



Hallam Land Management Ltd.

**NW Bicester**

## **Biodiversity Impact Assessment**

December 2021

**FPCR Environment and Design Ltd**

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Rev	Issue Status	Prepared / Date	Reviewed / Date	Approved/Date
-	DRAFT	MAF / 06.12.21	JDH / 07.12.2021	JD / 08.12.2021

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## 1.0 INTRODUCTION

- 1.1 This report has been prepared by FPCR Environment and Design Ltd on behalf of Hallam Land Management Land for land northwest of Bicester, in support of a hybrid planning application for a proposed mixed-use development located to the northwest of Bicester (central OS Grid Reference: SP569248) herein referred to as 'the Site', forming a part of the wider NW Bicester Eco Town.

### Site Location and Context

- 1.2 The land for the proposed development (hereafter referred to as the Site) is situated northwest of Bicester town (centred on grid ref: SP569248).
- 1.3 The Site comprises primarily arable farmland with associated field margins, and a number of fields of semi-improved and improved grassland which have been subject to grazing or silage production. Other habitats include areas of dense and scattered scrub, and a small area of bare ground with rubble piles. Hedgerows form the predominant boundary habitat and support frequent mature standards. A watercourse flows eastwards through the southern extent of the Site. Two dry ditches are present in the north, and east of the site, and a single pond is present.
- 1.4 Habitats within the wider locality include the town of Bicester to the southwest, and farmland habitat surrounding most of the site. A new housing development lies adjacent to the site boundary in the northeast.

### Site Proposals

- 1.5 Proposals are for a mixed-use development, including residential housing and employment with associated green infrastructure and community uses.

### Aims and Objectives

- 1.6 This Biodiversity Impact Assessment is based on the Chartered Institute of Ecology and Environmental Management (CIEEM) guidance<sup>1</sup>. The scope and objectives of this report are to:
- Summarise the results of the baseline UKHab survey undertaken on the Site and to present the results of habitat condition assessment surveys following the Defra Biodiversity Metric 3.0 Technical Guidance.
  - Provide an overview of the proposed habitats following completion of the scheme.
  - Present the results of the Defra Biodiversity Metric 3.0 assessment completed for the proposals
  - Assess the feasibility of the proposals to achieve a net gain in biodiversity through the Defra Biodiversity metric 3.0
  - Recommendations for the proposals to maximise their biodiversity potential
- 1.7 This report has been prepared to support an Ecological Appraisal prepared for the site, which provides a detailed description of the habitats present, itself part of an Environmental Impact Assessment for the Site. This report provides only a summary description of the habitat baseline,

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<sup>1</sup> CIEEM (2021) Biodiversity Net Gain Report and Audit Templates Chartered institute of Ecology and Environmental Management, Winchester, UK.

and this report should be read in conjunction with the Ecological Appraisal (FPCR, 2021) and Chapter 9 Ecology and Biodiversity of the NW Bicester Environmental Statement (ES).

### Legislative and Policy Context

- 1.8 The UK Government, as signatory to the Rio Convention on Biological Diversity, is committed to conserving and enhancing biodiversity. This commitment is further enforced in the Natural Environment and Rural Communities Act (NERC) 2006 and the Natural Environment White Paper (June 2011).
- 1.9 DEFRA's 25 Year Environment Plan (2018) seeks to embed a 'net environmental gain' principle for development to deliver environmental improvements locally and nationally. Current policy is that the planning system should provide biodiversity net gains where possible; however, this is moving towards a mandatory requirement.
- 1.10 The NPPF (2021) in particular seeks to ensure that the planning system contributes to and enhances the natural and local environment, protect and enhance biodiversity and geodiversity by:
- "174. d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- 179. b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity."*
- 1.11 Cherwell Local Plan Part 1 2011-2031 (Adopted 2015) includes a number of policies of relevance to biodiversity generally and at the NW Bicester EcoTown, together with a Supplementary Planning Document as follows:
- Policy Bicester 1: NW Bicester EcoTown
- Preservation and enhancement of habitats and species on site, particularly protected species and habitats and creation and management of new habitats to achieve an overall net gain in biodiversity including the creation of a local nature reserve and linkages with existing BAP habitats*
- Policy ESD 10: Protection and enhancement of Biodiversity and the Natural Environment
- Development which would result in damage to or loss of a site of biodiversity or geological value of regional or local importance including habitats of species of principal importance for biodiversity will not be permitted unless the benefits of the development clearly outweigh the harm it would cause to the site, and the loss can be mitigated to achieve a net gain in biodiversity/geodiversity*
- Development proposals will be expected to incorporate features to encourage biodiversity, and retain and where possible enhance existing features of nature conservation value within the site. Existing ecological networks should be identified and maintained to avoid habitat fragmentation, and ecological corridors should form an essential component of green infrastructure provision in association with new development to ensure habitat connectivity*
- NW Bicester SPD, February 2016
- Development Principle 9 (e) – Biodiversity*

*This development principle refers to the preservation and enhancement of habitats and species on site, particularly protected species and habitats. It also includes the creation and management of new habitats to achieve an overall net gain in biodiversity.*

#### **The Environment Act 2021 (9<sup>th</sup> November 2021)**

- 1.12 This Act requires an at least 10% biodiversity net gain (BNG), as calculated using a Biodiversity Metric and a Biodiversity Gain Plan, with habitat used for net gain to be secured for a minimum of 30 years. Whilst the Act mandates a 10% BNG delivery and for this to be a condition of planning permissions (Part 6 section 98 and Schedule 14 part 1), section 147 (3) states that this will only come into force once the secondary legislation is in place to support this requirement. Therefore, there is a transition period (the length of which is not defined but anticipated as being around 2 years) until the mandated 10% is required under law.

#### **Measurable net gain**

- 1.13 A key point in the current legislative context is that the term “measurable net gain” is not defined within the NPPF. Additionally, this term currently has no agreed definition in local or UK policy. Whilst a figure of 10% is widely viewed as best practice, it currently has no adopted policy support at either a local or national level.

## 2.0 METHODOLOGY

### Baseline Habitat Assessment

2.1 This report accompanies an Ecological Appraisal for the Site which has been undertaken to inform the development proposals and to provide recommendations for mitigation and enhancement (of which measurable biodiversity net gain will form a part of). The following elements from the Ecological Appraisal have also used to inform this assessment:

- Extended Phase 1/UKHab Survey: completed by Jude Dorward, an Associate Director with over 15 years' experience in ecological consultancy who is experienced in botanical surveys having achieved a level 4 on the Botanical Society of Britain and Ireland's (BSBI) Field Identification Skills Competency (FISC). The UKHab survey was undertaken on 12<sup>th</sup> August 2020 during clear weather with some cloud cover (approximately 30%) with no rain and a light breeze (3 on the Beaufort Scale). The survey followed Extended Phase 1 and UKHab Survey technique as recommended by Natural England<sup>2</sup> and the Chartered Institute of Ecology and Environmental Management<sup>3</sup>.
- A desktop study was undertaken by consulting Thames Valley Environmental Records Centre (TVERC) and the Multi Agency Geographic Information for the Countryside (MAGIC) website<sup>4</sup>.
- Habitat Condition Assessment Survey: Completed by Jude Dorward on 12<sup>th</sup> August 2020. This was completed in accordance with the Natural England's The Biodiversity Metric 2.0 technical supplement in place at the time of survey.
- Additional phase 1 / habitats condition surveys were undertaken by Molly Foulds, Ecologist and James Hutchison Senior ecologist (FISC 3) in 2021.

2.2 Full details of the survey methodologies employed during the above surveys are provided in the accompanying Ecological Appraisal (FPCR 2021).

### Natural England's The Biodiversity Metric 3.0

2.3 Natural England's published biodiversity net gain metric is an MS Excel spreadsheet that is used to quantify the predicted net-change in biodiversity value ("biodiversity units") of a proposed development site before and after development. It treats the flat "habitats" and linear features "hedgerows" separately, and is based on pre-determined values, along with published written guidance, set by a Natural England-led team of experts. The latest version of this metric is 3.0, published in July 2021, and this has been used for this scheme.

2.4 To facilitate this, the Site has been mapped and digitised using the Biodiversity Metric 3.0 QGIS Template, with the existing habitats identified and areas automatically generated. In accordance with the 3.0 Metric User Guide, habitats have been defined under UK Habitat Classification. The detailed landscaping proposals for the Site were then uploaded into the QGIS template, and the proposed habitats mapped and digitised to generate areas for each of the habitats proposed for creation.

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<sup>2</sup> Natural England, 2014. Protected species and development: advice for local planning authorities. (updated 2021) [online] Available at: <https://www.gov.uk/guidance/protected-species-how-to-review-planning-applications> [Accessed 05/03/2021]

<sup>3</sup> CIEEM (2017) Guidelines for Preliminary Ecological Appraisal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester

<sup>4</sup> [Online]. <http://magic.defra.gov.uk/>

- 2.5 These pre- and post-development habitat areas were then inputted into the 3.0 Metric Calculation tool. Pre-development habitats were grouped into their habitat type and condition based on the results of the UKHab and condition assessment surveys, while post-developments were classified into their UKHab type as identified through the classification of proposed habitats within landscaping plans into appropriate UKHab types and their target condition scores. The metric then provides a habitat distinctiveness score for each of the baseline and proposed habitats which are pre-assigned scores based on the habitat type.
- 2.6 The strategic significance of the habitats was also assessed for both the pre- and post-development habitats based on the location of the site, its proximity to existing areas of biodiversity interest and its setting within wider habitat corridors.
- 2.7 The metric then assigns a range of pre-assigned factors to each of the proposed habitats. These have been advised by subject knowledge experts and are universal multipliers generated by the metric itself for the following variables relevant to habitat creation, enhancement or restoration proposals:
- Difficulty of creating or restoring/enhancing a habitat: This pre-assigned score is based on how difficult a particular habitat type is to create or restore/enhance
  - Temporal risk: This is the ‘time to target condition’ for any particular habitat and determines how long a particular habitat type is likely to take to reach the condition score that the desired condition score assigned to it.
  - Spatial Risk: This score is based on the distance between the site of habitat loss and any habitats creation or enhancement proposals at any offsite offsetting solutions.
- 2.8 Full details of the calculation methodology used is provided in the Biodiversity Metric 3.0 – User Guide<sup>5</sup>.

### Limitations

- 2.9 Data provided by third party sources collated during the desktop study is generally made up from a wide range of sources including (but not limited to) those submitted by ecological consultancies, wildlife conservation organisations and volunteers. As such, this data is typically focused on areas of known nature conservation, is reliant upon formal surveys having been undertaken within an area or the presence of an expert within the locality and as such this data can never be fully relied upon as a complete ecological dataset for any given area. Rather, this data is used as a guide to likely presence of notable ecological features and can never be relied upon for likely absence.
- 2.10 The UKHab habitat map has been reproduced from detailed field notes and informed by aerial imagery, OS mapping and site maps provided by the client. The accuracy of this figure is therefore ultimately guided by the accuracy of these sources and can only be relied upon to a certain degree of resolution.
- 2.11 Natural ecological communities are susceptible to change; at times this change can be rapid as a result of internal and external environmental factors. The biodiversity offsetting calculations are based on ecological assessments of habitats carried out during 2019; as a result, changes which

<sup>5</sup> Natural England, The biodiversity metric 2.0 (2019) Available at: <http://publications.naturalengland.org.uk/publication/5850908674228224>



may affect the conclusions of this report may occur, if a prolonged period of time elapses prior to the commencement of the project.

- 2.12 The aim of biodiversity offsetting is to compensate for significant adverse impacts on biodiversity identified after appropriate avoidance, minimisation and on-site rehabilitation measures have been taken, according to the mitigation hierarchy as required by the NPPF.
- 2.13 The most recent site survey was undertaken in October 2019 which is a sub-optimal time for habitat surveying as many plant species will not be present, making accurate determination of habitat types difficult. While the survey was conducted just outside the recommended survey season (April – September inclusive) it is however considered that sufficient information was collected to enable the determination of broad habitat and types and the identification and assessment of features of ecological value for the purposes of this assessment, given the extent of previous survey information recorded since 2015, including during the recommended seasons, and the nature of the habitats at the Site.
- 2.14 No other limitations specific to this report influenced this assessment.

### 3.0 BASELINE CONDITIONS

- 3.1 The baseline conditions are taken from the Ecological Appraisal (FPCR; 2021) submitted in support of the hybrid planning application.

#### Biodiversity Units

##### Habitats

- 3.2 The site was comprised of cereal crop, improved grassland and poor semi-improved grassland. The arable areas supported only narrow field margins where management appeared to focus on maximising space for agriculture, with the margins less than 500mm in places. The field compartments across the site were occasionally separated by footpaths or tracks for farm vehicles, with the majority of boundaries comprising hedgerows. Other habitats on-Site include dense scrub, tall ruderal and scattered scrub.
- 3.3 A summary of the baseline habitats is provided in table 2 below. The baseline Habitats are shown in Figure 1.
- 3.4 The biodiversity units for each habitat on the site have been calculated and are presented in Table 2. A brief description of the habitats and their target condition are detailed below with species lists provided in Appendix B of the accompanying Ecological Appraisal and full survey results of condition assessment scores provided in Appendix A of this report.

**Table 2: Biodiversity Units: Baseline On-Site Habitats**

Habitat	Description	Area	Condition	Distinctiveness	Biodiversity Units
Mixed Scrub h3f	This habitat was represented by a small patch in association with the watercourse in the north of the site.	0.69	Moderate	Medium	5.52
Cropland – Cereal Crop c1c	Across the site cereal crops were sown, which supported a range of common and widespread weed species with a patchy distribution. The arable fields on Site had very narrow margins where intensive field management had been undertaken close to the field edges, tracks and garden boundaries.	102.02	N/A	N/A	199.16
Modified Grassland g4	Semi-improved grassland across the site	45.14	Moderate	Low	180.56
Modified Grassland g4	Improved grassland across the site	24.13	Moderate	Low	48.26
Ruderal/Ephemeral	Ruderal habitat present in association with scrub	0.25	Poor	Low	0.50
Pond (Non-Priority Habitat)	A small pond in the centre of the site with limited marginal vegetation and moderate shade.	0.01	Moderate	Medium	0.08

Habitat	Description	Area	Condition	Distinctiveness	Biodiversity Units
Other Broadleaved Woodland (w1g7)	One small block of immature broadleaved woodland was present along the road and housing. The boundary included mature crack willow <i>Salix fragilis</i> , ash <i>Fraxinus excelsior</i> , silver birch <i>Betula pendula</i> and aspen <i>Populus tremula</i>	2.34	Moderate	Medium	7.12
Developed Land; Sealed Surface		0.49	N/A	V.Low	0.00
Mixed Scrub h3f	A small area of mixed scrub was present in association with the watercourse in the triangle section of the site in the west and was mostly goat willow with a bramble understory.	0.20	Poor	Medium	0.80

### Condition Assessments

#### TN1 Mixed Scrub – Moderate

3.5 Fails two of the condition assessment criteria:

- Criteria 4: The scrub does not have a well-developed edge with scattered scrub and tall grassland and/or herbs present between the scrub and adjacent habitat(s).
- Criteria 5: There are no clearings, glades or rides present within the scrub, providing sheltered edges.

#### TN2 Modified Grassland – Moderate

3.6 Poor semi-improved grassland fields which fail two of the assessment criteria:

- Criteria 1: There are not 6-8 species per m<sup>2</sup>. Note - if a grassland has 9 or more species per m<sup>2</sup> it should be classified as a moderate distinctiveness grassland habitat type.
- Criteria 2: Sward height is not varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.

#### TN3 Modified Grassland – Moderate

3.7 Improved grassland fields which fail three of the condition assessment criteria:

- Criteria 1: There are not 6-8 species per m<sup>2</sup>. Note - if a grassland has 9 or more species per m<sup>2</sup> it should be classified as a moderate distinctiveness grassland habitat type.
- Criteria 2: Sward height is not varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.

- Criteria 4: Physical damage was evident in more than 5% of total grassland area, such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities.

#### TN4 Ruderal/ephemeral – Poor

3.8 Fails two of the condition assessment criteria:

- Criteria 1: Vegetation structure is not varied, providing opportunities for insects, birds and bats to live and breed. A single ecotone (i.e. scrub, grassland, herbs) should not account for more than 80% of the total habitat area. Cover of bracken, scrub and trees more than 25%.
- Criteria 2: There is not a diverse range of flowering plant species, providing nectar sources for insects. These species may be either native, or non-native but beneficial to wildlife.

#### TN5 Pond – Moderate

3.9 Fails three of the condition assessment criteria:

- Criteria 1: The pond is not of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution. Turbidity is acceptable if the pond is grazed by livestock.
- Criteria 2: There is not semi-natural habitat (i.e. moderate distinctiveness or above) for at least 10 m from the pond edge.
- Criteria 8: Plants, be they emergent, submerged or floating (excluding duckweeds), does not cover at least 50% of the pond area that is less than 3 m deep.

#### TN6 Woodland – Moderate

3.10 In line with the 'moderate' (26-32 points) condition assessment due to the following scores:

- Criteria 1: Two age classes present (2 points)
- Criterion 2: No significant browsing damage evident in woodland (3 points)
- Criterion 3: Rhododendron or laurel not present, other invasive species < 10% cover (2 points)
- Criterion 4: Five or more native tree or shrub species across parcel (3 points)
- Criterion 5: 50-80% of canopy trees and 50-80% of understory shrubs are native (2 points)
- Criterion 6: 21- 40% of woodland has areas of temporary open space (2 points)
- Criterion 7: One or two classes present (2 points)
- Criterion 8: 11-25% mortality and/or crown dieback or low risk of pest of disease present (2 points)
- Criterion 9: No recognisable NVC plant community (1 point)
- Criterion 10: Two storeys across parcel (2 points)
- Criterion 11: No veteran trees present (1 point)
- Criterion 12: less than 25% of parcel has standing deadwood, large dead branches/stems and stumps (1 point)

- Criterion 13: Less than 1 hectare in total of nutrient enrichment across woodland area and/or less than 20% of woodland area has damaged ground (2 points)

#### TN7 Mixed Scrub – Poor

3.11 Fails three of the condition assessment criteria:

- Criterion 2: There is a not a good age range – all of the following are present: seedlings, young shrubs and mature shrubs.
- Criterion 4: The scrub does not have a well-developed edge with scattered scrub and tall grassland and/or herbs present between the scrub and adjacent habitat(s).
- Criterion 5: There are no clearings, glades or rides present within the scrub, providing sheltered edges.

### **Hedgerows**

3.12 The biodiversity units for each hedgerow on the site have been calculated and are presented in Table 3.

**Table 3: Biodiversity Units: Baseline On-Site Hedgerows**

Hedgerow	Length (km)	Condition	Biodiversity Units
H1 Native Hedgerow with trees	0.421	Medium	5.05
H6 Native Hedgerow	0.348	Low	2.09
H7 Native Hedgerow with trees	0.309	Medium	3.71
H8 Native Hedgerow with trees	0.233	Medium	2.80
H9 Native Hedgerow with trees	0.43	Medium	5.16
H11 Native Hedgerow with trees	0.322	Medium	3.86
H12 Native Hedgerow with trees	0.23	Medium	2.76
H13 Native Hedgerow with trees	0.367	Medium	4.40
H14 Native Hedgerow with trees	0.216	Medium	2.59
H15 Native Hedgerow - Associated with bank or ditch	0.263	Medium	3.16
H16 Native Hedgerow with trees	0.252	Medium	3.02
H17 Native Hedgerow with trees	0.197	Medium	2.36

H18 Native Hedgerow with trees	0.194	Medium	2.33
H19 Native Hedgerow with trees	0.467	Medium	5.60
H20 Native Hedgerow with trees	0.26	Medium	3.12
H21 Native Hedgerow with trees	0.394	Medium	3.15
H22 Native Hedgerow with trees	0.282	Medium	3.38
H23 Native Hedgerow with trees	0.162	Medium	1.94
H24 Native Hedgerow with trees	0.157	Medium	1.88
H25 Native Hedgerow - Associated with bank or ditch	0.193	Medium	2.32
H26 Native Hedgerow - Associated with bank or ditch	0.177	High	3.19
H27 Native Hedgerow with trees	0.149	Medium	1.79
H28 Native Hedgerow with trees	0.25	Medium	3.00
H29 Native Hedgerow with trees - Associated with bank or ditch	0.25	High	4.50
H31 Native Hedgerow with trees - Associated with bank or ditch	0.481	High	8.66
H32 Native Hedgerow with trees - Associated with bank or ditch	0.29	High	5.22
H33 Native Hedgerow with trees - Associated with bank or ditch	0.58	High	10.44
H34 Native Hedgerow with trees	0.16	Medium	1.92
H35 Native Hedgerow with trees	0.12	Medium	1.44
H36 Native Hedgerow with trees	0.23	Medium	1.84
H30 Native Hedgerow with trees - Associated with bank or ditch	0.23	High	4.14
H37 Native Hedgerow	0.47	Low	0.94
H5 Native Hedgerow with trees	0.3	Medium	3.60
H38 Native Hedgerow with trees	0.47	Medium	5.64
H39 Native Hedgerow - Associated with bank or ditch	0.24	Medium	2.88

H40 Native Hedgerow - Associated with bank or ditch	0.11	Medium	1.32
H41 Native Hedgerow	0.25	Low	1.50
H42 Native Hedgerow - Associated with bank or ditch	0.56	Medium	6.72
H43 Native Hedgerow - Associated with bank or ditch	0.31	Medium	2.48
H44 Native Hedgerow - Associated with bank or ditch	0.45	Medium	5.40
H45 Native Hedgerow - Associated with bank or ditch	0.47	Medium	5.64
H46 Native Hedgerow - Associated with bank or ditch	0.41	Medium	4.92
Total	12.65	-	151.87

Please note there may be minor discrepancies (rounding errors) between the columns and the totals, however, the numbers duplicate those presented within the matrix calculator.

## 4.0 PROPOSED DESIGN

### Habitats

#### Retained/Enhanced

- 4.1 Habitat retention is illustrated in Figure 2.
- 4.2 The proposals include the retention of woodland and areas of scrub.

#### Habitat Creation

- 4.3 Habitat creation is shown in Figure 3.
- 4.4 Whilst proposals are indicative, the extent of GI with new planting and habitats alongside the retained habitats, as indicated by the Framework Plan and Green Infrastructure Strategy provides the scope for the mitigation and enhancements necessary to achieve a net gain in biodiversity. Overall, the GI proposals include a mix of public open space sports/play areas flood attenuation and semi-natural habitats, integrated with and linked to the existing retained habitats at the Site, which will be restored and enhanced as part of the GI, with GI forming around 40% of Site. GI will provide a habitat mosaic with enhanced habitat connections around the site and will include features of biodiversity value as follows:
  - The main extent of semi-natural habitat will lie to the west of the Site, including a Country Park, directly linked to the northern buffer corridor. It is currently anticipated, including for the purposes of this BNG assessment, that it will comprise 60:40 ratio of semi-natural woodland to species rich grassland.
  - Three semi-natural green corridors will follow existing retained ditches, bear the north, west and southern boundaries which will contribute to ecological connectivity.
  - The majority of hedgerows and their existing trees provide the basis of a network of smaller green corridors through the built areas, linking with the main habitat corridors and open spaces, with new grassland alongside the hedgerows, creating new habitats and enabling faunal movement around the Site.
  - In addition, other more formal aspects of the GI, whilst offering lower biodiversity value, would still contribute to the overall biodiversity value as follows:
    - Smaller green corridors, including alongside existing public footpaths and new access tracks, small formal play areas and larger playing pitches, including retained and enhanced hedgerows.
    - Attenuation features including swales, designed where possible with biodiversity in mind and with associated wet grassland
    - Allotments and a burial ground in the south of the Site and a solar farm in the north
- 4.5 Target conditions and assessment criteria for created habitats are shown in Appendix A.



## Hedgerows

### Hedgerow Creation

- 4.6 The proposals include the creation of a number of native species-rich hedgerows, with trees as well as hedgerows along roadways with trees.
- 4.7 Native species-rich hedgerows will be planted to ensure they provide a diverse range of species along their length. Altogether, 3.4km of native species-rich hedgerow planting will be carried out generating a total of 24.00 units. Where possible these will be created in association with new ditches/banks providing valuable seasonally wet habitats for local amphibian species. These will be managed to target moderate condition by implementing the following measures:
- failed specimens will be replaced during establishment on a like-for-like basis,
  - hedgerows will be managed to encourage tall, wide and bushy features,
  - fertiliser use will be prohibited adjacent to hedgerows to reduce nutrient enrichment,
  - a minimum of 1m adjacent to the hedgerows will be managed as 'undisturbed' ground where possible. Management of grasslands within these areas adjacent to hedgerows will be in line with the management of meadow grasslands.

### Additional Enhancements

- 4.8 Additional mitigation measures will be implemented to contribute to a biodiversity net gain across the Site. This will focus on the provision of faunal enhancements that are not captured within the Natural England Biodiversity Metric 3.0 calculations and include:
- Provision of a bat hop-over across the site access road.
  - Inclusion of baffles/louvres to reduce light spill onto sensitive habitats.
  - Provision of a range of pole mounted bat boxes
  - Provision of a range of bird nesting boxes
  - Creation of hibernacula features in association with attenuation features.

## 5.0 BNG METRIC

- 5.1 The habitat retention, enhancement and creation proposals highlighted within this report have all been inputted into the Biodiversity Metric 3.0. Table 4 provides a summary of the headline results of the biodiversity metric 3.0 assessment completed for the proposals. The full metric has been provided in Appendix B.
- 5.2 Indicative proposals have provided the basis for the selection of anticipated habitat types post-development used within the calculations, with achievable target conditions applied accordingly.

**Table 4: Biodiversity Metric 3.0 Headline Results**

<b>Baseline</b>	Habitat Units	506.74
	Hedgerow Units	151.87
	River Units	23.33
<b>Post-Intervention</b>	Habitat Units	588.39
	Hedgerow Units	171.60
	River Units	23.33
<b>Total Net Unit Change</b>	Habitat Units	81.65
	Hedgerow Units	19.73
	River Units	0.00
<b>Total Net Percentage Change</b>	Habitat Units	17.74%
	Hedgerow Units	13.23%
	River Units	0.00%

- 5.3 The assessment has demonstrated that this phase of the proposals will lead to a gain in area habitat units and a gain in hedgerow units, and no change in river units.
- 5.4 A summary of post-intervention biodiversity units is provided in tables 5 and 6 below.

**Table 5: Biodiversity Units: Post-intervention On-Site Habitats**

Habitat and Description	Area (ha)	Condition	Biodiversity Units
<b>Creation</b>			
Heathland and shrub - Mixed scrub Structurally diverse native scrub.	2.42	Good	20.34
Other woodland; broadleaved Woodland providing connectivity across site and within the country park	8.53	Moderate	23.44
Other Neutral grassland Areas of public open space managed for biodiversity	31.32	Good	263.19
Other Neutral grassland Informal areas of grassland managed for biodiversity within country park	4.82	Good	40.50
Urban – Amenity grassland Formal areas of species poor grassland	6.32	Good	29.55
Urban – Developed Land Access road	2.23	N/A - other	0

Habitat and Description	Area (ha)	Condition	Biodiversity Units
Urban – Developed Land School	4.81	N/A - other	0
Urban – Developed Land	56.98	N/A - other	0
Vegetated Garden	24.42	Poor	51.84
Urban – Developed Land	1.31	N/A – other	0
Other neutral grassland Areas underneath solar panels	10.44	Moderate	69.89
Cemeteries and Churchyards Natural burial ground	4.00	Good	15.77
Allotments	3.70	Moderate	14.26
Other neutral grassland Wet grassland	1.73	Good	1.73
Urban -amenity grassland Sport's pitches	9.2	Moderate	31.91
<b>Total</b>	<b>10.32</b>		<b>572.30</b>

Please note there may be minor discrepancies (rounding errors) between the columns and the totals, however, the numbers duplicate those presented within the matrix calculator.

**Table 6: Biodiversity Units: Post-intervention On-Site Hedgerows**

Habitat	Length (km)	Condition	Biodiversity Units
Native Species Rich Hedgerows – with trees	1.48	Good	13.07
Native Hedgerows – with trees	1.92	Good	11.29
<b>Total</b>	<b>3.40</b>	<b>-</b>	<b>24.36</b>

Please note there may be minor discrepancies (rounding errors) between the columns and the totals, however, the numbers duplicate those presented within the matrix calculator.

5.5 Four hedgerows are also being enhanced within the proposals: H17, H31, H33 and H40.

- H17 is being planted with native species going from medium distinctiveness to high and moderate condition to good.
- H31 is being planted with native species going from medium distinctiveness to medium and moderate condition to good.
- H33 is being planted with native species going from low distinctiveness to high and poor condition to good.
- H31 is being planted with native species going from medium distinctiveness to medium and moderate condition to good.

### Habitat Trading Summary

- 5.6 Low distinctiveness arable fields, modified grassland fields and ruderal vegetation will be compensated for through the creation of higher distinctiveness habitats

## 6.0 BIODIVERSITY NET GAIN PRINCIPLES

- 6.1 The above have been guided by the Biodiversity Good Practice Principles (CIRIA-CIEEM-IEMA, 2016) Table 7 lists all of the principles along with a description of how the principles has been applied to this assessment.

**Table 7: Application of the Biodiversity Net Gain Principles to the Proposals**

Principle	Indicators
Principle 1: Apply the Mitigation Hierarchy	Medium and high distinctiveness habitats have been retained throughout site wide proposals wherever possible, notably the scrub, woodland and pond.
Principle 2: Avoid losing biodiversity that cannot be offset by gains elsewhere	The proposals have sought to retain specific habitats of interest wherever possible. This included the woodland and pond.
Principle 3: Be inclusive and equitable	Preliminary biodiversity net gain calculations were provided during the design stage to inform the proposals.
Principle 4: Address risks	The condition scores have been set at achievable levels, though management will ultimately strive to improve the condition scores above those stated above where possible.
Principle 5: Make a measurable Net Gain contribution	Further to this a range of other biodiversity enhancements are incorporated in the scheme including faunal features such as bird boxes, bat boxes and hibernacula to provide a range of features for faunal species to bring these species into the heart of the built environment as well as just on the peripheries.
Principle 6: Achieve the best outcomes for biodiversity	
Principle 7: Be additional	
Principle 8: Create a Net Gain legacy	Management will be secured in the long-term to ensure that the target conditions can be achieved.
Principle 9: Optimise sustainability	The drainage proposals have been designed to provide additional opportunities for habitat creation through the creation of attenuation features that will hold some degree of water year-round. The network of footpaths throughout the green infrastructure will provide opportunities for employees and local residents cross through the site and to take advantage of less formally managed habitats.
Principle 10: Be transparent	All assumptions have been set out within this report and its appendices to ensure that the information used to inform the biodiversity metric 3.0 calculations can be reviewed

## 7.0 CONCLUSION

- 7.1 The approach to habitat creation has aimed to maximise biodiversity value within the space made available within the proposals for green infrastructure. Biodiversity Net Gain has then been used to inform the initial habitat creation and enhancement proposals for the scheme and to guide decisions around additional habitat provision. Future changes to the post development habitat types, their extents and targeted conditions will inevitably lead to a change in the post development scores.
- 7.2 The results of the assessment demonstrate that the outline scheme currently has the ability to lead to an overall gain of biodiversity units associated with the baseline habitats when compared with the proposed habitats. This can be achieved if the recommended habitat conditions are adhered to.
- 7.3 The proposals have demonstrated that a net gain in hedgerow biodiversity associated with the baseline hedgerows when associated with the proposed and enhanced hedgerows can be achieved if the recommended hedgerow conditions are adhered to.
- 7.4 To ensure that the proposals further lead to an overall net gain in biodiversity in line with the NPPF, a range of other habitat creation measures have been recommended within the proposals to provide additional gains for faunal species. These include a range of bird, bat and insect boxes and hedgehog highways, and herptile habitat features.

**APPENDIX A: PROPOSED HABITAT CREATION**

Soft Landscaping Typology	Habitat (UKHab)	Targets for Creation/Management	Area (ha)	Target Condition
Public open space	Other neutral grassland	<ol style="list-style-type: none"> <li>1. The appearance and composition of the vegetation closely matches characteristics of the specific grassland habitat type (see UKHab definition). Wildflowers, sedges and indicator species for the specific grassland habitat type are very clearly and easily visible throughout the sward.</li> <li>2. Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.</li> <li>3. Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.</li> <li>4. Cover of bracken less than 20% and cover of scrub (including bramble) less than 5%.</li> <li>5. There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981). Combined cover of undesirable species<sup>1</sup> and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area.</li> </ol>	31.32	Good
Managed grass	Modified grassland	<ol style="list-style-type: none"> <li>1. There must be 6-8 species per m<sup>2</sup>. Note - if a grassland has 9 or more species per m<sup>2</sup> it should be classified as a moderate distinctiveness grassland habitat type. NB - this criterion is non-negotiable for achieving good condition."</li> <li>2. Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.</li> <li>3. Some scattered scrub (including bramble) may be present, but scrub accounts for less than 20% of total grassland area. Note - patches of shrubs with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.</li> <li>4. Physical damage evident in less than 5% of total grassland area, such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities.</li> <li>5. Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warren</li> <li>6. Cover of bracken less than 20%.</li> </ol>	6.32	Good

		7. There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and undesirable species <sup>1</sup> make up less than 5% of ground cover.		
Gardens	Vegetated garden	1. The gardens associated with the houses will be classed as poor condition as they will be a mixture of amenity grassland and will be controlled by residents.	24.42	Poor
Country Park	Other neutral grassland	<ol style="list-style-type: none"> <li>1. The appearance and composition of the vegetation closely matches characteristics of the specific grassland habitat type (see UKHab definition). Wildflowers, sedges and indicator species for the specific grassland habitat type are very clearly and easily visible throughout the sward.</li> <li>2. Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.</li> <li>3. Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.</li> <li>4. Cover of bracken less than 20% and cover of scrub (including bramble) less than 5%.</li> <li>5. There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981). Combined cover of undesirable species<sup>1</sup> and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area.</li> </ol>	4.82	Good
Solar Panels	Other neutral grassland	<ol style="list-style-type: none"> <li>1. The appearance and composition of the vegetation closely matches characteristics of the specific grassland habitat type (see UKHab definition). Wildflowers, sedges and indicator species for the specific grassland habitat type are very clearly and easily visible throughout the sward.</li> <li>2. Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.</li> <li>3. Cover of bracken less than 20% and cover of scrub (including bramble) less than 5%.</li> <li>4. There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981). Combined cover of undesirable species<sup>1</sup> and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area.</li> </ol>	10.44	Moderate
Natural burial ground		<ol style="list-style-type: none"> <li>1. Vegetation structure is varied, providing opportunities for insects, birds and bats to live and breed. A single ecotone (i.e., scrub, grassland, herbs) should not account for more than 80% of the total habitat area.</li> <li>2. There is a diverse range of flowering plant species, providing nectar sources for insects. These species may be either native, or non-native but beneficial to wildlife. NB - To achieve GOOD condition, criterion 2 must be satisfied by native species only (rather than non-natives beneficial to wildlife).</li> <li>3. "Invasive non-native species (Schedule 9 of WCA) cover less than 5% of total vegetated area.</li> </ol>	4.00	Good

		4. NB - To achieve GOOD condition, criterion 3 must be satisfied by a complete absence of invasive non-native species (rather than <5% cover)."		
Allotments		<ol style="list-style-type: none"> <li>1. There is a diverse range of flowering plant species, providing nectar sources for insects. These species may be either native, or non-native but beneficial to wildlife.</li> <li>2. Invasive non-native species (Schedule 9 of WCA) cover less than 5% of total vegetated area.</li> </ol>	3.7	Moderate
Wet grassland	Other neutral grassland	<ol style="list-style-type: none"> <li>1. The appearance and composition of the vegetation closely matches characteristics of the specific grassland habitat type (see UKHab definition). Wildflowers, sedges and indicator species for the specific grassland habitat type are very clearly and easily visible throughout the sward.</li> <li>2. Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.</li> <li>3. Cover of bracken less than 20% and cover of scrub (including bramble) less than 5%.</li> <li>4. There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981). Combined cover of undesirable species<sup>1</sup> and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area.</li> </ol>	1.73	Moderate
Sports pitches	Modified grassland	<ol style="list-style-type: none"> <li>1. Some scattered scrub (including bramble) may be present, but scrub accounts for less than 20% of total grassland area. Note - patches of shrubs with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.</li> <li>2. Physical damage evident in less than 5% of total grassland area, such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities.</li> <li>3. Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warren.</li> <li>4. Cover of bracken less than 20%.</li> </ol>	9.2	Moderate
Native Woodland Planting	Other woodland; broadleaved	<ol style="list-style-type: none"> <li>1. Two age classes present</li> <li>2. Evidence of significant browsing pressure is present in 40% or less of whole woodland</li> <li>3. Rhododendron or laurel not present, other invasive species &lt; 10% cover</li> <li>4. 50-80% of canopy trees and 50-80% of understory shrubs are native</li> <li>5. 21- 40% of woodland has areas of temporary open space.</li> <li>6. Less than 1 hectare in total of nutrient enrichment across woodland area and/or less than 20% of woodland area has damaged ground</li> <li>7. Standing and fallen dead wood of over 20 cm diameter are present including fallen large dead branches/stems and stumps.</li> <li>8. The area is protected from damage by agricultural and other adjacent operations.</li> <li>9. There should be no evidence of inappropriate management (e.g. deep ruts, animal poaching or compaction).</li> </ol>	8.53	Moderate



		<p>10. Invasive non-native plants are below 5% (see list below).</p> <p>11. No signs of significant nutrient enrichment present.</p> <p>12. More than 3 different native trees and 3 shrub species in an average 10 m radius.</p>		
Scrub	Mixed scrub	<p>1. There are at least three woody species, with no one species comprising more than 75% of the cover (except common juniper, sea buckthorn or box, which can be 100% cover).</p> <p>2. There is a good age range – a mixture of seedlings, saplings, young shrubs and mature shrubs.</p> <p>3. Pernicious weeds and invasive species make up less than 5% of the ground cover.</p> <p>4. The scrub has a well-developed edge with un-grazed tall herbs.</p> <p>5. There are many clearings and glades within the scrub.</p>	2.42	Good

**APPENDIX B: BIODIVERSITY METRIC 3.0 CALCULATIONS**

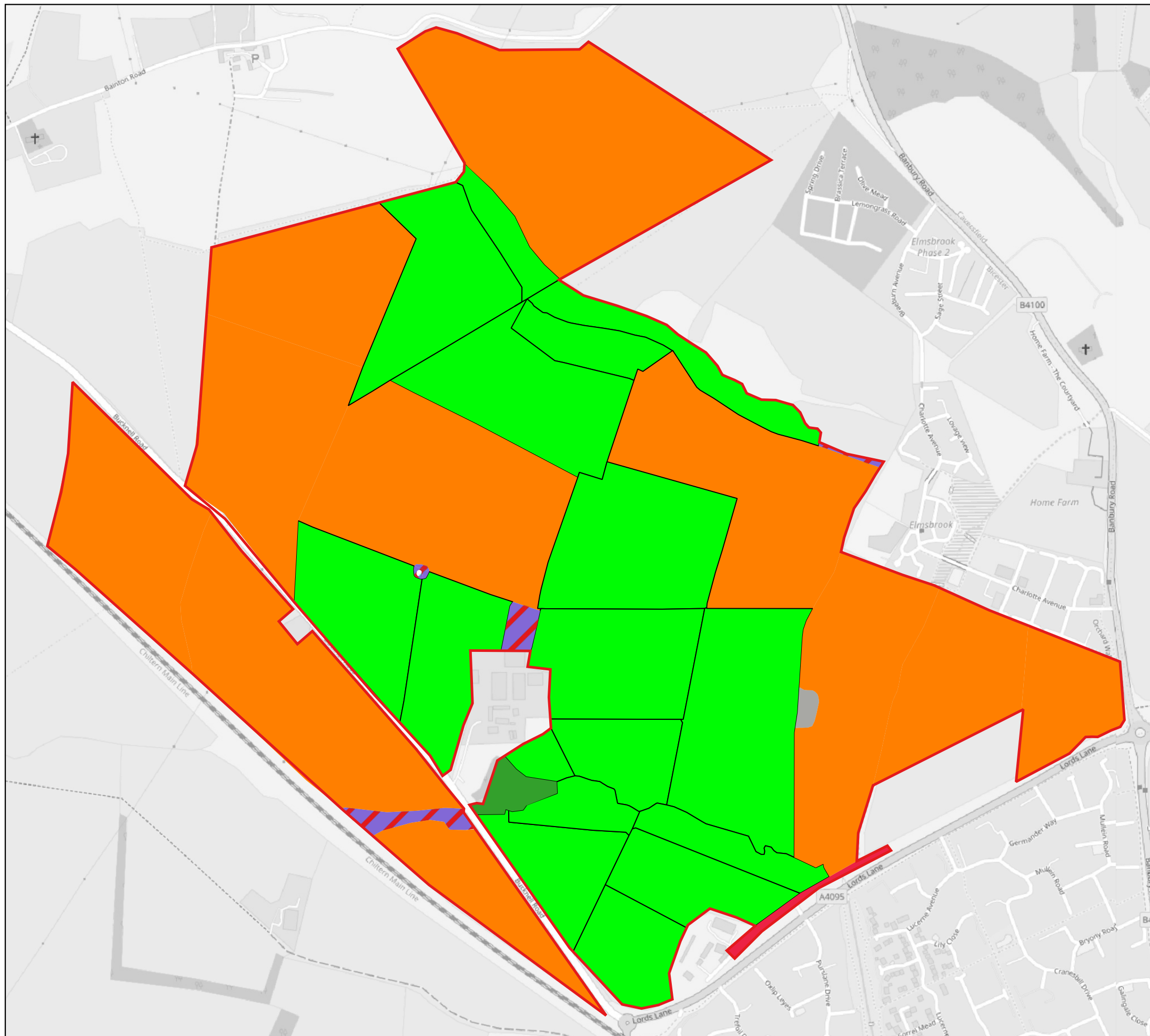
On-site baseline	<i>Habitat units</i>	506.74
	<i>Hedgerow units</i>	151.87
	<i>River units</i>	23.33
On-site post-intervention <small>(Including habitat retention, creation &amp; enhancement)</small>	<i>Habitat units</i>	596.62
	<i>Hedgerow units</i>	171.96
	<i>River units</i>	23.33
On-site net % change <small>(Including habitat retention, creation &amp; enhancement)</small>	<i>Habitat units</i>	17.74%
	<i>Hedgerow units</i>	13.23%
	<i>River units</i>	0.00%
Off-site baseline	<i>Habitat units</i>	0.00
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00
Off-site post-intervention <small>(Including habitat retention, creation &amp; enhancement)</small>	<i>Habitat units</i>	0.00
	<i>Hedgerow units</i>	0.00
	<i>River units</i>	0.00
Total net unit change <small>(including all on-site &amp; off-site habitat retention, creation &amp; enhancement)</small>	<i>Habitat units</i>	89.88
	<i>Hedgerow units</i>	20.09
	<i>River units</i>	0.00
Total on-site net % change plus off-site surplus <small>(including all on-site &amp; off-site habitat retention, creation &amp; enhancement)</small>	<i>Habitat units</i>	17.74%
	<i>Hedgerow units</i>	13.23%
	<i>River units</i>	0.00%
Trading rules Satisfied?	Yes	

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### Key

- Red Line Boundary
- g4 - modified grassland
- w - woodland
- h3 - dense scrub
- c - cropland
- u - urban
- s - sparsely vegetated land
- r1 - standing open water and canals



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### Key

 Red Line Boundary

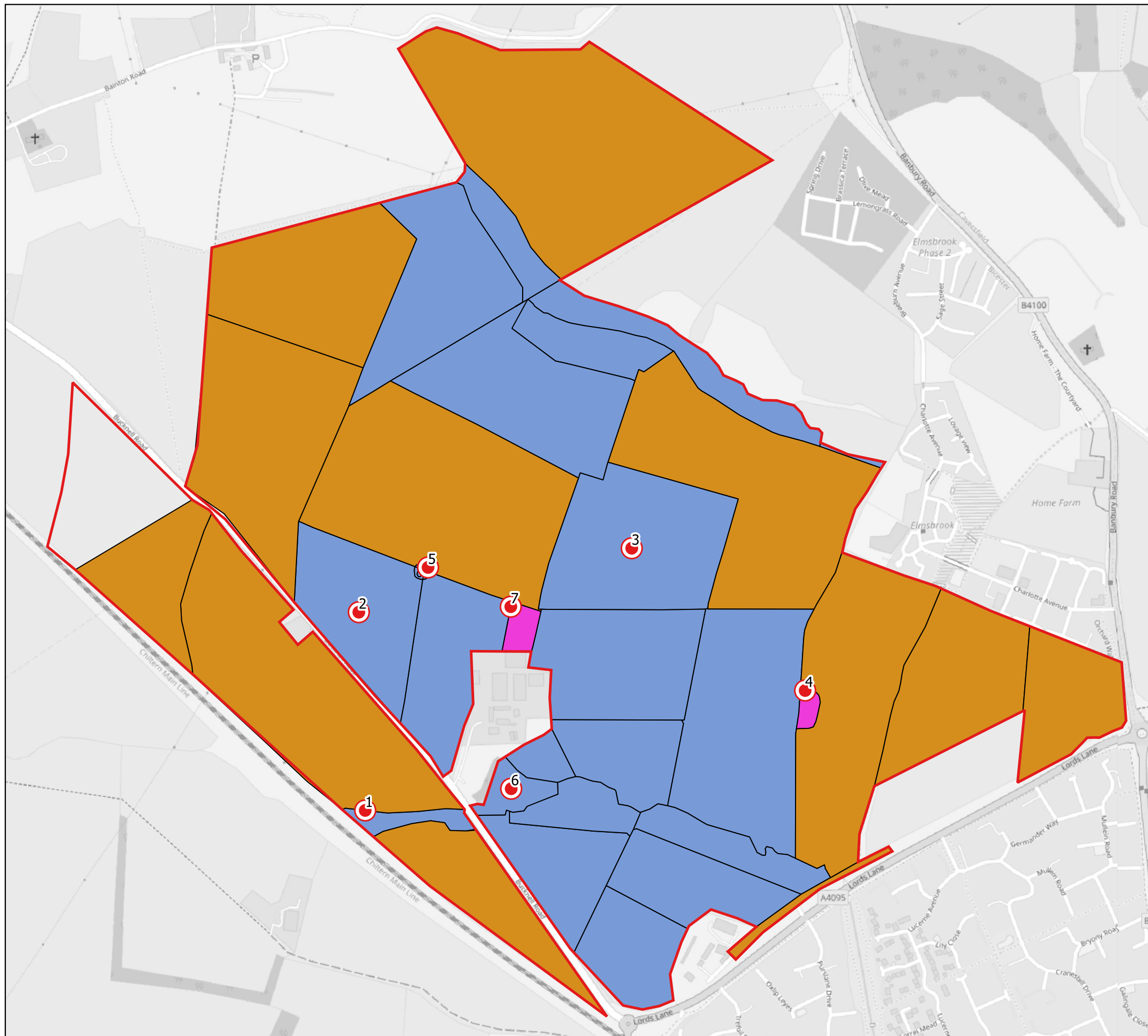
Condition

 Poor

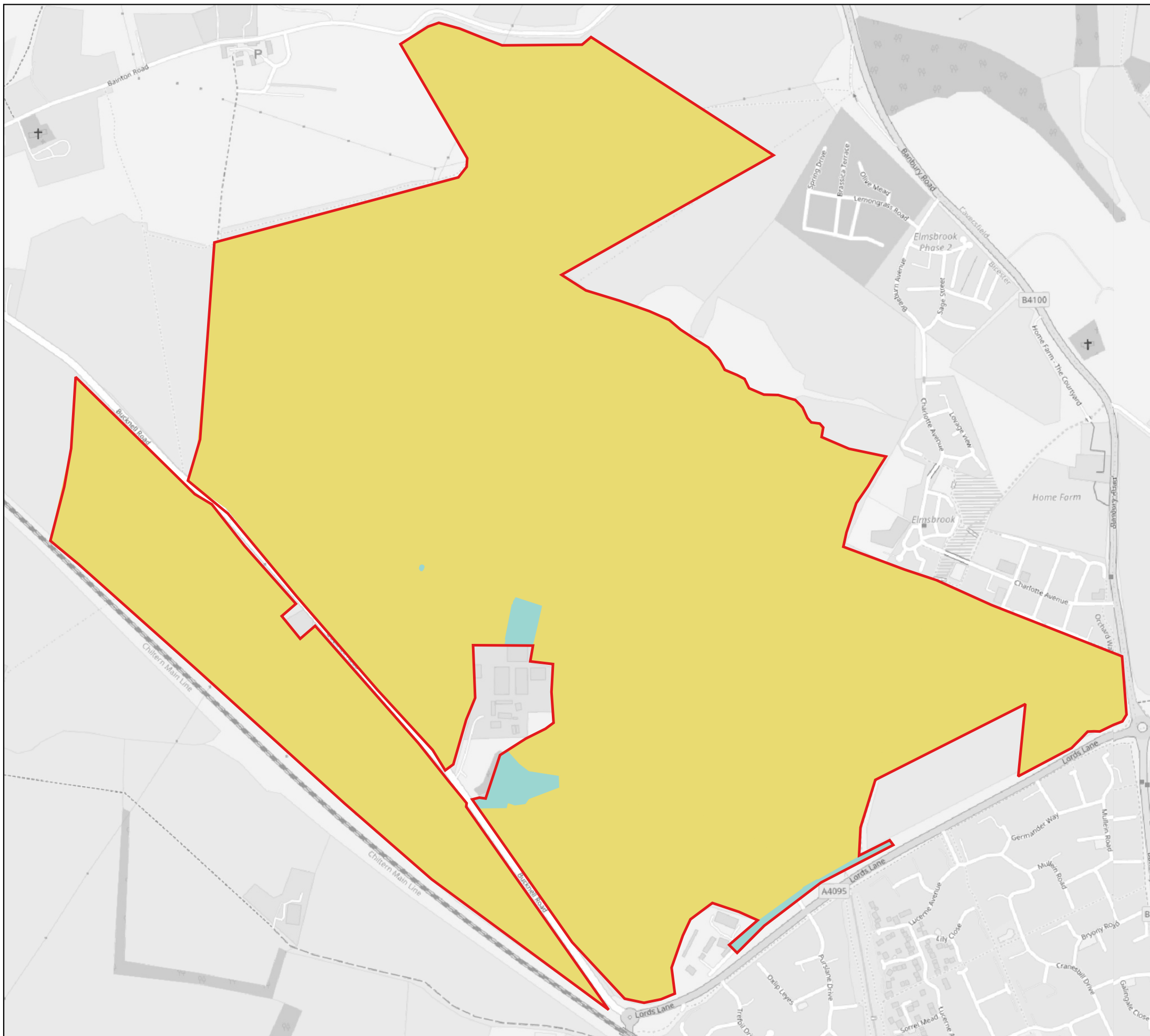
 Moderate

 N/A

 Target notes - conditions analysed in report







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### Key

Red Line Boundary

### Habitat Retention

Lost

Retained

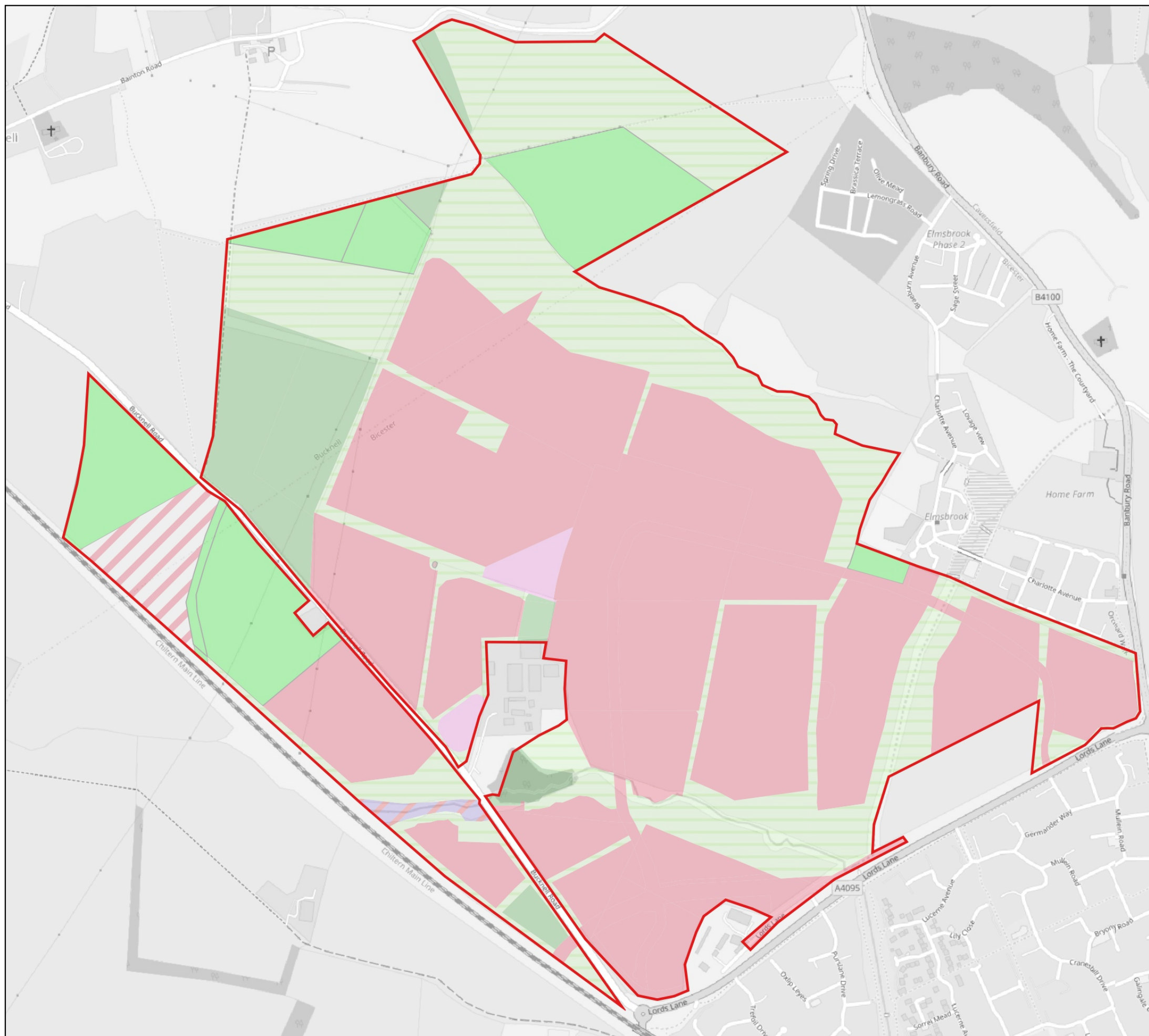


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### Key

- Red Line Boundary
- Net Gain Habs Sept
- g3c - other neutral grassland
- g4 - modified grassland
- w - woodland
- h3 - dense scrub
- f - wetland
- u - urban
- u1 - built-up areas and gardens



fpcr

client  
**Hallam Land Management**

project  
**North West Bicester,  
Bicester**

drawing title  
**Proposed Habitats**

scale: A3  
1:7500

drawing / figure number  
**Figure 4**

drawn  
JDH/JD

issue date  
6/12/2021



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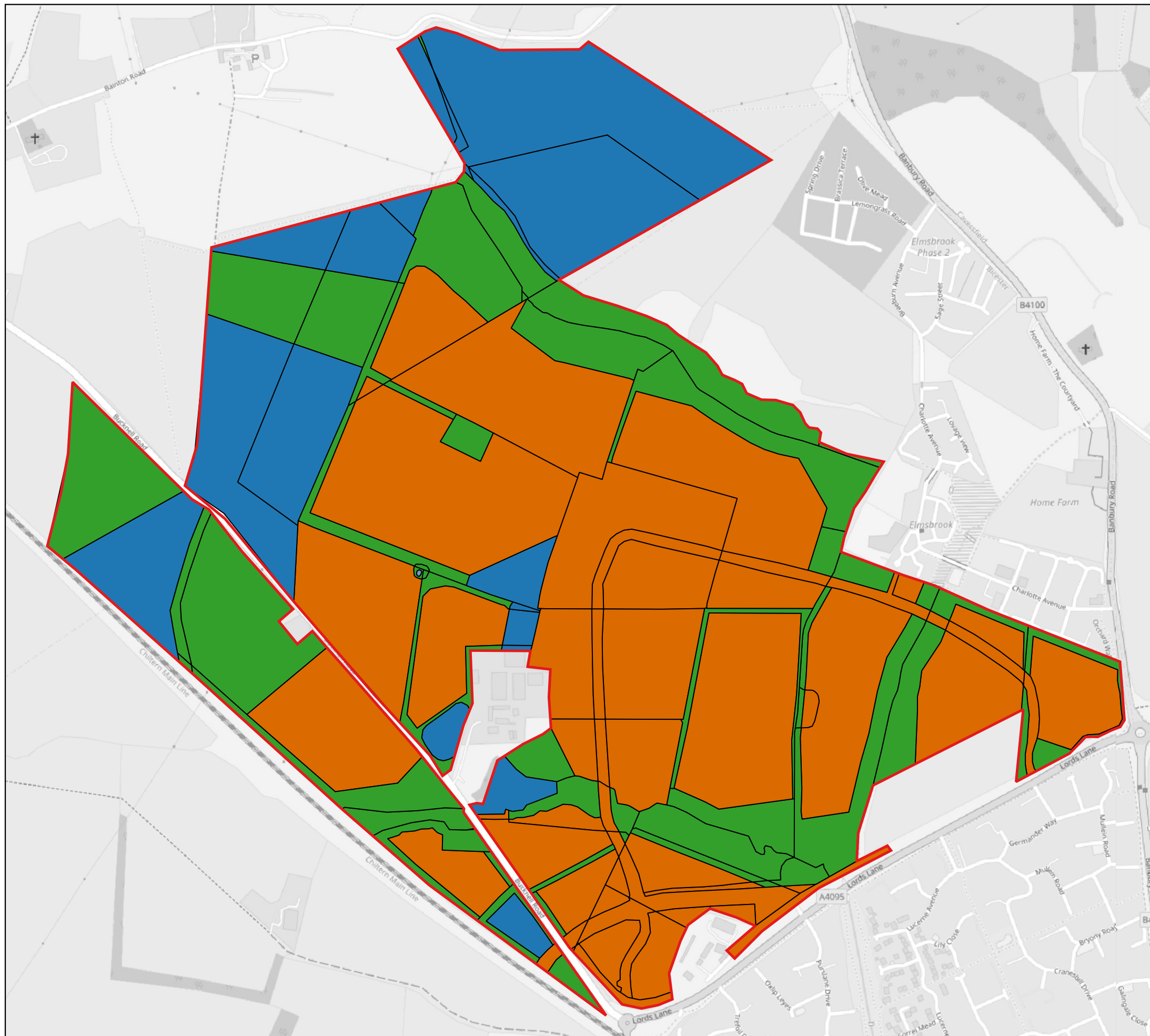
 Red Line Boundary

Net Gain Habs Sept

 Good

 Moderate

 N/A



client  
Hallam Land Management  
project  
North West Bicester,  
Bicester  
drawing title  
Proposed Habitat Condition Plan

scale @ A3  
1:7500  
drawing / figure number  
MAF/JD  
issue date  
6/12/2021






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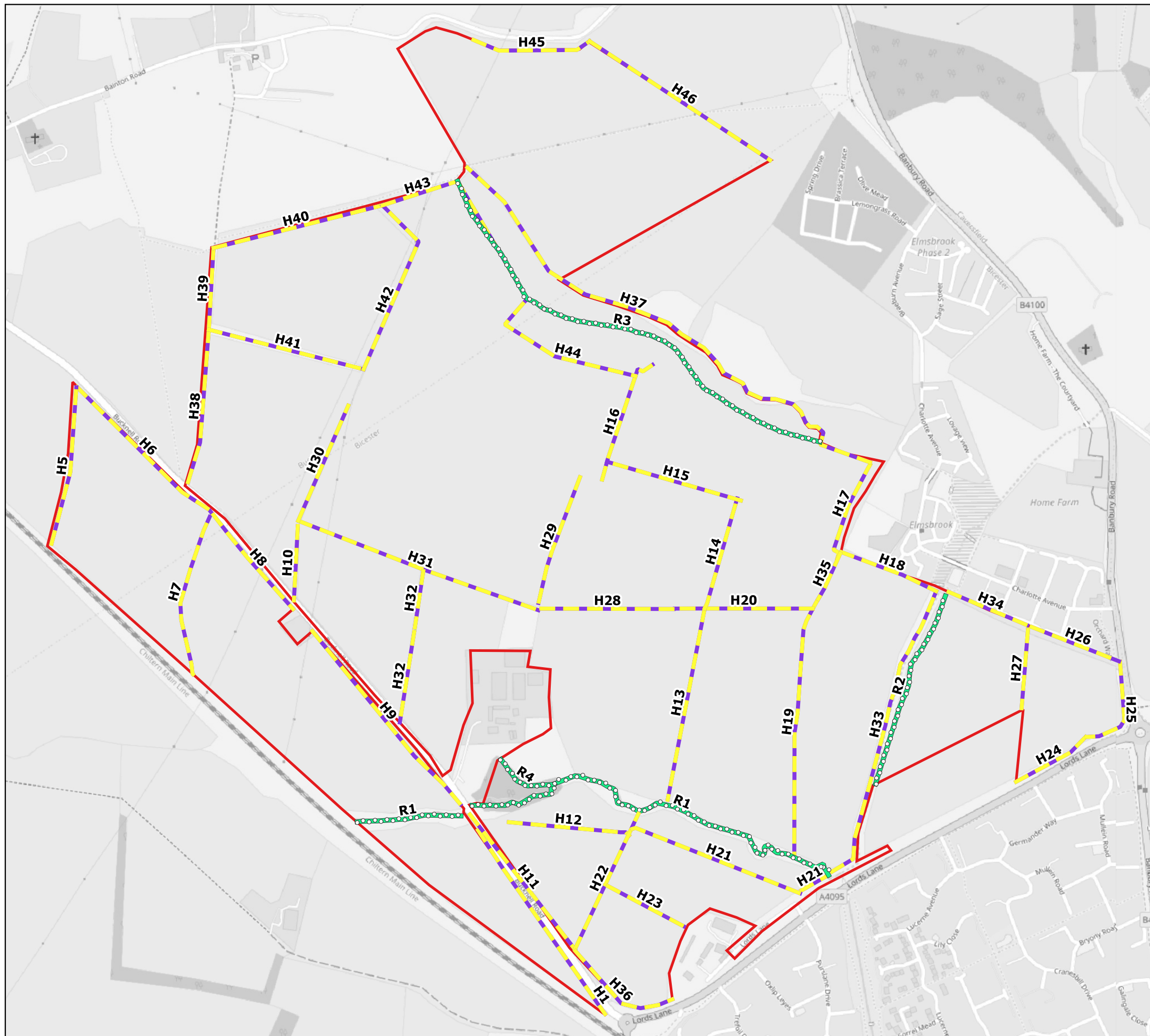


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### Key

-  Red Line Boundary
-  Native Hedgerow
-  Stream



client  
Hallam Land Management

project  
North West Bicester,  
Bicester

drawing title  
Baseline Linear Features

scale @ A3  
1:7500

drawing  
MAF/JD

issue date  
6/12/2021

drawing / figure number  
**Figure 6**

rev  
-

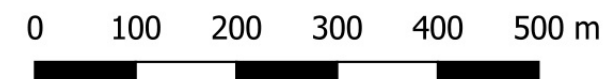
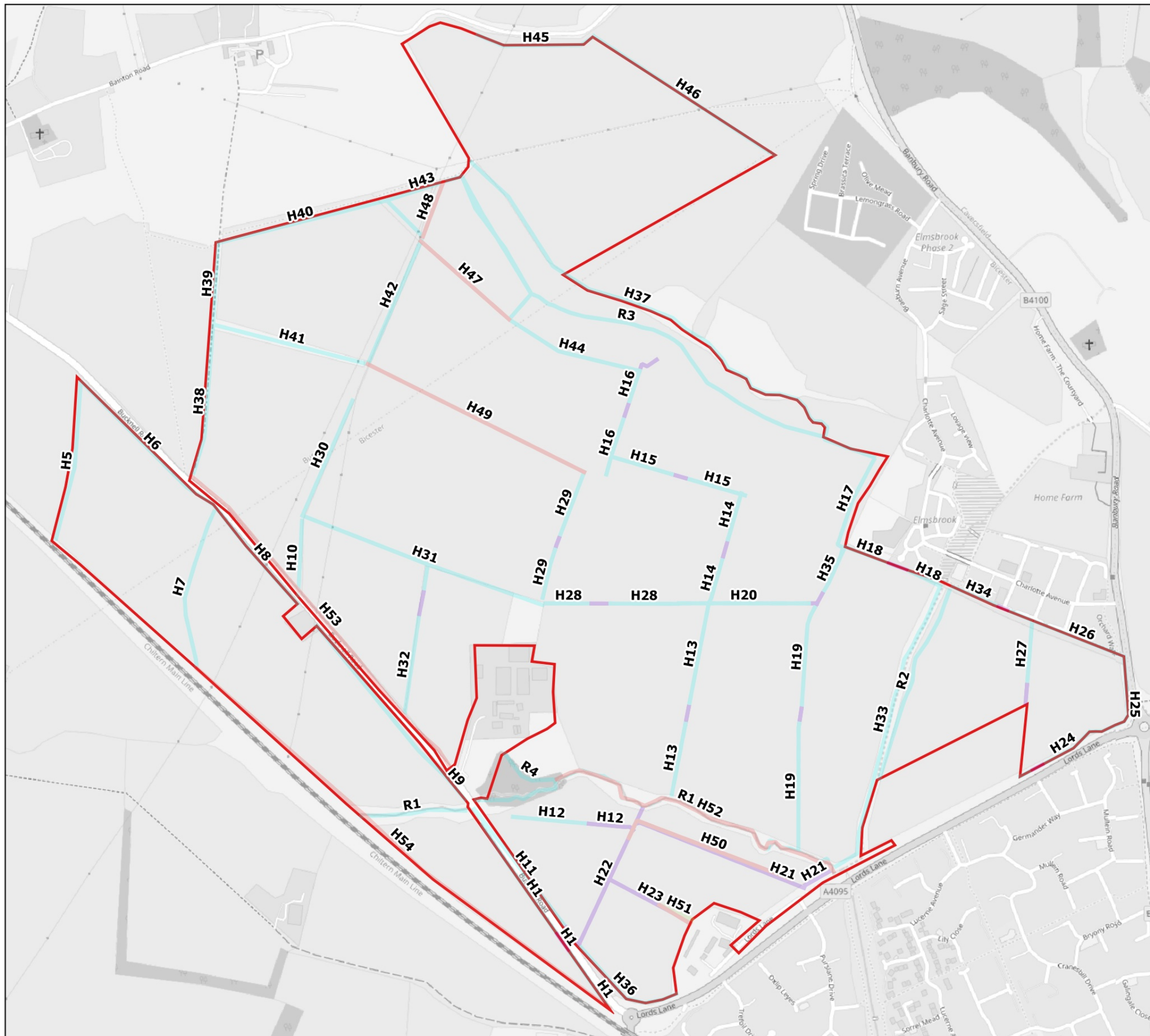


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**Key**

- Site Boundary Sept 2021
- Created
- Lost
- Retained



client  
Hallam Land Management

project  
North West Bicester,  
Bicester

drawing title  
Hedgerow Retention Plan



scale @ A3  
1:7500

drawn  
JDH/JD

issue date  
6/12/2021

drawing / figure number  
**Figure 7**

rev  
-