or robustness of this EclA, however note that details of any qualifications specifically relevant to any particular floral or faunal survey are provided in the relevant appendices, where relevant (**Appendices 8.1** to **8.7**)

8.5 Baseline Environment

Existing Baseline

8.5.1 The site has been subject to both desk and field-based surveys between March and October 2013. A number of these were updated between June-August 2015 and further site visits undertaken in 2016. There are factual reports containing full details of these surveys and these are provided in the appendices listed below. However, a summary of each is presented in this chapter in order to inform the Nature Conservation Evaluation for each of the sensitive receptors identified; ;

- **Appendix 8.1 – Extended Phase 1 Habitat Survey** with Target Notes (WYG 2013 updated in 2015 and again in 2016);
- **Appendix 8.2 – Great Crested Newt Survey** (WYG 2013);
- **Appendix 8.3 – Breeding Birds Survey** (WYG 2013);
- **Appendix 8.4 – Bat Activity Surveys** (WYG 2013 and 2015);
- **Appendix 8.5 – Badger Surveys** (WYG 2013, updated in 2015 and 2016). A confidential badger report containing details of the locations of badger setts is available on request, but is not appended to this public document.
- **Appendix 8.6 – Wintering Bird Surveys** (WYG 2016)
- **Appendix 8.7 – Nocturnal Bat Surveys - Wanlip Hill Farm** (WYG 2016)

8.5.2 Please note that the species discussed in this report are referred to by their common name, wherever possible. This has been done to make it concise and readable; however their Latin names are provided in the relevant appended reports.

Desk Study

Statutory Designated Sites

8.5.3 There are no statutory designated sites within or adjoining the application site. There are three records of statutory designated sites: Sites of Special Scientific Interest (SSSIs) and two Local Nature Reserves (LNR) within 2km of the site boundary. Two of the SSSIs; Bradgate Park & Cropston Reservoir SSSI and Buddon Wood & Swithland Reservoir SSSI are designated for biological reasons. The third SSSI, Main Quarry Mountsorrel, has been designated for geological reasons and is therefore outside the scope of this chapter of the ES. Both biological SSSIs support nationally important numbers of wintering waterfowl, both contain UK priority species and LBAP priority habitats and species and plants listed on the Leicestershire & Rutland Rare Plant Register and/or Nationally Scarce Species¹. Buddon Wood supports approximately one third of the UK spider population.

1. Nationally scarce species have been recorded in between 16 and 100 ten km squares in the UK. Species listed on the County Rare Plant Register are found at a maximum of ten sites in Leicestershire & Rutland.

Watermead Country Park Local Nature Reserve has been designated for its wintering waterfowl assemblage, herb-rich neutral and wet grassland, wet woodland, hedgerows and veteran trees. It also supports at least two legally protected Schedule 1 breeding bird species in addition to other locally notable bird species, breeding amphibian and reptile assemblages, notable plants listed on the Leicestershire & Rutland Rare Plant Register (including aquatic species) and several notable moths, in particular those associated with the wetland habitats.

Halstead Road Centenary Pasture LNR has been designated for its neutral grassland with prominent ridge and furrow features and a granite rock outcrop supporting locally notable lichens and bryophytes (mosses and liverworts).

- 8.5.4 The three SSSIs (including the geological one) have been assessed as of **National** value; whereas the two Local Nature Reserves have been assessed as of **County** value (i.e. Leicestershire & Rutland).

Non-statutory Designated Sites

- 8.5.5 There are no non-statutory designated sites (known as Local Wildlife Sites in Leicestershire) within the site although Broadnook Spinney meets the criteria for woodland as it contains an area of native bluebells above the size threshold (i.e. 500m²), contains sufficient mature trees with evidence of heart rot (i.e. bat roost potential) and also supports a qualifying assemblage of breeding birds, some of which are in decline nationally.
- 8.5.6 There are three species-rich hedgerows (see below) which are considered likely to meet the Local Wildlife Site criteria on species assemblages and associated features such as the presence of adjacent ditches and the number of mature trees.
- 8.5.7 There are seventeen Local Wildlife Sites within 2km of the site.
- 8.5.8 The non-statutory designated sites listed above have been assessed as being of **County** value.
- 8.5.9 Statutory and non-statutory designated sites in this part of South Charnwood and within 2km of the application site are shown at **Figure 8.1**.

Protected and Notable Species

- 8.5.10 Desk-based consultations to cover the site and the surrounding 2km area were undertaken in 2013 with the following bodies;
- Leicestershire & Rutland Ecological Records Centre (LRERC)
 - Leicestershire Badger Group (via Charnwood Borough Ecologist)
- 8.5.11 A range of protected species records were returned, the full detail of which are provided in Section 2.2 of **Appendix 8.1** for all recent records (i.e. post 2000). This included records of the following protected and notable species;
- White-clawed crayfish (historical);

- Great crested newt;
- Water vole;
- Otter;
- Common pipistrelle roosts, brown long-eared bat, whiskered and Natterer's bat roosts and also roosts of unidentified bats; records of a further four bat species plus unidentified bats;
- Badger setts;
- Three UK Biodiversity Priority species, common toad, harvest mouse and polecat;
- Thirty one legally protected birds listed on Schedule 1 of the Wildlife and Countryside Act, including breeding barn owl, Cetti's warbler, little ringed plover and kingfisher;
- Twelve UK Biodiversity Priority / Locally Notable bird species; cuckoo, sand martin, common redstart, grasshopper warbler, tree sparrow, turtle dove, grey partridge, lapwing, house sparrow, spotted flycatcher, reed bunting and lesser redpoll;
- Twelve UK Biodiversity Priority moths and two UK Priority butterflies (one of which, wall brown, may no longer be extant);
- Plants – Several county rare and county scarce plant species have been recorded from Buddon Wood & Swithland Reservoir SSSI and Bradgate Park and Cropston Reservoir (SSSI citations) and there are several records of the native bluebell within the 2km data search area.

Field Surveys

Habitats

- 8.5.12 An Extended Phase 1 Habitat Survey of the area of the initial study boundary was carried out by Richard Penson (Senior Ecologist at WYG) on 20 March 2013. The initial area of interest incorporated the now excluded land east of A6, north and south of A46. Since then, the redline boundary has increased to include an additional area of agricultural land to the north and north-west of Broadnook Spinney. An Extended Phase 1 Habitat Survey of this additional area was also undertaken by Richard Penson in October 2013. Due to the intervening time, update site walkovers were completed in July 2015 and June 2016. The final set of target notes and photographs are provided in **Appendix 8.1** and locations of the habitats currently present are shown on **Figures 8.2a and b Extended Phase 1 Habitat Plans**.
- 8.5.13 The site area within the application boundary is 204 ha. The following Phase 1 habitats were recorded within the site boundary during the extended Phase 1 habitat surveys;
- Plantation broad-leaved woodland
 - Plantation mixed woodland

- Plantation coniferous woodland
- Mature trees
- Dense scrub
- Introduced scrub
- Species-rich hedgerows (including with trees)
- Species-poor hedgerows (with or without trees)
- Poor semi-improved grassland
- Standing water
- Running water
- Arable
- Ephemeral vegetation
- Ruderal vegetation
- Buildings
- Bare ground
- Invasive species

Plantation Broad-leaved Woodland

- 8.5.14 The largest block of this habitat type is Broadnook Spinney which, although it has been replanted to some extent with non-native tree species, still retains a semi-natural appearance as the majority of trees are native and there are some elements of ancient woodland ground flora; a large area of native bluebells and a small clump of early purple orchids. The other main area of this habitat comprised Bridle Road Spinney which is used for game bird rearing and contains a high proportion of non-native species and an impoverished ground flora typical of secondary woodland. Ryecklose Spinney occurs in the southern section of the survey area and is dominated by mature sycamore with a very sparse shrub layer which includes non-native species. There is however a small amount of apparently native bluebells amongst what is otherwise a very impoverished ground flora. An area of recently planted broad-leaved woodland occurs adjacent to a species-rich hedgerow near the centre of the site where the ground flora is still dominated by grasses and ruderal vegetation.
- 8.5.15 As Broadnook Spinney meets the criteria for a Local Wildlife Site and fits within the UK Biodiversity Priority habitat definition for deciduous woodland it has been assessed as of **county value**. Bridle Road Spinney and Ryecklose Spinney have very low botanical diversity and so have been assessed as of **value at the site level only**. Both of these woodland areas have potential supporting value for protected species including nesting birds.

Mixed Plantation

- 8.5.16 Bridle Road Spinney is the only mixed woodland within the site where there is a significant percentage of Scots pine amongst the broad-leaved species. The ground flora is impoverished and dominated by bramble with a small amount of other ground flora species typical of secondary woodland.

- 8.5.17 The mixed woodland within the site has been assessed as of **value at the site level only**. This habitat has potential supporting value for protected species including common nesting birds.

Coniferous Plantation

- 8.5.18 This habitat has been planted relatively recently and is composed entirely of Norway spruce. The ground flora is still grass-dominated.
- 8.5.19 Coniferous plantation is a common habitat in the UK and Leicestershire and, as it supports a very limited suite of common and widespread faunal species, this has been assessed as of **value at the site level only**.

Mature Trees

- 8.5.20 There are many mature trees within the site boundary, most being within Broadnook Spinney and the hedgerow network although there are also some within large arable fields. None of these are considered likely to meet the LWS criteria for veteran trees although there are twenty-six trees with bat roost potential scattered throughout the site. These have been assessed as of **value at the District level**.

Dense Scrub

- 8.5.21 Hawthorn and bramble dominated scrub was present in small patches throughout the site although the majority was too small in extent to show on the plans.
- 8.5.22 This habitat is commonly occurring in the UK and Leicestershire and has been assessed as of **value at the site level only**. However, scrub habitat is likely to have supporting value for common bird species, amphibians, badgers and hedgehogs.

Introduced Shrub

- 8.5.23 The introduced shrub on the site is predominantly associated with providing cover for game birds and is dominated by snowberry with some dogwood (of a cultivated variety) and cherry-laurel. This habitat is of very low biodiversity value and has limited value to nesting birds; therefore it has been assessed as of **value at the site level only**.

Species-rich Hedgerows

- 8.5.24 There are three species-rich hedgerows within the site, each having a minimum of seven locally native tree and shrub species along their lengths plus associated features such as wet ditches and mature trees. These hedgerows meet the criteria for LWS designation and are also considered likely to qualify as “Important” under The Hedgerows Regulations (1997) and also fit within the definition of “hedgerow” within the UK Priority Habitat list and the LBAP. They have added value in providing nesting and foraging opportunities for notable bird species and in providing foraging and commuting routes for bats. These hedgerows have been assessed as of **value at the District level**.

Species-poor Hedgerows

- 8.5.25 The remainder of the hedgerow network within the site has been assessed as species-poor, typically dominated by either hawthorn or blackthorn (sometimes both) although there are short sections where wych elm is dominant as saplings, kept in a more or less perpetual immature state by the trimming regime. The ground flora is also species-poor and dominated by ruderals and coarse grasses. They do have added value in providing habitat for nesting birds and foraging bats and also meet the broad definition within the UK Priority Habitat criteria and the LBAP but due to their low botanical diversity, they have been assessed as being of **value at the site level only**.

Poor Semi-improved Grassland

- 8.5.26 This grassland has all been sown within the site and is cut for either silage or hay. It is dominated by commercially available grass species with a limited variety of herbs, dominated by clovers (both red and white). It occurs within fields and also as strips around arable fields. In view of the impoverished nature of this resource it has been assessed as being of **value at the site level only**.

Standing Water

- 8.5.27 There are eight ponds within the site, of which one is artificial comprising a lake which has been created for wildfowl (adjacent to Broadnook Spinney). All of these waterbodies supported a very low diversity of aquatic plants (some apparently none at all). Three of the ponds supported small populations of common amphibians (smooth newt, common frog and common toad). In view of the low botanical diversity and small numbers of amphibians, the water bodies have been assessed as being of **value at the site level only**.

Running Water

- 8.5.28 This habitat was restricted to three very narrow ditches in the northern half of the site. They all had very low botanical diversity and were assessed as being unsuitable for water vole, otter or white-clawed crayfish. For these reasons, they have been assessed as being of **value at the site level only**.

Arable

- 8.5.29 This habitat dominated the site and is intensively managed. There are several strips which have been planted to provide forage and cover to game birds around the field edges. Although Field Margins are a priority habitat in the LBAP, those present within the site have a very impoverished flora, not including any notable species. This habitat does have some added value in providing habitat for a diverse farmland bird assemblage; it has been assessed as of **local value**.

Ephemeral/Short-Perennial

- 8.5.30 This habitat is of a very scattered nature within the site, occupying sites which are too small to show on the plans. It does not contain any notable species, provides only limited value as foraging habitat for birds due to its small size and has been assessed as of **value at the site level only**.

8.5.31 Ruderal Vegetation

This habitat occurred in areas of sown game strips within arable fields, around the ruined farm buildings, alongside hedgerows and the Great Central Railway line. It also occupied field corners and other areas which are too small to show on the plan. The dominant species were creeping and spear thistles, stinging nettle, docks and willowherbs and also included some alien bristle-grasses derived from food put down for game birds and crop relics. This is a common and widespread habitat, not containing any notable species and has been assessed as of **value at the site level only**.

Buildings

- 8.5.32 The buildings within the site comprise those at Wanlip Hill Farm on the west side of the A6 and include a mixture of modern metal-framed agricultural buildings and traditional brick-built farm house and cottages, with pitched slate roofs. The ecological value of these buildings is to roosting bats and both daytime roost assessments and nocturnal emergence / re-entry surveys were carried out in 2015. Two bat roosts were identified in two of the traditional type buildings comprising low numbers of common pipistrelles. As this is a common and widespread bat species and only low numbers were encountered, the value of the buildings has been assessed as of **value at the site level only** (but see section 8.5.48 (bats) within the fauna section below).

Bare Ground

- 8.5.33 This habitat occurs along tracks throughout the site. The nature of this habitat is such that it is not considered likely that any notable invertebrates will be associated with it and consequently has been assessed as of **value at the site level only**.

Flora

- 8.5.34 Three notable flora species were recorded during the extended phase one surveys and during other surveys for protected species within the site. None of them are rare enough to merit inclusion in the Leicestershire & Rutland Rare Plant Register, neither are they listed on the UK list of priority species or the LBAP.

Early Purple Orchid

- 8.5.35 A small clump of four flowering plants was found on the northern fringe of Broadnook Spinney in proximity to the water body. This species has a restricted distribution in the county although in some woods it can be abundant. It is scarce in Charnwood and has been assessed as of **value at the District level**. The small size of the population within the site militates against a higher valuation.

Smooth-leaved Elm

- 8.5.36 A single immature tree was recorded on the northern fringe of Broadnook Spinney. Although the Flora of Leicestershire shows it as being widespread within the county, it is scarce in the North West (including Charnwood); this species (amongst other elms) having suffered from several outbreaks of Dutch elm disease since the 1970s and many populations recorded in the county flora (Primavesi 1988) may no longer be extant. There are several forms and varieties of smooth-leaved elm, some of which are rare in the county, although the identification of these need mature trees for exact determination and it is these which have been most seriously affected by disease. The population on-site has been determined as smooth-leaved elm in the broad sense (*sensu lato*) as it was not possible to be more specific due to the trees' immaturity. As such, it has been assessed as being of **value at the District level**.

Native Bluebell

- 8.5.37 Native bluebell is a widespread species in Leicestershire, being most particularly abundant in the western half of the county. It is considered here as it receives partial legal protection under Schedule 8 of the Wildlife and Countryside Act where it is protected from commercial exploitation. As the population in Broadnook Spinney is large enough to merit LWS designation, it is **valued at the District level**.

Fauna

- 8.3.38 Based on the habitats found in the extended Phase 1 habitat surveys and their suitability, the following further protected species surveys were carried out;
- Great crested newts (2013)
 - Breeding birds (2013, 2015)
 - Bat roosts and activity (2013, 2015)
 - Badger (2013, 2015, 2016)
 - Wintering Birds (2016)

Some invertebrates, in particular butterflies, were recorded during the above surveys.

Great Crested Newts

- 8.5.39 A Habitat Suitability Index (HSI) was calculated for the nine waterbodies within the site plus a small section of static water in a wet ditch. The HSI provides an objective method for assessing the suitability of a pond as habitat for great crested newts and was undertaken in accordance with the guidelines in Oldham *et al.*, (2000). Four presence/likely absence surveys were undertaken on the nine water bodies between 13 May and 11 June 2013 in accordance with the guidelines in English Nature (2001). No great crested newts, eggs, efts or juveniles were found during the surveys although a small population of smooth newts was recorded. Full details are provided in **ES Volume 2: Appendix 8.2**.

- 8.5.40 Great crested newts are unlikely to be present on site and are not considered further in this assessment. There is however an assemblage of common amphibians comprising common frog, common toad and smooth newt. This assemblage has been assessed as of **value at the site level only** due to the small population sizes of these animals.

Note that this survey information was collected in 2013 and is now three breeding seasons old, however we have not done an update repeat of these for this application as we believe that the likelihood of any material change to the baseline conditions is very low indeed as no nearby populations of GCN are known, from where the site could have become colonised in the intervening period.

Breeding Birds

- 8.5.41 A total of 58 bird species were recorded within the original site boundary during breeding bird surveys that were carried out in May and June 2013. Of this total, 46 species were considered to have potential and/or confirmed breeding within the site. The remaining twelve species were exhibiting no breeding behaviour or were clearly only foraging. Some migrant bird species were recorded on the site during spring, however as no suitable breeding habitat was present within the site, they were considered to be passage individuals and these have therefore not been mapped on the breeding bird plans. See **Appendix 8.3** for full details of the survey results and plans of the records made.
- 8.4.42 Of the species recorded, one was listed on Schedule 1 of the W&CA – namely barn owl. A single barn owl was recorded twice from the same hollow tree and the accumulation of pellets beneath this tree indicates that this is a frequently occupied roost site. However, as only a single bird was seen and there was no supporting evidence in the form of birds carrying food, it is considered that barn owls failed to breed on site in 2013. This roost appeared to have been abandoned in 2015 as no pellets were found although it remains available to barn owls and re-occupation in the future is considered probable.
- 8.5.43 The entry for barn owl in *The Birds of Leicestershire & Rutland* (Fray et al) states that this species is an “uncommon resident breeder” which has undergone a historic decline (between 1962 and the late 1990s) but which is now recovering from a low point of only two breeding pairs in the two counties in 1998 to more than 53 pairs in 2007. However, the majority of the breeding population is in Rutland and Melton districts and only ten confirmed breeding pairs occur north and west of Leicester City and only three in Charnwood (Fray et al, Fig. 371, page 422). The population on site is thus considered to be of **value at the District level**.

8.5.44 The overall results of the breeding bird survey can be summarised as follows;

Table 8.1 Summary of Breeding Bird Survey Results

Total bird species recorded	58
Number of birds of high conservation concern (inc. W&CA Schedule 1)	14
Number of birds of medium conservation concern	15
Number of birds probable/confirmed breeding	46
Number of birds P/C breeding and high conservation concern (inc. W&CA Schedule 1)	12
Number of birds P/C breeding and medium conservation concern	9
Number of common and widespread birds P/C breeding	24

8.5.45 To assess the overall breeding bird assemblage Fuller (1980) described a method for assessing the ornithological interest of sites, whereby the importance of a site is defined by the number of breeding species present. Since the publication of this method further declines of bird species have been recorded which caused the CIEEM to issue an adaptation to the level of importance (CIEEM 2006). It is this adapted criterion which is shown in Table 8.2 below.

Table 8.2 Site Importance by Number of Breeding Bird Species Present

Number of breeding bird species	Site Importance
<25	Local
26-49	District
50-69	County
70-84	Regional
>85	National

8.5.46 Forty-six species have been assessed as either confirmed or probably breeding within the site boundaries, therefore using Table 8.2 above, the site is considered to be of **district value**. This is strengthened by the fact that twelve of these species are of high conservation concern (plus a Schedule 1 species – barn owl which summered but did not attempt breeding in 2013 although further attempts in the future are to be expected); and nine species of medium conservation concern (Amber). However this is not considered sufficient to warrant it being promoted to a higher level of importance.

Note that this 2013 survey information has not been formally updated, however the two wintering bird surveys that were undertaken in March 2016 were carried out late on in the wintering period, but within the breeding season (see below). These visits revealed no significant changes to the species composition recorded previously, therefore we do not consider that any material changes to the 2013 assemblage is likely to have occurred.

Wintering Birds

- 8.5.47 Following a specific request from Charnwood Borough Council, we completed two wintering bird walkover surveys of the site in March 2016. Note that these were completed outside the optimal season for such surveys due to the timing of the request, however they were completed in order to supplement the existing bird assemblage information already held for the site.

A total of 53 species were recorded and of these three are listed as Wildlife and Countryside Act Schedule 1 species, these being: fieldfare, greylag goose and redwing. However both fieldfare and redwings are listed when breeding only and those recorded are considered to be wintering birds that are very unlikely to breed within the site. The greylag goose recorded on site is considered to relate to feral birds rather than truly wild birds.

Ten of the birds recorded have a red list status within the Birds of Conservation Concern (Eaton et al., 2015), these are: grey partridge, herring gull, lapwing, linnet, mistle thrush, skylark, song thrush, tree sparrow, woodcock and yellowhammer.

Nine of the birds recorded have an amber status within the Birds of Conservation Concern, these are: black-headed gull, bullfinch, dunnock, kestrel, mallard, meadow pipit, reed bunting, snipe and stock dove. The remaining species have a green list status within the Birds of Conservation Concern, except for three species which have not been assessed, these are: mandarin duck, pheasant and red-legged partridge.

The majority of the species recorded were primarily associated with the hedgerows and woodland edges and represent a good farmland bird assemblage. Of that species assemblage the following species are considered likely to remain within the site to breed: grey partridge, lapwing, linnet, mistle thrush, skylark, song thrush, tree sparrow, woodcock, yellowhammer, bullfinch, dunnock, kestrel, mallard, meadow pipit, reed bunting and stock dove.

As no significant wintering bird populations were recorded on site, it is considered to be of **value at the site level only** for this group of species.

Bats

Bat Roost Assessment

- 8.5.48 In 2013 a daytime bat roost assessment was carried out on seven buildings, a bridge and many trees in accordance with the guidance in Hundt (2012), together with several buildings directly adjacent to the site but outside the application area. All of the buildings within the site and the bridge were assessed as having negligible potential to support roosting bats. The complex of ten buildings at Wanlip Hill Farm included a mixture of barns of modern construction and traditional brick-built buildings with pitched slate roofs. Five of these buildings were assessed as being of moderate to high bat roost potential. A total of twenty-seven mature trees were also identified as having bat roost potential; fourteen having high potential, eleven of moderate potential and two of low potential. These trees were positioned within mature woodland, within the hedgerow network and as individual trees in the middle of arable fields.

8.5.49 Further detail is provided in the factual bat report (see **Volume 2: Appendix 8.4** which includes location of trees, buildings and bridge). Detailed internal inspections and dusk/dawn re-entry surveys had been completed of the buildings at Wanlip Hill Farm in 2015. At least six species of bats have been recorded from the site (see below) although not all of them may be roosting there and two confirmed roosts, each of low numbers of common pipistrelles (maximum of eight individuals in the two roosts); have been recorded at Wanlip Hill Farm. The roosting bat assemblage (within both buildings and trees) has been assessed as of **value at the local level**. It should be remembered that bats and their roosts are protected through UK and EU legislation.

Bat Activity Surveys

8.5.50 Bat activity surveys were carried out on the site between May and September 2013 which included the use of automated bat detectors strategically placed along woodland edges and at intersections of hedgerows. A minimum of six bat species have been recorded from the site comprising; common and soprano pipistrelles, Nathusius' pipistrelle, noctule, brown long-eared bat and at least one bat species from Genus Myotis. Myotis bat records returned from the data search comprised whiskered, Daubenton's and Natterer's bats. As nearly half of the 13 species present in Leicestershire have been recorded from the site, the value of the site for foraging bats has been assessed as of **value at the district level**.

These 2013 surveys have not been updated as they revealed a typical pattern of foraging and commuting activity across the site, in association with the existing linear features and blocks of woodland. This information has been used to inform the Masterplan (see Figures 8.3a & b Ecological Constraints & Opportunities Plans) and therefore we do not consider that an update to this survey would be likely to alter our existing findings or except any significant influence on the Masterplan layout.

Badgers

8.5.51 Regular badger surveys have been undertaken across the site between March 2013 to June 2016. The following badger field signs were recorded either within or in close proximity to the site boundaries. However, exact locations are confidential and are only provided in the un-appended Land North of Birstall: Factual Badger Report (WYG, v4 2016).

The most recent badger survey carried out in June 2016 recorded some changes in the badger activity, with additional entrances to the main sett being excavated and a further two setts being excavated elsewhere within the site giving a total of three active setts in June 2016. However two of outlier setts have been abandoned since the previous survey in June 2015. The extent of habitat utilised for foraging in 2013 remains essentially the same in 2016. To summarise:

- Two main badger setts and one subsidiary sett were found during the surveys, all of which were active.
- Two outlier setts were recorded, both of which were disused in 2016;

- Foraging activity was widespread in the northern half of the site with an extensive badger path network connecting setts to foraging habitat which included rotting logs being torn open to access beetle grubs and snuffle holes in the grassland;
- Badger footprints were found in the vicinity of both new setts in 2016 although no foraging evidence was found near either of these new setts.

8.5.52 Badgers are highly mobile species and further surveys have been recommended to record their future movements; badger activity within the site appears to have declined slightly since 2013. They are however relatively abundant locally and nationally and have been assessed as having a biodiversity **value at the site level only**. Badgers and their setts are however protected through legislation in Great Britain.

Invertebrates

8.5.53 A range of butterfly species were recorded from the site during surveys for protected species between April and October 2013 and during a site visit with Charnwood Borough Council staff in August 2013. Further butterfly species were recorded during an update phase 1 survey in late June 2015, these surveys covering the majority of the flight season. Given the suite of habitats present, confidence is high that the majority of butterfly species present on site have now been recorded. Following this update information, the butterfly assemblage totals 33 species, which represents 63% of the total number of species recorded for Leicestershire. This total includes white-letter hairstreak (a UK Biodiversity Priority Species and listed on Sect. 41 of the NERC Act). Apart from this species and clouded yellow, the remainder are common and widespread both in Leicestershire and nationally and are termed “habitat generalists” which are mobile and do not have exacting larval requirements. The clouded yellow is a migrant species which is not resident in Leicestershire but occurs spasmodically when weather conditions are favourable and there are no permanent breeding sites in the county. Due to the relatively high percentage of Leicestershire’s butterfly fauna being present, the butterfly assemblage is assessed as of value **at the local level**. The presence of only a single habitat generalist species within this assemblage militates against a higher valuation.

The white-letter hairstreak has a scattered population within Leicestershire and Rutland, present in between 30 and 40 colonies (East Midlands Butterfly Conservation data 2006-2015) and is a scarce species in Charnwood. This species also receives partial legal protection through listing in Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) although this relates only to commercial exploitation. One individual was recorded in diseased hedgerow elms to the east of the A6 in late June 2015 at the start of their adult flight season. This is an elusive species and easily overlooked; it is considered probable that further colonies are present within the site, elm trees within the existing woodland areas being most likely to support the species. The white-letter hairstreak population is assessed as being of **district value** due to its scarcity within Charnwood.

Other Species

- 8.5.54 Common toad (and common frog) tadpoles were found in four of the nine water bodies within the site during great crested newt surveys. This is a UK Biodiversity Priority species and as such has been assessed as of **local value**.

Invasive Species

- 8.5.55 Two invasive species listed on Schedule 9 of the W&CA 1981 (as amended) was recorded from the site; a stand of giant hogweed (*Heracleum mantegazzianum*) was growing within tall ruderal vegetation close to the western boundary of the Manor Farm site (see Target Note TN5). Two plants of Himalayan balsam (*Impatiens glandulifera*) were recorded growing in disturbed ground adjacent to one of the buildings at Manor Farm (see Target Note TN6). Both these and the giant hogweed are no longer within the current application area. The latter had been cut down prior to October 2013, however the root systems and seed bank are considered likely to remain and persist in the topsoil respectfully.

Future Baseline

- 8.5.56 No attempt has been made to estimate the potential future nature conservation value of this site, as this is typically difficult to estimate as it is dependent on the specific local pressures which are hard to predict with any level of certainty. For example, if left entirely undisturbed, the grassland habitats would continue to mature with the scrub spreading to the more open grassland areas of the site, causing it to naturally succeed over time, steadily both creating and replacing a range of potential ecological receptors in the process. No invasive species were recorded from the current application area during the update surveys in 2015 and the site is not considered to be vulnerable to dumping of garden waste which could contain invasive species.

8.6 Mitigation Embedded within the Submitted Design

- 8.6.1 The initial scheme design was developed in response to the findings of the baseline studies carried out on the site. This was then presented and discussed at numerous meetings over a three year period between June 2013 and June 2016. These meetings involved inputs from both Charnwood Borough Councils own Landscape & Ecological representatives. We have also held separate meetings and site visits with representative of the Leicestershire & Rutland Wildlife Trust to seek their inputs to our design. It has also been influenced by advice gathered at meetings of the Green Infrastructure and Masterplanning Sub-Group meetings held in the context of a Planning Performance Agreement (PPA) process.

The feedback from these meetings was fed into the design process and our current layout is a response to all of those considerations. In order to provide some background to the main topics which these discussions focused on, we have produced two Ecological Constraints and Opportunities plans. These reflect the main themes which drove the initial layouts – which were namely:

- The protection of Broadnook Spinney in-so-far as possible.
- Provide a connection from Broadnook Spinney to habitats to the further south and west.
- Provision of strong habitat corridors within the site, to provide foraging routes for bats & birds.
- Key foraging areas to be provided to support the existing (albeit variable) badger population on site.
- Provision of strong perimeter habitats along key areas adjacent to the A46 and Great Central Railway.
- Locating key areas of biodiversity gain along the northern boundary of the site, so that it is continuous with the open parkland habitats character beyond.

Figure 8.3a is the Initial ECOP, which was based on our field survey findings and illustrates a potential layout of pathways which would provide a good framework of connective habitats across the site. The two key species being considered were bats and badger – although nesting and foraging birds would also benefit from these provisions. These principles were fed into the previous iterations of the Masterplan, which were tabled at each of the consultation meetings noted above.

Figure 8.3b then presents a further iteration of the ECOP which has been adjusted following consideration of the other non-ecological masterplanning influences and constraints relevant to this site. Whilst it shows that some of the initially proposed linkages are not as strongly expressed, there are significant gains elsewhere within the Green Infrastructure – particularly in relation to the width and strength of the corridors proposed and the significant habitats proposed to the south and north-west of Broadnook Spinney.

The final layout has therefore responded directly to a large number of the ecological priorities which were identified for this site and overall, these various inputs have resulted in a scheme which now includes the following features;

- (i) provides structural scale habitat connectivity with major new woodland to the northern boundary including a major ecology park. This will deliver landscape-scale new habitat ensuring strong connectivity along an east-west axis between Charnwood Forest habitats to the west and the river corridors of the Soar and Wreake (together with the Watermead area) to the east.
- (ii) strong linear wooded edges to the south and west boundaries.

- (iii) a range of interconnected green spaces and corridors within the site with ecological/nature conservation priorities including;
 - the south-west to north-east corridor
 - a corridor from 3 Parish Point to the north-western edge
 - a heavily wooded corridor to the extensive northern boundary
 - the corridor along the Great Central Railway boundary (including the Great Central Halt)
 - linear green infrastructure along the A46 boundary and green space east of the A46
 - (iv) integration of sustainable drainage priorities into the structure of the green infrastructure.
 - (v) a bespoke design to the proposed underbridge to A6 enhancing wildlife connections and leading to new mixed planting east of A6.
 - (vi) a matrix of Garden Suburb planting to encourage creative conservation and enhanced habitat.
 - (vii) careful attention to the new footpath and cycleway network in terms of extent, range, type, surfacing and lighting. It is important to ensure that desire lines and connections for people are sensitively and appropriately dealt with in balance with corridors for wildlife.
 - (viii) following Charnwood Core Strategy policies and principles, ensuring that biodiversity, open space, recreation and climate change are considered together and planned in an integrated and mutually beneficial manner.
- 8.6.2 The existing blocks of mature woodland (both broad-leaved and mixed) will be connected through additional planting, significantly strengthening its function as a wildlife corridor around the site perimeter, allowing dispersal of woodland species into the wider landscape; in particular foraging bats (See **Landscape Framework Plan** and detailed design). Additional habitat will be created for badgers, foraging bats (and in the long term, roosting bats as the trees mature) and nesting birds.
- 8.6.3 Low intensity usage of land immediately adjacent to the existing woodland (and additional planting) will retain badger foraging habitat and also minimise possible disturbance to sensitive nesting birds. No lights will be placed alongside woodland edges or hedgerows to ensure that badger and bat foraging behaviour can continue unhindered.
- 8.6.4 In relation to Broadnook Spinney, supplementary planting is proposed to extend it to southwards in order to reinforce the existing woodland block. As there are recreational uses proposed a short distance to the south, the topography of the site has enabled alignment of the drainage infrastructure to be such that it will provide an additional barrier to pedestrian access and discourage informal access to this woodland.

- 8.6.5 The species-rich hedgerows will be retained in situ and strengthened, with small sections affected by road/footway/cycleway connection. This will be mitigated by significant additional planting alongside existing hedgerows in areas of green space which will benefit nesting birds including notable species such as song thrush, dunnock and bullfinch. Trees planted either side of intersections will, when mature, effectively provide a closed canopy to allow bats to traverse the gap. This will benefit slower-flying bat species such as the brown long-eared bat. Some sections of the species-poor hedgerows will be removed but will be replaced in stronger format and added lengths, strengthened by new planting and in additional corridors, providing a much stronger framework of habitat and planting than currently exists.
- 8.6.6 Additional parkland will be created adjacent to and to the south of Broadnook Spinney which will replicate this habitat type occurring off-site to the north of the Spinney at the east end. This is both a UK and LBAP priority habitat which will be of benefit to bats (both roosting and foraging) in the medium to long term and will also benefit some notable birds particularly hole-nesting species.
- 8.6.7 Additional waterbodies will be created within the development area which will benefit the existing common amphibian assemblage through creation of additional habitat. These will be linked by terrestrial habitat which will allow for gene transfer between populations and bolster what are currently small populations of three species.
- 8.6.8 The design also includes compensation and enhancement for other habitats that are affected and includes the following;
- The loss of arable farmland, in itself a species-poor habitat, will nevertheless have a significant impact on some farmland breeding birds, in particular skylark, lapwing and yellow wagtail. The arable land under the control of the application to the north, but outside the development boundary, will continue to be managed as farmland and two additional wetland areas (associated with the proposed SUDS scheme) will be created to the north-west and to the east of Broadnook Spinney. This will provide compensatory habitat for lapwings, yellow wagtails and skylarks. Control of corvids (crows, jackdaws and magpies) will continue although the development will entail the removal of the majority of food sources for these birds (which were associated with the arable habitat and game cover areas), which will be expected to result in a diminution in their numbers.
 - The public will be deterred from accessing Broadnook Spinney to avoid trampling bluebells, causing disturbance to sensitive nesting birds and badgers and also for health and safety reasons due to the high number of mature trees with rotting heartwood, some of which have been wind damaged. These trees will be allowed to senesce and decay naturally, providing rot holes and cavities for roosting bats and hole nesting birds such as marsh tit (recorded breeding in Broadnook Spinney and listed on Section 41 of the NERC Act). Interpretation boards will be erected which will provide details on the reasons for exclusion and the valuable nature of the habitat and the species it supports. Broadnook Spinney will be put forward for formal designation as a Local Wildlife Site.

- Disease resistant elms (such as Sapporo “Autumn Gold”) will be used in the additional planting regime to minimise (as far as practicable) the potential impacts of Dutch elm disease on the population of smooth-leaved elm within the site and to provide a more secure and more continuous habitat for the white-letter hairstreak butterfly. These disease-resistant elms will be allowed to grow to maturity with minimal management to allow them to flower and set seed. The hairstreak larvae feed, at least initially, on developing elm flowers, later moving to leaf buds and seeds as they both mature. Planting of disease-resistant elms will greatly expand the available habitat and allow the hairstreaks to disperse through the landscape through the provision of ‘stepping stones’ planted in habitats currently hostile to them.

The current population of wych elm (considered to be susceptible to disease) is predominantly within the hedgerow network which will be trimmed as per the current regime to keep the wych elms at a size and trunk girth where they are not attractive to the elm bark beetles which transmit the disease.

- Two additional barn owl boxes will be erected on land to which the public have no access. This will provide additional roosting and nesting sites for this species. Control of crow species will be continued on the surrounding farmland which will also be of benefit to barn owls by maintaining the current low level of competition and incidence of mobbing which have knock-on impacts on efficiency of foraging behaviour and overwinter survival, particularly of inexperienced juvenile birds.
- Bird boxes, including open-fronted types, will be erected in areas of new plantation woodland once the trees reach sufficient size to accommodate them. This will benefit hole and cavity nesting species such as spotted flycatcher besides more common species and will allow expansion of range into habitat which would not otherwise be suitable for nesting as the trees would not be old enough to have natural holes.
- New buildings will incorporate bat roosting features within them and these will be strategically placed on and within buildings with adjacent woody vegetation such as broad-leaved woodland and/or hedgerows. This will benefit house-dwelling species such as the three pipistrelles and brown long-eared bats.
- Bat boxes will be erected on mature trees which do not currently have bat roost potential and also on planted trees once they are sufficiently mature to accommodate them.

We will install an equivalent of ten bat boxes per phase – with the boxes for the first phase being installed at the outset of the construction phase.

- 8.6.9 The mitigation and enhancement features will be part of an overall Landscape and Ecology Management Plan to be approved by the Borough Council in consultation with Natural England and the Leicestershire and Rutland Wildlife Trust. It will include short and longer term objectives and will be the responsibility of the Broadnook Garden Suburb Trust – a charitable management company established to care for the green infrastructure and public realm, resourced from initial endowment and by annual occupier subscription.

Construction Phase – working programme considerations

- 8.6.10 This section includes details of a range of environmental protection measures that will be employed during the construction phase. These commitments have been made in order to avoid and prevent environmental harm arising from general construction works and activities on the site. This includes adherence to standard industry best practices, including all relevant Pollution Prevention provisions.
- 8.6.11 The main construction impacts relate to potential damage to species-rich hedgerows, disturbance of breeding birds, badgers and roosting bats.
- 8.6.12 The development will be subject to both a **Landscape and Biodiversity Management Plan (LBMP)** and, for the construction phases, a compatible and mutually supportive **Construction Environmental Management Plan (CEMP)**. These Plans will ensure, through the definition of and adherence to best working practices, maximum benefit from mitigation, compensation and enhancement measures set out.
- 8.6.13 These site management protocols will be used to ensure that no offences are committed under the Wildlife and Countryside Act 1981 (as amended) or the Conservation of Habitats and Species Regulations 2010 (as amended);
- 8.6.14 Draft versions of both these documents have been produced to support this application. They demonstrate how the various mitigation, ecological and environmental protection measures can and will be implemented and delivered on site. Please see Appendices for copies of these documents.

Operational Phase

- 8.6.15 No specific operational mitigation for ecology is currently proposed within the scheme. It is anticipated that this will be driven by the outcome of the EclA below and the additional mitigation, compensation and enhancement measures that are recommended as a result. Operational management of the site is therefore discussed in Sections 8.7 onwards.

8.6.16 However, following the findings of the surveys completed for this scheme, this application is seeking to promote Broadnook Spinney as a LWS and we have treated and considered it as such within this assessment. The exact boundary of any new LWS designation would have to be set by Charnwood Borough Council, however we would recommend that the existing wooded extent is used as the initial boundary. Once the new structural and enhancement planting we will create has been put in place and become established, it may be appropriate to review this extent in future years. The LEMP will provide a suitable vehicle for regulating the permitted access, uses and management of Broadnook Spinney in the long-term and the Broadnook Garden Suburb Trust would play a key role in helping to deliver this biodiversity gain.

8.7 Potential Environmental Effects of the Scheme

8.7.1 As stated in Section 8.4.13, impacts are only assessed in detail for features both of sufficient value that impacts upon them and which may be significant in EIA terms and also potentially vulnerable to significant impacts arising from the development. Consequently, impacts have only been assessed in detail for those receptors that are of at least **local value** or are subject to legal protection.

8.7.2 This detailed assessment will therefore concentrate on the likely impacts in respect to the following receptors only;

- Non-statutory designated sites (County value);
- Arable farmland (Local value as it supports a suite of farmland bird species);
- Species-rich hedgerows (District value, legal offence);
- Breeding birds (District value and legally protected);
- Barn owl (District value, legally protected);
- Bats (Local value and legally protected);
- Badgers (Legally protected);
- Other UK BAP species (Local value);
- Bluebells (District value, legally protected);
- Early purple orchid (District value);
- Smooth-leaved elm (District value).
- Butterfly assemblage (Local value)
- White-letter hairstreak butterfly (District value)
- Japanese knotweed (Legal offence)

Construction Impacts and Effects

Non-statutory Designated Sites

- 8.7.3 Broadnook Spinney meets the criteria for a Local Wildlife Site, although it has not been formally designated at the time of writing. The Spinney will not be directly impacted upon by the construction phase as it will be fenced off and with an appropriate buffer zone implemented (minimum of 10m) to avoid damage to tree roots. This will also protect the populations of bluebells, early purple orchid and smooth-leaved elm. This is considered sufficient to allow this risk to be adequately managed. It is therefore **certain/near certain that no significant adverse impact** will affect this site or the notable flora species which are present. This will also minimise the risk of any commercial exploitation of the bluebells
- 8.7.4 The three species-rich hedgerows also meet the Local Wildlife Site criteria and are also considered likely to qualify as “important” under The Hedgerows Regulations (1997). As with the above site, a ten metre buffer zone will be implemented adjacent to those hedgerows to be impacted upon to protect their roost systems from inadvertent damage whilst creating footpaths and minor roadways. It is therefore **certain/near certain that no significant adverse impact** will affect the species-rich hedgerows.

Habitats

Arable Farmland

- 8.7.5 A significant amount of Grade 3b arable farmland will be lost to the development. Whilst this is botanically species-poor, including the marginal flora, its value is to a notable farmland breeding bird assemblage which will be impacted upon by a direct loss of habitat. The scheme design mitigation proposals have included a commitment to retain existing arable farmland usage to the north and north-west of Broadnook Spinney however, it is recognised that this alone will not address all of the impact that will arise during the construction phase – i.e. the diminution in numbers or loss of some bird species to residential development. Therefore in the absence of any additional mitigation, it is **probable** that the impact on arable land in terms of its bird population would be **significant**.

Species-rich Hedgerows

- 8.7.6 The three species-rich hedgerows also meet the Local Wildlife Site criteria and are also considered likely to qualify as “important” under The Hedgerows Regulations (1997).
- As with the above site, a ten metre buffer zone will be implemented adjacent to those hedgerows to be impacted upon to protect their roost systems from inadvertent damage whilst creating footpaths and minor roadways. It is therefore **certain/near certain that no significant adverse impact** will affect the species-rich hedgerows.

Fauna

Breeding Bird Assemblage

- 8.7.7 The site as a whole is notable for woodland and farmland bird assemblages of value at the district level. There will be no significant loss of habitat in the woodland areas supporting notable birds, however there will be significant impact on the farmland breeding assemblage through direct habitat loss. This will affect some species more than others; yellowhammer, whitethroat, dunnoek and bullfinch are considered likely to benefit from additional planting of scrub. On the other hand, lapwing, skylark and yellow wagtail will be significantly affected by direct habitat loss. Therefore it is **certain/near certain** that the impact on these three species will be **significant** in the absence of mitigation.
- 8.7.8 All birds are protected from disturbance whilst breeding – therefore vegetation clearance and ground works could result in an offence under the W&CA. Due to the presence of a resident breeding assemblage, in the absence of any mitigation, it is **probable** that a **significant adverse impact** would occur due to a breach of the legislation.
- 8.7.9 One species of Schedule 1 bird has been recorded (barn owl) although it is considered that this species failed to breed in 2013 and no evidence of its presence was found in 2015 (although this is not proof of its absence). As a Schedule 1 species, it receives additional protection from that discussed above – namely their dependant young are also protected from disturbance, regardless of whether they are associated with the nest or not. Therefore, in the absence of any mitigation, vegetation and ground clearance in proximity to the nest/roost tree is considered **probable** to cause a **significant adverse impact**, due to a breach of the legislation.

Bats

Habitat Loss/Disturbance

- 8.7.10 The species-poor hedgerow routes which have been found to be used as commuting routes by bats are to be safeguarded by a combination of retained, enhanced and/ or new planting. However, small sections will be lost to allow for footpaths and minor roads. This will impact on slower flying species such as brown long-eared bat and less so on faster flying species such as noctule and pipistrelles. It is considered **probable** that this will be a **temporary and reversible adverse impact** which is **not considered significant** in the medium to long term as it would only significantly affect one species out of the six bats recorded on site in the **short term**.
- 8.7.11 During construction, any works at night between April and September (inclusive) alongside hedgerows and areas of mature woodland are likely to disturb bat foraging activity in the areas concerned. It is considered **probable** that without mitigation, this would cause a **significant adverse impact** on foraging bats of at least six species.

- 8.7.12 The newly created habitats will increase bat foraging and commuting habitat. The additional tree and woodland planting will provide new commuting routes and foraging habitat and the new wetland areas will support increased insect populations which the bats prey on. It is **probable** that the construction of the scheme will result in a **significant beneficial impact** on the bat population in the medium to long term.

Bat Roosts

- 8.7.13 Two roosts, supporting low numbers of common pipistrelles were identified through nocturnal surveys at Wanlip Hill Farm and a further four buildings were assessed as having high or moderate bat roost potential at this location even though no evidence of bat use was evident at the time of the nocturnal surveys in 2015. There are also twenty-seven trees with bat roost potential within the development boundary, of which fourteen have been assessed as having high bat roost potential and nine with moderate potential. Should either of the two known roosts within the buildings, the other four farm buildings with bat roost potential or any of these trees be impacted upon without any mitigation in place, this would result in a **significant adverse impact**, due to a breach of UK and EU legislation.

Badgers

- 8.7.14 Based on the results of the update 2016 surveys, no direct impacts as a result of habitat loss will take place on the badger population(s) identified on the site and all active setts are all at least 30m away from the proposed works within the first Phase of the development. Their preferred foraging and commuting routes will also remain unaffected and will be reinforced in certain parts of the site.
- 8.7.15 However, there is the potential for harm during construction from badgers falling into open trenches or sheltering under construction materials resulting in death or injury. It is likely that noise and vibration during construction could cause disturbance to an active sett. The potential to harm and disturb badgers from these causes could all contravene the Protection of Badgers Act 1992 and it is **probable** that a **significant adverse impact** would occur.

All staff involved in site construction will be made aware of the possible presence of badgers and all trenches or holes will be covered over at night or planks emplaced in such a manner as to allow a ready escape route for any animals should they fall in.

Other Species

- 8.7.16 During construction there is potential for individual common toads to be killed or injured. There is also potential for temporary loss of common toad habitat. This is likely to represent relatively minor effects as extensive suitable habitat is available on adjacent land and there will be an increase in suitable habitat (e.g. water bodies, grassland, hedgerows and tree belts) when construction is complete.
- 8.7.17 However, if no consideration for these species is undertaken during construction it is **probable** that there will be a **significant impact** to the local populations of this species.

- 8.7.18 The majority of the semi-mature wych elms considered capable of supporting colonies of white-letter hairstreak butterflies are within existing woodland areas, principally Broadnook Spinney and these trees will be safeguarded from felling or root damage during the construction phase by a buffer zone. The elms within the hedgerow network to the west of the A6 are considered unsuitable to support hairstreaks and removal of these young trees is not considered likely to have a negative impact on white-letter hairstreaks. The known colony of white-letter hairstreaks is within hedgerow elms to the east of the A6, which showed symptoms of Dutch elm disease in June 2015 although the trees were still considered suitable to support the hairstreaks in the short to medium term. These trees will also be safeguarded from felling and **no significant impacts** on white-letter hairstreaks are anticipated as a result of construction. However these trees will be expected to succumb to disease in the long term (i.e. next 15 years) and mitigation has been proposed (see Section 8.7.33).
- 8.7.19 During construction, there is the potential for some degree of habitat loss for an assemblage of butterflies valued at the local level. However, with the exception of white-letter hairstreak (mentioned above) and the immigrant clouded yellow, this assemblage involves habitat generalists whose larval food plants are common and widespread throughout the development site. It is considered **near certain** that sufficient habitat will remain during the construction phase to support the overall populations comprising the butterfly assemblage and **no significant impacts** are anticipated at the construction stage.

Invasive Species

Japanese Knotweed

- 8.7.20 It is an offence under the W&CA to cause or permit Himalayan balsam and giant hogweed to spread in the wild. These are aggressively growing, non-native invasive species that are spread through the transmission of seeds. If any vegetation clearance or ground disturbance works are carried out in the areas where they occur (Manor Farm site) without any mitigation in place, it is probable this would lead to an offence under the legislation, therefore causing a significant adverse effect.

Operational Impacts and Effects

Statutory Designated Sites

- 8.7.21 Bradgate Park & Cropston Reservoir SSSI and Buddon Wood & Swithland Reservoir SSSI are unlikely to be directly impacted upon during the operation of the site due to the distances between them and the site. However, **indirect impacts could occur** through increased visitor usage and consequent damage or disturbance to sensitive habitats and species. Bradgate Park is open-access although the most sensitive habitats have been excluded from public access and this extends to the shores of Cropston Reservoir. There is no public access to Buddon Wood or Swithland Reservoir away from existing roads and footpaths around the periphery of these sites. It is **certain/near certain** that there will be **no significant impact** upon these sites during operation.

- 8.7.22 Watermead Country Park Local Nature Reserve already has a high footfall of visitors although this is managed via footpaths throughout the site. The most sensitive habitats and areas supporting sensitive nesting birds are excluded from public access; including the wetland areas. Although Halstead Road Centenary Pasture LNR is open access it is considered that sufficient open green space will be created within the site to accommodate both formal and informal recreation. Moreover, there are no direct links between the site and Halstead Road. It is considered **certain/near certain** that there will be **no significant impacts** upon these sites during operation

Non-statutory Designated Sites

- 8.7.23 Due to the distances involved and the fact that the majority of the seventeen Local Wildlife Sites are in private ownership with no public access, it is considered **certain/near certain** that there will be **no significant impacts** on these sites during operation.
- 8.7.24 Broadnook Spinney and the species-rich hedgerows are unlikely to be impacted upon during operation of the site as the spinney will be generally fenced off from the public (except for a permissive route through with interpretation boards and boardmarks) to avoid adverse impacts on the notable flora, badgers and breeding bird assemblage. No significant impact on the three species-rich hedgerows is anticipated as a result of operation of the site. It is **certain/near certain** that there will be **no significant impact** upon these sites during operation.

Habitats

Arable

- 8.7.25 As the majority of this habitat will be lost during the construction phase and the remaining arable habitat is outside the development footprint, **no significant impact** on the arable habitats are anticipated as a result of operation.

Species-rich Hedgerows

- 8.7.26 Broadnook Spinney and the species-rich hedgerows are unlikely to be impacted upon during operation of the site as the spinney will be generally fenced off from the public (except for a permissive route through with interpretation boards and board marks) to avoid adverse impacts on the notable flora, badgers and breeding bird assemblage. No significant impact on the three species-rich hedgerows is anticipated as a result of operation of the site. It is **certain/near certain** that there will be **no significant impact** upon these sites during operation.

Created Habitats

- 8.7.27 There is a commitment for ongoing operational management of the site and created habitats therein to be undertaken by a Broadnook Garden Suburb Trust which will be set up with full stakeholder representation. The Landscape and Ecology Management Plan will be the responsibility of the Trust. It is **probable** that this will have a **significant beneficial impact**.

Fauna

Breeding Birds

- 8.7.28 Once constructed, no specific operational impacts are anticipated to affect the woodland assemblage of breeding birds. The introduction of domestic pets and increased levels of disturbance due to formal and informal recreation on the site is likely to influence the location and distribution of breeding birds. However the local bird populations are likely to habituate to this and adjust their breeding locations accordingly. The significant additional planting of woodland and other areas of trees (including both new gardens and park areas) will create additional habitat for the woodland bird assemblage and some of these areas will be excluded from public access. Therefore it is **probable** that **no significant adverse impacts** are likely to occur in the long to medium term.
- 8.7.29 Once constructed, **no specific operational impacts** are anticipated to affect the farmland assemblage of breeding birds, including barn owl. The additional habitat which will be created will have restricted and controlled access to minimise the impacts of disturbance. The barn owl boxes will be inspected annually to ensure they remain fit for purpose as part of the management plan.

Bats

- 8.7.30 The proposed development means that new sources of lighting will be introduced in order to provide safe vehicular access and pedestrian rights of way through the site. Lighting will not generally be placed adjacent to any of the woodland areas or hedgerows which are used by bats as foraging and commuting routes. A lighting strategy has been produced for the scheme, which had modelled the potential light-spill anticipated from the development. This has found that no sensitive bat foraging corridors or known bat roosts will experience light levels in excess of 1 lux – the level above which some species can become disturbed or discouraged from feeding. The planting of additional woodland areas and removal of non-native species will also re-connect and significantly enhance the available habitat for foraging bats, enabling them to access additional foraging resources in the wider landscape. Therefore due to the significant increase in suitable foraging habitat within the development, it is predicted to have a **significant beneficial impact** on foraging bats.

Badgers

- 8.7.31 No roads are planned in proximity to the badger setts and low intensity usage will take place adjacent to Broadnook Spinney and all other places where badger foraging activity has been recorded during the surveys. This area will remain unlit at night to ensure that badger foraging behaviour can continue unhindered. Additional woodland planting will provide additional habitat and cover for setts, encouraging badgers to move away from the planned new roads and areas of built development. As a result of this, it is unlikely that badgers would be affected by traffic or lighting. It is **probable** that **no significant adverse impact** would occur.

Other Species

- 8.7.32 No specific mitigation has been made for common toad during operation of the site. The newly created woodland areas, grasslands, hedgerows and waterbodies will provide additional habitat for the populations of this species; but some individuals may be lost as traffic casualties or become trapped in gully (kerb) pots. However on balance, it is considered that there will be **no significant impact** on common toads during operation.
- 8.7.33 No specific mitigation has been made for the butterfly assemblage during operation of the site. The newly created woodland areas, grasslands and hedgerows will provide additional habitat for this assemblage and the creation of gardens will enhance the available nectar resource for the majority of butterfly species recorded, enabling this resource to be available for a longer period than exists currently as the grassland areas are mown in late summer annually. This will provide a **significant beneficial impact** to the butterfly assemblage.
- 8.7.34 Mitigation proposed for white-letter hairstreak butterfly would involve safeguarding all semi-mature elms, the majority of which are within Broadnook Spinney and other existing woodland areas which will remain unaffected, Those elms within the hedgerow to the east of the A6 which support a colony of hairstreaks will not be felled. Disease resistant elms will be planted in existing gaps in this section of hedgerow to provide continuity of habitat prior to the point where the existing elms succumb to disease. This will represent a **significant beneficial impact** on white-letter hairstreaks in providing continuity of habitat and enabling the colony to function naturally as far as possible through allowing them to disperse through the landscape. Disease resistant elms will also be planted at intervals throughout the site as well as in proximity to Broadnook Spinney which will significantly enhance the habitat for white-letter hairstreaks in providing continuity of habitat and in providing a series of 'stepping stones' through the habitat allowing dispersal through what is currently largely hostile habitat for this species.

Cumulative Impacts and Effects

- 8.7.35 The Broadnook Garden Suburb proposals incorporate a wide range of ecological features as part of generous green infrastructure. Extensive areas of new habitat will be created which will mitigate any short term impact and significantly enhance the biodiversity resource. There will be long term benefits for nature conservation.

In Scoping the Environmental Impact Assessment, the Borough Council identified three other sites involving development proposals which it recommended should be considered in assessing any likely cumulative effects. These sites are;

- (i) the Hallam Fields Birstall proposals south of A46 – now substantially completed and entering its final phases
- (ii) new housing and replacement primary school off Loughborough Road/ Hallfields Lane Rothley. This project is well underway; the school has been completed and is occupied at the time of writing

(iii) proposed Watermead Business Park, hotel and ancillary uses, Wanlip Road, Syston.
This proposal now has planning permission.

8.7.36 These three sites are dispersed over a wide area and are themselves surrounded by significant green infrastructure. They have all been subject to well-considered design and mitigation strategies. It is not considered that the completion or implementation of these projects in conjunction with the Broadnook proposal will have a significant adverse effect on the environmental resource.

8.8 Additional Mitigation, Compensation and Enhancement Measures

8.8.1 The following measures are proposed in order to address any significant adverse impacts that have been predicted to be likely to occur, as discussed in Section 8.7 above - noting that those assessments were considered in the absence of any additional mitigation measures.

Design

8.8.2 It is recommended that as the detailed design for Development Zones is identified, consultation is undertaken to confirm that the materials, scale and form of development are considered appropriate. The submitted Landscape and Ecological Mitigation: Detail Study Areas forms the basis for identifying the future mitigation on the site.

8.8.3 All new landscaping and planting works within the new development shall be designed so that native species, ideally of local provenance, are used in the planting wherever possible. The exception to this will be the planting of non-native disease resistant elms of the variety 'Sapporo Autumn Gold'. These are as close genetically to native species as possible whilst still retaining resistance to disease and have a proven track record for supporting white-letter hairstreaks and other notable invertebrates associated with elms. The rationale for this is to reduce the incidence of Dutch elm disease as far as practicable to safeguard the small population of smooth-leaved elm trees in Broadnook Spinney and to increase / enhance habitats for a population of white-letter hairstreak butterflies assessed as of District value.

Construction and Implementation

8.8.4 The Garden Suburb design accounts for national and local planning policy ambitions and the priorities for nature conservation and biodiversity are balanced and integrated with the wider aspects of green infrastructure provision. Distinct advantages apply in this case because by its very nature the Garden Suburb ideals and character enable intensively farmed land to be replaced with new green infrastructure with very positive capacity for habitat creation and enhanced nature conservation – in terms of both quality and quantity.

8.8.5 The Broadnook Garden Suburb Masterplan has evolved through an iterative design process incorporating comprehensive mitigation and enhancement measures. The total area of green space and planting within the application site amounts to some 107 hectares and will be significantly further increased by the spacious and heavily planted housing and employment areas.

8.8.6 Newly created habitats will contribute recreational, biodiversity and sustainability benefits. Key biodiversity features of the overall Garden Suburb proposals are:

- existing trees, woodland and copses are retained as are the species-rich hedgerows, and in combination these provide a strong baseline framework upon which to create enhanced connectivity. Habitats with ecological value will be retained and incorporated into the green infrastructure through and around the site.
- the provision of large areas of new woodland, wildflower grassland, native hedgerow planting, aquatic habitats and areas of native structural planting will increase the biodiversity across the site and will create enhanced existing and new green corridors throughout the Garden Suburb.
- creation of extensive open space and parkland supporting existing habitats and creating new ones to support Leicestershire & Rutland Biodiversity Action Plan (BAP) objectives.
- sustainable drainage routes and features within parkland and open space with a network of paths around them and through adjacent planting.
- creation of extensive and connected structural planting and wetland associated with the drainage system will provide enhanced foraging, with wetland and woodland habitats, as well as grassland providing habitats of value to invertebrates, increasing opportunities for bats to prey on and creating new foraging and nesting opportunities for birds.
- a landscape-scale set of green infrastructure assets at the northern boundary of the Garden Suburb providing strategic level connectivity for wildlife between the Charnwood Forest area to the west and the river/canal corridors of the Rivers Soar and Wreake to the east.
- the proposed layout of the site pays full regard to the existing field structure and provides a network of linear features for bat commuting routes.
- the surface water drainage system will produce potential for a mix of seasonally wet grassland, locally native aquatic emergent herbs and some shrub and tree planting including alder *Alnus glutinosa*, and willows *Salix spp* in these areas.
- at the extensive woodland edge, mixed shrub understory planting will provide a graded edge – an “ecotone” transition – to maximise habitat diversity.

- significant lengths of new hedgerows are proposed within, on the edge of and beyond the developed areas providing a matrix and continuity of hedgerow habitat for associated fauna such as birds, bats and invertebrates and more than compensating the small scale losses of sections of hedgerow for road and footpath access.
- green infrastructure will include a balanced mosaic of habitats including amenity grassland, informal areas of species-rich grassland composed of species of local provenance enhancing the overall grassland resource and providing a significantly greater nectar resource through enhanced herbaceous diversity.
- lighting will need to be carefully considered and designed where adjacent to existing and known potential bat foraging areas and commuting lines. Generally lighting will be avoided where desirable to ensure there are dark corridors through and around the Garden Suburb to allow the movement of bats and badgers across the site without disturbance and to maintain connectivity for these species. Where lighting is provided it will be designed to minimise light spill and glare and to be directionally downward. All new lighting will meet current good practice standards by reducing potential light pollution and using lowest intensity for purpose. An initial lighting study has been produced and this has found that the Masterplan is appropriate and no significant light spill on key habitat corridors are currently predicted.
- where existing or potential linear bat commuting routes are bisected by roads or paths “hop-overs” will be utilised – comprising semi-mature trees and vegetation at hedgerow ends to raise naturally the flight line of birds (particularly barn owl) and bats or to continue established plantation vegetation.
- the introduction of a variety and dispersal of nest boxes suitable for a range of birds including hole nesting and eave dwelling species on selected mature trees. These will include boxes of a size suitable for barn owls.
- 10 bat boxes will be installed on suitable trees per phase and where possible boxes and bat bricks will be incorporated into the design of suitable buildings, particularly where these are close to hedge and woodland edge habitats that could offer foraging links and habitats.
- to the east of the A6 the proposals include a new park, a tree and shrub nursery for the Garden Suburb planting requirements with copse and hedge layout characteristics, and with an option of additional playing field provision should the need arise. This area will also enhance habitat and commuting routes for bats and birds.

- 8.8.7 On the phased completion of the Garden Suburb, all retained and created habitats are proposed to be managed in accordance with the **Landscape and Ecology Management Plan** in order to promote biodiversity (see **Appendix 8.8**). It will include detailed prescriptions for the range of habitats and a rolling five year implementation programme with appropriate monitoring. The Plan will ensure that the enhanced biodiversity of the habitats is sustained in the longer term and that there are improved foraging and sheltering opportunities for badgers, bats and birds across the site and improved habitat for flora and invertebrates, including butterflies and moths..
- 8.8.8 Species lists are to be agreed partly in support of the detailed elements of the hybrid application and subsequently in relation to a series of reserved matters applications during the phased Garden Suburb implementation. Plants and seeds will be sourced from local native seed, seeds and green hay from nearby wildlife sites, stock from the bespoke Broadnook nursery – all to ensure local provenance with overlap and continuity with the wider Borough of Charnwood area. Disease resistant elms will be sourced as locally to Charnwood as is feasible. Once these trees have become established, cuttings can be taken and grown on in the nursery area. These can be supplemented with commercially available stock to increase genetic diversity as far as possible ².

Non-Statutory Designated Sites

- 8.8.9 It is considered that the standard industry best practice approach, including adherence to all relevant Environment Agency PPGs will provide protection to these areas.
- 8.8.10 However, it is recommended that Broadnook Spinney is fenced throughout the construction phase in order to prevent accidental harm to the sensitive habitats and species within it. This will remain in place for the duration of the construction period and retained and maintained for the operational regime thereafter.

Habitats

Standing Water

- 8.8.11 It is proposed that an additional wetland area will be constructed to the north of Broadnook Spinney as part of the Sustainable Surface Water Drainage Strategy. This will deliver betterment to the drainage and flood regime associated with Rothley Brook. It could also perform a role as a source of water for irrigation of Rothley Golf Course via gravity feed. This area will have sinuous gravel banks which will provide additional habitat for nesting lapwings and yellow wagtails. The wetland will be planted with submerged and floating aquatic plant species - although emergent species will not be included in order to retain the attractiveness of the banks to ground-nesting species, principally lapwings and yellow wagtails. This area will be fenced once created to ensure disturbance is minimised for the first and subsequent nesting seasons through exclusion of the public. This wetland will have shallow banks, which are able to support the greatest variety of pond wildlife including tadpoles, newt larvae, water beetles and dragonflies. Ecologists will be included in the project team by providing specific advice on the exact design and specification of the wetland creation proposals.

² As Sapporo Autumn Gold is derived from clonal material, genetic diversity is not considered likely to be high as trees that are commercially available will have been grown from a limited amount of parental stock.

Broad-leaved Woodland

- 8.8.12 The individual trees within areas of new planted woodland will have plastic guards for at least the first three years to prevent bark damage by grazing fauna. Undesirable species (such as ruderals and coarse grasses) will be removed during the first three growing seasons to reduce competition. Tree condition will be checked annually and any saplings which have died will be replaced. Locally native species will be used as far as practicable. Ash saplings will not be included in the planting proposals to avoid spread of ash die-back disease (*Chalara fraxinea*), however some self-set individuals are expected to establish and grow in the medium to long-term from the existing stock on site.

Hedgerows

- 8.8.13 Hedgerows to be created will have ecological input into the planting specifications to enhance their ecological value.

Fauna

Invertebrates

- 8.8.14 Mitigation would be considered necessary if vegetation clearance involved the loss of semi-mature elm trees supporting populations of white-letter hairstreak butterflies. The existing elm population within the woodland areas is currently threatened by further outbreaks of Dutch elm disease; the elms within the hedgerow network are effectively prevented from flowering and seeding by the current trimming regime and are thus not considered suitable to support this butterfly in their current state.
- Planting of disease resistant elms 'Sapporo Autumn Gold' throughout the site will provide alternative and more secure habitat for white-letter hairstreaks and these trees will be allowed to grow to maturity, producing flowers and setting seed; both of which are necessary to support white-letter hairstreak larvae. The provision of these trees will act as stepping stones through the landscape, enabling effective dispersal throughout the site.
 - Grassland area within green space will be sown with native wild flowers that are already present within the wider landscape surrounding the site. A list of recommended plants is provided within **Volume 2: Appendix 8.3 and 8.8**
 - It is recommended that both fallen and standing dead wood is retained as far as practicable as this habitat is utilised by saproxylic beetles and hover-flies (dead wood specialists).
 - Where possible and in accordance with the Landscape and Ecology Principles rides and glades could be created throughout the newly planted woodland area as these provide specific habitat niches for invertebrates.

Following the creation of the new habitat areas, these recommendations listed above for enhancement are made in order to maximise the value of the site for invertebrates, including both the butterfly assemblage and white-letter hairstreaks specifically.

- 8.8.15 It is proposed that the location and extent of these enhancement measures would be agreed in consultation with the relevant stakeholders and delivered over time through the mechanism of the Management Plan.

Breeding Birds

- 8.8.16 In order to prevent an offence under the W&CA, all vegetation clearance and ground disturbance work should be done outside the breeding bird season (which extends between March-September inclusive). If this is not possible, any areas that are to be cleared during this time will be checked by a suitably qualified ecologist prior to the works, in order to confirm the absence of any active nests.
- 8.8.17 Should any active nests be found, a buffer zone will be established around the nest and it will be left in situ until the young have left the nest. Note that the size of this buffer zone required is species specific - therefore it may be necessary to adjust the timing, approach and sequence of work proposed in areas adjacent to the buffer zone, until the fledglings have left the nest.
- 8.8.18 Note that the above inspections are required for both areas of scrub/trees and also any areas that are suitable for ground nesting species – e.g. lapwing, skylark and yellow wagtail.
- 8.8.19 It is likely that barn owls will continue to try and nest in the hollow tree (in the virtual absence of any alternative sites) in future years. As this species is protected through listing on Schedule 1 of the W&CA every effort should be made to avoid causing disturbance during the breeding season and for the period when barn owls have dependent young. It will be necessary to regularly monitor the status of these birds until the young are able to feed and fend for themselves. Consequently the buffer zone would be variable during this phase and it should be noted that it may typically take 6-8 weeks for eggs to hatch and fully fledge. Therefore regular monitoring will allow the phasing and timing of any such disturbance works to be reviewed and adjusted, as appropriate, to prevent an offence occurring.
- 8.8.20 In order to enhance the value of this site for barn owls during the disturbance caused by the construction, it is recommended that additional barn owl boxes are erected elsewhere on the site in areas where public access will be controlled. This will provide alternative nest sites and will give additional opportunities for the current pair to move away from potential sources of disturbance as well as providing additional roosting habitat for young birds reared on site.

Corvid control will continue in the nearby arable areas at the current level to reduce incidence of mobbing as this has knock-on effects on hunting success, especially of inexperienced juvenile birds.

Bats

- 8.8.21 Further surveys for roosting bats in the buildings at Wanlip Farm and the twenty-seven trees identified as having bat roost potential will be undertaken prior to the commencement of any works near to these, should these subsequently be required. These will involve internal inspections and roost emergence and re-entry surveys if necessary. As the development phases will span more than three years the surveys will be undertaken during the bat survey season (April-September inclusive) prior to any works in each phase commencing. This will give adequate time for any licensing or mitigation that may be required to be undertaken before works commence in the event of a currently unidentified bat roost being found.

Therefore we are proposing to carry-out bat emergence survey of the ten trees which are located within the Detailed Phase of the development during the Summer of 2016. This information will then be available in advance of the commencement of construction, which is proposed to commence in 2017, to allow sufficient time to implement any relevant mitigation. The works will be micro-phased as required, in order to allow these to be done at the most appropriate time of year as necessary.

- 8.8.22 A lighting assessment has already been completed, however there will also be ecological input into the detailed design and specification of the final lighting models chosen, in order to avoid illuminating potential foraging and commuting habitats. This will include the final lighting specification throughout the scheme, to ensure the final light spill and light levels continue to meet the proposed levels adjacent to potential bat foraging corridors.

Badgers

- 8.8.23 To mitigate against the impacts on badgers, the following measures are to be implemented pre-construction.
- 8.8.24 Badgers are highly mobile species, so repeat badger surveys are to be undertaken prior to construction in order to establish their locations and any interim movements. Surveys will commence at least 12 months before the construction start date and be repeated annually. A pre-construction survey three months before the start date of any works in a given zone of the site will also be undertaken to provide additional certainty.
- 8.8.25 Dependent on the location(s) of any badger sett(s) found in the update surveys it may be necessary to apply for a Natural England licence permitting the closure of a badger sett, and such a licence should be obtained prior to the requirement for sett closure. Natural England will not usually issue licences for sett closure during the badger breeding season; that being 30 November – 1 July. Development licences from Natural England can only be obtained after planning permission has been granted. Should a sett need to be closed it is likely to involve using one-way gates followed by a period of monitoring to make sure badgers are not using it. An alternative artificial sett would be provided elsewhere on site in order to accommodate the excluded badgers. Note that the location, size and design of any replacement sett would be dependent on the findings of the survey. However it is considered that there is sufficient cover and secluded locations in the vicinity of Broadnook Spinney to accommodate a replacement sett.

- 8.8.26 Any setts found during the update surveys that would not require closure but may be subject to disturbance from the works due to close proximity may also need a Natural England licence granting before works commence. The following measures will also be implemented during construction.
- 8.8.27 Toolbox talks are to be given to contractors who should be vigilant for badgers which may enter the works area. If badgers or setts are found within the site an ecologist will be notified for advice to offset potential impacts.
- 8.8.28 Works covered by a badger licence and works close to known setts will be completed under ecological supervision of the licence holder or an accredited agent.
- 8.8.29 Vegetation clearance close to badger setts will be undertaken in a sensitive manner with regard for potential effects of such work on badgers. This includes felling trees away from setts. Badger/mammal paths will be cleared of any felled trees or scrub.
- 8.8.30 Temporary badger fencing will be installed along the boundary of sections of the working corridor to prevent access and inadvertent harm where the surveys confirm evidence of continued use of the area and movement by badgers.
- 8.8.31 In areas known to support badgers trenches will be covered overnight to prevent badgers from falling in or trenches will include an earth or wooden ramp to allow badgers to climb out should any fall in
- 8.8.32 If vehicles have to be temporarily parked on-site they will be kept within the site construction area to minimise disturbance to the surrounding area.
- 8.8.33 Consideration will be given to any potential light and noise pollution, especially that arising from construction, and mitigation to minimise light and noise pollution in the vicinity of any badger setts will be employed.
- 8.8.34 Works close to setts will be restricted at night to reduce disturbance to any badgers which may be leaving or returning. If night works are essential in these areas then the need for ecological supervision should be considered in each case.

Invasive Species

- 8.8.35 Works will be required in area where giant hogweed and Himalayan balsam have been recorded. It is recommended that management control measures are undertaken in accordance with the Environment Agency's best practice guidelines for treatment and disposal prior to the commencement of works to remove them. Wholesale removal is preferential, but if not other practical control measures could be considered

These measures will be included within the management plan so that procedures are in place should the plant spread or appear elsewhere on site during the construction phase(s). It is also recommended that this be included as an item in the general site induction, so that all contractors and workmen on site are aware of their responsibilities in this regard and the procedures to be followed if it is encountered.

Other Species

- 8.8.36 Mitigation for common toad is covered by the generic mitigation discussed below

Generic Mitigation

- 8.8.37 Ecological clerk of works supervision – the development will be monitored by an ecological clerk of works who will be responsible for ensuring that mitigation proposals are carried out and that guidance/legislation is complied with during construction. The clerk of works will also be responsible for monitoring activities close to sensitive habitats to prevent damage and all clearance of valuable habitat will be supervised. This is to include works on/near watercourses and habitats occupied by protected species.
- 8.8.38 Toolbox talks for contractors – contractors will be briefed on the ecological value of the development site by a qualified ecologist (i.e. a member of the CIEEM) to facilitate appreciation of the need for mitigation and careful working practices.
- 8.8.39 During construction, control measures will be put in place to prevent spillages resulting in pollution (e.g. storage away from ponds and watercourses) and Environment Agency Pollution Prevention Guidance will be adhered to, thus controlling this risk.

Operation

Non-statutory Designated Sites

- 8.8.40 In order to enhance the ecological value of the newly created area of habitats adjacent to Broadnook Spinney and elsewhere within the site, it is proposed to develop a long-term management strategy for them. This will be designed in liaison with the relevant stakeholders, so that operations such as thinning, control of invasive or other undesirable species (if any) and management of the grassland and wetland areas are timed in order to prevent disturbance to sensitive receptors such as breeding birds, badgers and roosting bats. It is proposed that a management body or other nominated nature conservation body would be commissioned to undertake the works.

Habitats

- 8.8.41 The newly planted woodland areas (including parkland) will need to be managed during the establishment phase to reduce competition with ruderal vegetation and coarse grasses and to replace any saplings that may have died. The wetland areas will also need to be managed to prevent invasion of undesirable species.
- 8.8.42 The Management Plan details a management and maintenance schedule for each habitat within the site. It also identifies the roles and responsibilities of the various parties and stakeholders associated with the site along with a mechanism for regular reviews of the condition of the new habitats and the appropriateness of the management taking place. This will then allow it to be adjusted accordingly to match the maturing site and any new native species which may colonise in the future.

- 8.8.43 Access will also be considered such that the newly created areas are protected from disturbance. The decision regarding the desired levels and type of future formal or informal access elsewhere on the site will be taken in consultation with the relevant stakeholders, as appropriate.
- 8.8.44 Once established, the woodland areas will require regular monitoring and management during the operational phase of the development. In order to help maintain their biodiversity value, a management regime will be implemented. See **Appendix 8.8** for more details.
- 8.8.45 The Management Plan will cover the whole of the green space areas so that the wider value is promoted and enhanced. It is considered that a coherent site-wide management plan will have a greater biodiversity benefit on the value of the designated, newly created and retained habitats within the site.

Fauna

Breeding Birds

- 8.8.46 Once the planted trees are sufficiently mature, the installed bird boxes will need to be monitored on an annual basis in order to assess the level of adoption. They will be visited and maintained yearly, so that any old nests can be cleared out (outside of the nesting season) and any damaged boxes will be repaired, re-hung or replaced, as appropriate. The barn owl boxes will also be monitored externally to avoid causing disturbance to roosting barn owls and potentially also to breeding owls as they can breed early in the year, depending on availability of their rodent prey. They will be checked for external damage during the winter months and re-hung should this become necessary. In the event that a more intrusive cleaning regime is deemed necessary, this will be carried out by a licensed barn owl worker.

Bats

- 8.8.47 The new bat boxes will be monitored and maintained throughout the construction phase and for a minimum of 5 years post-completion. This will involve an annual inspection by a licensed bat worker to confirm whether any are being used and they will also be cleaned in order to lessen the likelihood of premature decay of the boxes, the build-up of parasites and any other source of diseases.

Badgers

- 8.8.48 Following the completion of the development phase where badgers are known to be present, a full badger survey should be undertaken 1 and 3 years post-development to determine if badgers are still using any setts in proximity to the development and to check for any new setts which may have been excavated.

8.9 Assessment Summary and Residual Environmental Effects

- 8.9.1 The application site area is 204 ha in extent and predominantly constitutes intensively managed agricultural land. The remaining grassland is predominantly species-poor, semi-improved grassland dominated by sown commercially available species. Except for three sections of species-rich hedgerow, the majority of the hedgerows are species-poor and intensively managed. Broadnook Spinney and individual and groups of mature trees are also notable.
- 8.9.2 In 2008 and 2012 the Borough Council commissioned ecological surveys to inform its evidence base for a new Local Plan Core Strategy covering the period to 2028. For the North of Birstall location, the surveys revealed that of the habitats surveyed, none were considered to be of high ecological value at the national level and there are no designated (statutory or non-statutory) sites of ecological value within or immediately adjacent to the application site. The intensively managed land has low ecological value with relatively poor species composition.
- 8.9.3 The Borough Council's work recommended that if development proposals are brought forward then further surveys should be carried out and identified a number of priorities for the masterplanning process, including;
- the retention and enhancement of a wooded landscape including a network of hedgerows and mature/veteran trees for foraging areas and "commuting" routes for wildlife;
 - the restoration, enhancement and/or replacement of "links" at a structural scale to reinstate connectivity between important habitats in the river valleys and Charnwood Forest;
 - to identify sufficient buffer zones and balance between development and areas known to support wildlife;
 - to pursue enhancement of the water environment including, if possible, betterment to Rothley Brook in terms of flood risk and water quality.
- 8.9.4 During 2013 a desk study exercise and the additional detailed survey work was carried out to build on the earlier assessments and to follow the recommendations made. An Extended Phase 1 Habitat Survey was completed together with bat, breeding birds, badger and great crested newt surveys. That baseline information has been revisited during 2015 and again in 2016. In addition a formal Scoping Opinion by the Borough Council in April 2014 confirmed the range of work carried out and its methodology.

- 8.9.5 In summary, the method of evaluation and assessment of effects follows four stages;
- (i) evaluation of nature conservation importance of features of the site;
 - (ii) consideration of the constraints to development presented by the nature conservation resource as well as the opportunities presented to achieve a nett gain in biodiversity;
 - (iii) analysis of the magnitude of the development's effect on the features of the site prior to mitigation and enhancement;
 - (iv) assessment of the significance of the development's effect on the features of the site taking account of mitigation and design proposals.
- 8.9.6 The design, mitigation and creative conservation process is an iterative one utilising survey information to inform draft proposals for discussion, review and refinement. The survey work has not identified significant constraints to development. In the context of a Planning Performance Agreement, appropriate mitigation and nature conservation enhancement proposals for habitat creation and increased biodiversity have been discussed with specialist representatives of the Borough Council and Leicestershire and Rutland Wildlife Trust. It is recognised too that these mitigation and enhancement proposals for biodiversity interact with and inform proposals for landscape, recreation, sustainability and routes for people and wildlife within and across the garden suburb area.
- 8.9.7 In carrying out this design iteration, the project team has been mindful of the planning policy priorities. The National Planning Policy Framework requires proposals to minimise impact on biodiversity and to provide nett benefits where possible – including by establishing and extending coherent ecological networks that are more resilient to current and future pressures including climate change.
- 8.9.8 The Borough Council is very keen to ensure that these priorities are delivered in implementing its strategic development schemes. The earlier development plan (the Borough of Charnwood Local Plan 2004) set the scene but it is the new Core Strategy which enthusiastically takes up the themes, objectives and priorities in both a generic and site-specific way.
- 8.9.9 The Core Strategy's general approach (expressed by Policy CS13) is to;
- conserve and enhance the natural environment;
 - support development proposals which protect, enhance, restore or recreate biodiversity;
 - ensure designated wildlife sites, priority habitats and protected species are safeguarded;
 - improve ecological networks.
- by endorsing a Masterplan which is based on thorough survey work and which follows consideration of alternatives in order to define the optimum scheme.

- 8.9.10 The Core Strategy's location-specific advice and definition of priorities are established by Policy CS20. This identifies two important wildlife corridors – Broadnook Spinney and Great Central Railway. Proposals are expected to respect and enhance these two corridors as well as to consider the creation of new wildlife networks;

“This includes considering opportunities to create a network across the landscape along the north-south and east-west axes to help enhance connections to the River Soar”

- 8.9.11 In addition the planning authority has emphasised the importance of taking a balanced and integrated design approach based on the wider aspects of green infrastructure including priorities for nature conservation and biodiversity in producing a genuine garden suburb. The Core Strategy states:

“We want to see the sustainable urban extension provide good access to open spaces, sport and recreational facilities to benefit both new and existing residents... Green Infrastructure will be a fundamental prerequisite in establishing the garden suburb style and character”; and

“The sustainable urban extension is well related to the River Soar and the Watermead Regeneration Corridor. We want the development to complement and maximise the opportunity for access to this wider Green Infrastructure network for recreation and leisure to the benefit of the existing and new communities.

We expect biodiversity, open space and climate change to be considered and planned in an integrated manner”.

- 8.9.12 Distinct advantages apply in this case to achieve the policy objectives and priorities. Scale, space and positive landowner support can combine to produce an exemplary proposal with *“beautiful character”* which demonstrates;

“generous green space linked to the wider countryside, well managed and high quality gardens, tree lined streets and open space with opportunities for residents to grow their own food”

- 8.9.13 By its very nature the garden suburb proposal, by being based on this approach and character presents a major opportunity to facilitate extensive multi-functional green infrastructure with very positive potential for habitat creation.

- 8.9.14 Against the above policy background and as a result of the robust assessment methodology, **Table 8.3** (following) provides a summary of this EclA chapter, it details the impacts which have been assessed for those ecological receptors that were considered ,likely to experience significant effects as a result of the proposed development, in the absence of mitigation.

- 8.9.15 Only those impacts identified above as having a significant effect have been taken forward to residual impact assessment. Additional mitigation has been specified for the development where it could not be included in the design. Where the magnitude of impact has been reduced after additional mitigation, this is based on the anticipated effect of applying that mitigation.

- 8.9.16 The designated sites within 2 km of the site will not be significantly impacted by the development, either directly or indirectly. All of these sites have no public access to their most sensitive habitats. The commitment within the design to manage the valuable habitats within the site and to newly create a much greater amount of them will, in the long-term, provide notable biodiversity benefit.
- 8.9.17 Not only have the impacts within the boundaries of the site been mitigated in the design, areas of land that may meet the criteria for designation as a Local Wildlife Site (LWS) i.e. habitats of county value elsewhere within the site have been included and their enhancement has also been included in this ES chapter.
- 8.9.18 Consultation between Charnwood Borough Council and WYG has been undertaken during the development of the design to address issues of impacts upon habitats and it is anticipated that further consultation will be undertaken during the detailed design stages and as implementation takes place by phase.
- 8.9.19 The development proposals have taken full regard of the existing ecological resource and ensure that there will be no significant impacts. The proposals have also been designed to ensure that habitats for bats, breeding birds, badgers and white-letter hairstreak butterflies are retained where possible and substantially enhanced by very large areas of green space and green corridors – within and around the application site.
- 8.9.20 The majority of the site comprise arable land use and the loss of this habitat is considered to have a negligible effect on local nature conservation and biodiversity. The landscape and ecology proposals will, on full implementation and with appropriate long-term management, produce overall significant nett beneficial effects for this area and species associated with it.
- 8.9.21 High quality long-term management and maintenance is an important consideration not only for the ecological resource but for green infrastructure and the public realm at Broadnook Garden Suburb as a whole. **Appendix 8.8** includes the draft **Landscape and Biodiversity Management Plan** and sets out objectives and priorities for the key habitats/species. It will be the subject of further discussion in order to reach a full and enduring management regime.
- 8.9.22 So far as planning policy is concerned the Broadnook Garden Suburb proposals;
- (i) plan positively for the creation, protection and enhancement of networks of biodiversity and green infrastructure;
 - (ii) plan for biodiversity at a landscape-scale;
 - (iii) promote the preservation, restoration and re-creation of priority habitats, ecological network and the recovery of priority species;
 - (iv) respect existing wildlife corridors and create new networks including across the landscape along the north-south and east-west axes, enhancing connections to Charnwood Forest, the Rivers Soar and Wreake and Watermead Park;

- (v) deliver strategic green infrastructure and support the enhancement of the “urban fringe”.

in full accord with the National Planning Policy Framework and the Charnwood Local Plan policies, priorities and principles.

Table 8.3 Assessment Summary Table

Ecological Receptor	Potential Impacts	Value of Receptor	Nature	Significance (incl. Confidence)
Construction Impacts				
Non-statutorily Designated Sites - Broadnook Spinney	<i>Pollution Disturbance</i>	County	Adverse Direct & Indirect Long-term	Not Significant Certain/Near-certain
Arable farmland	<i>Habitat loss for birds</i>	Local	Adverse Direct	Significant Probable
Species-rich hedgerows	<i>Habitat loss</i>	District	Adverse Direct	Not Significant Certain/Near-certain
Breeding Birds	<i>Disturbance Habitat loss</i>	District	Adverse Direct Indirect	Significant Certain/Near-certain
Barn Owl	<i>Disturbance</i>	District	Adverse Direct	Significant Certain/Near-certain
Bats – Habitats	<i>Disturbance of foraging habitat</i>	Local	Adverse Temporary Short-term Reversible	Not Significant Probable
Bats – Roosts	<i>Disturbance Harm</i>	Local	Adverse Direct Permanent	Significant Certain/Near-certain
Badger	<i>Disturbance Harm</i>	Legal Protection	Adverse Direct	Significant Probable

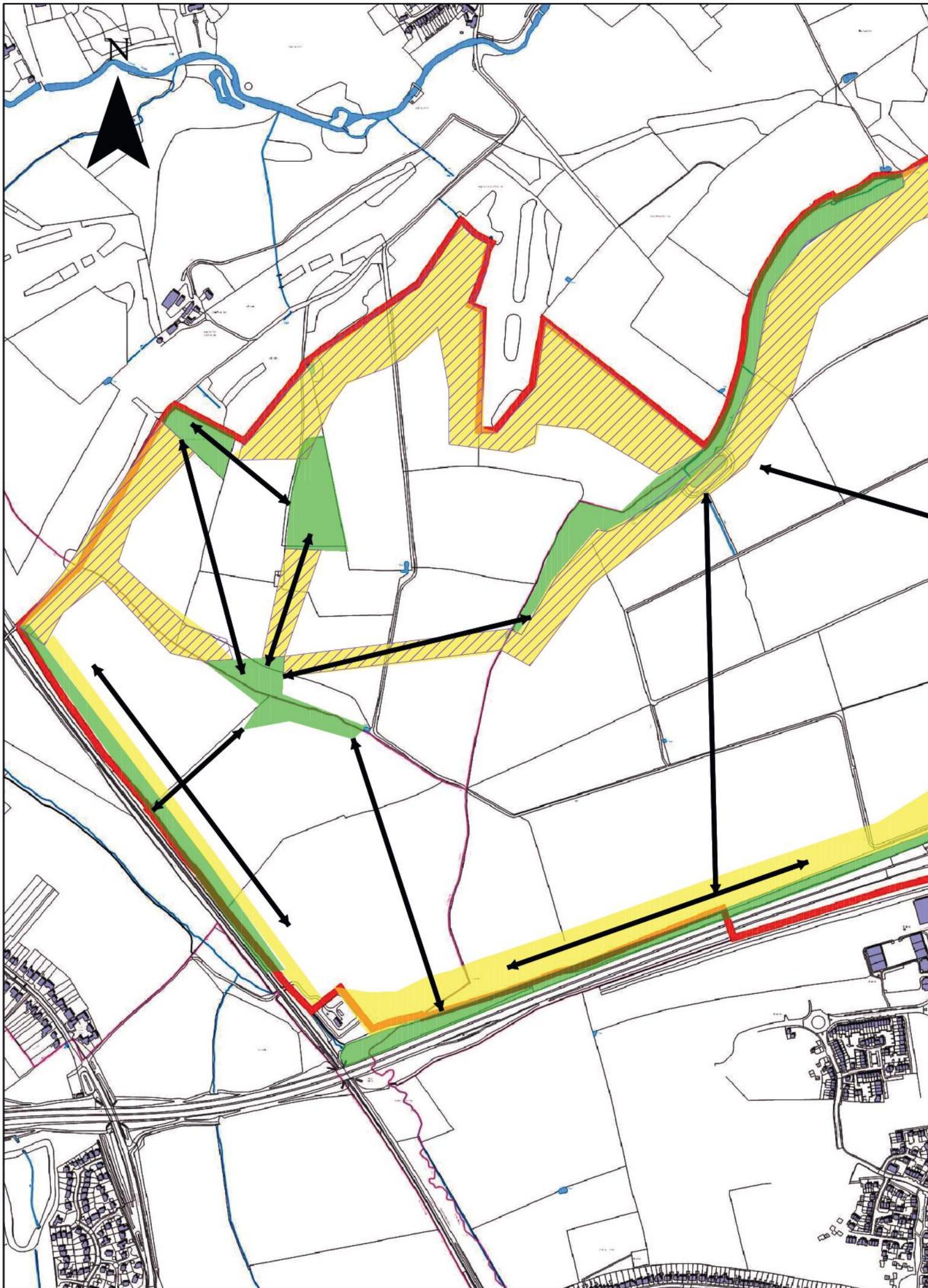
Proposed Mitigation / Enhancement Measures	Residual Effects
<p>Mitigation: n/a</p> <p>Enhancement: Protection measures provided through the LEMP</p>	<p>Not Significant Certain/Near Certain</p>
<p>Mitigation: Creation of alternative habitats</p> <p>Enhancement: Management measures provided through the LEMP</p>	<p>Not Significant Certain/Near Certain</p>
<p>Mitigation: Creation of significant additional hedgerows</p> <p>Enhancement: Management measures provided through the LEMP</p>	<p>Not Significant Certain/Near Certain</p>
<p>Mitigation: Sensitive timing of vegetation clearance works</p> <p>Enhancement: Installation of an equivalent of ten new bat boxes per phase. Creation of significant areas of additional breeding habitats</p>	<p>Not Significant Certain/Near Certain</p>
<p>Mitigation: Buffer zones around nest sites, should they subsequently establish on-site</p> <p>Enhancement: Installation of two barn owl boxes. Creation of significant additional feeding habitats and their management measures through the LEMP</p>	<p>Not Significant Certain/Near Certain</p>
<p>Mitigation: n/a</p> <p>Enhancement: Creation of significant additional feeding habitats and their management through the LEMP</p>	<p>Not Significant Certain/Near Certain</p>
<p>Mitigation: Secure European Protected Species Licence should disturbance works be required that would affect any bat roosts</p> <p>Enhancement: Installation of an equivalent of ten new bat boxes per phase.</p>	<p>Not Significant Certain/Near Certain</p>
<p>Mitigation: Buffer zones to be put in place around any setts. Protection measures during construction works – e.g. toolbox talks</p> <p>Enhancement: Creation of significant additional feeding habitats and their management through the LEMP</p>	<p>Not Significant Certain/Near Certain</p>

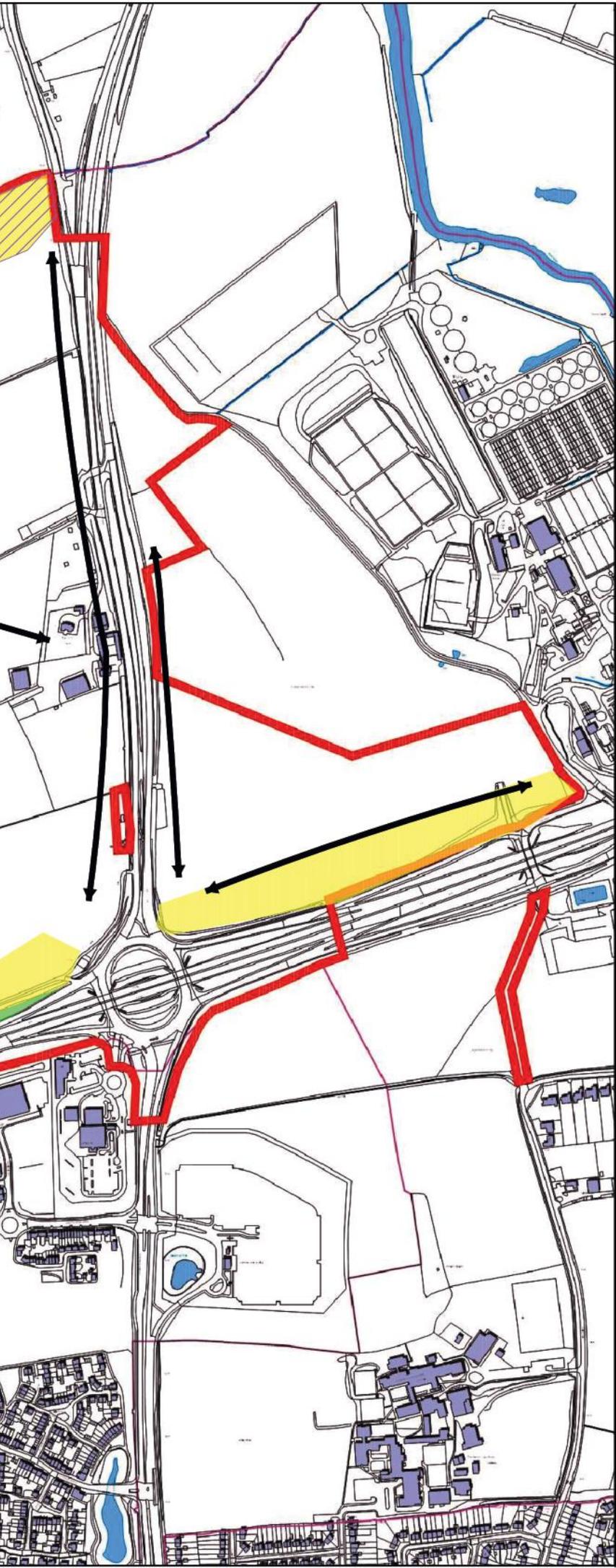
Ecological Receptor	Potential Impacts	Value of Receptor	Nature	Significance (incl. Confidence)
Other UK Priority Species – Various	<i>Habitat loss</i> <i>Harm</i>	Local	Adverse Direct	Significant Probable
Bluebells	<i>Legal offence</i>	District Legally Protected	Adverse Direct	Not Significant Certain/Near-certain
Smooth-leaved elm	<i>Disturbance</i>	District	Adverse Direct	Not Significant Probable
Butterfly assemblage	<i>Habitat loss</i>	Local	Adverse Direct	Not Significant Certain/Near-certain
Invasive Species	<i>Legal offence</i>	Legal Offence	Adverse Direct	Significant Certain/Near-certain
Operational Impacts				
Statutory Designated Sites - Various	<i>Increased Visitor Pressure</i>	National	Adverse Indirect	Not Significant Certain/Near-certain
Non-statutory Designated Sites - Broadnook Spinney	<i>Increased Visitor Pressure</i>	County	Adverse Direct Indirect	Not Significant Certain/Near-certain
Arable farmland	<i>Disturbance</i>	Local	Adverse	Not Significant Certain/Near-certain
Species-rich Hedgerows	<i>Disturbance</i>	District	Adverse Indirect	Not Significant Certain/Near-certain

Proposed Mitigation / Enhancement Measures	Residual Effects
<p>Mitigation: Retention of habitats and creation of significant additional habitats and their management through the LEMP</p> <p>Enhancement: n/a</p>	<p>Not Significant Certain/Near Certain</p>
<p>Mitigation: n/a</p> <p>Enhancement: Protection measures to limit access and disturbance within Broadnook Spinney</p>	<p>Not Significant Certain/Near Certain</p>
<p>Mitigation: n/a</p> <p>Enhancement: Tree being retained for benefit of white-letter hairstreak</p>	<p>Not Significant Certain/Near Certain</p>
<p>Mitigation: n/a</p> <p>Enhancement: Replacement of arable with significant additional feeding habitats and their management through the LEMP</p>	<p>Not Significant Certain/Near Certain</p>
<p>Mitigation: Treatment of affected areas and restrictions on works and soil disturbance in these areas, in accordance with best practice guidelines.</p> <p>Enhancement: n/a</p>	<p>Not Significant Certain/Near Certain</p>
<p>Mitigation: n/a</p> <p>Enhancement: n/a</p>	<p>Not Significant Certain/Near Certain</p>
<p>Mitigation: n/a</p> <p>Enhancement: n/a</p>	<p>Not Significant Certain/Near Certain</p>
<p>Mitigation: n/a</p> <p>Enhancement: n/a</p>	<p>Not Significant Certain/Near Certain</p>
<p>Mitigation: n/a</p> <p>Enhancement: Their long-term management through the LEMP</p>	<p>Not Significant Certain/Near Certain</p>

Ecological Receptor	Potential Impacts	Value of Receptor	Nature	Significance (incl. Confidence)
Created Habitats	<i>Various</i>	Various	Beneficial	Significant Beneficial Certain/Near-certain
Breeding Birds	<i>Disturbance Harm</i>	District	Adverse Direct	Not Significant Probable
Bats - Habitats	<i>Disturbance Habitat Gain</i>	Local	Beneficial	Significant Beneficial Certain/Near-certain
Badger	<i>Disturbance Harm</i>	Legal Protection	Adverse	Not Significant Probable
Other Species – Various	<i>Harm Habitat Gain</i>	Various	Beneficial	Not Significant Probable for white-letter hairstreak & the butterfly assemblage

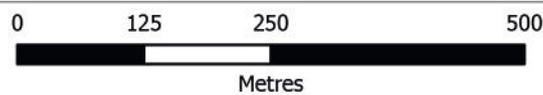
Proposed Mitigation / Enhancement Measures	Residual Effects
<p>Mitigation: n/a</p> <p>Enhancement: Their long-term management through the LEMP</p>	<p>Significant Beneficial Certain/Near Certain</p>
<p>Mitigation: n/a</p> <p>Enhancement: Creation of significant additional feeding habitats and their management through the LEMP Provision of bird boxes</p>	<p>Not Significant Certain/Near Certain</p>
<p>Mitigation: n/a</p> <p>Enhancement: Creation of significant additional foraging habitats and their management through the LEMP Provision of bat boxes</p>	<p>Significant Beneficial Certain/Near Certain</p>
<p>Mitigation: n/a</p> <p>Enhancement: Creation of significant additional foraging habitats and their management through the LEMP</p>	<p>Not Significant Certain/Near Certain</p>
<p>Mitigation: n/a</p> <p>Enhancement: Creation of significant additional habitats containing flowering species and their management through the LEMP</p>	<p>Not Significant Probable</p>





Legend

- Retained Woodland
- Potential Habitat Enhancement/Creation (Badger)
- Potential Habitat Enhancement/Creation (Bats/Birds)
- Bat Commuting Routes (Maintain/Enhance/Create)
- Application Boundary



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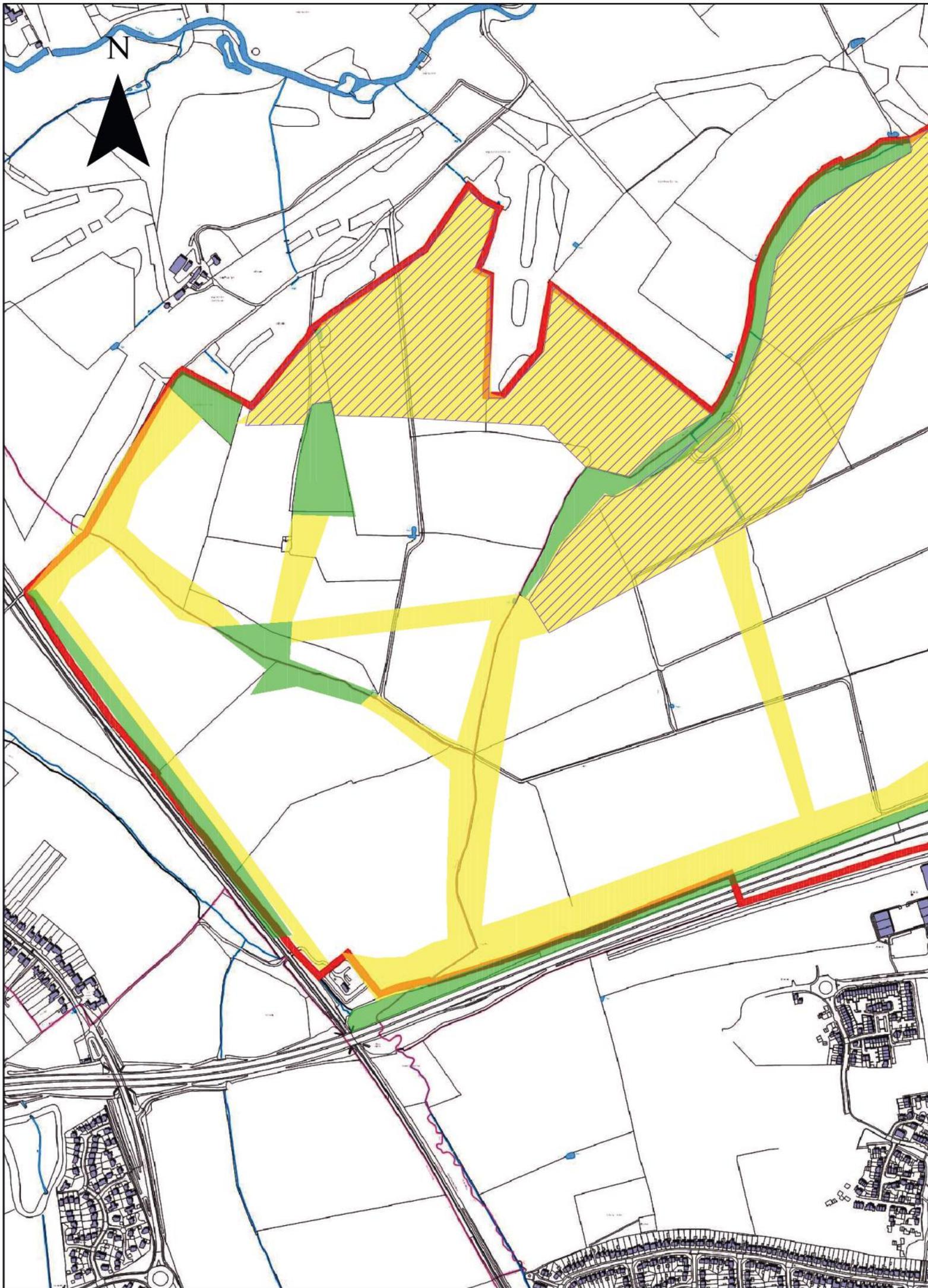
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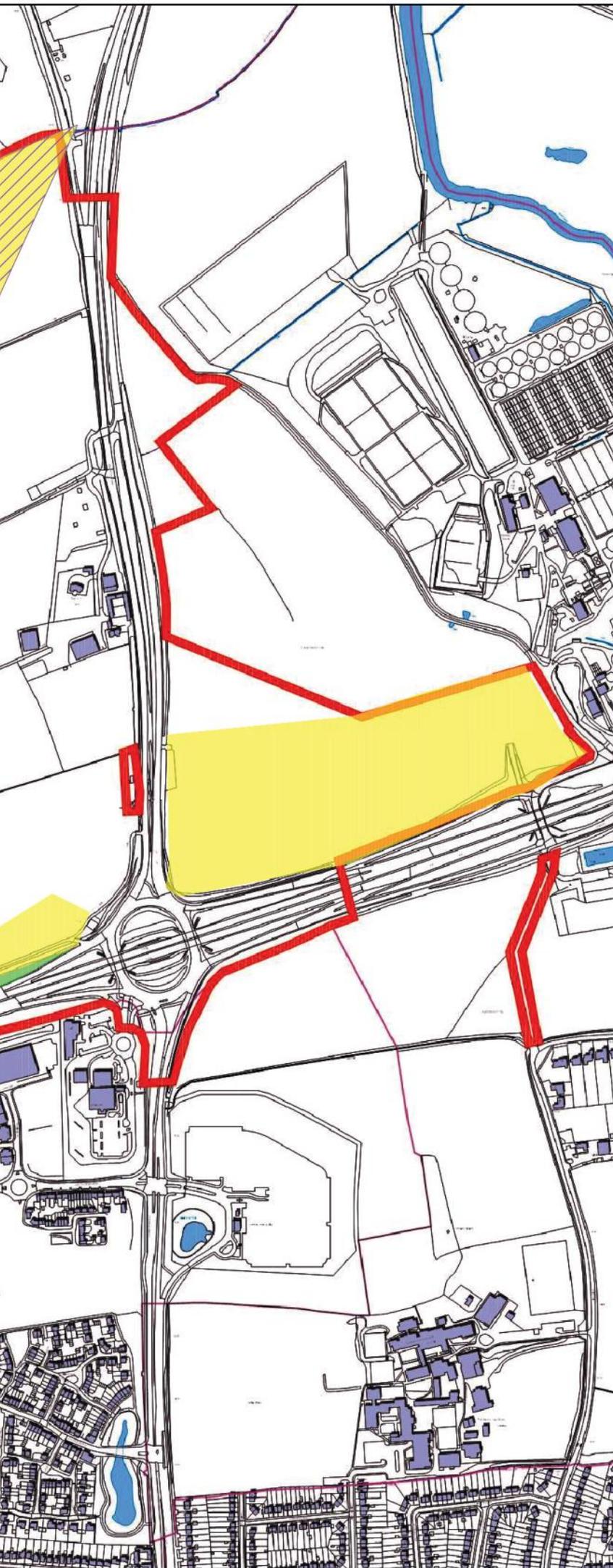
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Project: **Broadnook Garden Suburb**

Title: **Ecological Constraints & Opportunities Plan**

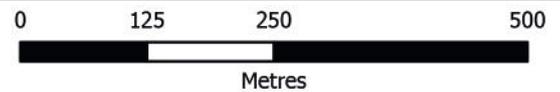
Office: 4594	Project No: A081029-1	Figure No: Figure 8.3a
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Legend

- Retained Woodland
- Potential Habitat Enhancement/Creation (Badger)
- Potential Habitat Enhancement/Creation (Bats/Birds)
- Application Boundary



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Client: **Palmer -Tomkinson Trust
& Cooper Family**

Project: **Broadnook Garden Suburb**

Title: **Informed Ecological
Constraints & Opportunities
Plan**

Office:
4594

Project No:
A081029-1

Figure No:
Figure 8.3b