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Letchworth Garden City Heritage Foundation

Housing Development Technical Report - Ecology

Final Report

4 November 2013

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EXECUTIVE SUMMARY

The ecology technical appraisal report is required to provide the Letchworth Garden City Heritage Foundation Board with information on the constraints and opportunities associated with the potential development site to enable them to make a decision on the site and to provide information to the local community.

The study has not identified any major significant ecological constraints to development associated with the land to the north of Letchworth Garden City. However, there are a number of potential constraints (hedgerows, watercourse, farmland birds and bats) that would need further consideration and may require on-site and off-site mitigation for proposals to be considered acceptable in planning terms.

1 INTRODUCTION

1.1 BACKGROUND

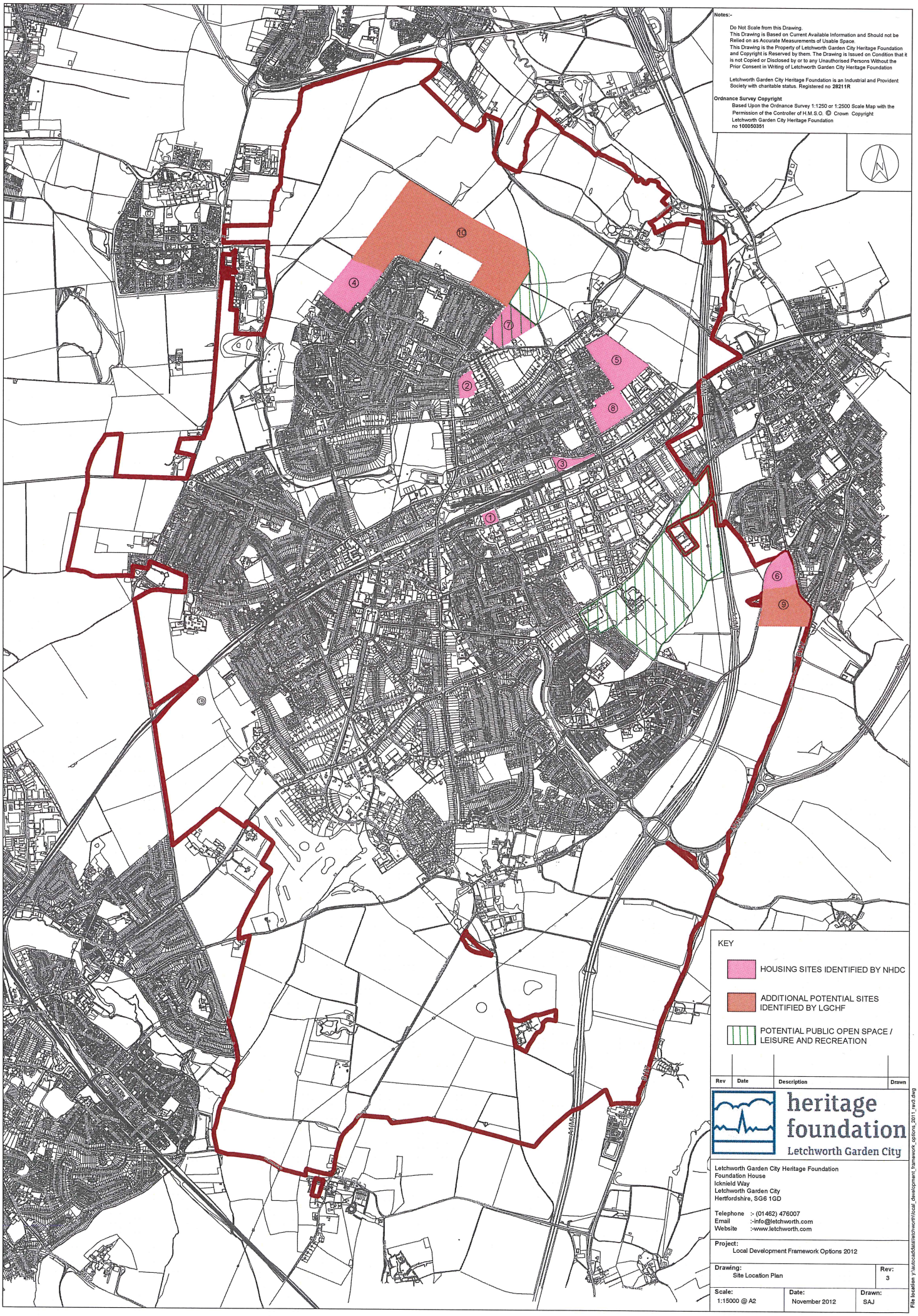
Letchworth Garden City Heritage Foundation is a self-funding charitable organisation with a significant landholding in Letchworth Garden City. The Heritage Foundation manages its property portfolio to generate income which is invested back into the community for the long term benefit of Letchworth Garden City.

North Hertfordshire District Council identified a number of potential housing development sites in their Local Development Framework for 2011 to 2031, which underwent consultation in early February 2013. Land to the north of Letchworth Garden City was included within this consultation. In addition to the land identified by North Hertfordshire District Council, Letchworth Garden City Heritage Foundation has identified additional sites with potential to support housing growth, which are identified on **Figure 1.1**. This study is concerned with land parcels 4 and 10 to the north and west of the Grange Estate.

Cascade Consulting was commissioned by Letchworth Garden City Heritage Foundation to provide the Foundation's Board with a strategic understanding of the key ecological constraints to this potential development. This information is required by the Board to enable them to identify whether or not they can support the development proposals. Therefore, the study has sought to identify potentially significant constraints within the study area and environmental impacts which could arise as a result of these development proposals for the site.

1.2 STUDY AREA

The ecological desk-based study was undertaken over an area of 2km radius from the site to identify the presence of key designated sites or species. The ecological walkover survey focused more closely on the proposed development site for the identification of significant habitat features, as these are less sensitive to impacts across large distances.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KEY
HOUSING SITES IDENTIFIED BY NHDC
ADDITIONAL POTENTIAL SITES IDENTIFIED BY LGCHF
POTENTIAL PUBLIC OPEN SPACE / LEISURE AND RECREATION
Rev
Date
Description
Drawn
heritage foundation
Letchworth Garden City
Letchworth Garden City Heritage Foundation
Foundation House
Icknield Way
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Hertfordshire, SG6 1GD
Telephone :- (01462) 476007
Email :-info@letchworth.com
Website :-www.letchworth.com
Project:
Local Development Framework Options 2012
Drawing:
Site Location Plan
Rev:
3
Scale:
1:15000 @ A2
Date:
November 2012
Drawn:
SAJ
File location y:\autocad\data\letchworth\local_development_framework_options_2011_rev3.dwg

2 METHODOLOGY

The aim of the study was to provide Letchworth Garden City Heritage Foundation with a clear strategic understanding of the ecological resources within the proposed development area and immediately surrounding habitats. At this strategic level it was not possible to identify the presence of all ecological resources, however the study concentrated on identifying those ecological features that could pose a significant constraint to the development.

To achieve this, a Preliminary Ecological Appraisal was carried out, in accordance with guidelines recommended by the Chartered Institute of Ecology and Environmental Management (CIEEM)[1].

The first step of the appraisal was to undertake a desk-based study, using publically available resources and data procured from the Hertfordshire Biological Records Centre. The desk-based study identified the presence of statutory and non-statutory designated sites, important habitat features (e.g. ancient woodland) in the study area and the presence, and potentially the distribution, of legally protected and ecologically significant species. The information gathered from these resources was incorporated into a GIS layer.

Aerial photography was interrogated to identify any habitats or features of potential significance for ecology and nature conservation. This included habitats, such as woodland or grassland, that either have the potential to be included within a national or local Biodiversity Action Plan (BAP) or which could contribute to the local habitat availability. Once these areas were identified, a walkover survey was undertaken to ground-truth the information and identify any additional features of potential value that were not observed from the aerial photographs.

[1] Chartered Institute of Ecology and Environmental Management (CIEEM) 2012. *Guidelines for Preliminary Ecological Appraisal - Technical Guidance Series*. CIEEM, Winchester.

3 BASELINE

3.1 DESIGNATED SITES

The following section identifies the designated sites within the study area, and should be read in conjunction with **Figures 3.1** and **3.2**. These figures identify the locations of the designated sites, with the exception of Blue Lagoon Wildlife Site, which is located 1.4km to the west of the potential site boundary.

3.1.1 Local Nature Reserves

The study identified a total of three Local Nature Reserves (LNRs) within 2km of the proposed development boundary, which are **Norton Common LNR**, **Ivel Springs LNR** and **Stotfold Mill Meadows LNR**. These are discussed below and identified in **Figures 3.1** and **3.2**.

Norton Common LNR is 25.89ha in area and is located approximately 900m to the south of the proposed development site with the Grange Estate separating the two. The site comprises a public open space of high ecological interest with areas of mown grass, neutral grassland, hawthorn *Crataegus monogyna* scrub and secondary pedunculate oak *Quercus robur* and ash *Fraxinus excelsior* woodland. The spring-fed marsh, which supports a rich flora including plants of regional and county rarity including marsh pennywort *Hydrocotyle vulgaris* and parley water-dropwort *Oenanthe lachenalii*, is of high importance. The area also supports a diverse range of birds and mammals, including the melanic variety of the grey squirrel *Sciurus carolinensis*. The Wildlife Site criterion has been identified as grassland indicators.

Ivel Springs LNR is 6.62ha in area and is located approximately 1.3km to the east of the proposed development site on the far side of Norton and the A1(M) road. The site is an area of mixed habitats with the River Ivel flowing through it. The site contains relic patches of former watercress beds, reed marsh, damp woodland and springs with developed marginal vegetation which comprise the source of the Ivel. The site supports an interesting variety of flora, amphibians, reptiles, birds and mammals, including water vole *Arvicola amphibious*. The Wildlife Site criteria has been identified as grassland indicators and species.

Stotfold Mill Meadows LNR is approximately 8ha in size and is located approximately 1.3km to the north of the proposed development site on the far side of two local roads (Norton Road and the A507). The site is an area of native tree plantings, hedges, a wildflower meadow and ponds on varying depths. The ponds are important for birds, invertebrates and amphibians.

Legend

- Site Boundary
- Local Nature Reserve
- Wildlife Site
- Small Heath Butterfly
- Common Lizard
- Common Toad
- Grass Snake
- Great Crested Newt
- Slow worm
- Veteran/Mature Trees

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The Distribution of Amphibian and Invertebrate Species Identified During the Desk Based Study

Figure 3.1

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The Distribution of Bird Species Identified During the Desk Based Study

Figure 3.2

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3.1.2 Wildlife Sites

The study identified a total of eight Wildlife Sites within 2km of the proposed development boundary, which are **Norton Pond**, **Icknield Way Railway Bank**, **Blackhorse Farm Meadow**, **Blackhorse Farm Storm Drain**, **Radwell Meadows**, **River Ivel**, **Radwell Lake**, **Radwell Road Banks** and **Blue Lagoon**.

Norton Pond Wildlife Site is located approximately 340m to the south-east of the proposed development site, with various hedgerows providing connectivity between the two sites. Norton Pond is an important ancient farm pond on the southern edge of an area of permanent pasture. The north-side of the pond supports goat willow *Salix caprea* with a perimeter fringe of fen and swamp on the south and east which supports a varied plant community that provides valuable wetland habitat. The pond supports important invertebrate and vertebrate species, with information boards on the site identifying the presence of dragonflies, damselflies, 3-spined stickleback *Gasterosteus aculeatus*, smooth newt *Lissotriton vulgaris*, common frog *Rana temporaria* and common toad *Bufo bufo*. The Wildlife Site criterion has been identified as species.

Icknield Way Railway Bank Wildlife Site is approximately 1.74ha in size and is located approximately 1.2km to the south east of the proposed development site on the far side of Norton and the railway line. The site is identified as being important for protected species, although does not list which ones, with the Wildlife Site criterion has been identified as species.

Blackhorse Farm Meadow Wildlife Site is approximately 3.2ha in size and is located approximately 1.2km to the east of the proposed development site on the far side of the A1(M) road. The site supports meadows on the alluvial deposits of the River Ivel, wet grazing pastures and unimproved marshy grassland, the River Ivel and ditches with rich wetland vegetation and scattered trees and boundary hedgerows. Species recorded on the site include marsh horsetail *Equisetum palustre*, jointed rush *Juncus articulatus*, lady's smock *Cardamine pratensis*, lesser spearwort *Ranunculus flammula*, marsh marigold *Caltha palustris*, fen bedstraw *Galium uliginosum*, marsh speedwell *Veronica scutellata* and bristle club-rush *Isolepis setacea*. The Wildlife Site criterion has been identified as grassland indicators.

Blackhorse Farm Storm Drain Wildlife Site is approximately 1.21ha in size and is located approximately 1.2km to the east of the proposed development site on the far side of the A1(M) road. The site comprises a flood pound which was constructed to receive storm water from the A1(M), which is surrounded by an embankment on its three sides. The embankment is largely covered by planted trees and scrub with a wet area to the north-west supporting a mixed inundation community which grades into fen in places and drier grassland along the south-east edge. Wetland species

recorded include blunt-flowering rush *Juncus subnodulosus*, lesser pond-sedge *Carex acutiformis*, reed canary-grass *Phalaris arundinacea*, wild angelica *Angelica sylvestris* and greater birds-foot trefoil *Lotus pedunculatus*. The Wildlife Site criterion has been identified as grassland indicator species and fen and swamp indicators.

Radwell Meadows Wildlife Site is approximately 16.06ha in size and is located approximately 600m to the north-east on the far side of a local road (Norton Road). The site comprises old alluvial meadows supporting mainly semi-improved grassland but with a diversity of habitats present including rheophilous marsh (i.e. marsh that is associated with running water), springs, unimproved calcareous banks, ditches, hedge banks and areas of scrub. The plants recorded include salad burnet *Sanguisorba minor*, cowslip *Primula vulgaris*, quaking grass *Briza media*, crested dog's-tail *Cynosurus cristatus*, red fescue *Festuca rubra*, greater knapweed *Centaurea scabiosa*, common knapweed *C. nigra* and field wood-rush *Luzula campestris*. The Wildlife Site criterion has been identified as grassland indicators.

River Ivel Wildlife Site is approximately 0.69ha in size and is located approximately 600m to the north-east of the proposed development site on the far side of a local road (Norton Road). The site comprises the River Ivel with marginal vegetation, scrub and trees and is an important site for water vole and common kingfisher *Alcedo atthis*. The Wildlife Site criterion has been identified as species.

Radwell Lake Wildlife Site is approximately 5.34ha in size and is located approximately 1km to the north of the proposed development site on the far side of a local road (Norton Road). The site is an old mill pond with marshy ground, ornamental gardens and mixed copse woodland. The site is of importance for birds, in particular wildfowl. The Wildlife Site criterion has been identified as species.

Radwell Road Banks Wildlife Site is approximately 1.72ha in size and is located approximately 1.4km to the north-east of the proposed development site on the far side of the A1(M). The site comprises road verges of the A507 which support areas of rich calcareous grassland with records of several orchids including bee orchid *Ophrys apifera* and pyramidal orchid *Anacamptis pyramidalis* and a good colony of common broomrape *Orobanche minor*. The Wildlife Site criterion has been identified as grassland indicators.

Blue Lagoon County Wildlife Site is approximately 0.5ha in size and is located approximately 1.4km to the west of the proposed development on the far side of a local road (Stotfold Road). The site is comprised of a eutrophic lake, which is a former chalk pit.

3.2 HABITATS

The following section provides a baseline of the habitats present within the study area, and should be read in conjunction with **Figure 3.3** which identifies those habitats considered to be of significant value.

The study area is dominated by agricultural farmland, with arable farmland comprising almost all of that present. Whilst this is typically of low ecological value due to the intensive management involved, it does provide important supporting habitat for a number of species. Whilst only the margins of such habitat is identified as a UK BAP priority habitat, where these are specifically managed to generate wildlife benefits, the Hertfordshire BAP identifies that arable farmland can provide an important habitat for a number of specialist flora, including cornflower *Centaurea cyanus* and corn chamomile *Anthemis austriaca*, and a range of specialist invertebrates, birds and mammals.

The site supports a network of **hedgerows** that define the boundary of the various agricultural fields within the study area. The hedgerows are largely continuous and are typically dominated by either hawthorn or blackthorn *Prunus spinosa*. The species diversity of the hedgerows varies, with typical species including field maple *Acer campestre*¸ dog rose *Rosa canina*, hazel *Coryllus avellana*, ivy *Hedera helix* and sycamore *Acer pseudoplatanus*. Some hedgerows also incorporate semi-mature and mature tree species, including oak *Quercus* sp., poplar *Populus* sp. and sycamore. The hedgerows do contain some gaps, although relatively small in size, but do not link up throughout due to openings for farm machinery access. The hedgerows are considered to comprise a UK BAP priority habitat, as they fall within the definition provided, in that they are all over 20m long, less than 5m wide and any gaps between tree/shrub species are less than 20m wide. In addition to this, any banks or ditches within 2m of the centre of the hedgerows are considered to comprise part of this feature. Although not a BAP habitat in itself within the Hertfordshire BAP, they are identified as part of the Farmland Habitat Action Plan (HAP) as an important refuge feature for wildlife in intensively farmed areas as well as assisting in the movement of species by linking important habitats.

Legend

- Site Boundary
- Flowing Water
- Standing Water
- Norton Well Spring
- Hedgerows and Linear Tree Features
- Mature Riparian Vegetation
- Semi-Natural Broadleaved Woodland
- X Mature Tree with Bat Roost Potential

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Ecological Interest Features Identified at the Site Visit

Figure 3.3

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In addition to the hedgerows, there are two **linear tree lines** surrounding the site, most notably along the northern boundary of the site and between the southern boundary and the Grange Playing Fields. A third is present along the western boundary of the proposed development area at the south-west corner. The tree species present are largely ash, field maple, sycamore, oak, rowan *Sorbus aucuparia* and silver birch *Betula pendula*. In addition to these, the tree line along the boundary of the Grange Playing Fields also includes a number of mature pine *Pinus* species. These linear features are covered by the hedgerow UK BAP priority habitat and provide a similar role in wider ecological connectivity.

Interrogation of aerial photography identified a number of woodland copses in the study area, however these were all identified as plantation woodland with tree species of similar ages planted in obvious lines. Whilst this habitat does have potential to support other species, the habitat is not considered to be of importance in its own right. However, there are a number of **scattered mature trees** that are of potential value and may be subject to Tree Protection Orders (TPOs) in addition to supporting features with potential for roosting bats. Whilst some were identified in the wider study area in the desk-study, additional mature trees were identified during the walkover survey nearer the proposed development site and surrounding habitats.

A single watercourse, **Pix Brook**, was identified in the study area, which was located approximately 400m to the west of the proposed development area. The watercourse is identified by the Environment Agency as being small, lowland and calcareous and is classified as heavily modified under the Water Framework Directive and of moderate ecological potential. Modification to the watercourse was evident to the south of Norton Well, with evidence of resectioned banks that had been cleared, along with artificial structures in the form of footbridges and outfalls. The watercourse does support macrophytes (water plants) typical of chalk streams, with extensive water-crowfoot *Ranunculus* and some emergent vegetation. The macrophyte cover reduced where Pix Brook flows through the woodland area, with a well established riparian habitat containing mature tree species to the north of Norton Well. Pix Brook demonstrated a variety of habitats, with variations in the flow structure, bank profile and vegetation. The watercourse may comprise a UK BAP priority habitat depending on whether it supports a BAP priority species, with the habitat present potentially suitable for kingfisher and water vole. The site is unlikely to qualify through the chalk river criteria.

A small spring was identified to the west of the proposed development site, which has been identified as **Norton Well**. Interrogation of mapping identified the likely presence of a small pond, however the walkover survey identified this to be a small spring. A small and shallow ponded area has developed in a hollow in part of the woodland, with water flowing in a small channel through the woodland into Pix

Brook. The spring is likely to be a chalk spring, comprising one of the multiple sources of Pix Brook. Whilst this is unlikely to comprise one of the best examples of the habitat type, they are hydrologically complex and provide habitat for specialised cold water invertebrates. Although the habitat is unlikely to comprise a UK BAP priority habitat, it is considered to represent a local BAP habitat.

3.3 SPECIES

The habitats on site have the potential to support a wide variety of legally protected and ecologically protected species, which are discussed below. The distribution of those habitats and species identified in the desk-study is shown in **Figures 3.1** and **3.2**.

Arable farmland provides suitable habitat conditions for a number of specialist floral species that require the disturbance of the soil for opportunities to grow. A number of these species could potentially be present on site, including cornflower, corn cockle *Agrostemma githago* and corn marigold. Although these species are in decline, recognised by their inclusion within the national BAP, it may be possible to compensate for any loss within the development footprint by changing farming practices in the surrounding habitat to improve opportunities for their growth.

The study area provides habitat opportunities for a variety of **bird** species, in particular those associated with farmland. **Figure 3.2** demonstrates the diversity of species present within the study area, with a total of 39 species recorded. These include a number of species considered to be of conservation concern in the UK. A total of 24 species are considered to be of conservation concern, with 12 species identified as Amber list species in the UK and an additional 12 species identified as Red list species[2]. In addition to this two species present, osprey *Pandion haliaetus* and peregrine falcon *Falco peregrinus*, are included within Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)[3]. Although the species are identified in three distinct locations, the distribution is limited by the geographic scale associated with the information supplied by the local records centre. However, it can be assumed that the majority of these birds will be using the habitat present throughout the study

[2] The conservation status for birds is assessed against a number of objective criteria to provide a quantitative review of their status. The status is indicated as either green, amber or red, reflecting an increasing level of conservation concern. Red list species indicates a species which is globally threatened, whose population or range has declined rapidly in recent years, or that have declined historically and not shown a substantial recent recover. Amber list species indicates a species which has an unfavourable conservation status in Europe, those whose population or range has declined moderately in recent years, those whose population has declined historically but made a substantial recent recovery or rare breeders and those the UK holds internationally important or localised populations.

[3] The Wildlife and Countryside Act 1981 (as amended) provides additional protection to species identified on Schedule 1 of the Act, protecting them from intentional or reckless disturbance whilst building a nest, or in, on or near a nest containing eggs or young, or to disturb dependent young of such a bird.

area.

A number of the species identified of conservation concern in the UK are typically associated with farmland habitats, particularly for foraging, notably yellowhammer *Emberiza citrinella*, corn bunting *Emberiza calandra*, common linnet *Carduelis cannabina*, turtle dove *Streptopelia turtur*, grey partridge *Perdix perdix*, and northern lapwing *Vanellus vanellus*. The importance of this habitat is highlighted by the Royal Society for the Protection of Birds (RSPB), whose Wild Bird Indicator statistics, released on 17 October 2013, identified that farmland bird numbers are continuing to decrease, with a long term decline of 50% although this has slowed in recent years[4].

Although arable farmland is not a key habitat of importance for most **bats**, with only pipistrelle *Pipistrellus pipistrellus* sp. and Natterer's *Myotis nattereri* associated with the habitat type[5], the linear habitats on site are important for commuting and foraging by bats as they provide shelter from the wind and cover from predators. Within the study area these include the hedgerows, tree lines and riparian habitats. A number of mature trees on the site were also considered likely to provide potential roosting opportunities for bats, particularly where they have a thick ivy coverage or support woodpecker holes, cracks in limbs or peeling bark.

The hedgerow and woodland habitats in the study area provide suitable habitat opportunities for **badger** *Meles meles*. Farmland habitat can also provide foraging habitat for the species, in particular where cereal crops are grown. Desk-based information from the local badger group was not available at the time of this study. Badger are a relatively common species and are not considered to be of conservation concern at any scale. However, they do receive legal protection, and as such the potential for their presence would need to be considered in any future developments.

A number of additional mammal species could also be present, including brown hare *Lepus europaeus* and European hedgehog *Erinaceus europaeus* that may need to be considered. Although the habitat is in the northern range of the distribution of dormice *Muscardinus avellanarius*, they are unlikely to be present in the study area as they typically require large areas of woodland to sustain a population, which is absent from the study area. Furthermore, the desk-based study did not identify the presence of dormice in the study area.

Records of **common reptiles** were obtained in the wider study area, including common lizard *Lacerta vivipara*, grass snake *Natrix natrix* and slow worm *Anguis*

[4] Information accessed through RSPB website (2013) - http://www.rspb.org.uk/news/355662-farmland-bird-numbers-continue-to-fall on 22/10/2013.

[5] Entwistle, A. C., Harris, S., Hutson, A. M., Racey, P. A., Walsh A., Gibson, S. D., Hepburn, I. and Johnston, J. (2001). Habitat Management for Bats. A guide for land managers, land owners and their advisors. Joint Nature Conservation Committee (JNCC), Peterborough.

fragilis. Although none of these fell within the proposed development site, the hedgerows and associated tall ruderals and grassland provide habitat opportunities for these species and opportunities to move throughout the study area. The hedgerows with a southern facing aspect are likely to be of greatest importance as these provide basking opportunities which reptiles will utilise to warm up their body temperatures quickly. The tall ruderal habitats to the north of the study area are also of potential value to common reptiles.

The desk-study has identified the presence of some amphibian species, with smooth newt, common toad and common frog associated with Norton Pond. Although the Wildlife Site designation has not identified the presence of **great crested newt** *Triturus cristatus* within the citation, the desk-study information identifies records for the species at this location in 2011. The pond habitat is also considered likely to be suitable for breeding great crested newt, with features of the habitat scoring favourably in the Habitat Suitability Index assessment criteria. This is located approximately 350m to the south-east of the proposed development site, with the hedgerow network providing opportunities for dispersal of newts into the wider area.

Some the habitats on site have potential to support notable or rare **invertebrate** species, in particular the spring habitat at Norton Well. In addition to this, the Hertfordshire Farmland Habitat Action Plan identifies that a large number of insects and invertebrates will spend part of their lifecycle in cereal fields.

4 DISCUSSION

Development within the identified site boundary has the potential to impact on a range of ecological features, with hedgerow and farmland habitat falling within the footprint of the site boundary as identified in the Local Development Framework options, see **Figures 1.1** and **3.3**. The loss of this habitat would represent a reduction in the local resource of BAP habitats with potential impacts on farmland birds, bats, badger, common reptiles, great crested newts and invertebrate species.

The loss of hedgerows would represent a loss of BAP habitat in the local area, and further investigation would be required to understand if these are ancient or species-rich. Depending on the status of the hedgerows, it may be necessary to consider implications under the Hedgerow Regulations 1997. However, early consideration in the design phase can ensure any loss of hedgerow can be compensated for through replanting around the boundary of the site and within the proposed Common area.

Impacts to farmland bird species are likely to represent the most significant constraint, especially in light of RSPB's recent announcement regarding their continued decline. The footprint of the works comprises a reasonable proportion of the arable farmland habitat in the area, which is likely to be of concern to RSPB. However, early consideration of (and consultation with RSPB on) potential mitigation actions, such as improving arable habitat or crop selection to benefit farmland bird species elsewhere within Letchworth Garden City Heritage Foundation's landholding, could provide benefits to farmland birds in the local area and help to mitigate the potential impact of a development of this site.

Impacts on bats could also represent a major constraint, with the identified site boundary potentially resulting in the severance of commuting corridors or foraging habitat and loss of roosting opportunities. For example, on the eastern side of the proposed development site, the loss of hedgerow could fragment the linear tree plantation to the north of Grange Playing Fields. However, early consideration of mitigation could help to avoid significant impacts through appropriate compensatory habitat provision to connect other commuting corridors. In the case of the example above, provision of new woodland or hedgerows along the eastern and northern boundary could compensate for the loss of foraging and commuting habitat by linking into the larger linear tree line to the north of the site. The potential loss of roosts could be mitigated through incorporation of suitable mature trees into the final design and provision of bat boxes in the Common area to improve roosting opportunities.

Impacts on badger, common reptiles, great crested newt and invertebrates are unlikely to be as significant, as these can generally be controlled at the detailed

design stage through the implementation of best practice mitigation that is well understood and known to be effective. Similarly, impacts on brown hare and European hedgehog are unlikely to be significant and mitigation can be included to minimise impacts. Furthermore, the habitats required by each species can easily be improved through targeted habitat provision within the Common area.

Inclusion of a Common in the development will provide a number of biodiversity opportunities, as discussed in parts above. Through appropriate and targeted planting and management, the area could provide significant habitat opportunities for various species, depending on location. For example, if the Common area is included on the eastern side, targeted habitat provision could help improve local habitat for great crested newt associated with Norton Pond, with hedgerows linking the two areas.

Additional infrastructure to support the development, such as improvements to road networks, should consider the distribution of important ecological resources in the surrounding habitats, as identified in **Figure 2.3**. Of particular concern is the spring associated with Norton Well, as these habitats are generally complicated hydrologically and often support specialist invertebrate fauna and compensation and re-creating them elsewhere is much harder to achieve. Pix Brook also represents a potential constraint, with a number of significant and ecologically sensitive species potentially associated with the habitat. This constraint is likely to be less significant than Norton Well because appropriate design can reduce the magnitude of impacts. There is also potential for further impacts on hedgerows, farmland birds and bats depending on the route of the road, however these impacts are likely to be able to be mitigated.

Although there are a number of designated sites present in the study area, they are not anticipated to represent significant constraints to development of the identified site. Norton Pond is the closest at 350m, and whilst increases in visitors may occur, the incorporation of a Common on the eastern side of the development could help to improve habitat provision for species associated with the pond. Impacts may occur on the other designated sites during construction on the development site, but considering the distance of these from identified or potential construction areas, it is anticipated that any impacts could easily be mitigated using best practice methods.

The impacts discussed above are relatively consistent with the representations submitted by Herts and Middlesex Wildlife Trust and Hertfordshire Biological Records Centre to North Hertfordshire District Council's consultation on housing development in the area. Both commented that ecological concerns are unlikely to be significant, however the presence of legally protected and ecologically significant species should be considered if the proposal was to be developed.

5 SUMMARY OF CONSTRAINTS AND OPPORTUNITIES

A summary of the key ecological constraints and opportunities is given below in **Table 5.1**.

Table 5.1 Summary of Key Ecological Constraints and Opportunities

Key Constraints	**Opportunities**
Loss of hedgerows Further investigation is required to identify whether the hedgerows qualify as species-rich or ancient hedgerows. If the hedgerows are considered to be "Important hedgerows" under the Hedgerow Regulations 1997, then an application to the Local Planning Authority will be required for their removal.	Incorporate compensatory hedgerows into final design.
Reduction in distribution of rare or declining arable flora	Consider altering farming practice in the surrounding habitat elsewhere in Letchworth Garden City Heritage Foundation's landholding to improve conditions for the growth of these floral species.
Reduction in diversity and abundance of farmland birds	Consider potential for compensatory measures elsewhere in Letchworth Garden City Heritage Foundation's landholding. Early consultation with RSPB to discuss and develop compensatory options which may be able to give net improvement in habitat for farmland birds.

Key Constraints	**Opportunities**
Bats - loss of roosting potential and impacts on commuting and foraging	Consider retention of some features, such as mature trees with roosting potential for bats, within the final design. Consider potential for compensatory measures in the design phase to provide new features for bats, e.g. hedgerows, that connect to important existing habitats.
Norton Well - loss of habitat and connectivity to Pix Brook as a result of possible new road infrastructure.	Re-route access road to avoid sensitive habitat.
Pix Brook - loss of habitat connectivity and riparian habitat loss as a result of possible new road infrastructure.	Re-route access road to avoid the river. If this cannot be done, the design of the bridge should seek to maintain habitat connectivity along the river.