Appendix 13.3

BIODIVERSITY NET GAIN ASSESSMENT

Appendix 13.4: Biodiversity Net Gain Assessment

Background

1.1 Biodiversity net gain is a strategy to develop land and contribute to the recovery of nature It is a way of making sure the habitat for wildlife is in a better state than it was before development. Developments are required to deliver net gains for biodiversity under paragraphs 174 and 179 of the National Planning Policy Framework.

1.2 In order to investigate the feasibility of the Proposed Development delivering measurable biodiversity net gain, the Defra Biodiversity Metric 4.0 has been used to calculate the biodiversity value of the Site both for the existing baseline conditions and for the post-development landscaping scenario. Metric 4.0 is the most recent version of the metric produced by Defra.

Method

1.3 Natural England's Biodiversity Metric 4.0 calculation spreadsheet (Natural England 2023a) was completed based on the guidance provided by Natural; England (Natural England 2023a). Condition assessment used current Natural England guidance (Natural England 2023c). The biodiversity calculation was undertaken by Dr Tom Flynn MSc MCIEEM CEcol, who is experienced in biodiversity net gain assessment. He has carried out biodiversity net gain assessments since 2017, has undertaken formal training in the UK Habitat Classification and habitat condition assessment, and trains BSG Ecology staff in habitat survey, habitat condition assessment and biodiversity net gain assessment.

Baseline Habitats and Conditions

1.4 Habitat type and condition for current habitats at the Site are set out in detail, and justifications provided, in the Baseline Ecology Report (see Appendix 13.2). Habitat type and condition are based on site surveys carried out by BSG Ecology and in 2022 and 2023. The baseline habitats within the Site are shown on Figure A13.4-1 and summarised in Table A13.4-1. Habitats included in this analysis include area habitats, hedgerows and watercourses; each is subject to separate biodiversity net gain analysis under Biodiversity Metric 4.0.

1.5 A 0.83 ha area north of Begbroke Science Park was excluded from the baseline and proposed scenarios since it is already being used for compensatory habitat creation in connection with ongoing developments at the Science Park.

Watercourse Assessment

1.6 Condition assessment of the Rowel Brook was carried out by a trained surveyor (Joe Bishop, Senior Ecologist at BSG Ecology) on 21 and 23 June 2023, based on current guidance (Gurnell et al., 2021). The survey employed six groups of five samples, with each sample being 10 m in length. In line with the guidance, the total survey length, 0.3 km, represents 20% of the ca. 1.5 km length of the Rowel Brook within the Site.

1.7 All other watercourses at the site are minor and are considered to be ditches. These were assessed using Natural England (2023c) guidance to be in Poor condition (see Appendix 13.2).

1.8 The Oxford Canal is adjacent to (but outside of) the Site along the ca.1.6 km eastern Site boundary. Habitats at the Site in its vicinity are currently agricultural (arable and grassland). These areas will be grassland and other habitats managed for nature conservation under the Proposed Development, with no encroachment. Given this enhancement of these adjacent habitats in the Canal's riparian corridor, and the fact that the canal is wholly outside the Site and not under the control of the applicant, it was not considered proportionate to include the Oxford Canal within this biodiversity net gain assessment.

Table A13.4-1 Baseline habitat types and conditions

Habitat type	Condition	Extent
Area habitats		**ha**
Cereal crops	N/A	129.621
Modified grassland	Moderate	16.566
	Poor	1.495
Other neutral grassland	Moderate	8.727
	Poor	0.372
Mixed scrub	Moderate	1.154
Ponds (non-priority habitat)	Moderate	0.065
Ponds (priority habitat)	Moderate	0.010
Ruderal/Ephemeral	Moderate	0.459
Allotments	Moderate	1.391
Developed land; sealed surface	N/A	6.077
Introduced shrub	N/A	0.083
Vacant or derelict land	Poor	0.420
Fens (i.e., swamp)	Moderate	0.078
Lowland mixed deciduous woodland	Moderate	2.530
Other woodland; broadleaved	Moderate	1.652
	Total	**170.7 ha**
Hedgerows		**km**
Various - see Excel sheet	Poor to Good – see Excel sheet	13.98
Watercourses		**km**
Other rivers and streams (Rowel Brook)	Moderate	2.079
Ditches	Poor	1.832
	Total	**3.911**

Proposed Habitats and Conditions

1.9 Proposed habitats at the Site (i.e., habitats present following the completion of the Proposed Development), are shown on Figure A13.4-2 and summarised in Table A13.4-2. Proposed habitat conditions are also shown and justified in this table.

1.10 Proposed habitats and habitat conditions have been allocated, taking a suitably precautionary approach to what is feasible at the Site, by an experienced ecologist.

Table 13.4-2. Proposed habitat types and conditions. With reference to condition criteria in Natural England (2023c).

Habitat type	Condition	Condition Justification	Extent
Area habitats			
Modified grassland	Poor	Feasible to achieve anywhere on site.	16.220

Other neutral grassland	Good	This grassland will be enhanced from existing grassland at the east of the site. This area has very low phosphorus and low nitrogen levels (see Appendix 13.5) and will not have public access in the proposed development. All five habitat condition criteria will need to be met to achieve good condition. Under these conditions and given appropriate management (see the Outline LEMP document), achieving this habitat type and condition is considered feasible.	8.883 ha
Other neutral grassland	Moderate	This grassland will be located on arable land and most areas will have public access. Therefore, the condition has been precautionarily set at moderate. This will require at least three of the six condition criteria to be met, including criterion 1, requiring a close match with the UK Habitat Classification definition of other neutral grassland. This is considered achievable given the proposed habitat creation and management in the Outline LEMP document.	36.388 ha (plus 0.592 retained)
Other neutral grassland	Poor	Retained from baseline.	0.372
Mixed scrub	Moderate	This will require three of the five scrub condition assessment criteria to be achieved. Given appropriate planting and management (as per the Outline LEMP document), this is considered feasible anywhere on Site.	1.162 (plus 0.8434 retained)
Allotments	Moderate	This will require a varied vegetation structure to be present (which is considered likely under multiple crop types) and <5% cover of non-native invasive plant species. This is considered feasible at the Site. This category also covers the community farm in the north of the Site.	0.147 plus community farm of 9.404
Artificial unvegetated unsealed surface	N/A	Part of the natural play area in the east of the Site.	1.359
Developed land; sealed surface	N/A	N/A	56.948 (plus 5.193 retained)
Sustainable drainage system	Moderate	This will require three of the five urban condition assessment criteria to be achieved. Given appropriate planting and management (as per the Outline LEMP document), this is considered feasible at the Site.	2.481
Vegetated garden	N/A	Comprises 30% of residential areas plus the majority of the central park.	18.446
Other woodland, broadleaved	Moderate	This plantation woodland category in moderate condition is considered feasible at the Site. Moderate condition will require a woodland condition assessment score of at least 26 to be achieved. This is considered achievable, given the proposed planting of canopy, understorey and ground layers with appropriate native species, and ongoing management indicated in the Outline LEMP document.	9.340
Pond (priority habitat)	Moderate	It is assumed that at least one priority pond will replace the pond at Begbroke Science Park, if this is to be lost, with an area double the existing pond. The exact location is not shown on the masterplan, but has been assumed this will be within the Other neutral grassland in Moderate condition above. Achieving Moderate condition will require at least six of the nine pond condition criteria to be met. This is considered feasible at the Site.	0.101
Ponds (non-priority habitat)	Moderate	It is assumed that the remaining ponds at the site will be managed to (as a minimum) maintain their moderate condition.	0.065
Other retained areas	Various	Various	2.656

		Total	151.94
Hedgerows			**km**
Total losses	Various	N/A	2.31
New hedgerow: Species-rich native hedgerow with trees – associated with bank or ditch	Moderate	The calculation assumes replacement of all hedgerow losses on a 3.5 to 1 basis (i.e., for every 1 m lost, 3.5 m of new hedgerow will be planted). This totals 8 km of new hedgerow. It also assumes that at least 3 km of the new hedgerow will be *Species-rich native hedgerow with trees – associated with bank or ditch* and the remainder will be *Species-rich native hedgerow*. Is is assumed that new hedgerow ill be maintained in moderate condition, which is considered achievable.	3
New hedgerow: Species-rich native hedgerow	Moderate		5
Watercourses			**km**
Other rivers and streams (Rowel Brook)	Fairly Good	This assessment assumes that the extensive habitat creation around the Rowel Brook (replacing intensively farmed arable land), plus conservation management of the Brook, will increase is condition from Moderate to Fairly Good. I.e., a modest enhancement is assumed to make this assessment suitably precautionary. Levels of encroachment will reduce due to habitat creation on current arable land within the river corridor.	2.079 enhanced
Ditches	Fairly Poor	This assessment assumes that the extensive habitat creation around the ditches in the east of the Site (replacing intensively farmed arable land), plus conservation management of these ditches, will increase their condition from Poor to Fairly Poor. I.e., a modest enhancement is assumed to make this assessment suitably precautionary. Levels of encroachment will reduce due to habitat creation on current arable land in proximity to ditches. A loss of 176 m of ditch is assumed: 50m of culverting to allow the new road bridge over the railway line, and the loss of 126 m of ditch in the centre-south of the site, due to proximity to a	1.205 enhanced 0.176 lost
		Total	3.284

1.11 All of the proposed habitat creation and enhancement in this assessment would occur on-site. No offsite habitat creation or enhancement has been included or assumed.

Strategic Significance

1.12 Baseline habitats within the Conservation Target Area in the north-east of the Site, or within the Rowel Brook Local Nature Reserve, Nature Conservation Area or Canalside Park shown on the Cherwell Local Plan Policy PR8 Plan are considered to be within the strategic significance category '*Formally identified in local* strategy'. This excludes arable and modified grassland, which are considered inappropriate for these areas.

1.13 Habitat creation or enhancement (of the appropriate habitats woodland, grassland, wetland and scrub and hedgerows) within the Conservation Target Area in the north-east of the Site, or within the Rowel Brook Local Nature Reserve, Nature Conservation Area or Canalside Park shown on the Cherwell Local Plan Policy PR8 Plan is considered to be within the strategic significance category '*Formally identified in local strategy'*.

1.14 All other baseline habitats and habitat creation or enhancement are considered to be within the Strategic Significance category '*Area/compensation not in local strategy/ no local strategy*'.

Limitations

1.15 There are not considered to be any significant limitations to this assessment, in its context as a feasibility study for an outline planning application, based on an illustrative masterplan. The actual

biodiversity gain in the completed development will depend on the detail of habitat creation within greenspace at the Site.

1.16 This assessment is based on an illustrative masterplan, and therefore it addresses the feasibility and approximate magnitude of biodiversity net gain from the Proposed Development. It does not represent a binding commitment to the creation of certain habitat types, extents, or location in the Proposed Development, or to a certain level of biodiversity gain. The proposed habitats plan (Figure 13.4-2) is based on the interpretation of the illustrative masterplan by the assessor, which has a subjective element.

Key results

1.17 The key results of the biodiversity net gain assessment are shown in Table 14.3-3. For area habitats, hedgerows and watercourses the biodiversity value of the Site is predicted to be higher than under baseline conditions by greater than 20%.

Table 14.3-3 Key results. Scores are in Metric 4.0 biodiversity units.

Habitat type	Baseline score	Post-intervention score	Difference	Biodiversity gain or loss (%)
Area habitats	471.37	586.92	115.55	24.51% gain
Hedgerows	227.32	274.44	47.11	20.72% gain
Watercourses	29.61	37.92	8.32	28.09% gain

1.18 The full calculation spreadsheet has been provided to Cherwell District Council.

Conclusion

1.19 Area habitats: the Proposed Development could feasibly deliver a biodiversity net gain of around 24.51% for area habitats.

1.20 Hedgerows: Given replacement of hedgerow losses at the site on a 3.5 to 1 basis, and the creation of at least 3 km of species-rich native hedgerow with trees – associated with a bank or ditch, the Proposed Development could feasibly deliver a biodiversity gain of around 20.72% for hedgerows.

1.21 Watercourses: Given the extent of habitat creation around watercourses that is shown in the Illustrative masterplan, with the potential to enhance these features, the Proposed Development could feasibly deliver a biodiversity net gain of around 28.09% for watercourses.

1.22 Chapter 13 of the Environmental Statement sets out various additional biodiversity enhancements to be delivered by the Proposed Development, which are outside the scope of the Biodiversity Metric 4.0 calculation.

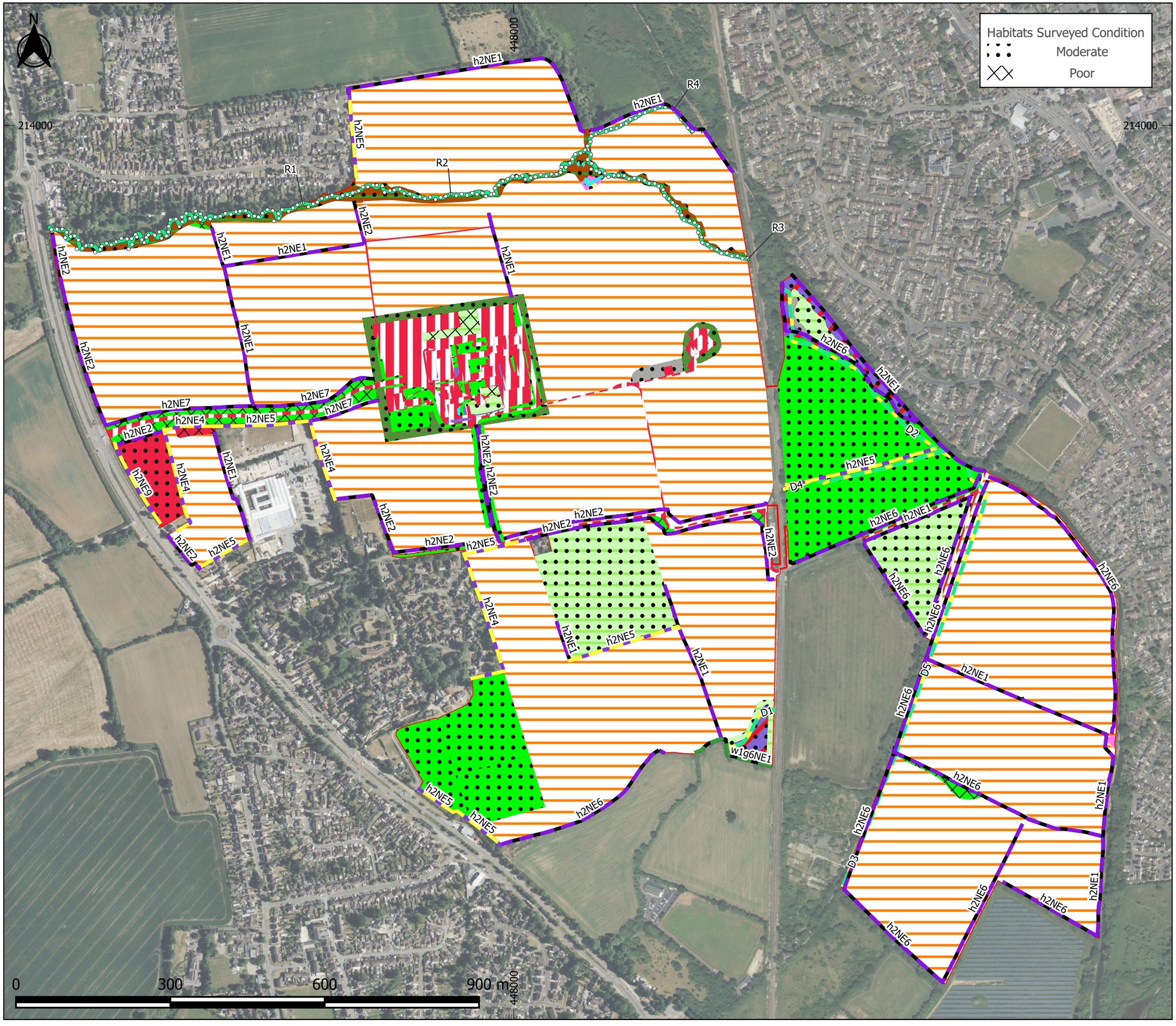
References

Gurnell A. et al. (2021) *A guide to Assessing River Condition: Part of the Rivers and Streams Component of the Biodiversity Net Gain Metric*. BM3.0 version: August 2021.

Natural England (2023a) *Biodiversity Metric 4.0: Calculation Tool, XLSM*. https://publications.naturalengland.org.uk/file/5338007268491264 [accessed 30/06/23].

Natural England (2023b) *Biodiversity Metric 4.0: Under Guide*. Natural England. https://publications.naturalengland.org.uk/file/6188841413902336 [accessed 30/06/23].

Natural England (2023c) *Biodiversity Metric 4.0: Technical Annex 1 – Condition Sheets and Methodology, XLXS*. Natural England. https://publications.naturalengland.org.uk/file/4593449018589184 [accessed 30/06/23].



Legend

- Line of Trees (Ecologically Valuable) - with Bank or Ditch (w1g6NE1)
- Native Hedgerow (h2NE5)
- Native Hedgerow - Associated with bank or ditch (h2NE9)
- Native Hedgerow with trees (h2NE4)
- Native Species Rich Hedgerow (h2NE2)
- Native Species Rich Hedgerow - Associated with bank or ditch (h2NE7)
- Native Species Rich Hedgerow with trees (h2NE1)
- Native Species Rich Hedgerow with trees - Associated with bank or ditch (h2NE6)
- Ditches
- Other Rivers and Streams
- Allotments
- Cereal crops
- Developed land; sealed surface
- Fens (upland and lowland)
- Introduced shrub
- Lowland mixed deciduous woodland
- Mixed scrub
- Modified grassland
- Other neutral grassland
- Other woodland; broadleaved
- Ponds (Non- Priority Habitat)
- Ponds (Priority Habitat)
- Ruderal/Ephemeral
- Vacant/derelict land/ bareground
- Site boundary

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PROJECT TITLE

BEGBROKE PR8, ECOLOGY SURVEY AND ASSESSMENT 2022

DRAWING TITLE

Figure 1: Baseline habitats

DATE: 03/07/2023 | CHECKED: TF | SCALE: 1:7,000

DRAWN: CS | APPROVED: JMG | VERSION:1.2

Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Graphics Ref. No.: 02042