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Church Lane, Wormley

Environmental Mitigation Strategy

Prepared by LUC
November 2017

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1 Background

Context

1.1 The draft Broxbourne Local Plan identifies the requirement for additional secondary school capacity, which may be required over the plan period to meet local needs due to planned growth. Policy INF10 of the emerging plan safeguards land at Church Lane, Wormley (hereafter referred to as the Site') as the preferred location for a new secondary school.

1.2 The Site is designated as Local Wildlife Site for the presence of priority neutral grassland habitat, which is afforded weight under relevant local and national planning policies. As part of the evidence base to support the examination of the Local Plan, Broxbourne Council (referred to hereafter as 'the Council') commissioned LUC to develop a mitigation strategy to demonstrate that a secondary school can be delivered on the Site in line with all relevant policies.

Aims and objectives

1.3 The aim of this strategy is to demonstrate that a secondary school could be delivered at the Site while achieving no net loss of biodiversity, particularly with regards to the priority neutral grassland habitat. This is to be achieved in accordance with the 'mitigation hierarchy', avoiding effects where possible, reducing / mitigating unavoidable effects through onsite measures at the Site itself, and finally providing offsite compensation measures to address any residual effects where necessary.

1.4 The objectives of the strategy are to:

- Assess the current ecological value of the Site;
- Assess the likely ecological impacts of the indicative proposals quantitatively and qualitatively;
- Identify and evaluate potential options for onsite avoidance and mitigation of ecological impacts;
- Identify and evaluate potential options for offsite compensation of residual ecological impacts; and
- Set out outline management measures and a monitoring regime for the Site and any compensation areas.

2 Policy context

National Planning Policy Framework

2.1 The Framework requires that allocations of land for development should prefer land of lesser environmental value (NPPF17), and that planning should minimise impacts on biodiversity and providing net gains in biodiversity (NPPF109). More specifically NPPF117 states that in order to minimise impacts on biodiversity, planning policies should:

'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.'

2.2 NPPF118 also embeds the mitigation hierarchy into the Framework:

'if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused'

2.3 While this paragraph deals specifically with the determination of planning applications, the principles should clearly be considered when making an allocation in a Local Plan in order to demonstrate that such a proposal is deliverable in line with the Framework.

2.4 In order to demonstrate compliance with the Framework, this strategy therefore aims to demonstrate how Policy INF10 can help to promote the restoration and re-creation of priority habitats, and that any significant harm resulting from the proposals can be avoided, adequately mitigated or compensated. The strategy does not deal with consideration of alternative sites, as an extensive options appraisal was carried out by Hertfordshire County Council in 2015 and 2016 which identified the Church Lane site as the preferred location for a secondary school prior to this strategy being prepared.

Pre-submission Broxbourne Local Plan

2.5 Policy NEB1 sets out a general strategy for biodiversity including a requirement to achieve a net gain to biodiversity through planning proposals, and secure this in the long term:

'I. Development proposals will be expected to apply the mitigation hierarchy of avoidance, mitigation and compensation.

II. Development proposals should result in net gains to biodiversity wherever possible.

III. The Council will seek the creation of new networks of biodiversity, as well as the extension, enhancement and active management of existing sites.

IV. Opportunities to connect habitat fragments through the creation of stepping stones, using built form, vegetation or green areas will be assessed as part of all relevant applications.

V. *When granting planning permission the Council will impose conditions or seek planning obligations that secure appropriate management regimes to deliver biodiversity gain in perpetuity.'*

2.6 More specifically, Policy NEB2 addresses the protection of Local Wildlife Sites:

'Development on, or which negatively affects, a Local Wildlife Site or Local Nature Reserve, as shown on the Policies Map, will not be permitted unless:

(a) the local development needs significantly outweigh the nature conservation value of the site; and

(b) the development provides appropriate avoidance or mitigation, and as a last resort compensation measures, to offset any detriment to the nature conservation interest on the site.'

2.7 While it also addresses the presence of protected species:

'When there is a reasonable likelihood of the presence of protected species or their habitats, development will not be permitted until it has been demonstrated that the proposed development will not result in a negative impact on these populations.'

2.8 In order to demonstrate compliance with policies NEB 1 and 2, this strategy therefore aims to demonstrate how effects on the Wormley Parkland Local Wildlife Site can be avoided, mitigated, and compensated to offset any detriment to the grassland interest on the Site and achieve net gain overall in the long term. It also aims to broadly identify the potential impacts on protected and notable species, and outline potential mitigation measures to help avoid a negative impact on these species. This strategy does not address the local development needs which are to be balanced against the nature conservation value of the Site, which would need to be considered in the planning balance when determining the planning application.

2.9 Policy INF10 safeguards the land at Church Lane from development:

'Land is safeguarded at Church Lane, Wormley for the development of a new secondary school'

2.10 It is worth noting that the policy itself does not propose any development at the Site, but rather it safeguards it from all types of development, other than a secondary school. The policy also does not specify the scale of any secondary school facility on the Site.

3 Methodology

Data search

3.1 Broxbourne Council received data from the Hertfordshire Environmental Records Centre (HERC) relating to the Site, which included:

- Archived species records;
- Habitat survey record and species list for the Local Wildlife Site 'Wormley Parkland East of A10[1]'; and
- Hertfordshire Ecological Network Mapping[2].

3.2 In addition, Hertfordshire County Council also recently commissioned a number of ecological studies of the Site which were carried out in 2015-16:

- Preliminary Ecological Appraisal[3];
- Invertebrate Survey[4]; and
- Ecological Evaluation (including bat surveys)[5].

3.3 All of these sources of information were reviewed for relevant information about the ecological characteristics and value of the Site.

Habitat survey

3.4 The Site and all potential compensation areas were subject to an Extended Phase 1 Habitat survey, in line with best practice guidance[6], which involved classifying and mapping all broad habitat types. Survey visits were carried out on 5th June and 11th September by experienced surveyors from LUC. This survey focussed predominately on the grassland habitats within the Site and the compensation areas, as neutral grassland is the qualifying feature of the Local Wildlife Site designation, and grassland habitat types are the target habitats for compensation.

3.5 In order to inform the habitat condition assessment, a full species list was prepared for grassland habitats on each site, and other features of relevance such as areas of bare ground were also recorded to help assign a habitat condition category (see below).

Calculating 'biodiversity units'

Onsite Impacts

3.6 In order to quantify potential biodiversity losses at the Site, the methodology set out in the published DEFRA guidance on biodiversity offsetting was used[7]. The Warwickshire Biodiversity Impact Assessment Calculator[8] was also used to help calculate the potential effects of the

[1] Site ref. no.72/041, dated 1996

[2] Hertfordshire Wildlife Trust (2013) Hertfordshire's Ecological Networks: A report on the current situation and priorities for restoration

[3] ELMAW Consulting (2015) Wormley Parkland, Broxbourne, Hertfordshire; Preliminary Ecological Appraisal

[4] Essex Ecology Services Limited (2016) Wormley Parkland Invertebrate Survey

[5] ELMAW Consulting (2016) Wormley Parkland, Broxbourne, Hertfordshire; Ecological Evaluation

[6] JNCC (2010) Handbook for Phase 1 habitat survey - a technique for environmental audit

[7] DEFRA (2012) Technical paper: The metric for the biodiversity offsetting pilot in England https://www.gov.uk/government/publications/technical-paper-the-metric-for-the-biodiversity-offsetting-pilot-in-england

[8] http://www.warwickshire.gov.uk/?page_id=699001

proposals on the habitats involved; this calculator is referenced within Policy NEB1 of the draft Local Plan, and has been widely applied elsewhere.

3.7 This method quantifies the value of a habitat in terms of 'biodiversity units' based on both 'distinctiveness' and 'condition' of all habitat to be lost. Distinctiveness is generally categorised according to the habitat type present:

- High distinctiveness – priority habitats, as defined in Section 41 of the NERC Act;
- Medium distinctiveness – semi-natural habitat types; and
- Low distinctiveness - intensive agricultural habitats.

3.8 This classification may be modified according to local conditions, for example where a habitat is particularly rare or common in an area.

3.9 Condition is generally assessed with the aid of the condition assessment tool in Natural England's Higher Level Stewardship Farm Environment Plan (FEP)[9], however this tool only covers priority habitat types, and professional judgement has also be applied in assigning condition categories for the areas of habitat involved.

3.10 The number of biodiversity units which need to be offset by a project is calculated by multiplying the area of habitat to be lost by these two factors, as shown in **Table 3-1**.

Table 3-1 - Matrix showing how condition and distinctiveness are combined to give the number of biodiversity units per hectare

		Habitat Distinctiveness		
		Low (1)	Medium (2)	High (3)
Habitat Condition	Good (3)	6	12	18
	Moderate (2)	4	8	12
	Poor (1)	2	4	6

3.11 Impacts on fauna are not included in the DEFRA metric, and indeed impacts upon such species will depend upon their use of the Site in the future when development commences, and also on the details of the final proposals for the school. Impacts upon fauna are therefore not included in this quantitative assessment, but have been assessed in line with best practice guidance, based on currently available information (see below).

3.12 Given that the DEFRA metric is based largely on habitat areas, it does not lend itself well to the valuation of individual trees, and neither the DEFRA guidance nor the Farm Environment Plan (FEP) manual indicate how individual trees should be assessed in terms of distinctiveness or condition. For the purposes of this assessment, the value of individual trees and groups have therefore been considered qualitatively using the information on size and age in the tree survey, assessments for bat roost potential, and observations during the field survey, rather than quantitatively using the metric.

Mitigation and compensation options

3.13 In order to calculate the number of units which could reasonably be achieved through onsite and offsite measures to offset the impacts of the project, it is necessary to estimate the potential future condition of the target habitat type which could be created / restored using the same metric as above. However some habitats take longer than others to create, and there can be inherent difficulties in creating certain habitat types, where very specific conditions such as drainage or pH are required and the risk of failure is therefore higher. Multipliers are therefore applied, based on both the difficulty in creating / restoring the target habitat type and the time required to achieve the target habitat condition. Where target habitats take longer to establish or

[9] Natural England (2010) Higher Level Stewardship Farm Environment Plan (FEP) Manual Technical guidance on the completion of the FEP and identification, condition assessment and recording of HLS FEP features (Third Edition)

are more difficult to create, larger areas of habitat will be required to achieve the required biodiversity units.

3.14 Multipliers can also be applied depending on whether or not offsetting measures are in line with a local strategy, whereby offsets which are not in line with the local strategy need to provide a higher rate of units than offsets which are in line with the local strategy. Although some preparatory work on such a local strategy was previously carried out by Hertfordshire Wildlife Trust[10], nothing has been adopted yet and as such these multipliers have not been included in the calculations.

3.15 This strategy aims to prioritise like for like habitat mitigation / compensation measures, therefore in most cases the target habitat is the neutral grassland priority habitat type 'Lowland Meadows'. Where this is not possible, the DEFRA guidance suggests that mitigation / compensation should be within the same distinctiveness band, or 'trading up' to a habitat in a similar band.

3.16 Outline management prescriptions are presented for the Site in order to demonstrate how the required number of biodiversity units could be delivered through onsite measures. The proposed management prescriptions are based on established best practice in habitat creation / restoration and LUC's experience of working on similar sites. It is worth noting that these management prescriptions would need to be developed in more detail once the details of the final scheme are known. The final scheme would be secured in a management plan for the Site, and monitored as required by any planning conditions attached to the planning permission for the proposals.

3.17 Proposals for the compensation areas are also briefly outlined, setting out the types of measures likely to be required to achieve grassland restoration, however these are described in less detail as there is currently no specific requirements for restoration of these areas.

Impacts on fauna

3.18 At this early stage in the design process, so far in advance of commencing construction, it is not possible to accurately predict impacts on protected or notable species, or to design detailed mitigation proposals. Impacts upon fauna have therefore been considered in accordance with best practice guidance for Preliminary Ecological Appraisal (PEA)[11]. This type of appraisal is intended to:

- provide an initial assessment of the baseline conditions including valuable features with potential to support protected or notable species;
- evaluate ecological features of the site (in a geographical context);
- identify potential impacts; and
- recommend further surveys, mitigation and enhancement.

[10] Hertfordshire Wildlife Trust (2013) Hertfordshire's Ecological Networks: A report on the current situation and priorities for restoration

[11] Chartered Institute of Ecology and Environmental Management (2013) Guidelines for Preliminary Ecological Appraisal

4 Evaluation of the Church Lane site

Desk Study

4.1 A habitat survey of the Site carried out in 1996 described the Site as a large expanse of sheep grazed unimproved neutral, slightly acidic grassland with parkland trees and birch scrub. A total of 44 plant species were recorded including seven indicators of neutral grassland, just below the threshold required for a Local Wildlife Site in Hertfordshire (eight indicator species). A wide range of fungi were also noted at the time of survey, however these were not identified and it is not clear whether these were associated with the grassland habitats or mature trees.

4.2 Hertfordshire's Ecological Network mapping shows the Site mapped as 'Existing habitat not currently qualifying under S41 NERC Act'; this category is understood to represent areas where the habitats present closely resemble a priority habitat type[12] but fail to meet the qualifying criteria based on the data held by HERC at the time. In most cases this is likely to be where the habitat present is degraded or in a poor condition. Based on the information held by HERC, it is most likely that the onsite habitats were considered to be close to qualifying as the priority habitat 'Lowland Meadows'.

4.3 The habitat assessment of the Site carried out in 2015 also found it to comprise four habitats, namely neutral, slightly acidic unimproved grassland; parkland/scattered trees; mixed plantation woodland and defunct species-poor hedgerow with dry ditch. The assessment suggests that the neutral grassland qualifies as the Lowland Meadows priority habitat type and the County BAP habitat 'Neutral Grassland', although the report itself includes limited information to support these classifications. The assessment also found that the Site did not qualify as the 'Wood-pasture and Parkland' priority habitat type due to the lack of veteran trees. The habitats present were assessed as being of District / County value overall.

4.4 A bat survey of the Site carried out in 2016 identified six trees with bat roost potential, distributed largely across the southern half of the Site, while the remainder of the trees had negligible potential to support roosting bats. Foraging surveys identified a total of eight species of bat foraging across the Site; activity levels recorded along the eastern site boundary (New River) were relatively higher than along other boundary features and within the more open parkland and grassland areas of the Site. The Site was predominately utilised by relatively common species, however it was assessed as being of Regional value due to records of two rarer species, namely nathusius pipistrelle and Lesler's bats.

4.5 An invertebrate survey of the Site recorded 239 species associated with grassland, open parkland trees and deadwood. Three of these species are listed in the Red Data Book as rare and threatened, nine species are classified as nationally scarce, 38 are described as of local importance, however none of these are listed as priority species. The assessment report suggests that the Site is of Regional / County value for its invertebrate assemblage.

4.6 Other species considered by the 2016 ecological assessment include birds, badger, otter and reptiles, however the Site was considered to have Negligible value for those species groups.

Field Survey

4.7 The Site comprises a mosaic of six broad habitat types, the area and distribution of which are shown in **Table 4-1** and as shown on **Figure 1**. Each broad habitat type is described in detail below.

[12] As listed by the JNCC in relation to Section 41 of the Natural Environment and Rural Communities Act http://jncc.defra.gov.uk/page-5718

Table 4-1 – Habitats recorded on the Site

Habitat	Area (ha)
Neutral grassland (unimproved)	8.7
Neutral grassland (semi-improved)	4.5
Poor semi-improved grassland	1.9
Tall ruderal	0.5
Broadleaved woodland (plantation)	5.7

Unimproved neutral grassland

4.8 This is the dominant habitat across the Site, distributed largely across the more open areas. The sward is variable in places, but generally dominated by a dense, tussocky sward of abundant red fescue *Festuca rubra*, with frequent common bent *Agrostis capillaris* and sweet vernal-grass *Anthoxanthum odoratum*, and occasional yellow oat-grass *Trisetum flavescens*, crested dogs-tail *Cynosurus cristatus,* Yorkshire fog *Holcus lanatus* and field woodrush *Luzula campestris*.

4.9 Herbaceous cover is generally low, with broadleaved herbs limited to locally abundant lesser stitchwort *Stellaria graminea*, frequent birds-foot trefoil *Lotus corniculatus*, and common vetch *Vicia sativa*, occasional common sorrel *Rumex acetosa*, white clover *Trifolium repens*, tufted vetch *Vicia cracca*, meadow vetchling *Lathyrus pratensis*, and rare thyme-leaved speedwell *Veronica serpyllifolia*.

4.10 Anthills are locally frequent within the north west of the Site, indicating that it has not been cultivated for a prolonged period (Photo 1). A layer of thatch has developed within the many areas of the sward, likely to be a result of under grazing. The cover of herbaceous species is relatively low for a mesotrophic grassland of this nature (close to MG5), and is lacking many of the annuals typically found in this community, with only perennial herbs such as lesser stitchwort persisting at any significant abundances. The previous surveys indicate a reduction / loss of annuals over time, and this shift in abundances typically occurs where swards are undermanaged over a prolonged period resulting in a dominance of grasses and development of a litter layer which prevent annuals from taking seed, gradually suppressing the diversity of herbaceous species.

4.11 This habitat is considered to be the Lowland Meadows priority habitat type, and is therefore assessed as having **High distinctiveness**. However it is considered to currently be in **Poor condition** due to the low cover and diversity of wildflowers and sedges (failing FEP criteria 2, 5, and 6).

Semi-improved neutral grassland

4.12 This community occurs as much smaller patches in shaded parts of the Site, typically beneath or on the northern side of tree groups, and next to boundary features. The sward is broadly neutral in character, sharing some species with the unimproved neutral grassland communities, however the finer grasses have been replaced by higher frequencies of coarse species including abundant Yorkshire fog and rough meadow-grass *Poa trivialis,* and frequent false oat-grass *Arrhenatherum elatius* (Photo 2). Herbaceous cover is also lower than the unimproved communities, with typical open meadow species being replaced by more shade tolerant species including frequent common nettle *Urtica dioica*, occasional ivy *Hedera helix* and lords-and-ladies *Arum maculatum*, and rare broadleaved heleborine *Epipactis helleborine*.

4.13 Given the distribution of this habitat type and its species composition, it is considered that these areas are likely to have previously supported unimproved neutral grassland communities, however the composition has gradually changed over time in response to shading, rather than changes in management.

4.14 This habitat does not qualify as a priority habitat type, but is a semi-natural habitat and as such it is classified as having **Medium distinctiveness**. There is no condition assessment tool for semi-

improved habitat types, however this habitat is considered to currently be in **Moderate condition** due to the relatively high cover of trees and shrubs and low species diversity.

Semi-improved, species-poor grassland

4.15 This habitat has a relatively localised, linear distribution throughout the Site. The sward in these areas is relatively open and shortly grazed, and although it shares some species with the neutral grassland areas (albeit at much lower frequencies), it is notably different due to the presence of grasses indicative of nutrient enrichment and disturbance including locally abundant perennial rye-grass *Lolium perenne*, frequent annual meadow-grass *Poa annua*, and occasional common couch *Elytrigia repens*, smooth meadow-grass *Poa pratensis*, soft brome *Bromus hordeaceus*, and rare rat's-tail fescue *Vulpia myuros*.

4.16 Most of the neutral indicator herbaceous species found in the unimproved communities are absent from these areas and herbacous cover is dominated by a small number of species more typical of agricultural improvement and / or disturbance including locally abundant white clover and creeping buttercup *Ranunculus repens*, and occasional common mouse-ear *Cerastium fontanum* and common nettle.

4.17 This habitat is closely associated with two informal tracks running north-south through the Site where the ground has visibly become disturbed and compressed from heavy vehicle tracks (Photo 3). A larger, sheltered area in the centre of the Site is likely to have become enriched by accumulations of animal dung which was visible in this area, as sheep are likely to gather in this sheltered part of the Site at night.

4.18 This habitat does not qualify as a priority habitat type, but is a semi-natural habitat and it is classified as having **Medium-Low distinctiveness**. Natural England's guidance does not include any criteria for assessing the condition of semi-improved grasslands and it appears fairly typical of this habitat type, therefore it is assumed to be in **Moderate condition**.

Tall Ruderal

4.19 Stands of tall ruderals occur in localised patches beneath individual trees and tree groups, and are typically dominated by common nettle with occasional perennial rye-grass, broadleaved dock *Rumex obtusifolius*, and white clover.

4.20 As for the semi-improved species-poor grassland, this habitat appears to occur in localised, sheltered areas where livestock shelter (Photo 4). It is therefore considered likely that a combination of nutrient enrichment, trampling and shading has created suitable conditions for this habitat in these locations.

4.21 The habitat does not qualify as a priority habitat type, but is a semi-natural habitat, and it is assessed as having **Medium-Low distinctiveness**. Natural England's guidance does not include any criteria for assessing the condition of tall ruderals and it appears fairly typical of this habitat type, therefore it is assumed to be in **Moderate condition**.

Plantation broadleaved woodland

4.22 This habitat occurs as mature tree belts along the northern and eastern site boundaries, where it comprised of varying mixtures of mature sycamore *Acer pseudoplatanus,* ash *Fraxinus excelsior*, hawthorn *Crataegus monogyna* and English oak *Quercus robur*. On the western boundary a screening belt associated with the A10 is comprised of semi-mature wild cherry *Prunus avium*, field maple *Acer campestre*, hawthorn and oak. Within the Site itself plantation broadleaved woodland also occurs as patches dominated varyingly by silver birch *Betula pendula,* common lime *Tilia x europaea* sp., and London plane *Platanus x hispanica*. Ground flora beneath these dense plantations is relatively sparse as a result of heavy shading and trampling by livestock, resulting in relatively bare ground with occasional patches of common nettle and ivy.

4.23 The majority of this woodland habitat is believed to have been planted as an extension to the older Wormleybury parkland (to the west of the A10) in the 19th century. Planting along the western boundary is clearly much younger and is understood to have been planted as part of the construction of the A10 dual carriageway in the 1970s.

4.24 The habitat does not qualify as a priority habitat type, but is a semi-natural habitat, and it is therefore assessed as having **Medium distinctiveness**. This habitat is considered to currently be in **Moderate condition** due to relatively even age stands, damage by livestock, and a lack of standing / fallen deadwood.

Scattered broadleaved trees

4.25 Scattered specimens of mature English oak, common line, ash, sycamore, small-leaved lime *Tilia cordata*, Turkey oak *Quercus cerris*, horse chestnut *Aesculus hippocastanum*, and beech *Fagus sylvatica* occur through the Site. Most specimens are mature but not veteran, although some specimens have died and provide standing deadwood habitats (Photo 5).

4.26 Most of these specimens are also likely to have been planted as part of the 19th century extension to Wormleybury parkland, although occasional specimens of hawthorn scrub may be self-seeded.

4.27 None of the scattered broadleaved trees are considered to be veterans.

0 50 100 m

Site boundary

Phase 1 habitats

A1.1.2: Broadleaved woodland (plantation)

B1.2: Acid grassland (semi-improved)

B2.1: Neutral grassland (unimproved)

B2.2 / A3: Neutral grassland (semi-improved) with scattered trees

B2.2: Neutral grassland (semi-improved)

B6: Poor semi-improved grassland

C3.1: Tall ruderal

G2: Running water

J2.2.2: Defunct hedge (species-poor)

J2.2.2 / A3.1: Defunct hedge (species-poor) with broadleaved scattered trees

Source: LUC

Map Scale @A3: 1:2,750

Broxbourne Environmental Mitigation Strategy

Figure 1: Phase 1 Habitat Plan of the Site

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5 Impacts of the proposals

Indicative proposals

5.1 While the entire site at Church Lane is safeguarded by Policy INF10, the policy does not specify the requirements or scale of the school facility. Nonetheless, current projections indicate that an eight form entry (8FE) would be required at the Site by the end of the plan period[13,14], and indicative proposals for the school have been developed in collaboration with Hertfordshire County Council on that basis. The indicative proposals are presented in **Appendix 1**, totally an estimated 83,700sqm broadly comprised of the following elements:

- Indoor and outdoor pitches – 33,685sqm
- Hard and soft informal areas – 7,200sqm
- School building – 10,853sqm
- Vehicular parking – 262 spaces
- Cycle parking – 410 spaces
- SUDS and landscaping – 1,625sqm

5.2 While the proposals are still indicative at this stage, the areas are based on typical requirements for an 8FE school, while the layout has been developed by the Council's Urban Designer, taking account of any known site constraints. The indicative proposals are therefore considered to provide a reasonable indication of the likely scale and layout of the development, and have been used to assess likely effects of the proposals.

5.3 It is worth noting that while the indicative proposals currently represent the best available information for the purposes of this impact assessment, the final proposals may differ somewhat due to the changing requirements of the school or more detailed studies of the Site.

5.4 The school would be delivered when it is required to meet local need for additional school capacity. There is currently no confirmed timescale for commencement or completion of the construction phase, however it is expected that the additional school capacity would not be required until the second half of the plan period, and as such for the purposes of this assessment it is assumed that construction would not commence for at least ten years.

Habitat loss

Current site value

5.5 The current value of the Site is **123.72 biodiversity units**, based on the breakdown of habitats set out in **Table 5-1,** and shown on **Figure 1**.

[13] Broxbourne Infrastructure Delivery Plan (currently unpublished)

[14] Vincent and Gorbing (2016) Church Lane, Wormley: Feasibility Report for an 8FE Secondary School

Table 5-1 – Current value of the Site

Habitat	Distinctiveness	Condition	Area	Biodiversity Units
Broad-leaved plantation	Medium	Poor	5.08	20.32
Unimproved neutral grassland	High	Poor	8.67	52.02
Semi-improved neutral grassland	Medium	Moderate	4.57	36.56
Poor semi-improved grassland	Medium-Low	Moderate	1.94	11.64
Tall ruderal	Medium-Low	Moderate	0.53	3.18
			Total	**123.72**

5.6 In addition to the loss of areas of habitat, the indicative proposals show the direct loss of a number of trees from within the footprint. These are predominately semi mature groups of non-native species such as sycamore and cappadocian maple *Acer cappadocicum* of low ecological value. The area does also include some mature specimens of beech and small-leaved lime; these are generally in good condition and do not currently support significant areas of rot or cavities which would provide valuable ecological niches for species such as deadwood invertebrates, birds and bats (see below), however they would be likely to do so in the future. For example, one mature specimen of beech (T46) within the development footprint has the decay fungus *Meripilus giganteus* growing at its base, which is likely to kill the tree and create standing deadwood habitat within the next ten years. Therefore while the direct loss of the current tree assemblage may only be significant at a Site level, it is worth noting that the loss of the future value of these trees is potentially more significant.

Impact of direct habitat loss

5.7 Assuming that all habitat within the development footprint is lost (as shown in **Appendix 1**), it is estimated that **the impact of the proposed scheme would be 49.42 biodiversity units**, as set out in **Table 4-2**.

Table 5-2 – Impacts of the proposed scheme

Habitat	Distinctiveness	Condition	Area	Biodiversity Units
Unimproved neutral grassland	High	Poor	3.87	23.22
Semi-improved neutral grassland	Medium	Moderate	2.29	18.32
Poor semi-improved grassland	Medium-Low	Moderate	0.11	0.66
Tall ruderal	Medium-Low	Moderate	0.49	2.94
Broad-leaved plantation	Medium	Poor	1.07	4.28
			Total	**49.42**

5.8 The greatest proportion of the impact would be due to the loss of unimproved neutral grassland habitat, as would be expected given the nature and distribution of habitats across the Site.

Indirect habitat degradation / deterioration

5.9 Habitats within the remainder of the Site (outside of the development footprint) could also be affected in the long-term by the change of use from agricultural to an educational facility. Potential impacts of this land use change include:

- Change in management – loss of grazing, neglect etc
- Trampling of vegetation
- Compaction of soils
- Habitat fragmentation / isolation
- Changes in environmental conditions e.g. shade, hydrology
- Herbicide / fertilizer drift from intensively managed areas e.g. amenity grassland

5.10 These effects will be dependent on both the detailed design of the final proposals and the long-term management of the Site which are not yet fully determined and therefore cannot be fully quantified at this stage. Nonetheless, they considered in the mitigation strategy (below).

Impacts on protected / notable fauna

Bats

5.11 The indicative proposals show that a single tree with bat roost potential could be lost as a result of the proposals (T65); this is mature turkey oak *Quercus cerris* with significant deadwood throughout the crown. Bat activity surveys carried out at the Site in 2016 indicate that this tree may support a small non-breeding roost of common pipistrelle bats, although this is unconfirmed. A roost of this nature is of relatively low conservation importance, and its loss is considered to be significant at the Site level.

5.12 The indicative proposals show that the development will also result in the direct loss of an area of bat foraging habitat, however it will not directly affect the most valuable feature of the Site (the eastern boundary with the New River). Loss of the relatively open area of habitat from within the Site will potentially affect bat species such as noctule or leisler's which tend to favour more open habitats, however those species have such large home ranges that the loss of this relatively small area would have a minimal impact on these populations.

5.13 Boundary features such as the eastern boundary are used by a wider range and larger number of bats, and the indicative proposals indicate that these should not be directly impacted by the proposals other than small gaps for access, although this would be dependent on the detailed design (see below). However light spill from some elements of the development could disturb foraging and commuting bats using these features, particularly from features such as sports pitches, car parking and tall buildings. If this light spill was substantial, and affected an important commuting route such as the New River, this could have an impact on light sensitive species of bats which could be significant at up to Local level.

Invertebrates

5.14 The assemblage of notable invertebrate species recorded during the 2016 survey were associated with dry wildflower grasslands, deadwood and open grown mature trees. The survey identified some areas of significant deadwood habitat within the Site which are presumably particularly valuable to the deadwood invertebrate species, however it is not sufficiently clear to identify which specific trees these areas relate to. Nonetheless, the indicative proposals show that several of these areas of significant deadwood would be directly lost to the proposals, and the development will undoubtedly result in an overall reduction in the availability of the main invertebrate habitats (dry wildflower grassland, deadwood and open grown mature trees); although the areas are not very large, these losses are likely to be particularly significant given that those habitat types are relatively limited in the local landscape and given the number of notable species associated with them.

5.15 Future changes in the management may also affect certain species groups, for example the loss of grazing animals at the Site would be detrimental for species associated with dung. Some species groups such as moths are also known to be sensitive to artificial lighting, which disrupts their foraging behaviour and efficiency, and the effects of external lighting (particularly floodlit pitches) could have a detrimental effect on local populations. Areas of amenity grassland such as sports pitches are likely to be treated with pesticide to ensure that they are hard wearing, however there is a risk that these chemicals could drift (on the wind) or leach to nearby habitats used by notable invertebrates.

5.16 The development could therefore have an adverse effect on the invertebrate assemblage significant at a Local - County level.

6 Onsite mitigation strategy

6.1 Please note, this section should be read alongside **Figures 2-4**.

Avoidance

Habitats

6.2 Given the sensitivity of the Site, efforts have been made to minimise the scale of the proposals as far as possible throughout the design process to date, while still fulfilling the minimum requirements of an 8FE secondary school and the pitch requirements of Sports England.

6.3 The value and condition of grassland habitats are clearly variable across the Site, as shown on **Figure 1** and described in **Section 4** above. Opportunities to reduce impacts through the layout have therefore been explored as part of the mitigation strategy, seeking opportunities to focus development on less valuable habitats while avoiding more valuable habitats. This reflects the requirement of the mitigation hierarchy in the NPPF to avoid adverse effects on habitats wherever possible. The proposed layout of the school facilities in the south eastern corner of the Site will affect a relatively low proportion of unimproved neutral grassland due to a higher proportions of semi-improved grassland and tall ruderals in this part of the Site. This layout would therefore avoid the potentially higher impacts that would occur if the school facilitates were to be located in more sensitive parts of the Site such as the north east corner.

6.4 While an alternative development layout focussed on the north western corner of the Site might reduce the total area of neutral grassland habitat affected by the proposals, this option would require a significant loss of mature tree groups. The pockets of grassland in this area also have a slightly higher cover of herbaceous species, and several anthills were observed, while the woodland edges and scattered trees provide a varied microclimate. This part of the Site is therefore likely to be of relatively high value for the notable invertebrate assemblage associated with grassland habitats and mature trees. It is also worth noting that if the school was located in the north west of the Site, this would also require significantly greater access infrastructure, increasing the overall footprint of the development. Therefore while an alternative layout development concentrating development in the north west of the Site might feasibly reduce the predicted impacts when applying the DEFRA metric tool alone, the overall ecological impact of the scheme would potentially become greater due to impacts on notable invertebrates which are not captured by the metric. The current layout is therefore considered to represent the best option at this stage, however this could be refined during subsequent detailed design stages.

6.5 Further loss and temporary damage of habitat could occur during the construction phase in order to facilitate construction access, storage, staff facilities etc. However it is expected that such losses could be avoided through the use of carefully planned site management and operation, which would be secured through a Construction Environmental Management Plan for the Site.

Fauna

6.6 It should be possible to retain the tree with bat roost potential which is located close to the edge of the development footprint (T65); during the detailed design stage efforts should be sought to accommodate this tree within a buffer of open space sufficient to at least accommodate its root protection zone including future growth, and avoid light spill and noise disturbance from nearby development such as sports pitches.

6.7 The southern and eastern boundaries should also similarly be fully retained and buffered from development sufficiently to physically protect the trees and avoid potential future conflicts with the users of the school due to issues such as shading and falling branches which might require lopping or felling. The detailed design should also avoid locating elements of the project such as

all-weather pitches, car parking, access roads and tall buildings too close to these features in order to avoid light spill into foraging areas and commuting routes as far as possible.

6.8 The indicative proposals show that the school could be accommodated whilst generally avoiding the most diverse areas of grassland (as described above) and the majority of mature trees. Nonetheless, efforts should be made to incorporate mature trees into areas of soft landscaping as far as possible at the detailed design stage, particularly those with significant deadwood features of value to invertebrates and bats. This may be difficult to achieve in practice, as most of these trees will have large root protection areas, and efforts to retain them will need to be balanced with the health and safety considerations of retaining mature specimens such as these within the context of a sensitive site such as a school. Indeed even if they can be retained, they may require such significant tree surgery to make them safe that their value to deadwood invertebrates would be degraded so much as to no longer warrant their retention.

Habitat mitigation

Restoration of Lowland Meadow habitat

Target habitat / condition

6.9 Although the condition of the unimproved neutral grassland habitat is currently poor due to a low diversity of herbaceous species (particularly annuals), the citation for the Local Wildlife Site also indicates that the sward previously supported a higher diversity of grassland species, and the loss of diversity has most likely been very gradual over time due to prolonged under grazing. The sward still exhibits a relatively strong neutral character and does not appear to have been ploughed or reseeded, while indicators of nutrient enrichment are present at very low frequencies, therefore soil conditions are expected be highly suitable for restoration. It is therefore considered reasonable to assume that the retained unimproved neutral grassland habitat (4.8ha) could be restored to Lowland Meadow priority habitat in **Good condition**. It is estimated that the target condition could be achieved within five years.

Habitat restoration / management measures

6.10 Restoration measures would aim to open up the existing sward to allow herbaceous species to colonise and diversify it. It is currently expected that it would no longer be feasible to continue grazing the Site once it becomes part of the school grounds. It is also assumed that the retained areas of habitat would be excluded from general school use (other than supervised educational use), with fencing between these areas to delineate a separate use and restrict public access.

i. A hay cut would be taken toward the end of the growing season (September) and all arisings removed from the Site, taking care not to destroy the anthills in the north west of the Site. This would remove the current year's growth and some of the layers of dead material which have accumulated.

ii. Any remaining layers of dead material would then be broken up using a chain harrow which should expose small patches of bare ground, making these available for colonisation by herbaceous species. Again, care should be taken not to destroy the anthills in the north west of the Site.

iii. The sward would then be over sown with yellow rattle seed. This species is hemiparasitic on grass roots which would help to suppress the dominant grasses in the sward, giving herbaceous species a competitive advantage over the long term. The yellow rattle may take 2-3 years to become established, during which time the Site should be managed by taking a late hay cut (late July) and a subsequent cut in late-August-September.

iv. Once the yellow rattle has become established, the sward would be opened up again by taking a close hay cut and chain harrowing to expose areas of bare ground. The sward would then be over sown with suitable wildflower seed mix in order to introduce a higher diversity of herbaceous species to the sward. After sowing, the seed should be bedded in by light rolling across the sward.

v. Alternatively, brush-harvested seed or green hay from a high quality local source such as a Site of Special Scientific Interest or other Local Wildlife Sites could be sown across the Site, however

these sources normally contain a relatively high proportion of grass seed, and therefore may not have such as targeted effect on species diversity as a purely wildflower seed mix.

vi. Immediately following sowing (September-November), the sward would be kept short to facilitate light penetration to encourage germination. The sward would be cut again in spring and the arisings removed to prevent seedlings from becoming shaded out.

vii. Once established, the sward should be managed as a hay meadow in the long-term, cutting in late July followed by further cuts in late-summer / early autumn, removing the arisings each time.

viii. It is very important grassland cutting is not undertaken prior to late July during restoration and subsequently during long-term management as this would prevent yellow rattle from setting seed, reduce its abundance and increase the risk of a decline in grassland condition.

ix. Further applications of wildflower seed may be required in order to increase the species diversity sufficiently to achieve the target condition. The species composition of the sward should be monitored, and further applications of wildflower seed made after approximately three years after the first application if the species diversity has not increased sufficiently.

Creation of Lowland Meadow habitat

Target habitat / condition

6.11 Areas of semi-improved species-poor grassland are currently of limited ecological value. In these areas the soil structure appears to have been disturbed and compacted by heavily vehicles and the sward has lost its neutral character, being replaced by more competitive grasses and weeds. Nonetheless the wider character of the Site indicates that these areas have not been reseeded or agriculturally improved, therefore the nutrient levels are likely to be suitable for habitat creation. These retained areas (1.94ha) would be difficult to restore back to a species-rich grassland by simply over sowing (as described above), particularly given the apparent damage to soil structure, therefore it is proposed that they would be reseeded in order to achieve the Lowland Meadow habitat with a target of **Good condition**.

Habitat creation / management measures

6.12 Wildflower grassland would be created by preparing the soil and reseeding the area with a suitable seed source at an appropriate time of year (ideally late-summer – early-autumn).

i. The ground would be prepared by rotavating the topsoil to a fine tilth.

ii. Wildflower seed from an appropriate local source would be sown, either as brush harvested seed or as green hay.

iii. Alternatively, a commercial wildflower seed source could be used, however this is also likely to require a non-persistent nurse crop.

iv. Harrow and lightly roll the ground.

v. For the first year it will be necessary to regularly cut the grass to a height of approximately 50mm and remove the arisings in order to avoid seedlings becoming smothered by vigorous grass growth.

vi. Weed control is likely to be required during the establishment period. Regular cutting during the establishment period should reduce the problem, however spot treatment with herbicide and hand pulling may be required.

vii. Following the establishment period these areas should be maintained as a hay meadow (two cuts annually, removing the arisings each time) along with the restored areas of neutral grassland, as described above.

viii. Again, further applications of wildflower seed may be required in order to increase species diversity sufficiently to achieve the target habitat condition. Monitoring should determine the need for a further application of wildflower seed after approximately three years.

Habitat protection

6.13 Public access should be limited within the areas required for habitat mitigation (as shown on **Figure 2**), as localised trampling could damage sensitive areas of grassland habitat. Incorporating features such as fences and hedges into the detailed design should help to reduce the effects of trampling caused by public access, and the leasehold agreement with the academy trust (see below) should include a clause restricting the use of this area of the Site for recreational purposes.

6.14 Intensive management of areas such as playing fields adjacent to the habitat mitigation areas could also impact upon sensitive grassland areas, however these effects could be reduced by creating buffer strips to reduce leaching of fertilizer and hedges or fences to reduce pesticide drift. The potential effects of shading (as a result of tall structures) and changes to hydrology (as a result of drainage) should also be considered at the detailed design stage in order to reduce these effects where they have the potential to become significant.

Net effects of proposed habitat mitigation

6.15 Restoration / recreation of grassland habitats at the Site, as described above, would create 65.10 additional biodiversity units at the Site. This would offset the impacts of development and result in a **net gain for biodiversity of 15.68 biodiversity units**, as shown in **Table 6-1.**

Table 6-1 – Net effects of onsite mitigation measures

Habitat	Existing Value	After mitigation		Time multiplier	Difficulty multiplier	Increase in Value
		Distinctiveness	Condition			
Restoration of Lowland Meadow habitat (4.9ha)	28.80	High	Good	1.2 (5 years)	1 (Low)	+48.00
Creation of Lowland Meadow habitat (1.94ha)	10.98	High	Good	1.4 (10 years)	1 (Low)	+17.10
	39.78				**Effects of onsite mitigation measures**	**+65.10**
					Impact of development	**-49.42**
					Net gain	**+15.68**

Further habitat mitigation options

6.16 Although the above measures should achieve net gain for biodiversity, as shown above, the following onsite measures are presented to provide flexibility in the delivery of net gain, in the event that the proposals change. It is not possible to estimate the potential effects of these measures at this stage, as they will be subject to detailed design matters.

Ecological enhancement of plantation broadleaved woodland

6.17 Several of the tree groups on the Site are single species stands which have been planted at a relatively high density, creating a heavily shaded environment with very little light or space for ground flora and understorey to develop; these woodland blocks are therefore currently lacking in structural and species diversity. Sheep grazing at the Site is also suppressing the ground flora through trampling, overgrazing and eutrophication as sheep tend to congregate in sheltered areas at night.

6.18 These areas could be diversified by thinning out the canopy trees to facilitate light penetration, which should allow ground flora to recover and understorey species to establish and develop over time in the absence of livestock (this could be supplemented by under planting if necessary), creating more structurally and botanically diverse woodlands. These measures would create biodiversity units by improving the condition of the woodland habitats, although this would not provide like for like mitigation for the loss of neutral grassland habitat.

Reduction of plantation broadleaved woodland

6.19 Several of the tree groups at the Site are relatively large, young, dense, single-species stands of limited ecological value. These groups cast a heavy shade some areas of the neutral grassland, which is limiting the species diversity of the sward (as described above), particularly in the north west of the Site. Removal of some tree groups would benefit the surrounding grassland communities and potentially restore further areas of Lowland Meadow habitat over time, however as noted above these tree groups contribute to the overall habitat structure and microclimate in this part of the Site, while the trees themselves are also covered by a TPO and contribute to the character of the Site and would help to screen views of the new school building. Any removal of trees would therefore need to be carefully planned and balanced with the potential negative effects of doing so, and as such this measure would probably be limited to reducing the size of some of the younger stands.

Soft landscaping

6.20 There may also be potential to create habitats within the soft landscaping scheme for the school proposals. While this is unlikely to provide significant opportunities for like for like habitat replacement i.e. species-rich neutral grassland creation, there may be potential to incorporate smaller features such as species-rich native hedgerows, trees belts and ponds.

Fauna mitigation

Bats

6.21 Loss of mature trees from within the development footprint is likely to reduce foraging opportunities for bats within the Site, therefore alternative opportunities should be created by hanging bat boxes on retained mature trees within the Site and incorporating them into the detailed design of the proposed buildings.

6.22 Although light spill on commuting / foraging features should be avoided as far as possible through the detailed layout, the final lighting scheme should also incorporate directional, low level and cowled lighting where necessary in order to further minimise light spill in sensitive areas of the Site (see **Figure 3**).

6.23 The proposed habitat restoration and creation measures (above) will increase the diversity of the sward, which will in turn support a greater diversity and abundance of invertebrate prey for foraging bats, which will reduce any impacts as a result of habitat losses (described in **Section 5** above).

Invertebrates

6.24 While the loss of mature trees should be reduced as far as possible through the detailed design scheme, the indicative proposals suggest that some losses will be inevitable. Where mature trees will be lost, the main trunks and branches should be moved into areas of retained habitat within the Site i.e. outside of the school area. It is important to provide both fallen and standing deadwood habitat types, as these provide a range of environmental conditions and niches for different species, and for animals during different lifecycle stages. Smaller limbs could be used to create log piles and stumperies (partially buried stumps), which will recreate fallen deadwood habitats. In order to recreate standing deadwood habitats, some larger pieces could also partially buried vertically in the ground. Alternatively, live trees could be pollarded (which encourages the development of rot holes) or ring barked (which kills the tree), however those measures would need to be advised upon by a suitably qualify arboriculturalist, and would likely require a TPO consent.

6.25 Restoration and creation of grassland habitats should diversify the sward and provide a greater range and abundance of opportunities for some species groups, particularly those associated with nectar sources. Long-term management of the sward may also need to be refined to accommodate notable species with particular habitat niches or lifecycle stages such as species which overwinter in grass tussocks or dead flower heads.

6.26 As for bats, lighting of sensitive areas should be minimised through detailed design and a sensitive lighting scheme, avoiding illumination of features likely to be used by moths, particularly areas of species-rich grassland and mature trees (see **Figure 4**).

6.27 Application of pesticides at the Site should be carefully planned and implemented to minimise risk of these spreading to sensitive areas used by notable invertebrate species. This could include incorporating fences / hedges and using spot treatments to reduce drift, and or may also include the use of non-persistent or targeted chemicals where appropriate.

0 50 100 m

Church Lane School Proposal

Mitigation

Area retained and managed for ecological mitigation

Creation of Lowland Meadow (1.94 ha)

Restoration of Lowland Meadow (4.9 ha)

Trees/ plantation woodland: possible removal/ thinning

Source: BC, LUC

Map Scale @A3: 1:3,000

Broxbourne Environmental Mitigation Strategy

Figure 2: Habitat Mitigation

LUC

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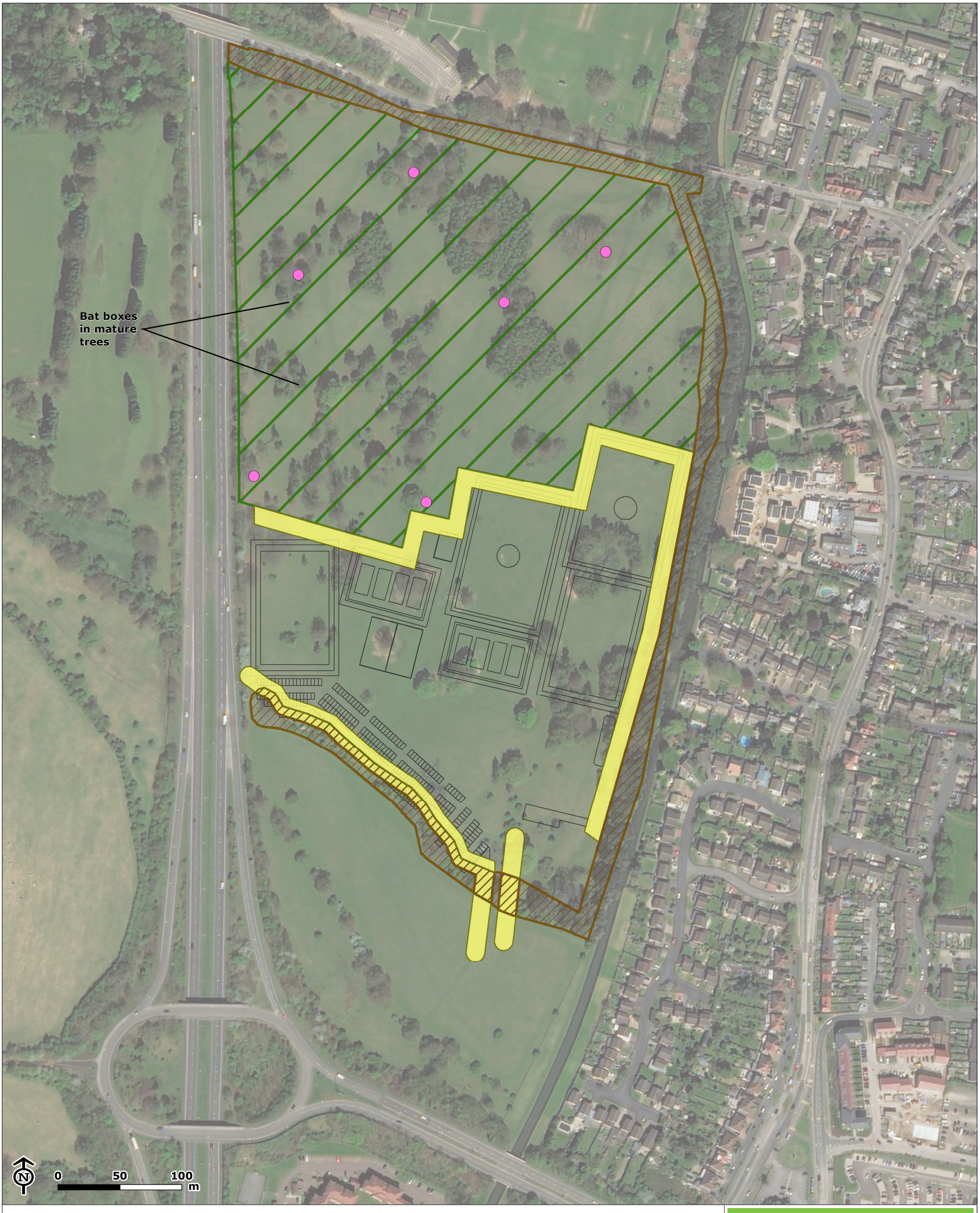
CB:KS EB:Stenson_K LUC FIG2_7147_r1_Habitat_Mitigation_A3P 24/11/2017



Church Lane School Proposal

Trees with bat roost potential: retain and protect

Mitigation

Increase diversity of sward to improve foraging habitat

Main bat foraging area/ commuting route: soft landscaping and low light levels

Sensitive lighting

Source: BC, LUC

Map Scale @A3: 1:3,000

Broxbourne Environmental Mitigation Strategy

Figure 3: Bat Mitigation

LUC

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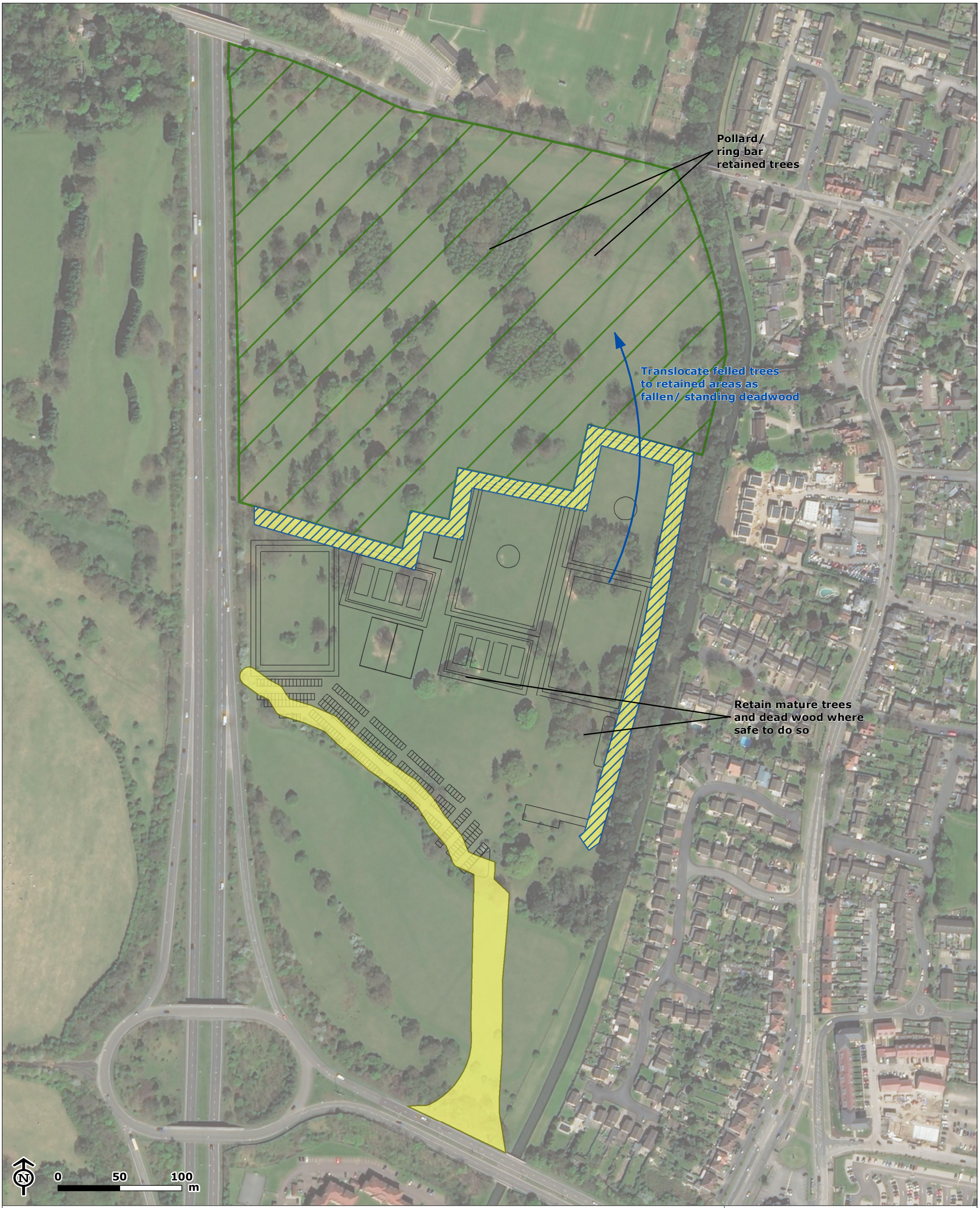
CB:KS EB:Stenson_K LUC FIG3_7147_r1_Bat_Mitigation_A3P 27/11/2017



Church Lane School Proposal

Invertebrate mitigation

Manage sward sensitivity for invertebrates

Sensitive lighting

Senstive use of pesticides and sensitive lighting

Source: BC, LUC

Map Scale @A3: 1:3,000

Broxbourne Environmental Mitigation Strategy

Figure 4: Invertebrate Mitigation

LUC

BOROUGH OF BROXBOURNE
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CB:KS EB:Stenson_K LUC FIG4_7147_r1_Invert_Mitigation_A3P 27/11/2017

7 Offsite compensation options

7.1 The previous section demonstrates that an 8FE secondary school could be developed at the Site, while still achieving a net gain for biodiversity through onsite mitigation measures alone, and ecological compensation measures are not required. Nonetheless, two areas have been identified as part of the strategy in order to demonstrate flexibility and further reassurance that net biodiversity gain can be achieved in the event that some of the above onsite measures may not deliver the required biodiversity units or the school proposals change. These options are therefore not currently proposed as part of the strategy, but are available to the Council as reserved options, if required at a later date.

7.2 The location of the two possible compensation areas are shown on **Figure 5**.

Compensation area A

7.3 This site includes approximately 5.4ha of land immediately south of this site (see **Figure 6**) which appears to be grazed. In the northern part of this site, the sward is dominated by sheep's fescue *Festuca ovina* and common bent with relatively few herbaceous species, while the overall community appears to have affinities to an acid grassland community (U1), although it is still relatively species-poor and has therefore been classified as semi-improved acid grassland. The difference in character from the proposed school site to the north appears to be due to the soil conditions, which are visibly very thin and sandy. This habitat does not currently qualify as a priority habitat type, but has a distinctiveness of Medium-High due to being relatively uncommon locally. The habitat is considered to be in Poor condition due to the low diversity of the sward.

7.4 This site slopes north to south towards the Turnford roundabout and the lower half lies within floodplain. The lowest lying, flatter areas of this site support more damp and mesotrophic communities dominated by tufted hair-grass *Deschampsia cespitosa* and rushes (MG9), indicating that the soils in these areas are likely to be waterlogged for prolonged periods. This area has been classified as semi-improved neutral grassland however it does qualify as the Floodplain and Coastal Grazing Marsh priority habitat type due to is location in the floodplain. Nonetheless, it is considered to be currently in Poor condition due to its low species diversity and a lack of open water features such as ditches and pools, which normally contribute to the value of this habitat type.

Table 7-1 – Current value of habitats on Compensation Area A

Habitat	Area	Distinctiveness	Condition	Value
Semi-improved acidic grassland	3.50	Medium-High	Poor	17.50
Semi-improved neutral grassland	1.20	Medium	Poor	4.80
Plantation broadleaved woodland	0.7	Medium	Moderate	5.60

7.5 It is considered that the semi-improved acid grassland could potentially be enhanced to qualify as the 'Low Acid Grassland' priority habitat type through appropriate habitat management measures. Less information is available about the previous value or management of this site, therefore for the purposes of this assessment it is only assumed that it could be restored to achieve Moderate habitat condition.

7.6 The condition of the Coastal and Floodplain Grazing Marsh could be significantly improved by excavating small pools, ditches and scrapes across this area. However it is unlikely to be grazed in the long-term as this will be a relatively small area, isolated by development and bisected by

the main access road to the school, and therefore it is considered unlikely to represent a viable grazing unit. As such it would no longer technically fit within the Floodplain and Coastal Grazing Marsh habitat definition, nonetheless it would be considerably more valuable than its current condition, therefore for the purposes of calculating the level of biodiversity gain, it would be assessed as having High distinctiveness and would achieve at least Moderate condition.

Table 7-2 – Effect of offsite measures in Compensation Area A

Target Habitat	Existing Value	After mitigation		Time multiplier	Difficulty multiplier	Increase in Value
		Distinctiveness	Condition			
Lowland acid grassland (3.5ha)	17.5	High	Moderate	1.4 (10 years)	1 (Low)	+17.5
Floodplain and Coastal Grassland (1.2ha)	4.8	High	Moderate	1.2 (5 years)	1 (Low)	+8
		Effects of offsite compensation measures				**+25.5**

Compensation area B

7.7 This is a part of a larger area of public open space owned and managed by the Council. While the wider area is heavily managed for amenity and recreation, this relatively small area (2.5ha) appears to be unmanaged. It is predominately comprised of relatively species-poor, rank grassland (MG1) dominated by false oat-grass, Yorkshire fog, cocksfoot, and bent, with relatively few herbaceous species and encroaching bramble and hawthorn scrub (see **Figure 7**). The dominance of tall robust grasses and specimens of encroaching scrub indicate that it has been unmanaged for some time. Scrub encroachment increases toward the south eastern corner, where it has become dense and continuous. By contrast, a small area in the north western corner is relatively species-rich and neutral in character, including perennial herbs such as black knapweed *Centaurea nigra,* wild carrot *Daucus carota*, ox-eye daisy *Leucanthemum vulgare*, and agrimony *Agrimonia eupatoria*; this area qualifies as Lowland Meadow habitat, however it is considered to be in Moderate condition due to the lack of annual species and encroachment of scrub.

Table 7-3 – Current value of habitats at Compensation Area B

Habitat	Area	Distinctiveness	Condition	Value
Semi-improved species poor grassland	1.57	Medium-Low	Moderate	9.42
Unimproved neutral grassland	0.36	High	Moderate	4.32
Dense continuous scrub	0.27	Medium-Low	Moderate	1.62
Plantation broadleaved woodland	0.30	Medium	Moderate	2.40

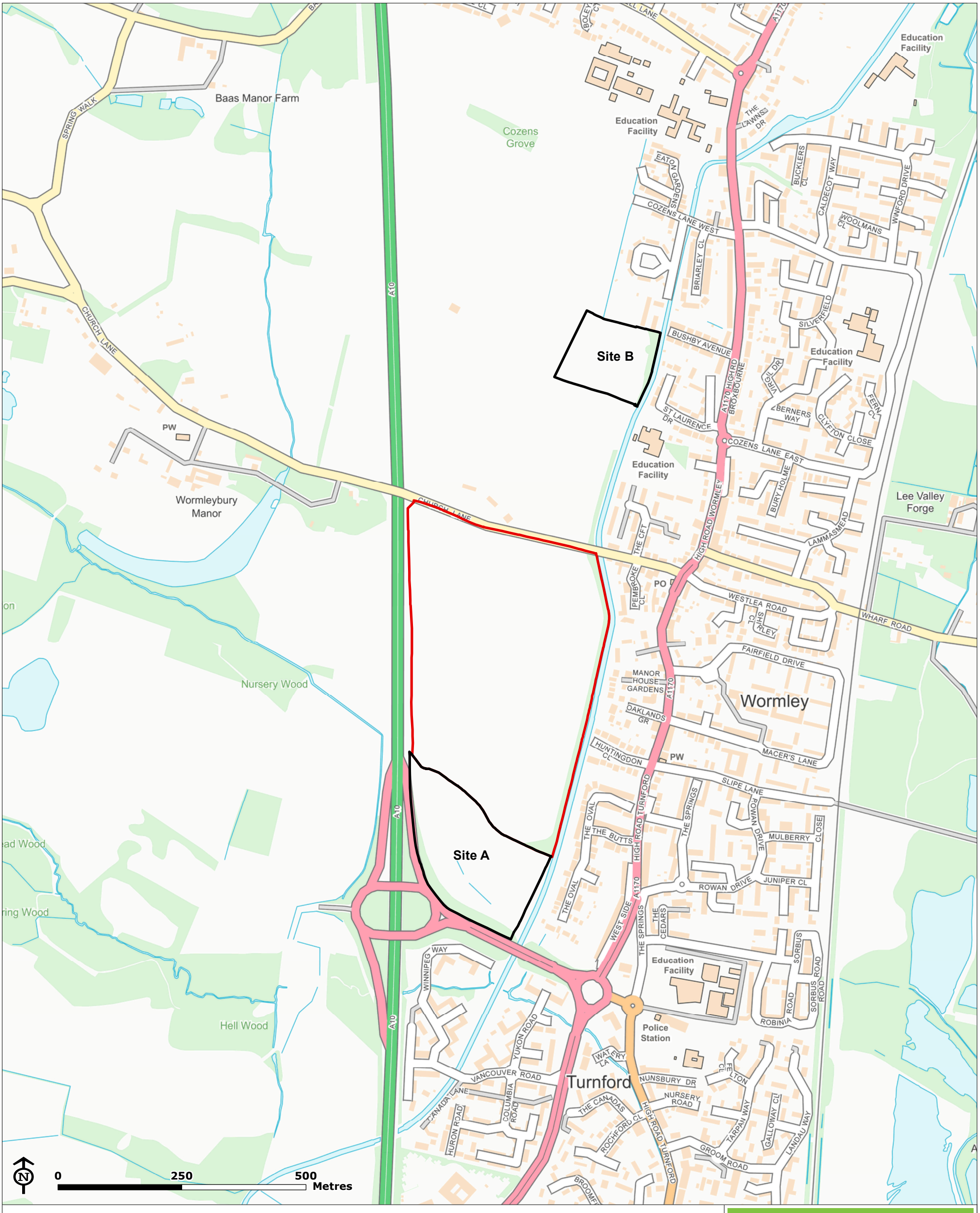
7.8 The semi-improved species-poor grassland is of relatively low ecological value, however the presence of species-rich grassland in the north west corner indicates that the soils are highly suitable for restoration of Lowland Meadows priority habitat. Management measures likely to be required would include scrub removal and treatment of stumps to prevent regrowth, sowing yellow rattle and wildflower seed, and a regular grassland maintenance in the long-term. Areas of semi-improved species-poor grassland and dense scrub would be replaced with Lowland Meadow habitat, which would achieve Good condition within 10 years. The condition of the existing area

of Lowland Meadow habitat in the north western corner of would also be improved from Moderate to Good.

7.9 An area of plantation broadleaved woodland also dominates the eastern boundary; no mitigation measures are proposed in this area.

Table 7-4– Effect of offsite measures in Compensation Area B

Target Habitat	Existing Value	After mitigation		Time multiplier	Difficulty multiplier	Increase in Value
		Distinctiveness	Condition			
Lowland Meadows (2.2ha)	15.36	High	High	1.4 (10 years)	1 (Low)	+20.20
		Effects of offsite compensation measures				**+20.20**



School site

Compensation sites

Source: LUC

Map Scale @A3: 1:7,500

Broxbourne Environmental Mitigation Strategy

Figure 5: Location Map

LUC

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Compensation site boundary

Phase 1 habitats

J2.2.2: Defunct hedge (species-poor)

J2.2.2 / A3.1: Defunct hedge (species-poor) with broadleaved scattered trees

A1.1.2: Broadleaved woodland (plantation)

B1.2: Acid grassland (semi-improved)

B2.2: Neutral grassland (semi-improved)

Source: LUC

Map Scale @A3: 1:1,500

Broxbourne Environmental Mitigation Strategy

Figure 6: Compensation Site A

LUC

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CB:EL EB:Stenson_K LUC FIG6_7147_r1_PHA1compA_A3P 27/11/2017

Compensation site boundary

Phase 1 habitats

J2.3.2: Hedge with trees (species-poor)

A1.1.2: Broadleaved woodland (plantation)

A2.1: Scrub (dense/continuous)

B2.1: Neutral grassland (unimproved)

B6: Poor semi-improved grassland

A2.2: Scrub (scattered)

Source: LUC

Map Scale @A3: 1:1,250

Broxbourne Environmental Mitigation Strategy

Figure 7: Compensation Site B

LUC

BOROUGH OF BROXBOURNE
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CB:EL EB:Stenson_K LUC FIG7_7147_r1_PHA1compB_A3P 27/11/2017

8 Delivery and costs

8.1 The following stages are expected to be required in delivering the mitigation measures required to achieve no net loss of biodiversity at the Site, as described in the preceding sections of this strategy. As requested in the brief, indicative costs are provided to deliver this mitigation strategy, however it should be noted that these are based on published contracting rate guides[15][16] and our experience of other projects, and rely on general assumptions in the absence of final details. They are intended to provide the Council with some initial figures to inform the project planning stage, but will need to be revisited and reviewed as the plans evolve.

Pre-planning habitat creation / restoration

8.2 It is recommended that some habitat mitigation measures should begin well in advance of commencing development if possible, as this will reduce the period between impacts occurring and mitigation becoming effective, during which negative effects will be occurring. In particular, it is recommended that grassland creation and restoration should be commenced in advance of development as this could take 5-10 years to reach the target condition. It would also be advisable to commence restoration soon, as the sward may become more difficult to restore if it is allowed to continue to decline.

8.3 The following cost estimates are for the initial capital works and establishment period of 3-4 years. Estimates for ongoing annual costs (after the establishment period) are provided in the subsequent 'Long-term management' section.

Onsite mitigation

8.4 Grassland creation / restoration:

- Capital works (Year 1) - £8,500 – 10,000
- Establishment (Years 2-4) - £6,000 – 9,000

Compensation area A

8.5 Grassland creation / restoration:

- Capital works (Year 1) - £600 – 1,000
- Establishment (Years 2-3) - £14,000 – 16,000

8.6 Wetland creation:

- Capital works (Year 1) - £23,000 – 36,000
- Establishment (Years 2-3) - £2,200

Compensation area B

8.7 Grassland creation / restoration:

- Capital works (Year 1) - £2,000 – 3,000
- Establishment (Years 2-3) - £7,000 – 10,000

[15] NAAC Contracting Charges Guide 2017

[16] SPONS External Works and Landscape Price Book 2018

Detailed design

8.8 Once the final requirements for the school are agreed and all other constraints are understood, it is recommended that the ecological baseline is updated as necessary, as some receptors (particularly fauna) may have changed.

8.9 The proposals should incorporate the broad recommendations set out in this mitigation strategy and shown on **Figures 2-4**, and it is recommended that a suitably qualified ecologist is also included in the design team to inform the design process.

8.10 An ecological appraisal should be carried out to reassess the effects of the proposals in detail and present this information in support of the planning application.

8.11 The following ecological input is likely to be required to inform a planning application for the Site:

- Input to detailed design – £1,000 – 2,000
- Update baseline surveys - £5,000 – 10,000
- Ecological appraisal - £2,000 – 3,000

Post-consent

8.12 Planning permission is likely to include conditions which will need to be discharged in relation to ecology, and may require specialist support:

- Preparation of a detailed mitigation and management plan - £2,000 – 3,000
- Design of a sensitive lighting scheme £2,000 – 5,000
- Supervision of onsite construction works - £500 – 2,000
- Preparation of a bat licence (subject to the findings of the updated baseline surveys and the final design scheme) - £2,000 – 3,000

Long-term management

8.13 The following cost estimates are for ongoing long-term management measures, following the initial establishment period (above), and are estimated on an annual basis.

- Onsite
  - Grassland management - £1,500 – 3,000 per annum
- Compensation area A
  - Grassland management - £1,000 – 5,000 per annum
  - Wetland management - £1,000 per annum
- Compensation area B
  - Grassland management - £500 - £5,000 per annum

Legal Agreements

8.14 Once the school is constructed, it is expected that the Site will continue to be owned by the Council, but leased to an academy trust on a long-term lease (normally 125 years) for a peppercorn rent; it is expected that entire site would then be managed by the academy trust in the long-term. In order to ensure the continued effectiveness of the agreed mitigation strategy, it is therefore recommended that the long-term lease includes clauses:

- restricting the use of any areas required for long-term ecological mitigation (this is as shown on **Figures 2-4**, however the final area may change at the detailed design stage);
- requiring the ongoing management and maintenance of this area in accordance with the approved ecological mitigation strategy; and
- preventing the academy trust from disposing of their leasehold interest in the ecological mitigation area.

8.15 The planning permission would also be subject to planning conditions and obligations (via S106), which would run with the land. Those conditions / obligations should require the occupier of the Site to continue to implement the approved management strategy in the long-term and submit monitoring reports as required. A planning obligation (via S106 agreement) could also allow the Council (in its role as the Local Planning Authority) to enter the land to inspect mitigation area and carry out any necessary remedial works at the cost of the academy trust, if it was deemed necessary.

8.16 No further legal agreements (and associated legal costs) are anticipated in order to secure the mitigation, other than the lease agreement and the S106.

Monitoring

8.17 The Site should be monitored to ensure that the mitigation measures are effective, identify any remedial measures required, and to demonstrate that the project has fulfilled the policy objective of no net loss of biodiversity. Full details of any monitoring scheme would be determined through the planning application process and secured as part of a planning condition / obligation.

8.18 For the grassland habitats, it will be important to monitor more regularly during the early stages of habitat creation and restoration when there is an increased risk of wildflowers failing to colonise and weeds becoming established. It is therefore recommended that development of the sward is assessed annually by an ecologist during the first three years of habitat restoration / creation works, while the contractors should also report any problems such as flushes of weeds during their visits. It is expected that the sward would be established after three years, and monitoring could subsequently be relaxed to every three years, up to ten years following commencement of mitigation works. Following each monitoring visit the ecologist should report on the condition of the sward, assess the current value of the habitats (in biodiversity units) and advice whether the management regime needs to be amended to address any problems.

8.19 Monitoring of effects on fauna will depend on the final effects of the scheme and would need to be determined at the detailed design / consent / licensing stage, but this might involve survey visits in years 1, 3, and 5. Again, following each monitoring visit the ecologist should report on the condition of fauna populations and advice whether the management regime needs to be amended to address any problems

8.20 Indicative costs for annual ecological monitoring visits (including reporting) are estimated as follows:

- Botanical / habitat monitoring - £2,000 – 3,000 per annum
- Bat activity monitoring – £2,000 – 5,000 per annum
- Invertebrate monitoring - £2,000 – 3,000 per annum

9 Conclusions

Ecological effects

9.1 The strategy demonstrates that the indicative proposals for an 8FE secondary school could be delivered on the Church Lane site, while still achieving a net gain of 15.68 biodiversity units through onsite ecological mitigation measures.

9.2 Offsite compensation measures are not currently believed to be necessary, however two potential compensation options could potentially deliver up to 45.7 further biodiversity units, if necessary.

9.3 With regards to fauna, the final effects of the project will depend on how the baseline situation changes between now and commencement, and the final design of the project. Nonetheless, provided the recommendations for detailed design and long-term site management are incorporated into the project, it is expected that the school could be delivered without significant ecological effects on bats or invertebrates.

Policy requirements

9.4 The mitigation strategy demonstrates that Policy INF10 can help to promote the restoration and re-creation of priority habitats, and that any significant ecological harm resulting from the proposals can be avoided, adequately mitigated or compensated, in accordance with the Framework.

9.5 The strategy also demonstrates how effects on the Wormley Parkland Local Wildlife Site can be avoided, mitigated, and compensated to offset any detriment to the ecological interest on the Site and achieve an overall net gain in the long term in accordance with Policies NEB1 and NEB2.

Appendix 1 – Photos

Photo 1 – Area of unimproved neutral grassland with anthills

Photo 2 – Area of semi-improved neutral grassland

Photo 3 – Area of compressed / disturbed ground supporting semi- improved species poor grassland

Photo 4 – Area of localised tall ruderal vegetation

Photo 5 – Standing deadwood

Appendix 1 - Indicative development proposals

Church Lane School Proposal

1:2500 @A3

CHURCH LANE

SecondaryAccess onto Church Lane

Site
Approx. 83,700m²

Soft PE
Approx. 30,2600sqm

Including
Full size G3 football & hockey pitches, MUGA and ancilliary building

HardPE
Approx. 3,425m²

Including
5 court sports hall + facilities and MUGA

Sports Hall
Indicative footprint for 5 court hall + facilities

Hard & soft informal & social
Approx. 7200m²

Vehicular parking
262 spaces

School Building
Indicative footprint for 10,853m² G+1

Cycleparking
410 spaces

SUDS Drainage
Approx. 1625m² + additional landscaping

Primary Access onto the Turnford Juction off-slip

- Developed area
- Hard & soft landscaping
- All werather sports
- Buildings
- Parking
- Environmental mitigation
- Tree Category A: High Quality
- Tree Category B: Moderate Quality
- Tree Category C: Low quality
- Tree category U: Unsuitable for retention
- New tree planting