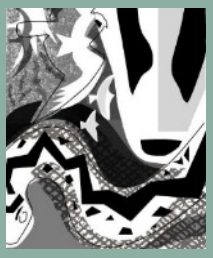

MKA
ECOLOGY

Biodiversity audit

Cambridge City Council

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1.0	*14 June 2021*	-

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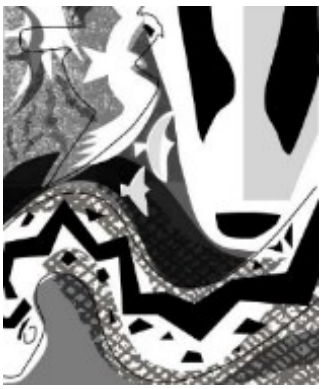

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1. Summary

Thirty-three sites, comprising a mixture of nationally and locally designated wildlife sites, along with large parks, 'Pieces', Commons and churchyards with no designations, were subject to habitat surveys and 'condition assessments' in the summer of 2020. The aim of the surveys was to provide baseline information on the type and quality or condition of areas of open space and/or sites of wildlife conservation importance under the control of Cambridge City Council.

The surveys were performed using standard methods; habitats were defined according to the UK Habitat Classification and habitat conditions were assessed against the 'Biodiversity Net Gain' schema. By assigning values to habitats by their 'distinctiveness' or rarity, and their condition, the overall measurable biodiversity contained within the surveyed sites was calculated using the methodology of the Defra Biodiversity Metric (v2.0); in principle, larger/longer, more valuable and better condition habitats score more highly. The key observations from this assessment are as follows:

Sites: Over a third of the total biodiversity units (area) are contained within two sites: Coldham's Common and Hobson's Park. This is largely on account of their greater size - these account for nearly 30% of the total area surveyed. This illustrates the first of the key principles of the Lawton Review of 2010: 'bigger, better, more joined up'.

Habitats: A total of 10 Priority Habitats were identified within the audit survey. Of these, woodland (of a variety of types) accounted for nearly a third of the total measurable biodiversity, this despite occupying only 15% of the total area; woodlands are more 'distinctive' or valuable habitats and those assessed were often in good condition. Neutral grassland was the second most valuable habitat, though nearly 27% is in poor condition. Lowland calcareous grassland scores relatively highly (11% of the total units) despite occupying a relatively small area (6%); lowland calcareous grassland is one of the most distinctive habitats in the survey.

Condition: Nearly 60% of the total area surveyed is in 'poor' condition. This is due to the presence of large areas (43% of the total) of amenity or 'modified' grassland in the sites surveyed, with recreation grounds, 'Pieces', Commons and larger open spaces within the River Cam floodplain all being heavily managed. These grasslands are also less distinct and so also score poorly for this reason.

A number of common observations were made during the surveys. Several of these relate directly to constraints on the condition of some habitats:

- **Larger sites hold more biodiversity.** This presents both an opportunity for habitat creation - the large commons, pieces and recreation grounds offer enormous potential for habitat creation or restoration. It also highlights a risk; at present, a lot of the biodiversity under City Council control is contained within a small number of sites, which is a less resilient approach.
- **Recreation pressure.** Many of the woodland and grassland sites suffer from high recreation pressure, particularly from dog-walking. The associated damage can be the main reason for a site's poor condition. A balance will need to be struck between enabling access to the City's green spaces and ensuring that the conditions of these areas are both maintained and not allowed to deteriorate.
- **Less is more.** The large areas of grassland habitats within the City are intensively managed. Cutting less often will both promote higher value grasslands and improve their condition. Similarly, many of the Commons are over grazed and a relaxation of grazing pressure will benefit these areas; the right amount of grazing can bring the best results for grasslands.
- **Deadwood**. Woodlands across Britain are usually stripped of their deadwood and those in Cambridge are no different. Introduction of deadwood, either from selective felling in sites or from outside, plus techniques to 'veteranise' existing trees will lead to improvements in the condition of the City's woodland, as well as providing habitat for a number of groups, particularly invertebrates.
- **Habitat succession and species.** The more objective approach taken in this audit is naturally habitat focussed. However, conservation objectives for

particular species, particularly those of Local or National Importance is still an important consideration when determining future management strategies. For example, deciding how to manage the succession of grassland to scrub or scrub to woodland may depend more on the needs of individual species, rather than concentrating 'on the numbers'.

The City is rich in biodiversity, but could be richer; the measurable biodiversity values associated with poor quality amenity/modified grassland habitats highlight the opportunity that the City Council has available to create or restore large areas, many of which are in the River Cam floodplain - a vital wildlife corridor within the Cambridge Nature Recovery Network. A number of case studies using the 'Biodiversity Net Gain Metric' are presented which highlight some general principles on how increasing the measurable biodiversity within the City can be achieved.

- **Wetland restoration.** Cambridge is built upon a river, yet there is little wetland. Most wetlands are of very high value and support a huge range of plants and animals. Two case studies illustrate the value of an imagined (Midsummer Common) and real life (Logan's Meadow) wetland restoration proposal.
- **Enhancement versus creation.** Creating habitat afresh from a 'blank canvas' is harder and takes more time than enhancing what is there.
- **'Non-measurable' biodiversity.** Whilst the desire to 'Double Nature' inherently implies some form of measurement, some aspects of biodiversity simply cannot be measured. The Cambridge City Council 'Biodiversity Toolkit' is a directory of habitat features and measures that can be deployed at almost any site and will have benefits. From bat boxes to 'beetle towers', each will contribute to overall gains for wildlife, even if they can't be measured.

A range of recommendations is presented for each site, but a number are common. These include, but are not limited to:

- Relaxation of grazing pressure or reduced mowing frequency on grasslands - to improve both value and condition of grassland, whilst potentially saving

costs and allowing operatives to focus their efforts on other measures to promote biodiversity.

- Restricting or limiting the impacts of recreation (especially dog walking) on grasslands, woodlands and waterways. This will likely need to go hand in hand with the provision of other habitats which are more suited to these kinds of activities.
- Increase the volume of deadwood in woodlands.
- Wetland restoration on the River Cam floodplain.
- Improving the connectivity of sites and habitats, particularly south of the City centre.

2. Introduction

2.1. Aims and scope

This Biodiversity Audit is a study of the value to biodiversity of several sites across the City of Cambridge. The audit directly supports the Cambridge City Council Biodiversity Strategy by providing a baseline estimate of the capacity for Cambridge greenspaces to hold valuable and protected habitats and species. The audit also provides targeted recommendations for enhancing and maximising the biodiversity value of these sites as a vital way to "double nature" across Cambridge.

The aims of the Biodiversity Audit were to:

- Outline existing site habitats and prepare habitat maps for each site including an assessment of the condition of each habitat type;
- Review existing management activities and where relevant provide management recommendations to improve the existing condition of the sites; and
- Evaluate the biodiversity units provided by the sites which will act as a baseline for assessing measurable biodiversity gain in the future.

2.2. Background

In June 2020 MKA Ecology Limited was commissioned to undertake a Biodiversity Audit of several sites owned or managed by Cambridge City Council. This report presents the findings of the audit which were gathered during 2020 and 2021 through desktop studies and field studies.

2.3. Site selection

Greenspaces around Cambridge City centre that were either owned or managed by Cambridge City Council were selected for the audit (Table 1). Geographically, they span the City and comprise a variety of sites from statutorily designated sites to

churchyards and recreation grounds. Some sites provide unique habitat in their own right whereas others provide biodiversity value through their provision of green corridors to enhance connectivity across the wider region. The sites do not represent the full extent of land under Cambridge City Council's ownership or management. They were selected as priorities for assessment.

Table 1: List of sites surveyed

Ref	Site	Area (ha)	Designations*
1	Coldham's Common	41.3	LNR (part), CWS ref. H5.1
2	Stourbridge Common	19.4	LNR, CityWS ref. G6.5
3	Sheep's Green	8.7	LNR, CWS ref. E4.5
4	Coe Fen	6.6	LNR, CWS ref. E4.10
5	Lower Vicar's Brook, New Bit and Coe Fen Straits	2.5	LNR, CityWS ref. E4.9
6	Barnwell East	3.3	LNR, CityWS ref. H5.4
7	Barnwell West	4.0	LNR, CityWS ref. H5.3
8	Paradise	2.2	LNR. CWS ref. E4.2
9	Lammas Land	5.5	None
10	Byron's Pool	4.4	LNR
11	Nine Wells	1.2	LNR
12	Histon Road Recreation Ground	1.8	None
13	Midsummer Common	13.8	CityWS ref. F6.4
14	Bramblefields	2.1	LNR
15	St Andrews, Chesterton	1.0	CityWS ref. G6.2
16	The Spinney	0.6	CityWS ref. J3.6
17	West Pit	3.0	LNR, SSSI
18	Limekiln Road Verge	0.2	SSSI (part), CWS ref. J2.1
19	East Pit	8.1	LNR, SSSI
20	Limekiln Close LNR	2.9	LNR, CityWS ref J3.4
21	Cherry Hinton Hall Bird Sanctuary	2.4	CityWS ref J3.2
22	Logan's Meadow	5.2	LNR, CityWS ref. G6.3
23	Mill Road Cemetery	4.0	CityWS ref G5.1

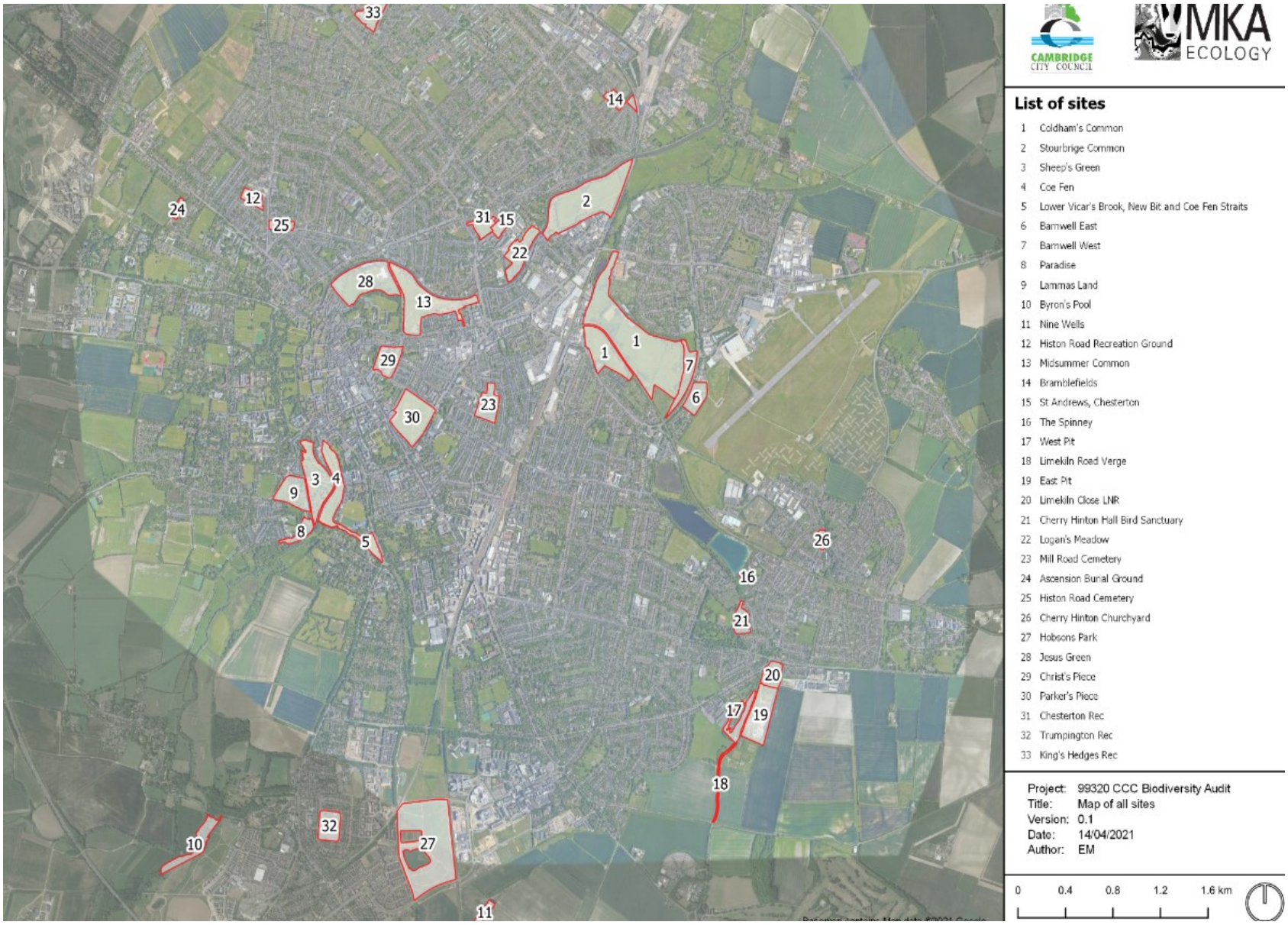
Ref	Site	Area (ha)	Designations*
24	Ascension Burial Ground	0.8	CityWS ref D6.6
25	Histon Road Cemetery	1.4	None
26	Cherry Hinton Churchyard	1.1	CityWS ref. J4.7
27	Hobsons Park	25.8	None
28	Jesus Green	11.7	None
29	Christ's Piece	4.1	None
30	Parker's Piece	9.6	None
31	Chesterton Rec	2.3	None
32	Trumpington Rec	4.1	None
33	King's Hedges Rec	3.9	None
	Total	**209**	

* SSSI - Site of Special Scientific Interest (biological); LNR - Local Nature Reserve; CWS - County Wildlife Site; CityWS - City Wildlife Site. Reference numbers quoted where relevant.

2.4. Wider application of methodologies and links with Biodiversity Strategy

This Biodiversity Audit is intended to provide evidence to support the Cambridge Biodiversity Strategy. It provides an overview of baseline biodiversity across Cambridge and highlights opportunities for improvement, be this through improving the condition of existing habitats or through habitat restoration or creation. The Biodiversity Strategy will outline the responsibility of Cambridge City Council to proceed with these recommendations and to align these objectives within the wider vision for biodiversity within the City.

Figure 1: Location of sites selected for the Biodiversity Audit



3. Methodology

3.1. UK Habitat Classification

The habitat surveys followed the methodology of the UK Habitat Classification (professional) version 1.0 (hereafter UKHab; UK Habitat Classification Working Group, 2018). UKHab works at two levels: a hierarchical primary habitat classification and a list of secondary codes. The primary classification builds on existing habitat and botanical classifications (e.g., Phase 1, NVC). Habitats are described through an increasingly detailed hierarchy until a match is found. The secondary codes provide a list of environmental qualifiers that capture details for a range of other factors (e.g., hydrological regime, management etc). A given primary habitat area may have many secondary codes attached.

Some modifications to the UKHab were made as follows:

- Amenity grassland was categorised separately as 'g4a', a level 4 code of 'g4 - modified grassland'.
- Native hedgerows were categorised according to the more detailed Biodiversity Metric habitat label (see below). A level 5 hierarchy was created under the existing level 4 code 'h2a - Priority hedgerows' to reflect the differing features that hedgerows might contain in combination:

    - Association with a bank or ditch.
    - Species richness.
    - With/without trees.

Incidental plant species lists were gathered for each habitat and distributions of species estimated (using the DAFOR scale; **D**ominant, **A**bundant, **F**requent, **O**ccasional and **R**are). Full botanical inventories were not feasible within the scope of this work. Botanical lists are provided as a separate appendix to this Biodiversity Audit.

3.2. Biodiversity Metric

Measureable baseline biodiversity

The Defra Biodiversity Metric 2.0 (Crosher et al., 2019) has been used for this Biodiversity Audit, with certain modifications as detailed in the Appendix. This method uses habitat as a proxy for biodiversity, whereby habitats are assigned the following 'multiplier' scores:

- Distinctiveness: A measure of the type and importance of a habitat. Habitats that are rare and/or support a wide range of species are more distinctive.
- Condition: A measure of the condition of a given habitat type. The condition is assessed according to a suite of criteria described within the methodology below. It should be stressed that condition in biodiversity terms is not to be confused with traditional perceptions of condition or maintenance. A grassland that might be perceived to be well maintained (e.g. regularly mown) is very likely to be in poor condition. Distinctiveness and condition are also not wholly independent. Some of the factors that lead to poor condition grasslands (intensive mowing or grazing) can also lead to a definition as a lower distinctiveness grassland.
- Strategic significance: Any site that possesses a designation, or falls within the Cambridge Nature Network Priority Area, is considered High, those deemed ecologically valuable but without designation are considered Medium, and those with limited ecological value and no designation are classed as Low.
- Connectivity: This was not assigned as a variable during the Cambridge Biodiversity Audit since it was rarely applicable for most habitat types and will not appear in version 3.0 of the Metric, which is due for release in the summer of 2021. Connectivity will therefore not feature in all future audits using this methodology.

These factors are then multiplied to the area (for habitat parcels) or length (hedgerows, lines of trees) to produce an overall 'biodiversity unit'. Large parcels of habitat or long linear features will score better.

The total number of units is presented for the surveyed areas, each site and by habitat type. Indications of how many units are currently contained within habitats of different conditions are also presented; this will help to indicate the opportunities that might be made to increase measurable biodiversity by improving the condition of existing habitats.

Future biodiversity

In typical development projects, predicted biodiversity units are also calculated and where a 'net gain' in biodiversity is the primary objective. The baseline biodiversity units are compared with the units that are expected to result - the sum of retained, enhanced and created habitats. In the case of predicted habitats, and in addition to the above factors/multipliers, additional 'risk' multipliers are associated with habitat creation or enhancement to reflect the fact that these activities are neither instantaneous (it takes time for habitats to develop and reach a certain condition) nor easy (some habitats are more difficult to create than others). For example, a pond is simple to create and takes little time to establish, whereas creating or enhancing calcareous grassland or woodland is more challenging and may take decades.

This audit focuses on the baseline value of sites. However, four case studies are presented where predicted scenarios of habitat creation or restoration are compared with the present and an overall 'net gain' is calculated. These cases are purely illustrative and are included here to demonstrate how *measurable* change in biodiversity can be achieved. In one case, Logan's Meadow LNR, a real life scenario for habitat restoration is presented.

The methods for calculating the predicted biodiversity units use the Natural England approved calculator tool (Natural England, 2019).

3.3. Condition assessment

Each habitat type was assessed for condition using the methodology outlined in the Defra Biodiversity Metric v2.0 (Crosher *et al.,* 2019a). Habitat condition is defined as either good, moderate or poor by assessment against a suite of condition criteria. A habitat in good condition will meet more of the criteria for good condition and fewer of the criteria for poor condition. A habitat in poor condition will meet fewer of the criteria for good condition and more of the criteria for poor condition. For the purposes of this assessment the interim categories of 'fairly good' and 'fairly poor' were not used because they are not clearly defined within the methodology and may present inconsistencies with future audit assessments. The habitat condition sheets were modified for use in the field and are supplied as supplementary data.

Habitats were therefore divided into parcels based upon their condition and minimum mappable unit of habitat area. Where doubt occurred over how to define a certain habitat parcel, particularly where succession was occurring, the 'target' habitat was chosen. This was particularly common in areas of calcareous grassland that were succeeding to scrub. Generally, these were defined as calcareous grassland in poor condition (scrub being a marker of poor condition).

3.4. Direction of travel

Where previous survey effort has been undertaken at a site, the past and present habitat conditions were compared to assign a direction of travel. In many cases, the primary source of information was the Cambridge City Wildlife Sites Register survey of 2005 (WTBCN & CCC, 2005). Other sources include published condition assessments for SSSIs, management plans or informal records (such as 'BioBlitzes') were used. The direction of travel is defined as stable, improving or declining and is linked to the existing condition (e.g. moderate improving, high declining, moderate stable). It is important to note that for this baseline audit these direction of travel assessment are based on judgement only. For future audits it will be feasible to establish a direction of travel based on evidence from the condition assessments.

3.5. Designated site review

The habitats and species at each site is compared against existing Designated Site criteria. These criteria naturally focus on County and City Wildlife Sites, though sites with higher levels of designation are also present within the audit (e.g., Cherry Hinton Pit SSSI). These reviews identify where existing designated sites may be failing these criteria (e.g., through a reduction in grassland indicator species), need an update (e.g., through the presence of species not previously recorded) or require further targeted surveys. Sites without designation are also evaluated against these criteria and proposals for additional survey effort or management to help achieve designation are made.

3.6. Management plan review

For each site a review was made of existing management plan objectives and operations and a brief summary of these is presented. Objectives or operations that are being met or undertaken and/or failed are highlighted.

3.7. Future risks to conditions

Following a review of the condition of habitats at each site, a list of risks to their existing or potential status is presented. Many of these are repeated and feature repeatedly, e.g., ‘impact of recreation, especially dog-walking’.

4. Results

4.1. Sites

Individual reports for each site are presented in Appendix 2. A total of 1358 area and 125 length biodiversity units were calculated for all sites. Because biodiversity units include the size (area or length) of the habitats, it is the larger sites that inevitably have more biodiversity units. Hobson's Park and Coldham's Common are the two largest sites within the survey and consequently have the most units. Together, these two sites alone account for 38% of the biodiversity of the sites surveyed.

Sites with a relatively high number of biodiversity units for their size indicate the presence of high distinctiveness habitats and/or habitats in good condition. For example, the sites associated with the Cherry Hinton Chalk Pits are among the more moderately sized sites (1-4 hectares) but are ranked in the top eight in terms of area units. Here, the presence of woodland and/or calcareous grassland in good condition makes these very valuable sites. By contrast, some larger sites that rank less well (e.g., Midsummer Common, 6.6ha and 29 area units) highlight the presence of low value and poor condition modified grassland habitat.

Table 2: Summary of biodiversity units (areas and lengths) for the 33 surveyed sites

Site	Area Units*	% Total area units	% Total survey area	Length Units**	% Total length units	% Total survey length
Hobson's Park	263.1	19.4	12.4	3.2	2.6	5.4
Coldham's Common	251.2	18.5	19.8	28.4	22.7	10.5
East Pit	109.7	8.1	3.9	-	-	-
Byron's Pool	80.3	5.9	2.1	3.6	2.9	1.2
Stourbridge Common	60.6	4.5	9.3	10.2	8.1	9.2
Limekiln Close LNR	53.8	4.0	1.4	-	-	3.1
Sheep's Green	50.8	3.7	4.2	0.8	0.7	0.6
West Pit	50.0	3.7	1.5	3.6	2.9	1.4
Barnwell West	44.3	3.3	1.9	-	-	-
Mill Road Cemetery	41.7	3.1	1.9	-	-	-

Site	Area Units*	% Total area units	% Total survey area	Length Units**	% Total length units	% Total survey length
Paradise	39.1	2.9	1.0	-	-	-
Cherry Hinton Hall Bird Sanctuary	36.4	2.7	1.1	-	-	-
Logan's Meadow	35.5	2.6	2.5	2.9	2.3	3.3
Barnwell East	29.4	2.2	1.6	1.1	0.9	0.8
Midsummer Common	29.3	2.2	6.6	7.6	6.0	7.6
Bramblefields	27.3	2.0	1.0	0.1	0.1	0.1
Jesus Green	24.1	1.8	5.6	14.6	11.6	12.9
Parker's Piece	18.8	1.4	4.6	5.5	4.4	4.7
Coe Fen	17.9	1.3	3.2	0.6	0.5	0.4
Nine Wells	16.0	1.2	0.6	4.3	3.5	2.5
Lammas Land	9.7	0.7	2.6	3.8	3.0	2.6
King's Hedges Rec	9.5	0.7	1.9	2.8	2.3	2.7
St Andrews, Chesterton	8.0	0.6	0.5	3.8	3.0	2.8
Trumpington Rec	7.1	0.5	1.9	2.8	2.3	4.4
Christ's Piece	6.9	0.5	2.0	5.8	4.7	5.0
Lower Vicar's Brook, New Bit and Coe Fen Straits	6.8	0.5	1.2	-	-	-
Ascension Burial Ground	6.2	0.5	0.4	4.4	3.5	3.1
Histon Road Recreation Ground	5.6	0.4	0.9	0.7	0.6	4.4
The Spinney	5.6	0.4	0.3	0.5	0.4	0.7
Histon Road Cemetery	5.2	0.4	0.7	1.0	0.8	2.7
Chesterton Rec	4.7	0.3	1.1	0.8	0.7	1.2
Cherry Hinton Churchyard	2.2	0.2	0.5	1.2	0.9	0.8
Limekiln Road Verge	1.5	0.1	0.1	11.0	8.8	6.0
Totals	**1365**			**125**		

* In descending order of area biodiversity units

** No units refers to an absence of linear features, rather than that those present have no value.

4.2. Habitats and conditions

The City of Cambridge supports a number of Priority Habitats which are listed as Habitats of Principal Importance on Section 41 of the Natural Environment and Rural Communities Act (2006). Within the 33 surveyed sites, the following were identified:

- Lowland calcareous grassland
- Lowland beech and yew woodland
- Wet woodland
- Lowland mixed deciduous woodland
- Wood-pasture & parkland
- Ponds
- Eutrophic standing water (ditches)
- Rivers & streams (including chalk streams)
- Hedgerows
- Reedbeds

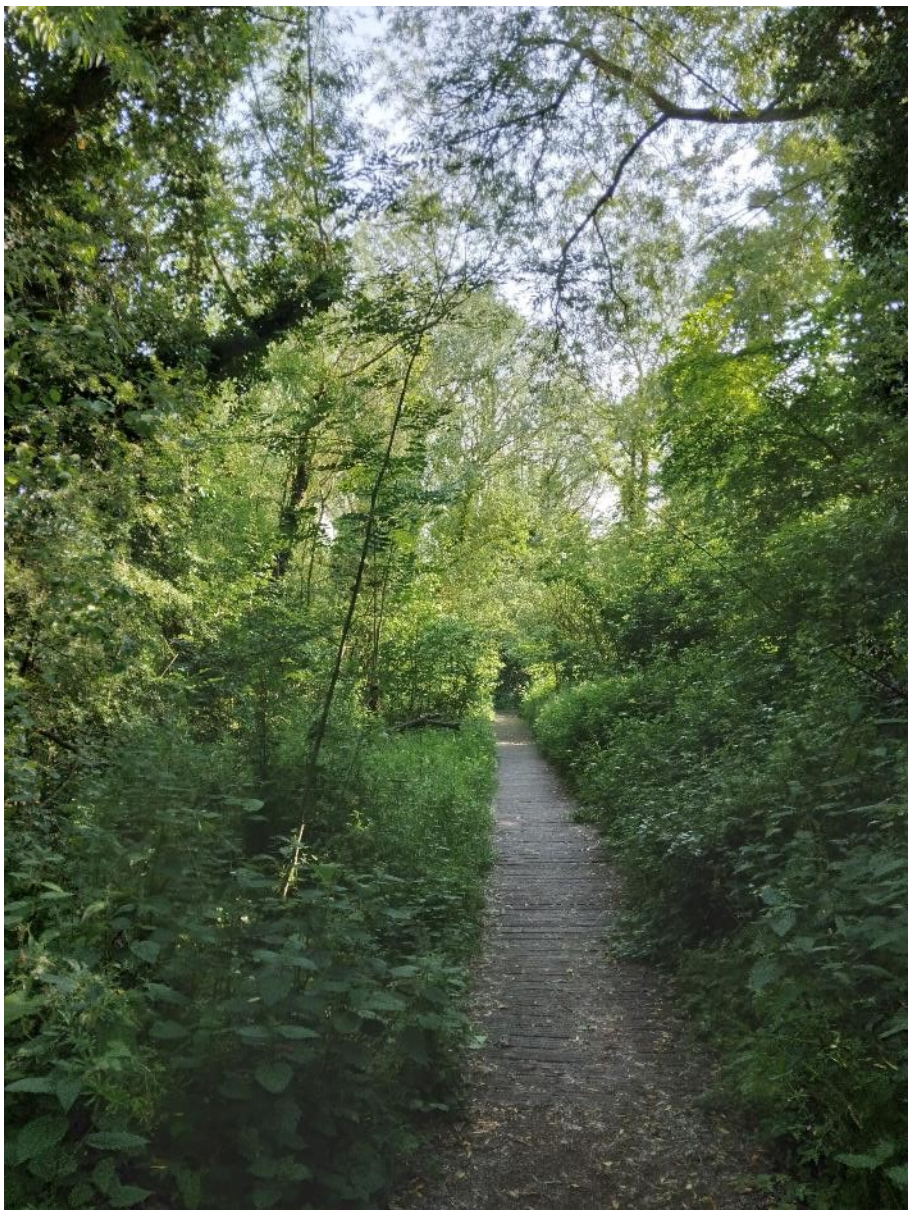
Woodland provides the most biodiversity units among the habitats found within the surveyed sites, accounting for 32% of the total. Neutral grasslands (all *Arrhenatherum* neutral grassland) are the second most productive accounting for 21%. That woodland provides more biodiversity units than neutral grassland reflects the fact that these are, for the most part, higher distinctiveness (i.e., more valuable) habitats, rather than being due to a difference of condition - approximately 14ha of each habitat type are in good condition. That said, 50% of the biodiversity units associated with neutral grassland is contained within Hobson's Park alone, where 14 hectares of good condition grassland gives rise to 194 units. The higher woodland category also includes 'Wood pasture and parkland'; a unique habitat defined more by structure (veteran trees often in grasslands) than botanical composition and found across Sheep's Green.

The largest areas of habitat within the surveyed sites are modified and amenity grasslands. Many of the sites surveyed are large recreational areas (Pieces and recreation grounds) or Commons which are dominated by these highly managed and therefore low value and poor condition habitats. By contrast, a smaller area of habitat that nevertheless provides a relatively high proportion of the total is found in lowland calcareous grassland, a high distinctiveness habitat. However, when compared to scrub, a medium distinctiveness habitat, there is little difference in the total units, despite occupying a similar area. This can be attributed to the fact that nearly 65% of

the total area of calcareous grassland is in poor condition (with 29% in good condition), whereas only 18% of scrub is in poor condition, (52% good). Figure 2 shows the number of biodiversity area units per hectare. This shows the location of distinctive and/or good condition habitats. Unsurprisingly, it is the designated sites with more valued habitats that score more highly on this area-independent measure (darker green).

Hedgerows and tree lines give approximately equal biodiversity value. That hedgerows provide relatively greater value for their length is a reflection of the fact that hedgerows of different types (there are eight categories within the audit) have different distinctiveness values. Those associated with banks or ditches and/or with trees or being species rich are more valuable. Lines of trees, by contrast, are all considered low distinctiveness habitats (see Appendix 1).

Wood pasture at Sheep's Green



Wet woodland habitats at Paradise

Tree lines at Jesus Green

Scrub habitats at Sheep's Green

Wildflower planting at Jesus Green

Figure 2: Biodiversity units per hectare for each site, darker sites are those with more distinctive habitats in better condition

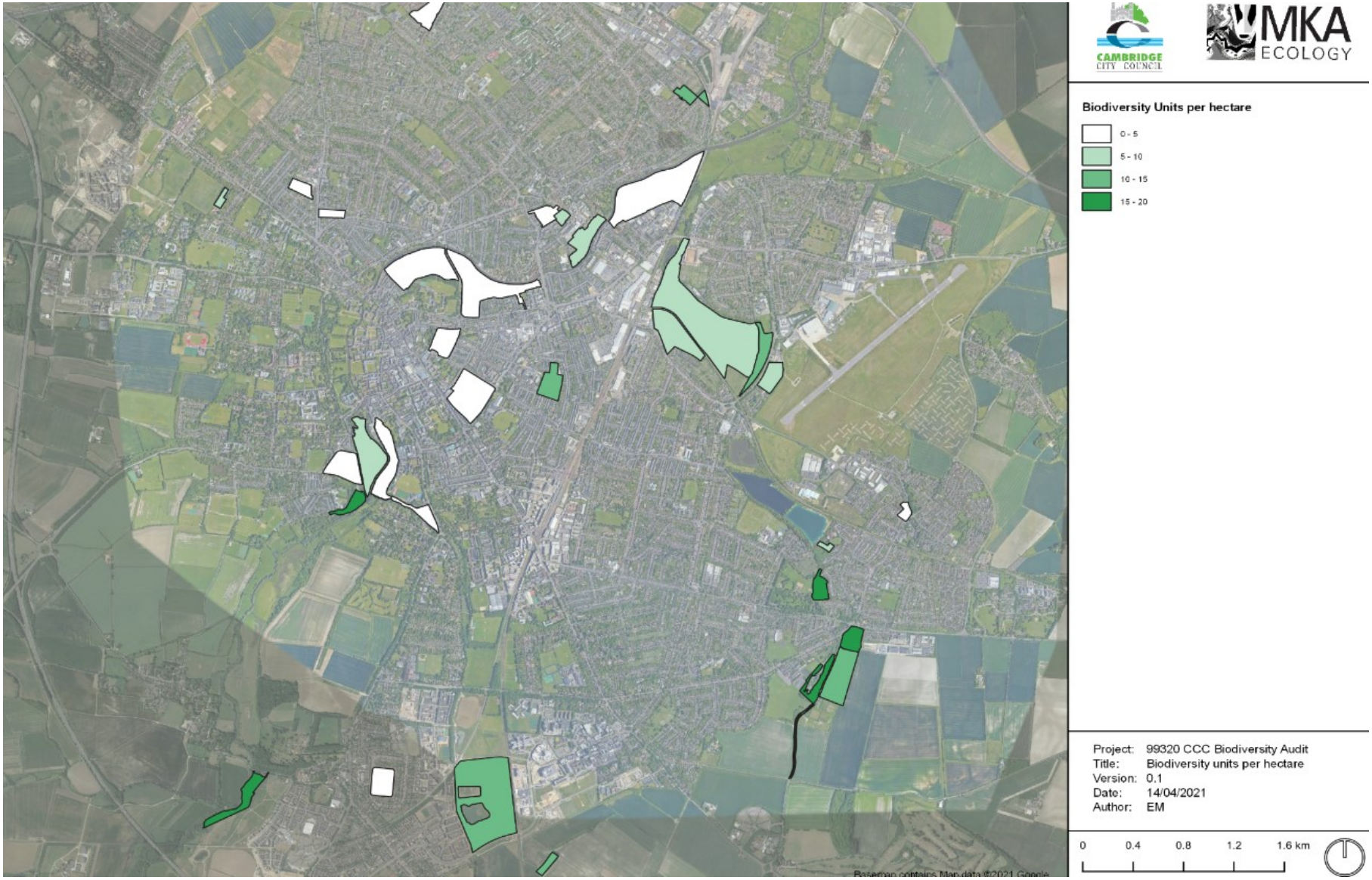


Table 3: Summary of the total biodiversity units of area-based habitats

Habitat type	Distinctiveness	Total area units	Total area (ha)	% Total area units	Condition	Area units	Area (ha)
Woodland*	High/Medium	436.6	32.8	32.2	Good	286.9	14.7
					Moderate	93.3	8.9
					Poor	56.5	9.3
Grassland - other neutral	Medium	383.3	40.1	28.2	Good	194.9	14.1
					Moderate	137.9	15.0
					Poor	50.5	11.0
Grassland - lowland calcareous	High	144.3	12.7	10.6	Good	77.5	3.7
					Moderate	9.9	0.7
					Poor	57.0	8.3
Scrub	Medium	142.3	13.3	10.5	Good	95.3	6.9
					Moderate	35.7	3.9
					Poor	11.2	2.5
Grassland - modified	Low	114.7	49.0	8.4	Moderate	6.0	1.4
					Poor	108.7	47.6
Grassland - amenity	Low	91.3	42.2	6.7	Poor	91.3	42.2
Ditches/channels**	Medium/High	24.3	3.2	1.8	Good	3.4	0.2
					Moderate	14.8	1.6
					Poor	6.1	1.3

Habitat type	Distinctiveness	Total area units	Total area (ha)	% Total area units	Condition	Area units	Area (ha)
Ponds	High	10.4	0.6	0.8	Good	6.6	0.3
					Moderate	3.3	0.2
					Poor	0.5	0.1
Wildflower	Medium	4.4	0.5	0.3	Good	0.7	0.0
					Moderate	3.6	0.4
					Poor	0.1	0.0
Urban***	Low/Very Low	4.3	13.9	0.3	Moderate	3.3	0.7
					Poor	1.0	0.5
Rock/scree	Medium	1.7	0.3	0.1	Moderate	0.8	0.1
					Poor	0.9	0.2
Reedbeds	High	0.6	0.1	<0.1	Moderate	<0.1	<0.1
					Poor	<0.1	<0.1

* High distinctiveness, except for 'Urban woodland' and 'Other broadleaved woodland'.

** Ditches are Medium, but includes a small (~400m2 area of reedbed associated with Coldham's Brook)

*** Only vegetated urban habitats (shrubs etc) score Low.

Table 4: Summary of the total biodiversity area units of different conditions

Condition	Area units	Area (ha)	% Total area units
Good	665.6	40.1	49.0

Condition	Area units	Area (ha)	% Total area units
Moderate	309.0	33.0	22.7
Poor	383.6	123.0	28.3

Table 5: Summary of the total biodiversity units of length based habitats

Linear Habitat	Total length units	Condition	Length units	Total length (km)	% Total area unit
Ditch/channel	2.6	Poor	2.6	0.6	2.1
Hedgerow	58.8	Good	43.0	3.4	34.3
		Moderate	14.4	2.2	11.5
		Poor	1.4	1.0	1.1
Tree line	63.9	Good	37.6	5.7	30.0
		Moderate	21.2	4.8	16.9
		Poor	5.1	2.3	4.0

4.3. Types of site

It comes as little surprise that Designated Sites (of all types) account for the overwhelming majority of the biodiversity units measured in this audit. As well as being, by definition, in high strategic locations, they also tend to contain more distinctive habitats, though not always in better condition. Cemeteries and churchyards contain a great deal more area units for their size. Whilst this can partly be attributed to their generally higher strategic value (many City cemeteries are also City Wildlife Sites), they also generally contain grassland managed in a more favourable condition. It serves to highlight that a considerable amount of biodiversity can still be contained within a relatively small space.

Table 6: Summary of the total biodiversity units within different types of site

Site type	Area units*	Area (ha)	Length units*	Length (km)
Designated sites	966.7	136.2	84.2	67.2
Recreation grounds	26.8	12.1	7.3	5.8
Pieces	59.4	30.9	29.7	23.7
Cemeteries/churchyards	63.4	8.3	10.4	8.3

* Different types of sites are not mutually exclusive; many cemeteries are also City Wildlife Sites

4.4. Themes

A number of recurring themes and observations can be highlighted. These serve to explain some of the patterns observed above, as well as highlight areas of opportunity and challenges for the future.

1. Over half of the surveyed area is in poor condition. Much of that stems from the inevitable association between amenity or modified grassland and poor condition found at many of the larger sites (recreation grounds and Pieces). However, it also provides a huge opportunity for a combination of habitat enhancement (improving condition) and/or restoration (recreating habitats). The results of large scale habitat creation and enhancement at Hobson's Park are evidence of this (though see below).

Modified grassland habitats at Midsummer Common

2. Whilst larger sites contain more measurable biodiversity, the concentration of the measured biodiversity in a small number of sites is a far less resilient approach. For example, 194 units (50%) of all biodiversity associated with neutral grassland across all sites is contained within the grassland areas in good condition at Hobson's Park. A failure in management of that single site, for whatever reason, would have a significant impact on the total biodiversity under the control of the City Council.
3. Almost all of the sites surveyed are popular venues for recreation. Whilst the future impacts of Covid cannot be properly known, anecdotal observations in 2020 indicate that more people will be more inclined to use green spaces closer to them. Recreational pressure was both a constraint for many of the habitats surveyed; some will never achieve more than moderate condition (e.g., woodlands at Logan's Meadow), or a risk; some areas may decline in condition if recreational pressure increases. To further exacerbate this, there is growing evidence (e.g., PFMA, 2021) that dog ownership has risen and will

continue to rise as a result of the pandemic. Impacts from dogs and dog-walking, such as trampled vegetation and areas with excessive nutrients, were all too evident during the surveys and poses a particular risk to grasslands. An example of this is seen at Hobson's Park; here, neutral grassland along an 'unofficial' walking route was in visibly poorer condition to a neighbouring area within the centre of the site. The increased frequency of dogs off leads presents a serious threat to ground nesting bird species at a number of sites, such as Mill Road Cemetery or Byron's Pool. At Sheep's Green, "the rush" fish pass was in notably worse condition south of Fens Causeway where children used it as a paddling pool compared to north of the road. The grassland also suffers at this site, with the northern part of Sheep's Green comprising nearly entirely of perennial rye-grass where it is a busy location for residents and visitors. Although the woodlands at Byron's Pool and Paradise are classed as good condition, they are showing signs of recreational damage with bonfire/BBQ damage and expanding pathways which could lead to a deterioration in condition over time.

4. Despite the fact that Cambridge is a city founded upon a river, and many of the sites surveyed occupy relatively large areas within the Cam's floodplain there is very little genuine wetland habitat. There is undoubtedly a huge opportunity to restore some of the floodplain to wetland, particularly with ongoing concerns of climate change and flood management, particularly in intensive storm events.
5. Several of the areas of woodland surveyed were in either poor or moderate condition on account of the lack of fallen or standing deadwood. This was particularly evident in areas formerly described as scrub and/or in plantations. Selective felling and retention of arisings *in situ* in a number of sites will have multiple benefits: As well as improving the condition of the woodland, there will be an increase in the volume of deadwood for invertebrates; increasing the structural diversity of habitat; greater opportunities for ground flora.
6. Some sites (e.g., Barnwell West, Barnwell East, Mill Road Cemetery and Bramblefields), habitat succession from grassland to scrub or scrub to woodland is evident. In many cases, deciding how to manage these habitats may not necessarily be all about choosing the most distinctive/'numerically valuable' habitats: maintaining a mosaic of scrub and calcareous grassland

may still be preferable over just calcareous grassland. Priority Species-specific management aims still need to be considered.

7. Grazing has a long history in Cambridge and is part of the quintessential and unique landscape achieved in the City. However, over-grazing is a problem in several sites (most notably on Coe Fen, Midsummer Common and Stourbridge Common) where sadly the expected improvement in species diversity of the grassland from grazing has not occurred, and other issues such as poaching in ditches and streams are now present. Achieving a balance between the benefits of grazing whilst prioritising grassland species diversity is key to improving the condition of these sites.

Grazing cattle at Sheep's Green

Examples of recreational pressures on habitats

5. Opportunities and what the City Council could achieve

5.1. Principles

A number of opportunities to increase the biodiversity of the surveyed area present themselves. Two general principles can be considered:

- Enhance, through the improvement of the *condition* of an area of habitat - *a measurable change.*
- Restore (or, if necessary create from scratch), new habitat - *a measurable change.*
- Install features of value to individual species or species groups - *non-measurable change.*

Recommendations specifically for the assessed sites are made, however, these could easily be applied across a much larger number of sites which Cambridge City Council manage or own. A simple example would be more sensitive management of grass verges (with cut and collect at appropriate times of year) which Cambridge City Council manage on behalf of the County Council.

Enhancement

Many of the habitats defined in the audit are in poor condition. By way of a simple example, if one were to take all the poor quality lowland calcareous grassland (8.3ha) within the surveyed sites and enhance them to a moderate quality, there would be a change from 57.3 units to 68.3 units, a 19% increase (at least for these habitat types in isolation). Whilst calcareous grassland is spread across a number of sites, with potential for a number of competing management requirements, when one considers that 81% (6.75 ha) of this grassland/condition combination is present at one site - Coldham's Common - it becomes apparent that significant gains can start to be made.

In many cases, enhancements can be made relatively easily and should be determined in the first instance reference to the condition assessment criteria. For example, many poor condition grasslands are defined as such due to the presence of a frequent mowing regime or physical damage. In some cases, simply reducing mowing frequency and adopting good practice guidelines (e.g., Plantlife's Road Verge management guidelines; Bromley *et al.,* 2019). Other, potential City-wide increases in biodiversity through enhancement are listed in Table 7.

Areas of reduced mowing at Jesus Green

Restoration/creation

A series of Case Studies is presented below to illustrate some of the principles of habitat creation or restoration. Very often, measurable results can be improved by opting for habitat enhancement, rather than habitat creation from a 'blank canvas'.

The Metric imposes less stringent multiplier values (i.e. 'risk factors') on the former method.

In some cases, habitats that are created cannot be measured in the way that the area or length based features can be. These 'value added' features are nevertheless important to include within scenarios of biodiversity enhancement. These have recently been described in the City Council's 'Biodiversity Toolkit' and some examples are provided below.

Table 7: Scenarios of large-scale habitat enhancement

Scenario	Current Units	Potential Units	% Increase	Notes
All (8.3ha) calcareous grassland in poor condition to moderate	57	68.3	20	80% of this scenario could be met at one site Coldham's Common
50% (5.5ha) of all neutral grassland from poor to moderate condition	50.5	68.3	35	63% of all neutral grassland is also at Coldham's Common
25% (10.5ha) of all amenity grassland to wildflower (assuming poor condition)	91.3	112	23	The potential value of adding wildflower areas to Recreation grounds and Pieces
50% (9.3ha) of all woodland in poor condition to moderate	56.5	62	10	Woodland enhancement is more difficult and takes time.

Scenario	Current Units	Potential Units	% Increase	Notes
50% (4.5ha) of all woodland in moderate condition to good	93.3	101	8	Woodland enhancement is more difficult and takes time.
50% (1.94km) of all native hedgerows in moderate condition to good.	14.4	16	11	Hedgerows often fail to reach good condition due to the quality of the ground 1-2m from the hedgebase alone.

5.2. Biodiversity toolkit

In 2021, Cambridge City Council published a 'Biodiversity Toolkit' (CCC, 2021) which provides a guide to land managers and community groups on how to build, install and manage features for the benefit of wildlife. The features within the toolkit can be broadly categorised as follows:

- Habitats: Areas of new habitat that can be physically created (e.g., digging a new pond) or allowed to exist by relaxation or change of management (nettle or bramble patches, rough grassland). These habitats, if included within a proposal for a site will contribute to a measurable change in biodiversity as they can have an area or length.
- 'Value added features': Other features (bird boxes, bee banks etc) are too small or aren't subject to the same rules as habitats. As such, they won't be included in any formal biodiversity account. However, their inclusion is vital in an overall narrative of achieving biodiversity net gain. What is more, they are almost always simple to create. Some examples of those commonly recommended in this audit are included below:

Examples of 'biodiversity features' from the Cambridge City Council Biodiversity Toolkit:

1. **Bat boxes:** "Artificial roosts designed to encourage bats into areas where there are few roosting sites."
2. **Bee banks:** "Mound of compacted soil kept bare by occasional disturbance, for the benefit of solitary bees, including tawny mining bees. They are also good habitats for pollinator-friendly plants such as viper's bugloss."
3. **Bee hotels (cavity nesters)**: "Structures that mimic the cavities where solitary bees nest."
4. **Beetle towers:** "Collection of logs or wood buried in the ground to encourage the wood to rot, providing a habitat for beetles to lay eggs. For the benefit of wood boring beetles such as Lesser Stag beetle."
5. **Hedgehog habitats**: "Construct or maintain nesting and foraging habitats."
6. **Hibernacula**: A reasonably dry and cool space for creatures to hibernate over winter in safety. For any creature that hibernates including hedgehogs, frogs, newts and toads."
7. **Wood piles (log piles):** "They are also similar to beetle towers which tend to have a larger portion of logs buried in the ground, including uprights."

5.3. Case studies

In order to demonstrate on a more practical level how an increase in measurable biodiversity can be achieved, we present four case studies. With the exception of Case study 2 (Logan's Meadow), these are purely illustrative and are not intended to represent current proposals, though that is not to say that such proposals could not be put forward for consultation in the future. The case studies have been selected to highlight different approaches to increasing measurable biodiversity:

- **Habitat enhancement:** In many cases improving the condition of what is already there will bring about significant gains. Given that condition and distinctiveness are linked in certain habitats, especially grassland, implementing measures to improve conditions will also bring about a more valuable habitat type.
- **Habitat restoration:** There are opportunities, at both small and large scales, to create new or restore historical habitats. From a simple wildlife pond in the

corner of a recreation ground to wholesale wetland restoration along the River Cam, both will have measurable benefits.

Case study 1: Midsummer Common - 'Recreation of an historic waterbody'

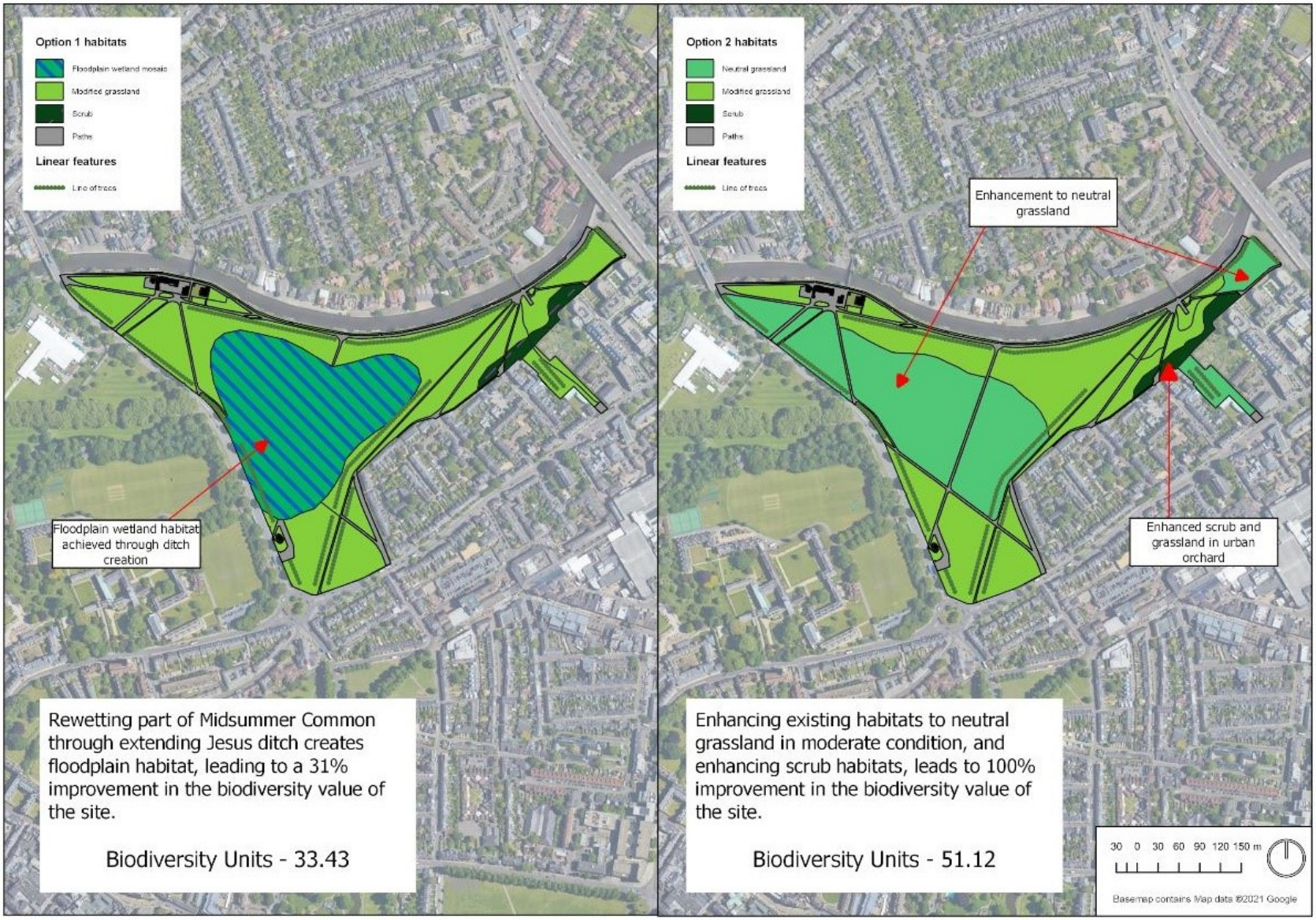
Formerly, Midsummer Common contained drainage ditches that also linked to Jesus Green. Water from Jesus ditch now flows under Victoria Avenue and Midsummer Common before joining the River Cam close to the Fort St George pub. Midsummer Common is currently dominated by grassland which is in poor condition, lacking species diversity and being over-grazed in parts. Sections of the common are also used for events (which have occurred on the common since the 13th Century), leading to grassland damage. Currently, Midsummer Common holds 25.47 biodiversity units, 95% of which is due to the 12 hectares of grassland despite its condition.

Below, we explore the option to restore Midsummer Common to its more historic condition, proposing that natural floodplain mosaic grassland habitat is created on the common as a result of re-exposing the ditch. Creating this habitat leads to an increase by 31% in the biodiversity value of Midsummer Common.

Another option is to improve the current habitats that exist on site, and this achieves a "doubling of nature". Enhancing the grassland in part to neutral grassland in moderate condition, and enhancing the scrub habitats also present on site leads to an increase of 100.72%, from 25.47 to 51.12 units. This doubling in biodiversity units reflects the underlying principle surrounding the Biodiversity Net Gain methodology: that enhancing existing habitats is more achievable, easier, and preferable to habitat destruction and re-creation. This is reflected in the multipliers in the calculator such that creating habitats have an increased 'difficulty' compared to enhancing existing habitats.

These two options demonstrate that enhancing existing habitats can lead to noteworthy increases in biodiversity, when compared to creating new habitats. However, a combination of both options above would likely be additive in effect and lead to a substantial improvement in biodiversity. Finding a balance where both options can be achieved will allow for the restoration of parts of Midsummer Common to its historic floodplain condition, whilst also improving the existing habitats and allowing sections of grassland to remain for events and grazing.

Case study 1: Restoration and enhancement options at Midsummer Common



Case study 2: Logan's Meadow - 'Creation of Priority Habitats in a priority area'

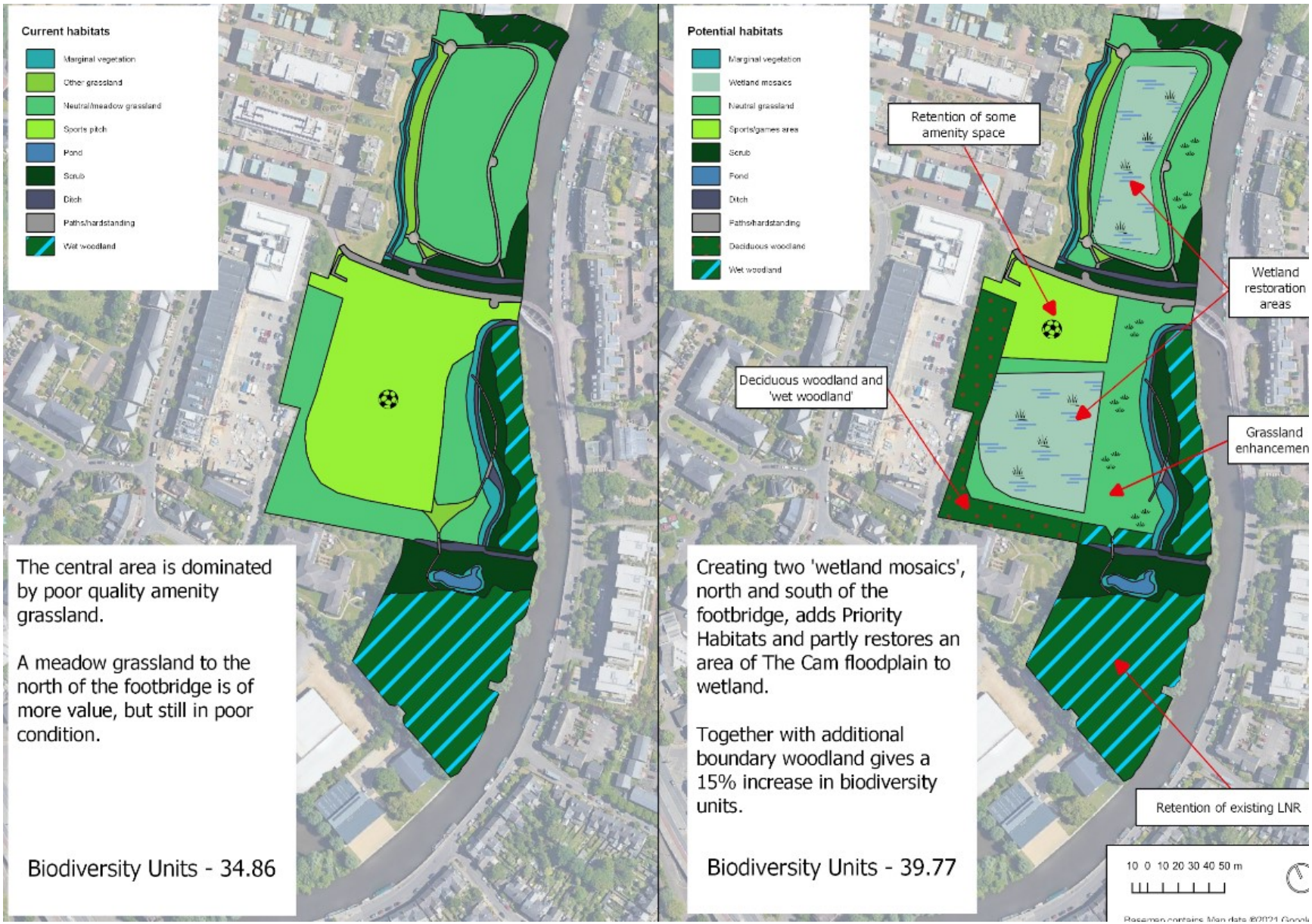
The heart of the proposed extension of the Logan's Meadow LNR involves the creation of two wetland mosaics either site of the footbridge, as well as buffer tree planting along the western boundary to increase the area of wet woodland. Some existing amenity area will be retained. This would see the restoration of part of the River Cam floodplain returned to wetland and an increase in the area of Priority Habitats within the City.

This results in a 15% increase in biodiversity units, rising from 34.86 to 39.77 units. This increase sounds comparatively modest when compared with some of the other cases studies, but it is important to bear in mind that there are risks and difficulties associated with habitat restoration. Whilst woodland and wetland habitats are both considerably higher value habitats than the existing poor quality grasslands, they are difficult to create. The Biodiversity Net Gain methodology accounts for this by applying a 'multiplier' or 'risk factor' for habitats that are more difficult and/or take longer to create.

What is also striking is the starting value of the habitats present. The baseline units of 34.86 (which includes the entire site; the LNR and north and south of the footbridge) is high in part because of the value of the existing habitats (wet woodland, in particular) but because of the location of the LNR. It is said to be in a 'strategic location'; both its status as an LNR and its location in the River Cam Corridor give it extra weight.

The proposals set out in the figure below are indicative and have yet to go through a second round of consultation.

Case study 2: Restoration of wetland habitats at Logan's Meadow LNR



Case study 3: Chesterton Recreation Ground - 'Pocket woodland'

Chesterton Recreation Ground is an area of amenity grassland with playground facilities located in the north east, and provides a walkway between Elizabeth Way and St Andrew's Road. The majority of the site comprises closely mown grassland that is occasionally used for sports. Lines of semi-mature trees occur across the site and there are also mature trees situated in the east. Currently, the site has 5.76 biodiversity units, and would benefit from improved management for wildlife.

Creating a suite of new habitats on Chesterton Recreation Ground leads to a total increase in 32% of the biodiversity value of the site. In particular, there is an opportunity to create a 'pocket woodland' area on the site without compromising the play and sports areas. Pocket woodlands are very small areas of tree planting that can provide value to invertebrates, birds and small mammals as well as sequestering carbon and providing aesthetic interest. Woodland habitat at the site would provide an additional 3.31 biodiversity units, accounting for nearly 40% of the total despite its small area.

In addition, creating a small wildlife pond on the woodland edge would also provide biodiversity benefits, especially for amphibians and invertebrate species. A pond would provide 0.09 biodiversity units.

A small section of seeded wildflower meadow has been planted adjacent to the playground areas at the site. Expanding this section to include the whole area east of the pathway would result in 0.24 units being delivered. In addition, existing areas of amenity grassland that are not heavily used can be enhanced to create neutral grassland, delivering 1.24 biodiversity units. This area of grassland would be less frequently mown and would provide a natural buffer or transition habitat into the woodland.

Case study 3: Chesterton Recreation Ground 'Pocket Woodland' and other enhancements

Case study 4: King's Hedges Recreation Ground - 'Amenity to meadow'

King's Hedges Recreation Ground is a 3.9 hectare area of open space, play facilities and sports' pitches in the north of the City. A popular playground and 'splash pad' are located near to the western entrance and avenues of planted trees surround most of the Site. The majority (64%) of the site is 'amenity grassland', i.e. closely and frequently mown grass with little floristic diversity and used for sport and other activities. These amenity areas are roughly split into northern and southern halves. To the north and on banked boundaries are less intensively managed grassland areas.

By enhancing the northern part of the site alone with the following measures, a 64% percent increase in the measurable biodiversity value of the site could be achieved, rising from 9.48 to 15.54 biodiversity units:

- Conversion of existing amenity spaces and banked areas to a 'neutral grassland' or 'meadow' with initial seeding. This would be managed much less intensively than the existing habitats, with twice yearly cuts and grass removal allowing a greater diversity of plants and micro-habitats for invertebrates. This delivers **10.51 units**.
- Creation of a pond. Ponds are one of the simplest and most effective biodiversity enhancement measures, favouring a range of plants, invertebrates and amphibians: **0.14 units**.
- Creation of additional scrub. Scrub is a really valuable habitat for invertebrates and birds and provides an interface between the pond, meadow and mature trees: **0.53 units**.
- The retained habitats (sports pitches and playground area) would still continue to provide **4.36 units.**

In addition, this 64% gain also acknowledges that these habitats are in a suburban setting and are therefore unlikely to reach peak (i.e. 'good') condition; in this case study, the target conditions of all enhanced habitats are assumed to be 'moderate'.

By changing the target condition of the enhanced meadow areas to 'good', a 94% gain could be achieved.

The measurable increases in biodiversity from habitats at both Chesterton and Kings Hedges Recreation Grounds ignores other, unmeasurable benefits that can be gained from features from the biodiversity toolkit, for example:

- Bird and bat boxes,
- Bee banks (sunny, south facing locations)
- Beetle towers (dead wood in the understorey of the trees).

Case study 4: Enhancement and creation of habitats at King's Hedges Recreation Ground

5.4. Summary of recommendations

A summary of opportunities identified and recommendations made throughout the audit of each site are summarised as follows:

- Grassland:
    - Reduction in the mowing frequency to a bi-annual cut (with regular autumn or winter cuts as required) and collection of cuttings. Given that both grassland type and condition are heavily determined by cutting frequency. This might be the single most effective (and potentially cost saving) measure to employ throughout the City.
    - Reduction, either through restriction (through the presence of 'dog-free areas') or control (enforcement of use of leads or limitation of the maximum numbers) of dog-walking in grassland (and other) habitats.
    - Reduction in numbers of grazing cattle across the Commons to prevent overgrazing of the grassland and to reduce poaching damage especially in areas where water vole are present.
    - Restoration, particularly where large areas of poor condition calcareous grassland already exist (e.g., East Pit).
- Woodland:
    - Increasing the volume of both standing and fallen deadwood. Selective felling of trees within sites will create more structural diversity within woodlands (favouring invertebrates, e.g., butterflies, and woodland ground flora) as well as providing deadwood habitat. 'Veteranisation' of trees (to create more standing deadwood) should also be considered.
    - Limitation/control of damage from recreation (as above).
- 'Meadow creation':
    - The majority of the large, open amenity areas within the City (recreation grounds and Pieces) have huge potential for the sowing of perennial or annual wildflower mixes, as are already present in small pockets.
- Scrub

    - Creation or enhancement of 'scrub islands' (e.g., Barnwells) to improve habitat heterogeneity.
    - Deciding on target habitats particularly in areas of scrub encroachment onto calcareous grassland (e.g., Coldham's Common) and where scrub has aged towards woodland (e.g. Bramblefields) to ensure a balance between habitat heterogeneity and preserving existing habitats.
- Waterways:
    - Enhancement through shade reduction (especially Coldham's Brook).
    - Increase the variability of flow and provide opportunities for aquatic vegetation (Hobson's Brook, Vicar's Brook).
    - Removal of non-native pondweed species (e.g. Coe Fen, Jesus Ditch) and non-native invasive plant species (e.g. Indian balsam at Paradise).
- Wetlands:
    - Several of the sites surveyed are within the River Cam floodplain. Very large areas presently recorded as 'modified grassland' or 'amenity grassland' have potential for the creation of wetland (wet grassland/marshy grassland/fen meadow), in some cases restoring to habitats present in recent historical times (e.g., Midsummer Common).
- Hedgerows:
    - Increase in the width and or quality of undisturbed land at the foot of the hedgerow (or 'margin'). In certain places, reducing the hedgerow width (Limekiln Close Road Verge) will have no negative impacts on the hedgerow value, but would significantly double the value of verge grassland habitat.
    - Increase the height of hedgerows to at least 1.5m at Lammas Land.
- Habitat connectivity and 'resilience':
    - Some sites, particularly those to the south of the City Centre, are relatively isolated (e.g., Nine Wells) or contain a great deal of the surveyed area's biodiversity value (e.g., Hobson's Park). It will be important to both connect these sites and ensure that the measurable biodiversity in the City is not concentrated on a small number of sites.

Several of the recommendations for habitats will naturally also apply to species or species groups of interest. Similarly, a number of the features listed in the site

reports under the 'Biodiversity Toolkit' will reference broad species groups (e.g., bird and bat boxes). Here, and more specific aims that might apply across the City are listed.

- Invertebrates. These will benefit from nearly all habitat enhancement or restoration. In chalk grassland, butterflies will benefit, including many of the 'blues'.
- Plants: A number of species are dependent on the maintenance of as well as species unique to this region and habitat; moon carrot, grape hyacinth and perennial flax.
- Water vole. The creation of and/or restoration of waterways will favour this species, as appears to be the case at Logan's Meadow.
- Grey wagtail. Provision of nesting opportunities, particularly along the series of connected sites along the River Cam and/or where other flowing water exists.
- Swift and house sparrow. Logan's Meadow has gained prominence in Cambridge for its 'swift tower'. Many of the locations surveyed, particularly where buildings are present in many of the cemeteries and churchyards offer ample opportunities for the installation of swift boxes. Swift is a 'Cambridgeshire Species of Additional Interest'. Support is also strong for this species within Cambridgeshire, with a number of projects run by 'Action for Swifts', a campaign group in Cambridgeshire. House sparrow, a Cambridgeshire and Peterborough Priority and Red Listed Species will also readily take to boxes designed for swift.
- Toads: A Cambridgeshire and Peterborough Priority Species and Species of Principal Importance. A species declining in the City and in the wider countryside, it will benefit from a number of the features recommended in the Biodiversity Toolkit: Hibernacula, pond creation, installation of appropriate drainage features ('toad ladders') and dead wood features all benefit toads and other amphibians.

6. Conclusions

The City of Cambridge and land under the control of Cambridge City Council possesses rich havens for wildlife, even within relatively urban and developed areas. A number of Habitats and Species of Principal Importance were recorded during the 2020 surveys and there is a great deal for the City to celebrate in terms of its biodiversity.

There is also a great deal of opportunity; of the 209 hectares covered in this audit, 91 hectares (44%) is given over to large areas of low value amenity or modified grassland in poor condition. Whilst not all of this area can realistically be enhanced or restored - amenity spaces are vital for people for a number of reasons, even the enhancement of a quarter of these areas would see a 25% increase in the value of these areas. Strategically placed, these and other enhancements have the potential to offer a great deal to species in the City. Whilst enhancements to existing grassland could take the form of targeted planting of wildflowers, gains can be made by actually doing less. There is much to be gained by reducing mowing frequency at a number of sites. Grasslands can become more species rich and in better condition, all at a potentially reduced cost of maintenance and freeing up operatives to take on more targeted habitat management work.

There are, however, risks. With an increasing population, much of which are increasingly ‘remaining local’ (either due to personal choice, or through the impact of covid-19), and with the associated increase in pet ownership, many of the habitats within the City are at risk of damage. Managing this and other risks to existing habitats will be as much of a challenge as that of providing new opportunities. The work conducted to date by Cambridge City Council, and their partners, who manage these site should be applauded in that they have retained much of their character and quality to the present day regardless of such pressures. However these threats to condition are only likely to increase over time and therefore continued investment in the management of these sites is required to retain and enhance their biodiversity value.

7. References

Baker, J., Hoskin, R., & Butterworth., T. (2019) *Biodiversity Net Gain. Good practice principles for development. Part A. A practical guide*. CIRIA, London

Bromley, J., McCarthy, B. & Shellswell, C (2019). *Managing grassland road verges*. Plantlife,

Cambridge City Council (2018). *Hobson's Brook Corridor: 10 year vision.* Cambridge City Council, In partnership with Hobson's Conduit Trust. Cambridge.

Cambridge City Council (2021). *Cambridge City Council Parks and Open Spaces: Biodiversity Toolkit.* Cambridge City Council, Cambridge

Countryside PLC, (2011). *Great Kneighton Country Park*. http://www.greatkneighton.co.uk/great-kneighton/country-park.html. Accessed 09/03/2021

Crosher, I., Gold, S., Heaver, M., Heydon, M., Moore, L., Panks, S., Scott, S., Stone, D. & White, N. (2019a). *The Biodiversity Metric 2.0: Auditing and accounting for biodiversity value: technical supplement* (Beta version, July 2019). Natural England

Crosher, I., Gold, S., Heaver, M., Heydon, M., Moore, L., Panks, S., Scott, S., Stone, D. & White, N. (2019b). *The Biodiversity Metric 2.0: auditing and accounting for biodiversity value. User guide (Beta Version, July 2019).* Natural England

ecosulis ltd (201) *Site Wide Nature Conservation Management Plan – Clay Farm* ecosulis ltd,

Hawksley, R. & Mungovan, R. (2020) Greater Cambridge Chalk Streams Project Report Wildlife Trust BCN and Wild Trout Trust.

Natural England (2018) *Defra Biodiversity Metric - Introduction to the Proposed Updated Metric (BD2020-10) Natural England*. Available at: http://publications.naturalengland.org.uk/publication/6020204538888192

Natural England (2019) *The Biodiversity Metric 2.0 auditing and accounting for biodiversity Calculation Tool: Short Guide.* Natural England Joint Publication JP029, Natural England

PFMA (2021). *PFMA Confirms Dramatic Rise In Pet Acquisition Among Millennials* Pet Food Manufacturers Assoc. Accessed 2021-04-09: Available at https://www.pfma.org.uk/news/pfma-confirms-dramatic-rise-in-pet-acquisition-among-millennials-

Queen Edith's Community Forum (2018) *Hobson's Park Bioblitz Records 8th/9th June 2018.* http://queen-ediths.info/get-involved/bioblitz/bioblitz-records.pdf Accessed 10/03/2021

UK Habitat Classification Working Group (2018). UK Habitat Classification – Habitat Definitions V1.0 Available at http://ecountability.co.uk/ukhabworkinggroup-ukhab

WTBCN & CCC (2005) *Cambridge City Wildlife Sites Register*. Wildlife Trusts Beds, Cambs and Northants (WTBNC) & Cambridge City Council (CCC)

8. Appendix

Appendix 1

Modifications to the Biodiversity Net Gain 2.0 methodology.

- Connectivity is ignored for these assessments. It is the understanding of the authors that this factor will be removed from the forthcoming version 3.0 of the calculator.
- Individual trees were not included within calculations (e.g., using the 'Urban Street Tree' habitat type). Either, these were incorporated into 'lines of trees' where appropriate, or were accounted for within the habitat type (e.g., Wood pasture). Also, given that one of the primary roles of this audit is to provide a basis for future wider habitat management and that the value of trees is to be incorporated within the City Tree Strategy, it was agreed that their inclusion would be unnecessary.
- Hedgerows and lines of trees are typically mapped as linear features with biodiversity units using lengths in kilometers. An exception to this rule is used at Limekiln Road Verge. Whilst the site and its habitats are essentially linear, they do have mappable areas and both the verge and associated hedgerow occupied significant areas. For the purposes of presenting biodiversity units within this site, area is used. For habitat- and survey-wide comparisons, the hedgerows are converted to a length.
- Ditches were also variously mapped as either areas or linear features. There are many ditches within the surveyed sites and some wide enough to warrant a mappable area, whereas others, for example where it forms the boundary, could only be mapped as a linear feature. Ditches are therefore included in both area and length calculations.
- All linear water bodies, regardless of their type, are assessed using the 'ditch' condition assessments. It was felt that this was appropriate as:
    - Most linear water bodies within the City are man-made, or at least have a significant human influence.

    - Condition assessments of Rivers require dedicated training and accreditation. Given that this audit is likely to be repeated in the future, it was deemed important to make the methodology as simple as possible, without losing important habitat information.
- The distinctiveness values of 'Lines of trees' can vary according to whether the feature is considered to be 'ecologically valuable'. This assessment can sometimes be made when other supporting evidence is present (e.g., it is a known commuting route for bats). As this supporting evidence was not uniformly present in this audit, all lines of trees are considered as low distinctiveness habitats.
- Churchyards and cemeteries are afforded a separate habitat type within the BNG calculations and is of 'Medium' distinctiveness. This habitat was not used for those sites as future management could only ever be concentrated on condition (the habitat would effectively be fixed). Instead, different (usually) grassland components were divided where possible so as to provide additional information on the type of grasslands present and where enhancement could restore to a higher quality (e.g., neutral or calcareous grassland at Histon Road or Mill Road Cemeteries, respectively).
- Areas of wildflower seed mixtures within amenity spaces are coded under the UKHab and BNG habitat classification as 'c1a6' - Cropland - Arable field margins pollen & nectar. However, the condition assessment was allowed to deviate from 'N/A - Agricultural' as this wasn't appropriate to the setting of these areas. Instead, they took on the condition of the grassland in which they were planted.

Appendix 2

Site reports

Coldham's Common

Results

Site description and status

Coldham's Common is over 40 hectares in size, making it one of the largest areas of green open space in Cambridge. It is located east of the city centre beyond Coldham's Lane, and Cambridge Airport lies to the west. Other areas of greenspace are located nearby, such as Barnwell East and Barnwell West Local Nature Reserves. Coldham's Common has a variety of habitats including woodland, scrub and grassland. There is a large area for playing fields, a BMX track, and other outdoor play or fitness areas. East Main Drain and Coldham's Brook run along the eastern boundary of the site.

The eastern side of Coldham's Common is a Local Nature Reserve and the whole site is designated as a County Wildlife Site. It qualifies for CWS status for neutral grassland (criterion 2c, supporting locally frequent numbers of at least 8 neutral grassland indicator species including 3 strong neutral grassland indicator species) and for habitat mosaic (criterion 5a, a site >10ha which supports three habitat features in close association, at least one of which is of or approaching CWS standard).

This site lies within the River Cam Corridor Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets)
g2a Lowland calcareous grassland
g3c Other neutral grassland (59 Cattle grazed)
g3c5 Arrhenatherum neutral grassland (16 Tall herb)

g4 Modified grassland (16 Tall herb, 510 Sports pitches, 600 provision for play and fitness, 610 Children's play space)

Description

Grassland varies much in its structure and composition across the site.

g2a Lowland calcareous grassland: Calcareous grassland is found in the area known as "the triangle" south west of the playing fields. This is species rich tussocky grassland with anthills, that has not been grazed or machine mown for many years. A variety of grassland indicator species are found here, including fairy flax *Linum catharticum*, ploughman's-spikenard *Inula conyzae* and spiny restharrow *Ononis spinosa.* Calcareous grassland is also found on the large chalk mound rifle butt in the eastern part of the site. This is now surrounded by scrub which is gradually encroaching onto the mound. The remainder of the eastern meadow is also calcareous grassland with frequent lady's bedstraw *Galium verum,* but also contained patches of common nettle.

g3c Other neutral grassland: South of the railway line, cattle grazed neutral grassland is present. This has a shorter sward but still retains neutral grassland characteristics.

g3c5 Arrhenatherum neutral grassland: Neutral grassland occurs in the common land west of Abbey Pool. This grassland has frequent false oat-grass *Arrhenatherum elatius* and is kept to a moderate sward height of 30-40cm. North of the triangle area, just south of the railway bridge, is an area of rank grassland completely dominated by common nettle *Urtica dioica*.

g4 Modified grassland: The playing fields are amenity grassland, closely mown and with a dominance of perennial rye-grass *Lolium perenne.* Grassland to the north of the site is dominated by tall fescue *Schedonorous arundinaceus* and lacks significant neutral grassland indicator species.

Condition

g2a Lowland calcareous grassland: The large expanse of lowland calcareous grassland is in poor condition due to the presence of nettles and thistles, poor floristic diversity, the regular mowing resembling amenity grassland, and the fact that the majority of condition criteria were failed. The areas of lowland calcareous

to the west are of moderate and good condition due to the increased floristic diversity and are clearly managed in a more sympathetic manner.
g3c Other neutral grassland: Poor condition largely due to low floristic diversity, close grazing and also high percentage of ryegrass.
g3c5 Arrhenatherum neutral grassland: Moderate condition due to lower floristic diversity but also low levels of ryegrass. A small areas is in poor condition dues to the high density of undesirable species (common nettle).
g4 Modified grassland: Poor throughout due to regular mowing and poor floristic diversity.

Woodland and forest

UKHabs habitat types present (secondary codes in brackets) **w1g6 Line of trees** **w1g7 Other broadleaf woodland types**
Description Woodland exists in small pockets scattered across the site. **w1g6 Line of trees:** Present around the play area to the west, off Coldham's Lane. Species include aspen *Populus tremula*, white willow *Salix alba*, lime *Tilia cordata x platyphyllos (T. x vulgaris)* and ash *Fraxinus excelsior*. **w1g7 Other broadleaf woodland types:** The largest areas are on the south west boundary of the playing fields, where two pockets of mature woodland are situated. Planting lines of the trees can still be seen in places, giving the woods a semi-natural impression. There is moderate species diversity including ash, Italian alder *Alnus cordata*, lime and Norway maple *Acer platanoides.* In addition, smaller planted areas exist south of the railway lines in the cattle grazed common land.
Condition **w1g6 Line of trees:** Good condition due to absence of gaps and mature trees. **w1g7 Other broadleaf woodland types:** Generally in moderate condition with the exception of the small areas south of the sport's pitches which are in good condition. The areas of moderate woodland are classified as such due to the lack of falling or standing deadwood and a poor diversity in age structure.

Heathland and scrub

UKHabs habitat types present (secondary codes in brackets) **h2a6 Native hedgerow associated with bank or ditch** **h2a11 Native species rich hedgerow with trees** **h3h Mixed scrub (11 Scattered trees)**
Description Distributed sparsely throughout the site. **h2a6 Native hedgerow associated with bank or ditch:** This provides the boundary between the sport's pitches and expanse of calcareous grassland. **h2a11 Native species rich hedgerow with trees:** Present alongside the railway and western perimeter. Comprising a good range of woody species including hawthorn, blackthorn, ash and field maple. **h3h Mixed scrub:** Scrub occurs in a large stand on the eastern boundary of the site, around the perimeter of the main meadow. This scrub has become very mature and in places has a structure more typical of woodland with a distinct canopy of hawthorn and understorey dominated by ivy *Hedera helix*. Younger scrub surrounds the grassland at "the triangle" and hides the railway line from view. This scrub has frequent bramble sp. *Rubus fruticosus agg.* and in the southern corner has started to encroach onto the calcareous grassland. Scrub is also situated just south of the East Main Drain on the north east boundary of the site. This scrub is mature and has a natural scalloped edge grading into tall herb grassland.
Condition **h2a6 Native hedgerow associated with bank or ditch:** Moderate condition due to the number of gaps in the hedgerow and the disturbed ground surrounding it on either side. **h2a11 Native species rich hedgerow with trees:** These hedgerows meet all the condition criteria and are therefore considered to be in good condition. **h3h Mixed scrub:** The scrub is typically in good condition throughout the site with the exception of one area close to the BMX track which is in moderate condition due to the prevalence of common nettle.

Wetland

UKHabs habitat types present (secondary codes in brackets) **f2e Reedbeds**
Description **f2e Reedbeds:** There is a small area of reedbeds east of the BMX park adjacent to the drain and Coldham's Brook on the north east boundary of the site,. This was mainly comprised of common reed *Phragmites australis* but the area as a whole did not have a high water level.
Condition **f2e Reedbeds:** Classified as poor condition as it fails the majority of the condition criteria for general wetlands, however performs functions as reedbed.

Urban

UKHabs habitat types present (secondary codes in brackets) **u1b6 Other developed land (500 Outdoor sports facilities, 612 Children's play space; non-permeable)** **u1d Suburban mosaic developed/natural surface (73 Bare ground, 580 Other recreational)**
Description **u1b6 Other developed land:** Present in the form of car parking, paths and hard sports pitches. **u1d Suburban mosaic developed/natural surface:** An interesting mosaic of habitats associated with BMX track comprising bare ground (with a mix of substrates including chalk), ephemeral vegetation and also scrub.
Condition **u1b6 Other developed land:** n/a **u1d Suburban mosaic developed/natural surface:** The BMX track was assigned moderate condition as the value to multiple species and invertebrates could not be proven and suspected not to be the case due to disturbance.

Rivers and lakes

UKHabs habitat types present (secondary codes in brackets) **r2b Other rivers and streams**
Description Comprising Coldham's Brook running alongside the allotments and the football stadium and the brook feeding into Barnwell Lake. **r2b Other rivers and streams:** The brook feeding into Barnwell Lake is species poor but Coldham's Brook contains a variety of aquatic species including meadowsweet *Filipendula ulmaria*, reed sweet-grass *Glyceria maxima*, water plantain *Alisma plantago-aquatica* and purple loosestrife *Lythrum salicaria*.
Condition **r2b Other rivers and streams:** Coldham's Brook is in good condition due to the good water quality, marginal vegetation and absence of poor quality indicators. The brook feeding Barnwell Lakes is of poor quality due to the lack of aquatic vegetation and heavy shading.

Priority habitats

The following Priority Habitats are present at this location;

- Lowland calcareous grassland
- Hedgerow
- Reedbed
- River and streams


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Habitats
f2e - Reedbeds
g2a - Lowland calcareous grassland
g3c - Other neutral grassland
g3c5 - Arrhenatherum neutral grassland
g4 - Modified grassland
h3h - Mixed scrub
r2b - Other rivers and streams
u1b6 - Other developed land
u1d - Suburban/mosaic of developed/natural surface
w1g7 - Other broadleaved woodland types
Linear features
h2a6 - Native Hedgerow - associated with bank or ditch
h2a11 - Native Species Rich Hedgerow with trees
w1g6 - Line of trees
Target notes/trees
Target Note
Project: 99320 CCC Biodiversity Audit
Title: Coldham's Common - habitats
Version: 0.1
Date: 23/02/2021
Author: JH
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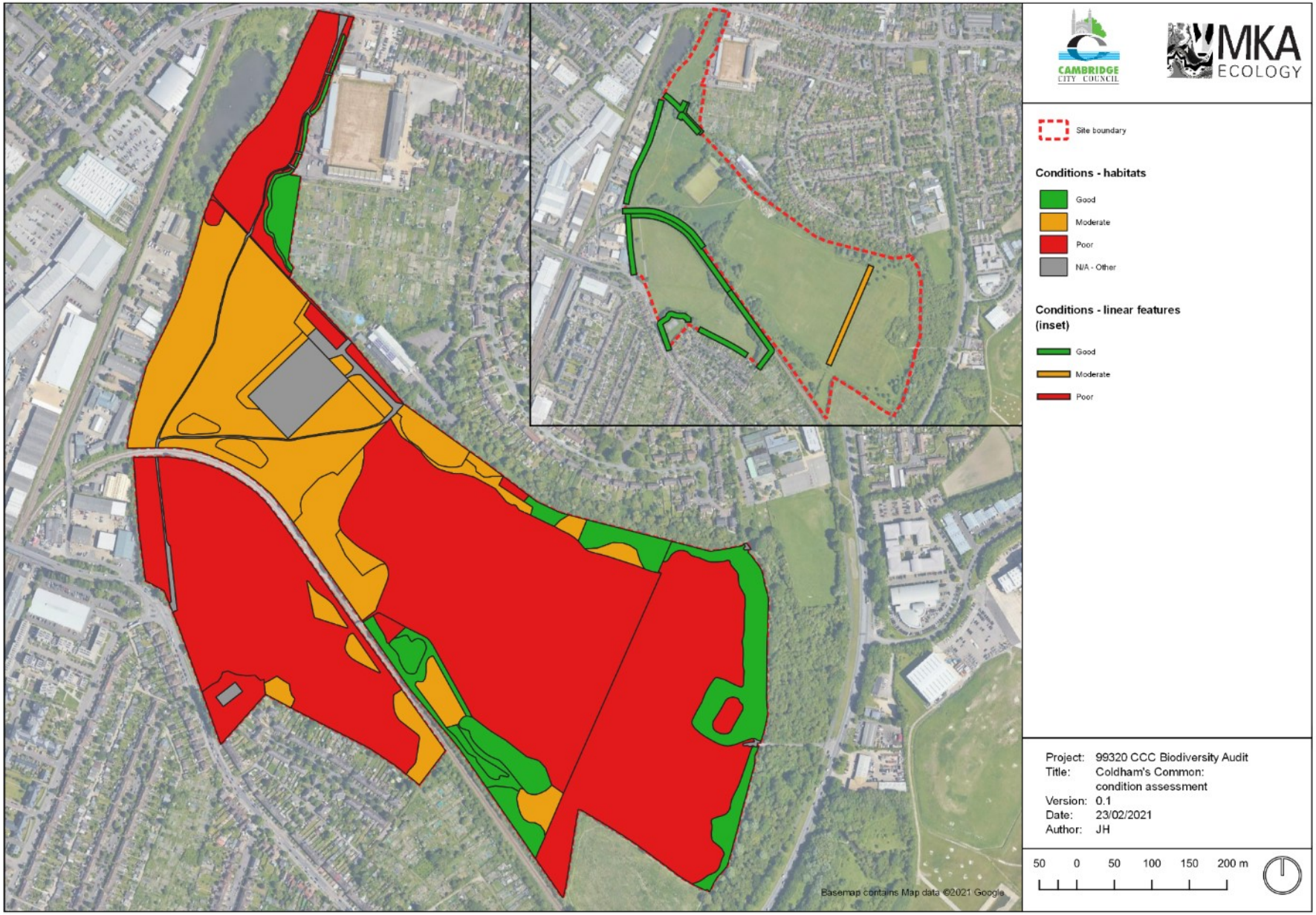
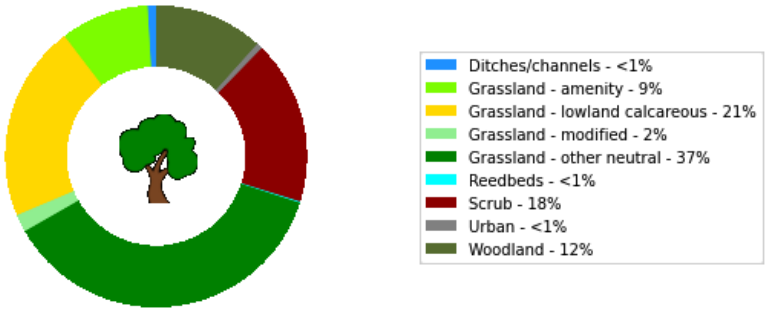
Basemap contains Map data ©2021 Google


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features (inset)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: Coldham's Common: condition assessment
Version: 0.1
Date: 23/02/2021
Author: JH
50 0 50 100 150 200 m
Basemap contains Map data ©2021 Google

Biodiversity units

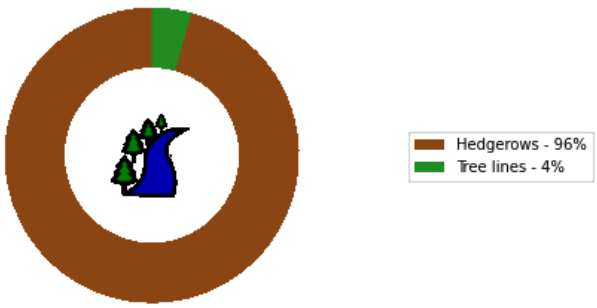
The following charts show the percentage of biodiversity units for each habitat/linear feature type at Coldham's Common.

Habitat areas



Habitat type	*Biodiversity units*
Ditches/channels	2.31
Grassland - amenity	23.78
Grassland - lowland calcareous	52.73
Grassland - modified	4.73
Grassland - other neutral	92.34
Reedbeds	0.33
Scrub	44.05
Urban	1.64
Woodland	29.24

Linear features



Habitat type	*Biodiversity units*
Hedgerows	27.17
Tree lines	1.23

Management

Review of exiting management

A management plan was prepared for Coldham's Common for 2016 – 2026 based upon survey work undertaken by The Bedfordshire, Cambridgeshire & Northampton (BCN) Wildlife Trust in 2013.

This plan outlines the important ecological features identified during the survey, and provides management recommendations for ten years. These are split into management objectives for grassland, scrub, woodland and watercourses. The grassland management focused on re-establishing grazing across the site and recommends a herd of 5-15 cattle. During the 2020 survey, a larger number of cattle than this was recorded in the grazed area. This could result in overgrazing which would have detrimental impacts on the grassland. In addition, the objectives note for the need to remove invasive weeds, creeping thistle, nettle and other undesirable species which is echoed here.

Scrub objectives include enhancing the scalloped edges and ecotones, ensuring the scrub has a diverse age structure, and removing scrub that is encroaching on the species rich grassland. These are still management actions that should be performed. In particular, the scrub in the east does not have a diverse age structure as it is dominated by "leggy" mature hawthorn trees.

The woodland management recommendations are sound and involve planting native understorey species in a cyclical program of woodland management. In addition, the watercourse objectives, if implemented, will vastly improve the condition of these watercourses.

Overall, the management plan contains sufficient detail for contributing to positively enhancing biodiversity across Coldham's Common. It was not obvious from the 2020 survey if any of the objectives had been implemented, since many of the issues surrounding scrub encroachment and the diversity of the grassland remain.

Assessment against selection criteria

During the 2020 survey, four neutral and calcareous grassland indicator species were recorded, with an additional four strong neutral grassland species and six strong calcareous grassland species. This means that Coldham's Common achieves CWS designation for its grassland. The site also achieves designation under the criteria for a habitat mosaic as a site >10ha with three habitats (grassland, woodland and scrub) in close association, with at least one of these at or approaching CWS standard.

Direction of travel

Habitat	Comments
Lowland calcareous grassland (East)	Poor declining because of recreational management and scrub encroachment around the rifle butt
Lowland calcareous grassland (The Triangle)	Moderate/good stable due to ongoing sympathetic management
Other neutral grassland	Moderate declining. Formerly more indicator species recorded in this area, potential overgrazing.
Arrhenatherum neutral grassland	Moderate declining. Formerly more indicator species recorded in this area, potential overgrazing
Modified grassland	Poor stable. Pitches under regular management with close mowing, grassland dominated by tall fescue with heavy grazing
Line of trees	Good stable
Other broadleaf woodland	Moderate or good improving due to maturation of areas of planting

Habitat	Comments
Native hedgerow with bank or ditch	Moderate condition and stable with regular management
Native species-rich hedgerow with trees	Good condition and stable
Mixed scrub	Good declining due to over maturation in parts
Ditch	Poor condition and likely to be declining due to duckweed, silting and recreational pressures
Reedbed	Poor stable
Ditch (Coldhams Brook)	Good improving. Formerly banks of nettles but now increasing in floristic diversity
Ditch (East Main Drain)	Poor stable

A Cambridge City Wildlife Site Survey was undertaken at Coldham's Common in 2005, and a survey of the site was also undertaken by the (BCN) Wildlife Trust in 2013.

The 2005 survey highlighted the importance of the chalk grassland, especially on the rifle butt and in the triangle. This was echoed in the 2013 survey with the problem of scrub encroachment also noted. Since the scrub encroachment is still an issue for these sections, the chalk grassland is assessed as "good – declining".

The other areas of calcareous and neutral grassland, including the cattle grazed section south of the railway line, the eastern meadow, and the strip of grassland north of the railway line towards Newmarket Road were noted for their indicator

species in 2005 but by 2013 these areas were highlighted as target locations for improving species diversity. Even though some indicator species were recorded in these locations during 2020, it is deemed that these areas are still suitable for improvements. In addition, the northern section of tall fescue grassland and the rank nettle-dominated grass by the railway bridge are areas in poorer condition than elsewhere on site. Therefore, the rest of the grassland on site is assessed as "moderate – declining".

The scrub has gradually increased in size from the 2005 survey through to 2020, and now the scrub in the eastern part has become over mature. Therefore, the scrub is deemed to be "good – declining", although it should be noted that the encroachment is not positive for the grassland.

The woodland has become more naturalised, with new saplings and with standing and fallen deadwood, since the 2005 survey. Therefore it can be classed as "good – improving".

Coldham's Brook has improved in condition since the 2005 survey which described its banks as being dominated by common nettle and creeping thistle. This is now not the case, so it can be described as "good – improving". The East Main Drain was shaded by scrub in 2005, 2013 and in 2020 and so no improvements have been made to its condition, resulting in "poor – stable".

Future risks to condition

Potential risks which may impact upon habitat condition and features include;

- Inappropriate grazing management;
- Increase in recreational pressures on sensitive grassland habitats;
- Problems with fly-tipping and rubbish;
- Pressure on habitats from activities associated with Cambridge Folk Festival;
- Impacts on aquatic habitats from recreational uses and dogs; and
- Increases scrub encroachment on sensitive grassland habitats.

Opportunities

Key features of ecological interest (and constraints if any)

Calcareous grassland is a nationally scarce habitat that is experiencing threats from scrub encroachment or habitat loss. The species rich area "the triangle" is of ecological interest for this reason and for its diverse structure of ant hills and tussocks providing many different microhabitats for invertebrates.

Opportunities

Opportunities at Coldham's Common should ideally focus on better management of the existing resources. Improved grazing and mowing regimes could result in significant changes in the biodiversity value of grasslands as this location. Due to the scale of these areas of grassland any improvement of condition will ensure a major uplift to the biodiversity of Cambridge. The potential development of a large expanse of high quality species rich calcareous grassland at Coldham's Common presents a major opportunity for promoting biodiversity in the City.

Creation of features	
Habitats	Calcareous/species rich grassland habitats in new areas New islands of scrub to promote habitat heterogeneity with benefits for groups such as invertebrates Developing further areas of reedbed alongside Coldham's Brook Biodiversity toolkit (bramble patches, nettle patches, mixed native hedge, ponds, woodpiles)
Species	Biodiversity toolkit (bat boxes, bee banks, bee hotels, beetle towers, bird boxes, bug hotels) Potential opportunity for translocation site for reptiles
Management/restoration of existing features	
Habitats	Grassland (reduced mowing/grazing regime and species-rich grassland creation, managing scrub encroachment)

	Improving condition of waterways by reducing shading and enhancing aquatic vegetation Hedgerow (improving condition of hedgerow between sports pitches and east area) Management of scrub to ensure continued good condition for the long-term
Species	Improving management of grassland areas, particularly calcareous grassland, for key indicator species. Potential introduction of local provenance seed and or green hay to increase species diversity.

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Improving the condition of the calcareous grassland through changes in the management regime will deliver significant biodiversity enhancement. Achieving moderate condition on the larger expanses of calcareous grassland could be a realistic target
- Maintaining condition in Coldham's Brook and improving condition of East Main Drain
- Developing areas of reedbed alongside Coldham's Brook

Further monitoring work

Monitoring the success of changes to the management of grassland will be critical to understand how these are influencing their condition.

Stourbridge Common

Results

Site description and status

Stourbridge Common is an area of cattle-grazed floodplain grassland, and is approximately 18 hectares in size. It is located in east Cambridge, and is bordered by the River Cam to the north. It forms an important link on the corridor from the south-eastern fringe of the City, through Cherry Hinton and Coldham to the River Cam. Coldham's Brook crosses the eastern part of the site, and further enhances this corridor. Lines of trees border tarmac paths that follow the River Cam and cross the site.

Stourbridge Common is a LNR and CiWS. The site qualifies for CiWS status as an area of undeveloped floodplain directly associated with the River Cam CWS (criterion 2.17).

This site lies within the River Cam Corridor Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g4 Modified grassland (59 Cattle grazed, 61 Horse grazed, 80 Unmanaged)** **g4a Amenity grassland**
Description **g4 Modified grassland:** The central part of the grassland is tussocky grass dominated by tall fescue *Schedonorous arundinaceus*. In the eastern and western parts of the site, and adjacent to the river along the northern boundary, the grassland is more diverse and not tussocky, and contains frequent perennial rye-grass *Lolium perenne* and patches of spear thistle *Cirsium vulgare*. A small section of unmanaged grassland exists surrounding a pond within the woodland

on the site's southern boundary. This grass is dominated by creeping bent *Agrostis stolonifera* and redshank *Persicaria maculosa*. **g4a Amenity grassland:** Amenity grassland was present in the playground area.
Condition **g4 Modified grassland:** The grassland across Stourbridge Common is classed as poor condition, due to the absence of any wildflowers and sedges, the abundance of tall fescue with few other species in the central part of the site, and the dominance of undesirable species such as nettle and thistle. **g4a Amenity grassland:** The amenity grassland is in poor condition as it fails most of the condition criteria.

Woodland and forest

UKHabs habitat types present (secondary codes in brackets) **w1f7 Other Lowland mixed deciduous woodland** **w1g7 Other broadleaved woodland types** **w1g6 Line of trees**
Description **w1f7 Other Lowland mixed deciduous woodland:** Along the southern boundary of the site is mixed broadleaved woodland that was fenced off from cattle and the public. Species included alder *Alnus glutinosa,* Norway maple *Acer platanoides,* dogwood *Cornus sanguinea* and silver birch *Betula pendula,* with an understorey dominated by common nettle *Urtica dioica,* ivy *Hedera helix* and cow parsley *Anthriscus sylvestris.* **w1g7 Other broadleaved woodland types:** Other pockets of trees existed in the west; namely by the footbridge and adjacent to the children's play area. **w1g6 Line of trees:** Mature trees of horse-chestnut *Aesculus hippocastanum*, white willow *Salix alba* and sycamore *Acer pseudoplatanus* amongst others flank the pathway that follows the River Cam, and also along the path that crosses the site linking to Oyster Row.
Condition **w1f7 Other Lowland mixed deciduous woodland:** This woodland along the southern boundary was in good condition, with a variety of native tree species providing complete canopy cover and fencing preventing any damage to the

woodland from cattle or from the public. This lack of access allows tree regeneration and a ground flora to develop. **w1g7 Other broadleaved woodland types:** The other small pockets of woodland were in moderate condition, but lacked features typical of more established woodland such as a diverse age range and standing deadwood. **w1g6 Line of trees:** The lines of trees across the site were mostly in good condition, with those in moderate condition being comprised either of young trees or being spaced apart.

Heathland and scrub

UKHabs habitat types present (secondary codes in brackets) **h3d Bramble scrub** **h3h Mixed scrub**
Description **h3d Bramble scrub:** Bramble scrub existed in small sections throughout the site, notably alongside the woodland at the southern boundary. **h3h Mixed scrub:** Mixed scrub was situated in a horse-grazed meadow just east of the Brook, which could not be accessed, but appeared to contain stands of nettle and thistle although woody species such as hawthorn *Crataegus monogyna* and elder *Sambucus nigra* were also present.
Condition **h3d Bramble scrub:** Bramble scrub across the site lacked woody species diversity, had a moderately diverse age range, and was thus in moderate condition. **h3h Mixed scrub:** The area of mixed scrub was also in moderate condition, with a greater species diversity but lacking a well-developed edge or any clearings or glades.

Running and standing water

UKHabs habitat types present (secondary codes in brackets) **r1a Eutrophic standing waters (117 Dry, 19 Ponds (Priority Habitat), 39 Freshwater -man-made)** **r2b Other rivers and streams**

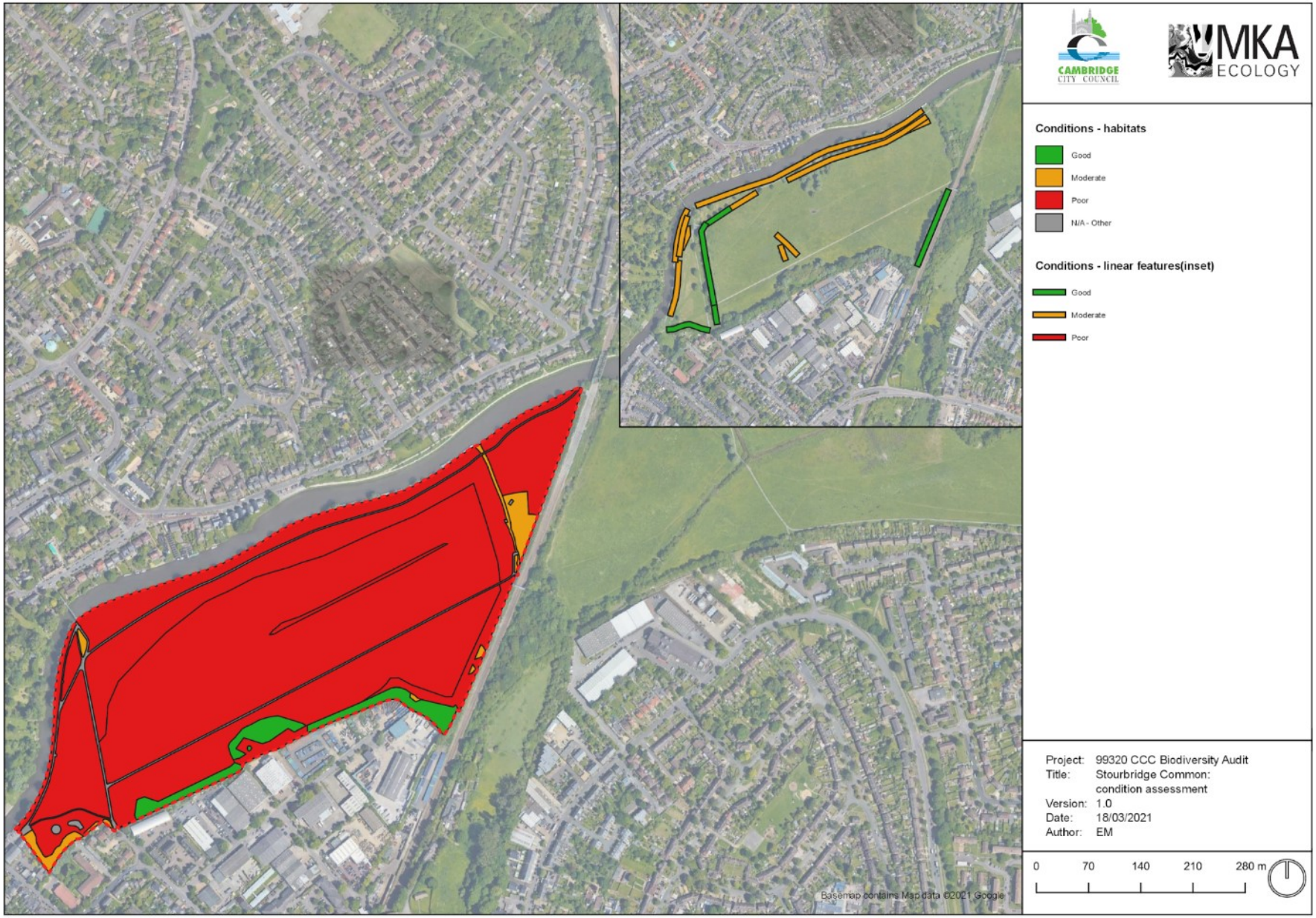
Description **r1a Eutrophic standing waters:** There was a ditch running through the central portion of the grassland, however, this was dry at the time of the survey. **r2b Other rivers and streams:** Coldham's Brook runs through the east side of the site, and contained an abundance of chub *Squalius cephalus* in clear, steady flowing water. However, cows had trampled the banks in some locations and Himalayan balsam was present in one location.
Condition **r1a Eutrophic standing waters:** The ditch running through the centre of the site was completely dry at the time of survey and had reverted to grassland similar to the rest of the site. It is therefore in poor condition. **r2b Other rivers and streams:** Coldham's Brook was in moderate condition, with clear fast running water but with areas of cattle poaching resulting in bare ground along some of the margins.

Priority habitats

The following Priority Habitats are present at this location;

- Lowland mixed deciduous woodland
- Ponds
- Rivers and streams


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site Boundary
Target Note/trees
Target Note
Linear Features
w1g6 - Line of trees
Habitats
g4 - Modified grassland
g4a - Modified grassland (amenity)
h3d - Bramble scrub
h3h - Mixed scrub
r1a - Eutrophic standing water
r2b - Other rivers and streams
u1b5 - Buildings
u1b6 - Other developed land
w1f7 - Other Lowland mixed deciduous woodland
w1g7 - Other broadleaved woodland types
Project: 99320 CCC Biodiversity Audit
Title: Stourbridge Common - Habitats
Version: 1.0
Date: 18/03/2021
Author: EM
0 40 80 120 160 m
Basemap contains Map data ©2021 Google
N1
N2
r2b
h3h
r1a
u1b6
g4
g4a
w1g6
w1f7
w1g7


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features(inset)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: Stourbridge Common: condition assessment
Version: 1.0
Date: 18/03/2021
Author: EM
0 70 140 210 280 m
Basemap contains Map data ©2021 Google

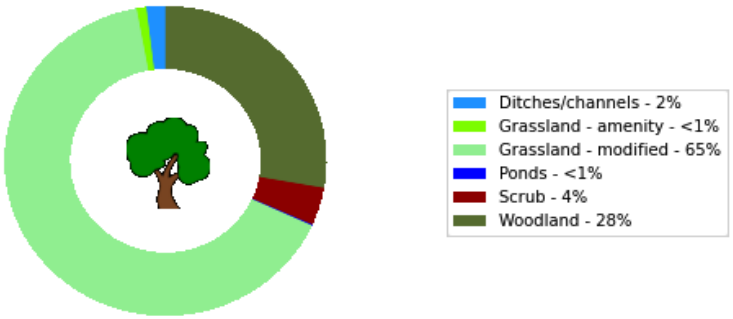
Target Notes:

1. Bee hives
2. Indian balsam

Biodiversity units

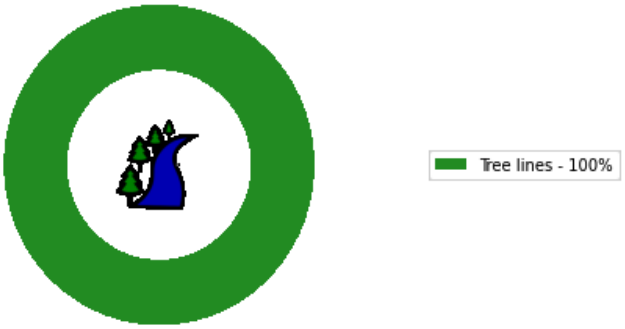
The following charts show the percentage of biodiversity units for each habitat/linear feature type at Stourbridge Common.

Habitats



Habitat type	*Biodiversity units*
Ditches/channels	1.16
Grassland - amenity	0.59
Grassland - modified	39.58
Ponds	0.06
Scrub	2.39
Woodland	16.83
Grassland - modified	39.58

Linear Features



Habitat type	*Biodiversity units*
Tree lines	10.20

Management

Review of exiting management

A management plan titled "Stourbridge Common Habitat Survey and Management Recommendations" was published in 2013 and was prepared by The Wildlife Trust for Bedfordshire, Cambridgeshire & Northamptonshire (BCN). Recommendations were made as follows:

1. Continue grazing, if not possible follow an alternative cutting regime.
2. Grass cutting, reinstate mid-summer hay cutting on a small portion of the site and cut areas of tall fescue in spring.
3. Control creeping thistle, spear thistle and himalayan balsam.
4. No more tree planting.
5. Pollard willow trees where suitable and thin the southern tree belt.
6. Reduce scrub along Coldhams Brook to 10-15% of its length.
7. Dredge western part of 'Southern pond'.
8. Implement soft-engineering of river banks.
9. Monitor key species / species groups.

For the most part, these activities have occurred as grazing still occurs on Stourbridge Common, and Coldham's Brook is not dominated by scrub. However, some Indian balsam remains and tall fescue was still the dominant species over the main part of the grassland. Future management will need to ensure that the correct balance between grazing and cutting is struck to ensure diversity, as well as control of undesirable species such as tall fescue. A combination of the two will almost certainly be required if the tall fescue (which is unpalatable to cattle) is appropriately managed. The management plan suggests an alternative for parts of the site with a return to the likely former management of a summer haycut in late June or early July and then aftermath grazing through to early spring if feasible. However the plan also recognises the challenges to manage this type of activity.

Assessment against selection criteria

Stourbridge Common meets the City Wildlife Site criterion 2.17, which relates to an area of undeveloped floodplain directly associated with the River Cam CWS. The site would also reach designation with its mature pollard willows growing adjacent to the River Cam.

Direction of travel

Habitat	Comments
Grassland	Poor declining condition
Woodland	Moderate condition which is likely to be stable
Lines of trees	Good stable condition
Scrub	Moderate condition which is likely to be stable
Ditch	Poor declining condition
Coldham's Brook	Moderate condition which is likely to be stable

A Cambridge City Wildlife Site Survey was undertaken at Stourbridge Common in 2005. Another survey was undertaken by the BCN Wildlife Trust in 2013 to inform the management plan for the site. Both these surveys provide baseline data from which to estimate a direction of travel for the habitats on site.

Many of the notable species recorded in the grassland in 2013, such as cuckoo-flower *Cardamine pratensis*, meadow vetchling *Lathyrus pratensis* and spiny

restharrow *Ononis spinosa,* were not recorded in 2020 suggesting that species diversity is still declining onsite. Therefore the grassland is classed as "poor – declining" and would benefit from targeted enhancement actions.

The ditch running through the centre of the site contained marginal vegetation during 2013, but was completely dry in 2020 and did not have a different species composition to the surrounding grassland. Therefore, the ditch is classed as "poor – declining" as it may have dried out permanently.

Coldham's Brook has benefited from scrub removal resulting in less shade and a diversity of bankside vegetation. It is classed as "moderate – stable".

The areas of planted trees and woodland at the south of the site were not assessed in detail during the previous surveys, and in the 2013 management plan it was recommended that no new trees were planted and that trees were not replaced once they die. Overall, the woodland is classed as "moderate – stable".

Future risks to condition

Potential risks which may impact upon habitat condition and features include:

- An increase in recreational pressures as a result of greater footfall and dog walking over time.
- Spread of invasive species in both terrestrial and freshwater environments.
- Impact on Coldham's Brook from cattle and dogs; and
- Issues with ditch permanence.

Opportunities

Key features of ecological interest (and constraints if any)

The floodplain pastures at Stourbridge Common are of significant and ecological value, and also offer great potential for enhancements. A key feature of this location, which is not present on the other commons and green alongside the River Cam in the City, are the areas of inundation which allow for standing water through the

winter months. Water vole present a potential protected species issue at this location, and the Himalayan balsam present a potential invasive species issue.

Opportunities

Creation of new areas of inundation may benefit a range of species such as wading birds, or round-fruited rush *Juncus compressus* which occurs at the site. These features are scarce in the City and may be more achievable at Stourbridge Common where there are not such significant demands for recreational space. Care would need to be taken to ensure that the disturbance from the creation of these features does not result in higher nutrient levels across the site (from the previously dumped materials buried there).

The triangle of grazing on the eastern side of Coldham's Brook is relatively undisturbed. Given the location between the river and the brook opportunities for wetland creation could be considered here with scrapes and reedbed. These habitats are uncommon in Cambridge and may help to augment the areas of inundation on Stourbridge Common and the creation of new wetland habitats at Logan's Meadow. Other species specific features could be considered in an areas like this, such as a sand martin bank or a kingfisher bank.

Creation of features	
Habitats	Develop new areas for seasonal inundation Developing reedbed and wetland habitats in triangle to east of Coldham's Brook
Species	*Biodiversity toolkit:* Bird boxes, bat boxes.
Management/restoration of existing features	
Habitats	Improved management of existing grassland habitats to raise condition levels Improving condition of ditch by deepening to ensure it contains water for the majority of the year. Improving condition of Coldham's Brook by restricting cattle access to allow for the establishment and growth of marginal vegetation.
Species	Improving management of grassland areas for key indicator species

	Improving the suitability of Coldham's Brook for water vole

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Improving the floristic diversity of the grassland through updated management with a view to reaching moderate condition
- Increasing area and quality of ditches and areas of inundation
- Creation of new reedbeds

Further monitoring work

Continued monitoring of the key indicator species in the grassland should take place as specified in the site management plan. In addition regular assessment of the grassland will be required to guide management and help to strike the right balance between grazing and cutting. If a different regime for grassland management is trailed then its success should be monitored.

Sheep's Green

Results

Site description and status

Sheep's Green is approximately 8.7 hectares in size located south west of the city centre, along the River Cam. It is situated west of Coe Fen, and is a large expanse of cattle grazed parkland adjacent to the River Cam, which floods periodically. There are areas of seasonal inundation and also channels and rushes that flow through Sheep's Green. Mature trees are scattered throughout the area which provide a parkland character together with the grazing beneath. Tarmac footpaths follow the River Cam, and cross Sheep's Green at other locations, and the Fen Causeway road crosses the middle of the site. Stands of tall herb are frequent and provide a valuable biodiversity resource and give Sheep's Green its special landscape character. Other interesting features are Robinson Crusoe Island which is a largely inaccessible and secluded area of habitat adjacent to the River Cam. Recent works have significantly improved the waterways through Sheep's Green.

The site is multi-functional both as a biodiverse open space and an area for public access and enjoyment. Areas to the north around the Mill Pool and Weir Pool are very well used for recreation, as are areas to the south around the newly created Rush, and close to the southern tip of the site where Sheep's Green more closely resembles a public park with amenity grassland and introduced planting.

Sheep's Green is a LNR and CWS. The site qualifies for CWS status for its pollarded willows (criterion 1.hii), and for supporting a population of a vascular plant rare in Cambridgeshire (criterion 6b).

This site lies within the River Cam Corridor Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g4 Modified grassland (20 Wood pasture and parkland)** **g4a Amenity grassland**
Description Grassland dominates Sheep's Green, however, it varies in species composition across the site. The grasses demonstrate complex gradients of dominance through the area, however perennial rye-grass was largely constant. The combination of grassland, grazing and mature trees has resulted in a classification as wood pasture/parkland. Another feature of the grasslands through Sheep's Green were the stands of tall herb. **g4 Modified grassland:** Areas close to footpaths and adjacent to the River Cam are dominated by perennial rye-grass *Lolium perenne,* whereas to the north west of the site red fescue *Festuca rubra agg.* is more abundant. Other grasses frequently recorded include crested dog's-tail *Cynosurus cristatus*, wall barley *Hordeum murinum*, particularly present under mature trees, Yorkshire-fog *Holcus lanatus*, annual meadow-grass *Poa annua*, cock's-foot *Dactylis glomerata* and creeping bent *Agrostis stolonifera.* All grass was heavily grazed by cattle and was kept at a short sward. Floristic diversity was generally poor. In the west part of the site, just north of the road, there is a large area of tall herbaceous vegetation, with species such as great willowherb *Epilobium hirsutum*, cow parsley *Anthriscus sylvestris* and white dead-nettle *Lamium album.* Mature trees typically of lombardy-poplar *Populus nigra 'Italica'*, white willow *Salix alba* and ash *Fraxinus excelsior,* are present across the grassland creating a parkland/wood pasture habitat. Sections surrounding trees are often dominated by wall barley, nettle and thistle. There are depressions within the grassland that were dry at the time of survey but appear to be seasonally waterlogged. Water whorl-grass *Catabrosa aquatica* has been recorded in the damp ditches on the site in the past and this species is rare in Cambridgeshire.

g4a Amenity grassland: Amenity grassland existed in the southern part of the site surrounding the paddling pool area. This grassland was fenced off from the main grassland, was mown regularly, and contained poor species diversity.
Condition **g4 Modified grassland:** The grassland across the site is ranked as poor condition, because heavy use by the public has led to patches of bare ground, litter and damage from barbecues, and over grazing prevents the establishment of any grassland indicator species or wildflowers. **g4a Amenity grassland:** The amenity grassland is ranked as poor condition as it fails the majority of the condition criteria

Woodland

UKHabs habitat types present (secondary codes in brackets) **w1g7 Other broadleaved woodland types** **w1g6 Line of trees**
Description **w1g7 Other broadleaved woodland types:** Pockets of broadleaved woodland were situated in the south of the site, and also on Robinson Crusoe Island with abundant mature trees and saplings of white willow *Salix alba*. Purple toothwort *Lathraea clandestina* and green-flowered helleborine *Epipactis phyllanthes* are known to be present there. On the island there was a relatively open canopy with some fallen trees. **w1g6 Line of trees:** Frequent mature trees are scattered across the site, giving the appearance of traditional parkland in certain locations. Elsewhere, a line of mature trees borders the western boundary of the site north of Fen Causeway. The most frequent species include alder *Alnus glutinosa*, lombardy-poplar *Populus nigra 'Italica'*, white willow *Salix alba* and ash *Fraxinus excelsior.*
Condition **w1g7 Other broadleaved woodland types:** The woodlands are classed in moderate condition, with a dominance of native species, however litter is also a problem in these areas. **w1g6 Line of trees:** The line of trees is in good condition, with mature and closely spaced trees forming a closed canopy.

Heathland and scrub

UKHabs habitat types present (secondary codes in brackets) **h3d Bramble scrub** **h3h Mixed scrub**
Description Similar to woodland, there are pockets of scrub habitat scattered across the site. **h3h Mixed scrub:** Notably, thick scrub surrounds the dry ditch in the north of the site, and there is a large section in the southern tip of the site. Bramble *Rubus fruticosus agg.* dominates the scrub, with occasional woody species such as dogwood *Cornus sanguinea,* dog rose *Rosa canina* and hawthorn *Crataegus monogyna* also present. **h3d Bramble scrub:** A small patch of bramble scrub exists adjacent to the fish pass.
Condition **h3h Mixed scrub:** The majority of scrub patches are in poor condition because of limited species diversity and lack of a well-developed edge. One exception is the scrub adjacent to the woodland at the southern part of the site. This scrub was well developed with a substantial height and diversity of woody species. **h3d Bramble scrub:** The bramble scrub is in poor condition, with a lack of species and age diversity.

Standing and running water

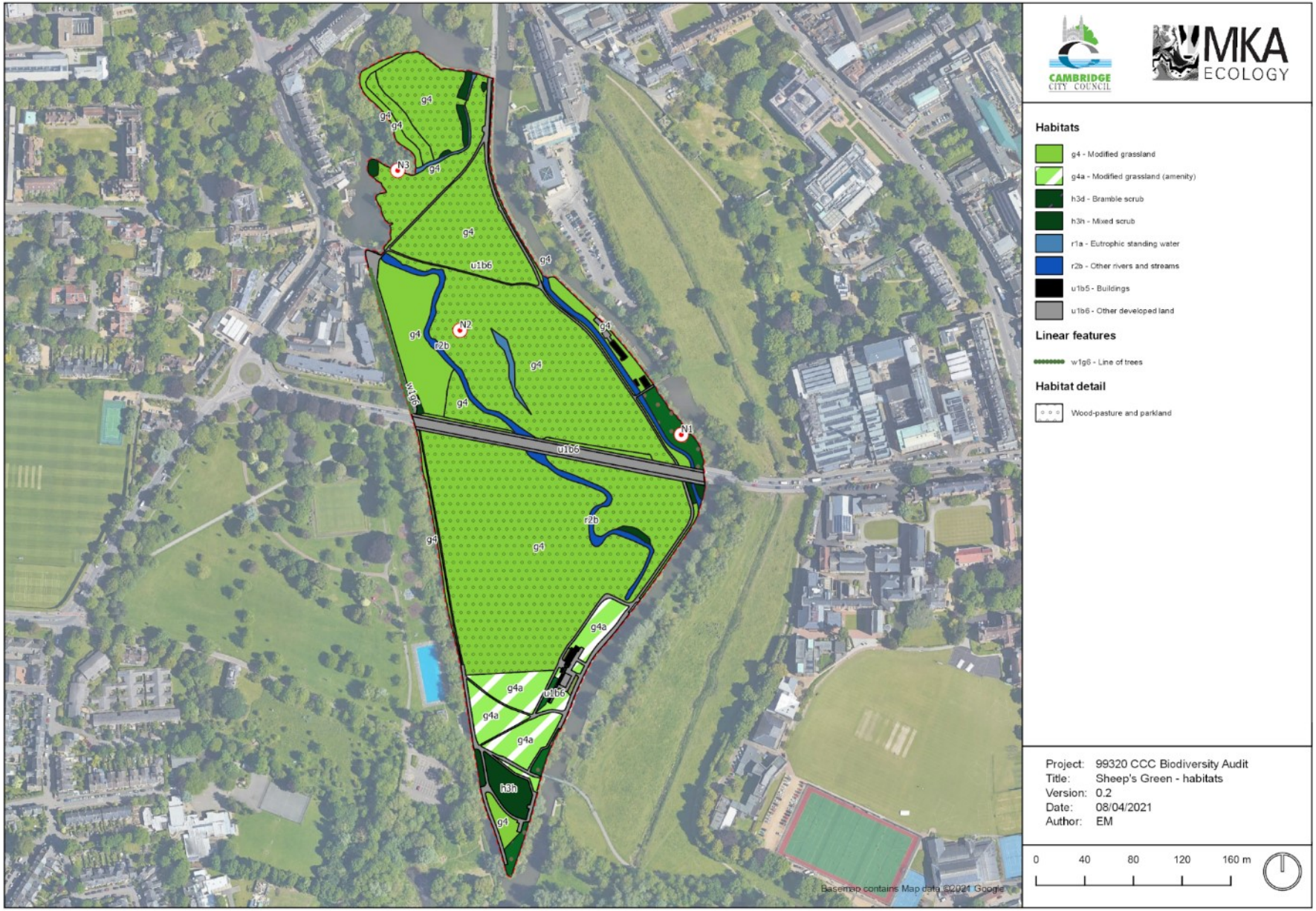
UKHabs habitat types present (secondary codes in brackets) **r1a Eutrophic standing waters (117 Dry, 19 Ponds (Priority Habitat), 39 Freshwater – man-made)** **r2b Other rivers and streams**
Description **r1a Eutrophic standing waters:** Across the site, but predominantly north of the road, there are several ditches and depressions in the grassland that may seasonally fill with water. However, they were dry at the time of the survey. **r2b Other rivers and streams:** South of the road, a fish pass has been created. Near to the River, this fish pass is bordered by large logs, but closer to Fen

Causeway the pass widens and has marginal vegetation on either side. This is also known as “The Rush”. North of the road, the small channel is bordered by tall herb vegetation on the west side, and grassland on the east. Submerged vegetation is present, as well as marginal vegetation such as water forget-me-not *Myosotis scorpioides*, reed sweet-grass *Glyceria maxima* and water mint *Mentha aquatica*. Robinson Crusoe Island is situated in the east of the site, separated by a small channel of the River Cam which is heavily covered in non-native least duckweed *Lemna minuta*.
Condition **r1a Eutrophic standing waters:** The ditches were in poor condition as they were completely dry at the time of the survey. **r2b Other rivers and streams:** Where the fish pass starts, the area is heavily used by the public and the banks have collapsed and are muddy and poached by the cattle. Children paddle in the fish pass and vegetation has failed to establish in the heavily used areas, leading to a poor condition. North of Fen Causeway the channel is in good condition with submerged and marginal vegetation present. Flow rates are varied with gravelly beds visible below the clear water.

Priority habitats

The following Priority Habitats are present at this location;

- Wood pasture and parkland
- Lowland mixed deciduous woodland
- Eutrophic standing waters
- Rivers and streams


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Habitats
g4 - Modified grassland
g4a - Modified grassland (amenity)
h3d - Bramble scrub
h3h - Mixed scrub
r1a - Eutrophic standing water
r2b - Other rivers and streams
u1b5 - Buildings
u1b6 - Other developed land
Linear features
w1g6 - Line of trees
Habitat detail
Wood-pasture and parkland
Project: 99320 CCC Biodiversity Audit
Title: Sheep's Green - habitats
Version: 0.2
Date: 08/04/2021
Author: EM
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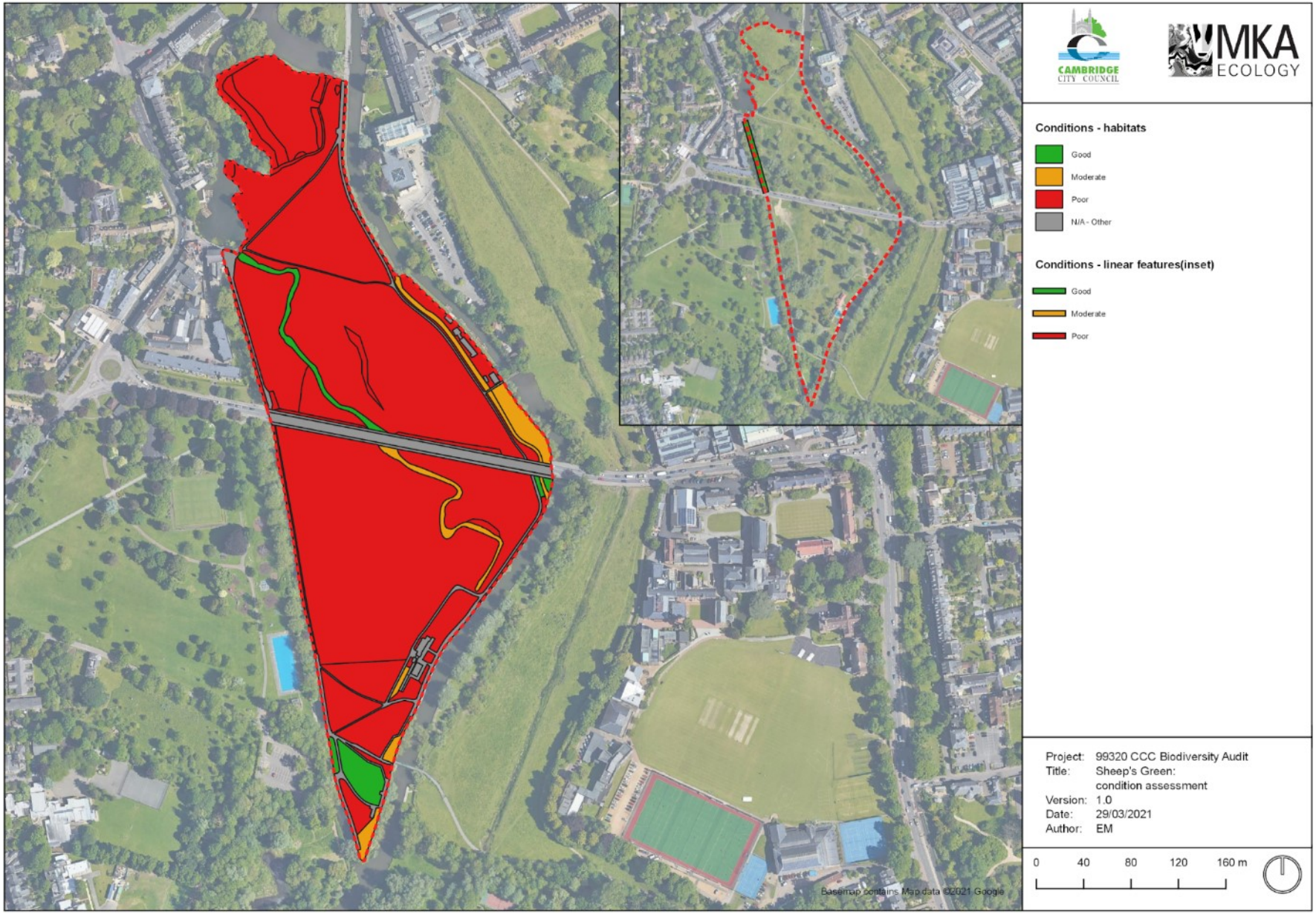
N1
N2
N3
Basemap contains Map data ©2021 Google


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features(inset)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: Sheep's Green: condition assessment
Version: 1.0
Date: 29/03/2021
Author: EM
0 40 80 120 160 m
Basemap contains Map data ©2021 Google

Target Notes:

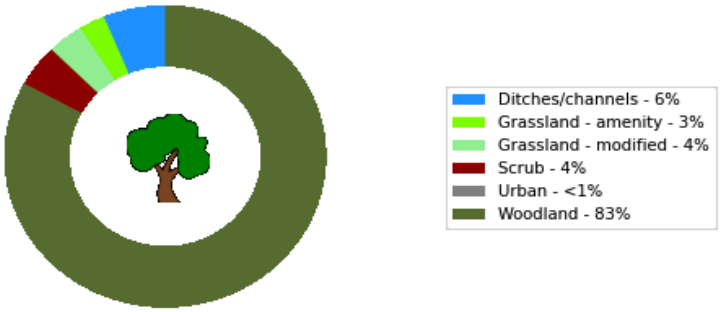
1. Purple toothwort and green-flowered helleborine known to be present
2. Dead lombardy poplar
3. Deadwood feature

Biodiversity units

The following charts show the percentage of biodiversity units for each habitat/linear feature type at Sheep's Green.

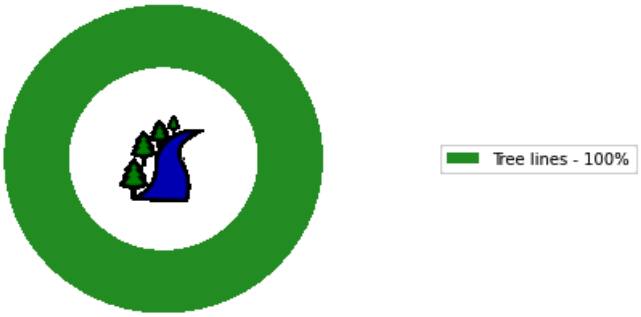
Habitats

Note that wood pasture/parkland is classified under "Woodland" for the Biodiversity Unit calculation despite the primary habitat being classified as grassland.



Habitat type	*Biodiversity units*
Ditches/channels	3.17
Grassland - amenity	1.32
Grassland - modified	1.86
Scrub	2.28
Urban	0.02
Woodland	42.15

Linear Features



Habitat type	*Biodiversity units*
Tree lines	0.84

Management

Review of exiting management

A management plan for Coe Fen, Sheep's Green, Vicar's Brook and New Bit for 2009-2019 was produced by The Bedfordshire, Cambridgeshire & Northampton (BCN) Wildlife Trust. Objectives are grouped by habitat type and are as follows:

Pollard willows

1. The number of Pollard Willows on the site is kept at the 2009 level.
2. The lifetime of each Willow is maximised by management through pollarding.
3. The Willows across the site are of a diverse age structure, which includes viable saplings and veteran trees.
4. The majority of trees on Sheep's Green and Coe Fen are pollarded Willows, with any others of native species.
5. All the Willows will be from local stock.
6. The Willows will provide standing and fallen dead wood.
7. The Willows will support the full range of associated species.

Woodland

1. Retain the 2009 area of woodland on the islands on the site
2. Woodland has predominantly native tree species only
3. Woodland has understorey of native species
4. Woodland contains some dead wood

Whorl-grass

1. Ensure Whorl-grass has regular presence at both Sheep's Green and Coe Fen
2. Maintain or increase distribution of Whorl-grass across the site
3. Maintain or increase areas of suitable habitat across the site
4. Ensure populations of Whorl-grass are not adversely affected by presence of cattle or people
5. Suitable habitat for Whorl-grass is available on site

Grassland

1. The area of grassland on the site is at least as large as in 2008 (see habitat map)
2. Enhance the species richness of the grassland to achieve a more natural floodplain grassland habitat with presence of NVC communities MG5 on New Bit and MG8, MG11 and MG13 on Sheep's Green and Coe Fen and increase the abundance to frequent of at least five neutral grassland indicator species in each area of the site.
3. Grassland on each area of the site qualifies for City Wildlife Status.
4. Retain the present proportion of grassland to trees to keep the 'common' feel of the site.
5. Presence of invasive weeds, creeping thistle, nettle, docks, ragwort and cow parsley will be reduced to no more than 5% of grassland.

Waterways and pools

1. The waterways will provide high quality habitat and corridor routes for aquatic animals and plants within and through the site.
2. The waterways will support a typical range of the associated animal and bird species.
3. The waterways will support a rich variety of aquatic plant species with at least 15 indicator species present in each area of the site, of which at least 5 will be frequent.
4. There will be a varying level of flow of water in the ditches.
5. The banks of waterways will provide habitat suitable for a diversity of wildlife, including for Water voles.

6. The areas of seasonally wet depressions on Sheep's Green will be maintained.
7. The waterways and their bank sides will support the population of Whorl-grass (see above).

The management plan anticipated that a few years of intense grazing on Sheep's Green, Coe Fen and New Bit would result in a more diverse flora for the grassland. However, the diversity of the grassland has not improved over time and is still very species poor. Furthermore, the grazing pressure across Sheep's Green is high, with the grass grazed to a very short sward and strong browse lines visible on the trees. The intention in the management plan was for grassland to reach city wildlife site standard, and this has not been achieved. Careful consideration of future grazing levels is required to create the right balance of vegetation.

The management plan also emphasised the importance of Whorl-grass, which was recorded at Coe Fen in 1987 and Sheep's Green in 2005. This species was not recorded during the 2020 survey, and over trampling and/or grazing by cattle around the ditches may be detrimental to their distribution. The plan outlined the importance of protecting the species, indicating some areas where they are present should be fenced off from cattle or from maintenance works on the ditch. This is still the case and should be re-emphasised. Areas fenced off from cattle and also people could have appropriate signage to educate visitors about the importance of this species.

The management objectives for woodland and pollarded willows have been achieved, with evidence of deadwood left on Sheep's Green south of Fen Causeway.

Assessment against selection criteria

Sheep's Green meets the County Wildlife Site designation for its pollard willows in association with grassland and the river.

Direction of travel

Habitat	Comments
Grassland	Poor and likely to be declining.
Woodland	Moderate stable
Scrub	Moderate stable
Freshwater habitats	Moderate declining

A Cambridge City Wildlife Survey was undertaken on Sheep's Green in 2005. In addition, survey work was undertaken in 2009 to inform the management plan for the site.

The grassland is described as poor semi-improved grassland in 2005, and the indicator species recorded during the survey were not found in 2020. Therefore, the grassland is classed as "poor – declining" since the management practice of grazing has unfortunately not resulted in tangible increases in species diversity.

The woodland and scrub areas are classed as "moderate – stable", as their management appears stable and unchanged since the previous surveys.

The fish pass and the Rush channel is heavily used by people and poached by cattle at the southern end, but along the rest of its length it is quieter and in good condition. If the use of the channel impacts its condition further downstream, then this should be classed as "moderate – declining".

Future risks to condition

Potential risks which may impact upon habitat condition and features include:

- Loss of key species such as whorl-grass from excessive grazing, recreational pressures, or accidental removal during management works;
- Inappropriate grazing management;
- Increase in recreational pressures on sensitive grassland habitats;
- Impacts on aquatic habitats from recreational uses and dogs; and
- Impacts on aquatic habitats from non-native species.

Opportunities

Key features of ecological interest (and constraints if any)

Sheep's Green provides numerous features of biodiversity interest and the in combination effect of these features provides added value. The mosaic of grassland, mature trees, scrub and aquatic habitats provide niches for a wide range of species, including uncommon species such as whorl-grass and water vole. These habitats, combined with the forage resource in the tall herb communities are likely to support important populations of invertebrates as well. The pollard willows in particular provide an important invertebrate habitat. Sheep's Green also forms a key location on the River Cam corridor.

Sheep's Green also provides an area for people to enjoy nature, and the presence of such habitats in the heart of the City are a quintessential feature of Cambridge. This access does have its detrimental effects and this is clearly visible in the condition assessments of the grassland habitats in particular. However, grazing pressures are also likely to have led to a deterioration in the grassland quality although this may in part be due to a desire for a number of years of intensive grazing (and cutting) to control undesirable species.

There are some protected species issues for consideration on the site and these include water vole and reptiles. Bats are likely to roost in the trees on site and certainly use the area for foraging. The presence of scarce and rare species, such as whorl-grass and green-flowered helleborine, should also be taken into consideration when planning management activity.

Opportunities

Management activities and biodiversity interventions should largely be focussed on improving the condition of, or enhancing, existing features. These should focus on;

- Improving grassland diversity and condition.
- Replacement of non native trees with other species over time such as black poplar or white willow.
- Managing populations of whorl-grass through appropriate management, creation of habitat and monitoring populations.
- Enhancing the seasonally wet ditches and hollows, through clearance activities if necessary.

These activities are all outlined with the current management plan for the site although it currently appears that the grazing pressures are high. The management of grazing will be critical to get the balance right for the grassland diversity, whorl-grass and appropriate management of undesirable species.

Intense recreational pressure appears unavoidable at Sheep's Green, and notably at the north of the site close to the Mill Pool. The Rush has attracted a large number of visitors and particularly parents with young children who paddle in the water. This is having a severe detrimental effect on the bankside and in channel habitats. Management of this pressure should be considered if this part of The Rush is to fulfil its potential as a biodiversity feature of significant value. It should be noted that the quality of this feature downstream of Fen Causeway is excellent.

There are some opportunities to establish new features for wildlife. For example grey wagtail nest boxes could be installed under the Fen Causeway bridge over the stream. Tawny owl and kestrel boxes could also be successful. Bat boxes could be considered around Sheep's Green.

Green-flowered helleborine has been recorded on Robinson Crusoe Island for a long period of time, and has historical significance in this location. This species favours closed canopy woodland on lime soils, and may be threatened by the open canopy and ruderal overgrowth currently present at the island. Further management could

aim to prevent any further tree loss and to create shaded bare ground habitat for this species.

During the Covid-19 pandemic and cessation of many recreational activities in the City many changes were noted for biodiversity features. At Sheep's Green the composition of the aquatic species within the River Cam was noted to change (Jonathan Shanklin, per comms) with some flora making a return due to a lack of disturbance from the punting activities. Management of the River Cam at this location could be considered with areas set aside for aquatic species where punting and boating is restricted.

Creation of features	
Habitats	n/a
Species	Biodiversity toolkit: Bird boxes (grey wagtail, kestrel, tawny owl), bat boxes
Management/restoration of existing features	
Habitats	Improved management of grassland, scrub and woodland through continued application of management plan. Management of recreational pressures at the southern end of The Rush. Consider restricting boating activity in parts of the Mill Pool to benefit aquatic plant species.
Species	Consideration of green-flowered helleborine in management of Robinson Crusoe Island Continued management for whorl-grass as specified in the site management plan

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Improving the floristic diversity of the grassland though changes in management (both for grazing and public access) with a view to achieving moderate condition
- Maintaining population of whorl-grass
- Improve the condition of the ditches from poor to good condition
- Enhancing seasonally wet ditches and hollows to prevent permanent drying

Further monitoring work

The following monitoring activities are proposed;

- Additional survey work on the botanical diversity of the River Cam, its side channels and the fish pass would be useful to inform future management options.
- Annual monitoring for whorl-grass should be conducted as recommended in the management plan.
- Monitoring of the grassland habitats against the management plan target NVC communities MG8, MG11 and MG13, and also assessment to ensure the grassland on each area qualifies for City Wildlife Site status.

Coe Fen

Results

Site description and status

Coe Fen is 6.6 hectares in size and is rectangular in shape. Coe Fen is dominated by cattle grazed pasture with linear ditch systems. A channel on the eastern edge of the site creates a linear island to the south of Fen Causeway which is more wooded in nature with some open grassland habitats. The River Cam forms its western boundary. Peterhouse College and the Leys School are present to the east. The Fen Causeway cuts through the middle of the site. There is one tarmac path that follows the eastern boundary of the site. On the opposite side of the River Cam lies Sheep's Green and to the south is New Pit, Paradise and Lammas Land. Coe Fen forms part of the complex of sites that line the Cam Corridor and bring the countryside right into the centre of Cambridge City. Coe Fen is publicly accessible although in a large part it appears to be less frequently used than the neighbouring Sheep's Green, and nearby Lammas Land.

Coe Fen is a LNR and CWS. The site achieved CWS status for pollard willows (criterion 1hii).

This site lies within the River Cam Corridor Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets)
g4 Modified grassland (16 Tall herb, 59 Cattle grazed, 73 Bare ground)
Description
g4 Modified grassland: Grassland dominates the site, and is heavily cattle grazed. On the western edge, there is some encroachment of nettles and thistles which also occur sporadically across the site. The grassland is fairly uniform

across the site, with the exception of a small area of wet grassland on the island located in the south west of the site. Typical species in the main part of the site include red fescue *Festuca rubra agg.*, perennial rye-grass *Lolium perenne*, cock's-foot *Dactylis glomerata* and creeping bent *Agrostis stolonifera*. Tall fescue is also present through the area. The grassland also contains undesirable species such as common ragwort *Jacobaea vulgaris*, cow parsley *Anthriscus sylvestris*, creeping thistle *Cirsium arvense* and common nettle *Urtica dioica.* Floristic diversity is low.
Condition **g4 Modified grassland:** The grassland is in poor condition, lacking significant neutral grassland indicator species or wildflowers and it is heavily grazed. There are sections of nettle and thistle stands adjacent to the ditch in the north west.

Woodland

UKHabs habitat types present (secondary codes in brackets) **w1g6 Line of trees** **w1g7 Other broadleaved woodland types**
Description **w1g6 Line of trees:** There is one line of trees on the eastern site boundary, just north of Fen Causeway. **w1g7 Other broadleaved woodland types:** A small area of woodland is situated on the island in the south east of the site. The majority of the trees are white willow *Salix alba,* but other species such as aspen *Populus tremula* and dog rose *Rosa canina* are also present.
Condition **w1g6 Line of trees:** The line of trees is in good condition, with mature trees that are closely spaced. **w1g7 Other broadleaved woodland types:** The woodland is in moderate condition, with mature trees, but lacks deadwood and protection from damage from the public or cattle.

Heathland and scrub

UKHabs habitat types present (secondary codes in brackets)

h3d Bramble scrub **h3h Mixed scrub**
Description **h3h Mixed scrub:** There are very small patches of mixed scrub scattered across the site, such as on the island, on the banks of Vicar's Brook at the southern boundary, and along a small part of the main ditch. The scrub has a diversity of species, including dogwood *Cornus sanguinea*, bramble sp. *Rubus fruticosus agg.* and dog rose *Rosa canina.* **h3d Bramble scrub:** A small area of bramble scrub exists adjacent to the river channel.
Condition **h3d Bramble scrub:** The scrub is in poor condition as it is dominated by bramble and lacks age range. **h3h Mixed scrub:** The mixed scrub areas are also in poor condition, lacking an age range.

Standing and running water

UKHabs habitat types present (secondary codes in brackets) **r1a Eutrophic standing waters (39 Freshwater - man-made)** **r2b Other rivers and streams**
Description **r1a Eutrophic standing waters:** There is a main ditch that runs down the centre of the site, and in the part of the site north of Fen Causeway there are also two ditches on the western and eastern boundaries. These two side ditches are heavily shaded, and in the west ditch least duckweed *Lemna minuta* is present. The main ditch contains a diversity of bankside vegetation such as water forget-me-not *Myosotis scorpioides*, hard rush *Juncus inflexus* and water mint *Mentha aquatica.* This ditch is likely to provide good habitat for water vole and also whorl-grass. **r2b Other rivers and streams:** The River Cam forms the western boundary of the site, and a small channel forms an island in the south east of the site.
Condition

r1a Eutrophic standing waters: The main ditch is in moderate condition, with good vegetation cover and good water quality. However, the ditch had been impacted by cattle accessing the water at various points along its length. The ditch along the north eastern side of the site was dry at the time of survey and was in poor condition, with shading and a lack of submerged vegetation. The ditch at the north western side of the site was also in poor condition, as the surface water was blanketed in non-native pondweed and was heavily shaded in parts.
r2b Other rivers and streams: The River Cam was not condition assessed.

Priority habitats

The following Priority Habitats are present at this location;

- Lowland mixed deciduous woodland
- Eutrophic standing waters
- Rivers and streams


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site Boundary
Target Note/trees
Scattered tree
Linear Features
w1g6 - Line of trees
Habitats
g4 - Modified grassland
h3d - Bramble scrub
h3h - Mixed scrub
r1a - Eutrophic standing water
r2b - Other rivers and streams
u1b6 - Other developed land
w1g7 - Other broadleaved woodland types
Project: 99320 CCC Biodiversity Audit
Title: Coe Fen - Habitats
Version: 1.0
Date: 29/03/2021
Author: EM
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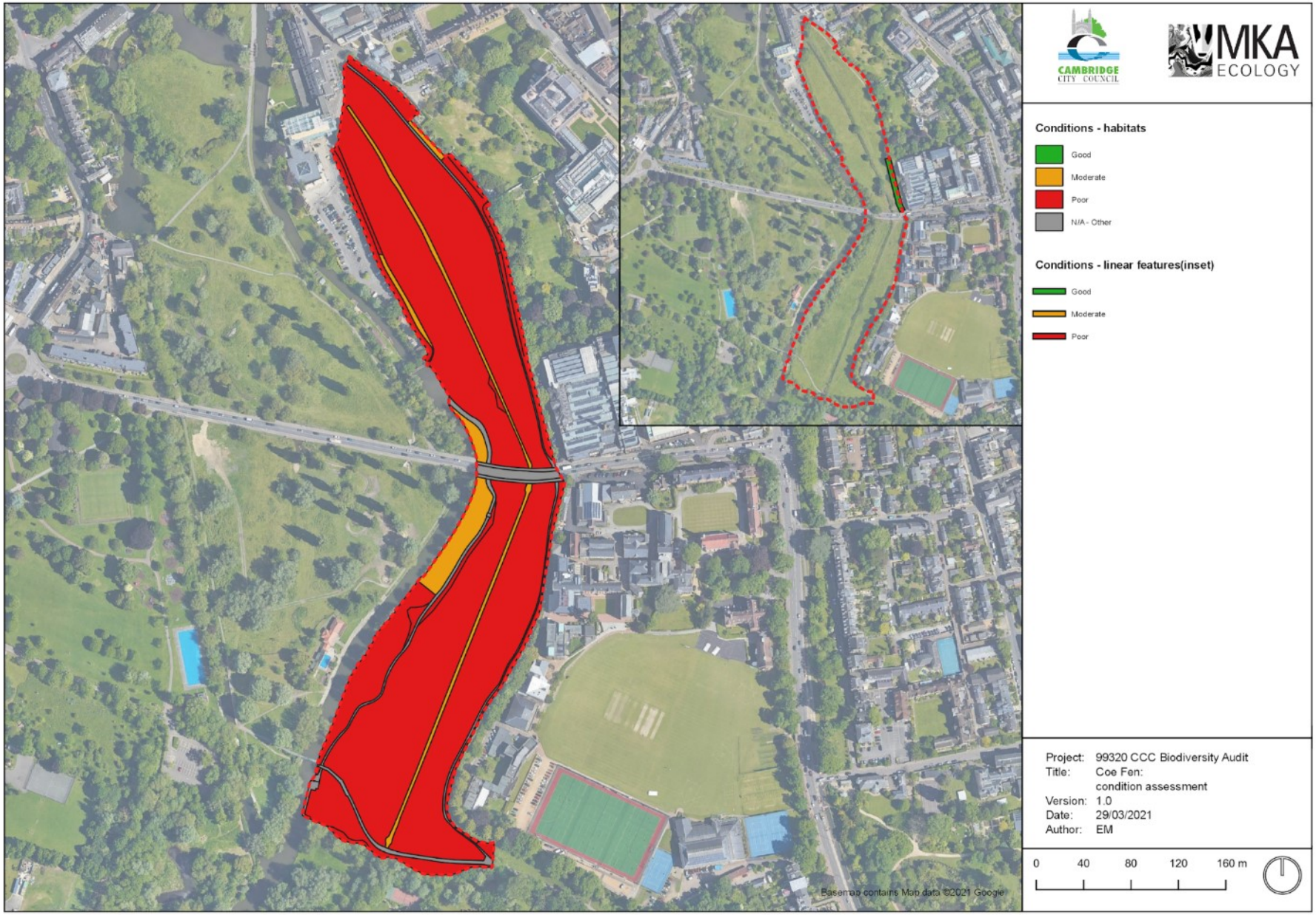
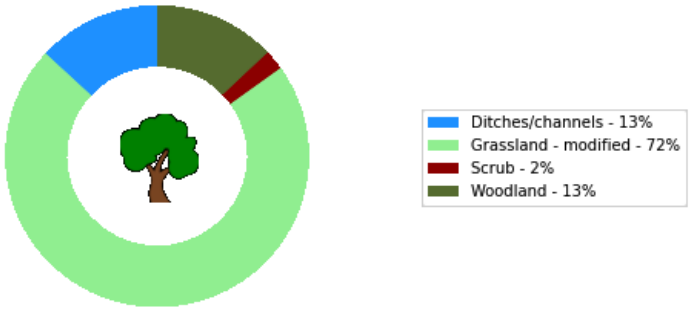
Basemap contains Map data ©2021 Google


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features(inset)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: Coe Fen:
condition assessment
Version: 1.0
Date: 29/03/2021
Author: EM
0 40 80 120 160 m
Basemap contains Map data ©2021 Google

Biodiversity units

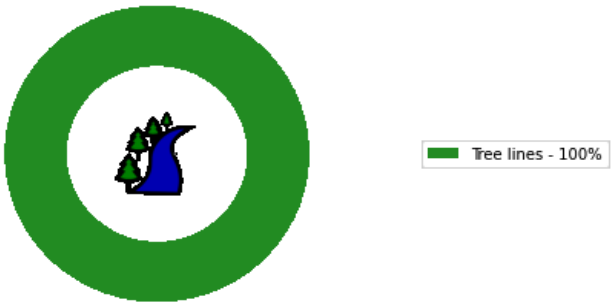
The following charts show the percentage of biodiversity units for each habitat/linear feature type at Coe Fen.

Habitats



Habitat type	*Biodiversity units*
Ditches/channels	2.35
Grassland - modified	12.89
Scrub	0.38
Woodland	2.32

Linear Features



Habitat type	*Biodiversity units*
Tree lines	0.60

Management

Review of exiting management

A management plan for Coe Fen, Sheep's Green, Vicar's Brook and New Bit for 2009-2019 was produced by The Bedfordshire, Cambridgeshire & Northampton (BCN) Wildlife Trust. Objectives are grouped by habitat type and are as follows:

Pollard willows

1. The number of Pollard Willows on the site is kept at the 2009 level.
2. The lifetime of each Willow is maximised by management through pollarding.
3. The Willows across the site are of a diverse age structure, which includes viable saplings and veteran trees.
4. The majority of trees on Sheep's Green and Coe Fen are pollarded Willows, with any others of native species.
5. All the Willows will be from local stock.
6. The Willows will provide standing and fallen dead wood.
7. The Willows will support the full range of associated species.

Woodland

1. Retain the 2009 area of woodland on the islands on the site
2. Woodland has predominantly native tree species only
3. Woodland has understorey of native species
4. Woodland contains some dead wood

Whorl-grass

1. Ensure Whorl-grass has regular presence at both Sheep's Green and Coe Fen
2. Maintain or increase distribution of Whorl-grass across the site
3. Maintain or increase areas of suitable habitat across the site
4. Ensure populations of Whorl-grass are not adversely affected by presence of cattle or people
5. Suitable habitat for Whorl-grass is available on site

Grassland

1. The area of grassland on the site is at least as large as in 2008 (see habitat map)
2. Enhance the species richness of the grassland to achieve a more natural floodplain grassland habitat with presence of NVC communities MG5 on New Bit and MG8, MG11 and MG13 on Sheep's Green and Coe Fen and increase the abundance to frequent of at least five neutral grassland indicator species in each area of the site.
3. Grassland on each area of the site qualifies for City Wildlife Status.
4. Retain the present proportion of grassland to trees to keep the 'common' feel of the site.
5. Presence of invasive weeds, creeping thistle, nettle, docks, ragwort and cow parsley will be reduced to no more than 5% of grassland.

Waterways and pools

1. The waterways will provide high quality habitat and corridor routes for aquatic animals and plants within and through the site.
2. The waterways will support a typical range of the associated animal and bird species.
3. The waterways will support a rich variety of aquatic plant species with at least 15 species listed in the box below present in each area of the site, of which at least 5 will be frequent.
4. There will be a varying level of flow of water in the ditches.
5. The banks of waterways will provide habitat suitable for a diversity of wildlife, including for Water voles.
6. The areas of seasonally wet depressions on Sheep's Green will be maintained.
7. The waterways and their bank sides will support the population of Whorl-grass (see above).

Objectives associated with grassland have not been met, with the grass on Coe Fen still having a poorly diverse sward. Grazing levels above capacity may be detrimental to the sward diversity, and additionally the cattle have poached the ditches, preventing the waterways and pools objectives from being met. Grassland Objective

2 should be prioritised with alternative methods to grazing, such as spreading green hay from the relevant NVC communities that grow locally.

The management plan also emphasised the importance of Whorl-grass, which was recorded at Coe Fen in 1987 and Sheep's Green in 2005. This species was not recorded during the 2020 survey, and over trampling and/or grazing by cattle around the ditches may be detrimental to their distribution. The plan outlined the importance of protecting the species, indicating some areas where they are present should be fenced off from cattle or from maintenance works on the ditch. This is still the case and should be re-emphasised. Areas fenced off from cattle and also people could have appropriate signage to educate visitors about the importance of this species.

Assessment against selection criteria

Coe Fen meets County Wildlife Site designation for its pollard willows in association with grassland, ditches and rivers. The grassland is not species rich enough for County or City Wildlife site designation. No neutral grassland indicator species were recorded.

Direction of travel

Habitat	Comments
Grassland	Poor condition and declining
Central ditch	Moderate condition which is likely to be improving
Eastern drain	Poor condition and declining
Woodland	Moderate condition which is likely to remain stable

Habitat	Comments
Scrub	Moderate condition which is likely to remain stable
Lines of trees	Moderate condition which is likely to remain stable

A Cambridge City Wildlife Site Survey was undertaken on Coe Fen in 2005. In addition, survey work was undertaken in 2009 to inform the management plan for the site. There have been structural changes to the central drainage ditch which no longer has scallops cut into the bank and is much less shaded with no trees on its banks. This ditch is classed as "moderate – improving".

The other drain to the east is in a similar condition to previously, with it being highly shaded. It is now nearly dry, so it is classed as "poor – declining".

The grassland was described as species-poor in 2005 and remains that way, although certain notable species recorded in 2005 such as cuckoo-flower *Cardamine pratensis* and wild clary *Salvia verbenaca* were not recorded in the 2020 survey. The grassland is therefore classed as "poor – declining".

The woodland, line of trees and scrub habitats are classed as "moderate – stable" as they are not particularly impacted by the change to grazing regime.

Future risks to condition

Potential risks which may impact upon habitat condition and features include:

- Loss of key species such as whorl-grass from excessive grazing, recreational pressures, or accidental removal during management works;
- Impacts on the ditch from cattle which could be detrimental to flora and populations of water vole; and
- Grazing pressure on the grassland.

Opportunities

Key features of ecological interest (and constraints if any)

The grazing pasture and ditch systems are key features at Coe Fen. The pollard willows provide an important invertebrate habitat. It is also important to note that Coe Fen forms part of a wider complex of open spaces which are of critical importance within Cambridge. The River Cam, which forms the western boundary of Coe Fen, is the thread that links this corridor of valuable biodiversity spaces.

Coe Fen is publicly accessible but does not receive the same levels of footfall as other nearby locations. This may offer an opportunity for more sensitive biodiversity management in the area.

There are some protected species issues for consideration on the site and these include water vole and reptiles. Bats are likely to roost in the trees on site and certainly use the area for foraging. The presence of scarce and rare species, such as whorl-grass, should also be taken into consideration when planning management activity.

Opportunities

Management activities and biodiversity interventions should largely be focussed on improving the condition of, or enhancing, existing features. These should focus on;

- Improving grassland diversity and condition.
- Replacement of non native trees with other species over time such as black poplar or white willow.
- Managing populations of whorl-grass through appropriate management, creation of habitat and monitoring populations.
- Enhancing the seasonally wet ditches and hollows, through clearance activities if necessary.

These activities are all outlined with the current management plan for the site although it currently appears that the grazing pressures are high. The management

of grazing will be critical to get the balance right for the grassland diversity, whorl-grass and appropriate management of undesirable species.

The ditches on the margins of Coe Fen could be enhanced and this could be done by reprofiling the edges, increasing flow, removing non-native pondweed species and reducing shading of the ditches to promote the growth of marginal bankside vegetation.

The island presents an interesting opportunity to create an undisturbed area for wildlife within the city. Options for restricting access could be considered to create a wildlife haven in the area. Habitats to consider might be seasonally inundated grasslands. Species specific features could also be created, such as artificial otter holts.

There are some opportunities to establish other new features for wildlife. For example grey wagtail nest boxes could be installed under the bridge over the River Cam. Tawny owl and kestrel boxes could also be successful. Bat boxes could be considered around Coe Fen.

Creation of features	
Habitats	Creation of a wildlife refuge on the island with habitat such as seasonally inundated grassland.
Species	Biodiversity toolkit: Bird boxes (grey wagtail, kestrel, tawny owl), bat boxes Artificial otter holt
Management/restoration of existing features	
Habitats	Improve ditch condition by reprofiling edges, increasing flow, removing non-native pondweed species and reducing shading of the ditches to promote the growth of marginal bankside vegetation. Improved management of grassland, scrub and woodland through continued application of management plan.
Species	Continued management for whorl-grass as specified in the site management plan

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Improving the floristic diversity of the grassland though changes in management (both for grazing and public access) with a view to achieving moderate condition
- Maintaining population of whorl-grass
- Improve the condition of the ditches from poor to good condition

Further monitoring work

The following monitoring activities are proposed;

- Annual monitoring for whorl-grass should be conducted as recommended in the management plan.
- Monitoring of the grassland habitats against the management plan target NVC communities MG8, MG11 and MG13, and also assessment to ensure the grassland on each area qualifies for City Wildlife Site status.

Lower Vicar's Brook, New Bit and Coe Fen Straits

Results

Site description and status

New Bit site follows Vicar's Brook from the A1134 road junction to its connection with the River Cam, adjacent to Hodson's Folly. Immediately north of Vicar's Brook lies the cattle-grazed grassland which is called New Bit. This area of grassland contains trees which have been relatively recently planted. The site is 2.5 hectares and is bordered on the south by private gardens. To the east lies Hobson's Conduit CiWS and Cambridge Botanic Gardens CiWS, whereas Paradise and Sheep's Green CWS lie to the east. Coe Fen CWS lies immediately north of Vicar's Brook.

New Bit is a CiWS, qualifying for its chalk stream with adjacent semi-natural habitat (criterion 2.14).

This site lies within the River Cam Corridor Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g4 Modified grassland (16 Tall herb, 59 Cattle grazed)**
Description **g4 Modified grassland:** The grassland on New Bit has a similar species composition and structure to that at Coe Fen and Sheep's Green. Species diversity is fairly low, but a number of grass species were abundant including annual meadow-grass *Poa annua*, red fescue *Festuca rubra agg.*, creeping bent *Agrostis stolonifera* and perennial rye-grass *Lolium perenne*. The grass is heavily grazed by a number of cattle. The narrow section of grassland between Coe Fen and New Bit, called Coe Fen Strait, has been trampled by cattle in places, leaving bare ground, but also has sections of tall herb dominated by common nettle *Urtica*

dioica. To the east of New Bit a number of trees have been planted in the grassland recently with a view to recreating the wood pasture/parkland habitats present at Sheep's Green.
Condition **g4 Modified grassland:** The grassland is in poor condition, with bare ground patches and evidence of bramble encroachment in places. Species diversity was also poor, with a lack of wildflowers and sedges >30%.

Scrub

UKHabs habitat types present (secondary codes in brackets) **h3d Bramble scrub** **h3h Mixed scrub**
Description **h3d Bramble scrub:** Bramble-dominated scrub surrounds the ditch opposite Vicar's Brook, but north of this ditch the habitat is mainly mature ash *Fraxinus excelsior* and sycamore *Acer pseudoplatanus* trees with bare ground. **h3h Mixed scrub:** All along the southern border of Vicar's Brook there is mixed scrub, which has occasional mature trees interspersed with a dense understorey of bramble sp. *Rubus fruticosus agg.*, dog rose *Rosa canina,* elder *Sambucus nigra* and hawthorn *Crataegus monogyna*.
Condition **h3d Bramble scrub:** The bramble scrub is in poor condition due to limited age range and a uniform dense structure. **h3h Mixed scrub:** The mixed scrub is also in poor condition, although does contain more structure and diversity.

Rivers and standing water

UKHabs habitat types present (secondary codes in brackets) **r1a Eutrophic standing waters (117 Dry, 39 Freshwater - man-made)** **r2b Other rivers and streams**
Description **r1a Eutrophic standing waters:** A ditch runs parallel to Vicar's Brook in the narrow section of land between Coe Fen and New Bit. This ditch had turbid water,

with no flow, and non-native least duckweed *Lemna minuta* was also present. Mature trees and scrub shaded the ditch along most of its length.

r2b Other rivers and streams: Vicar's Brook has a varying channel width, between 1-1.5m on average, and its depth also varies. The water was clear and had a moderate flow in sections, especially in shallower areas with a gravel substrate. Mature trees flank most of the brook, creating shade for the majority of its length. Bankside or marginal vegetation such as pendulous sedge *Carex pendula*, fool's water-cress *Helosciadium nodiflorum* and great willowherb *Epilobium hirsutum* were also present, but were infrequent and restricted to the north bank or in places with less tree cover. Non-native species such as bamboo were also recorded along Vicar's Brook.

Condition

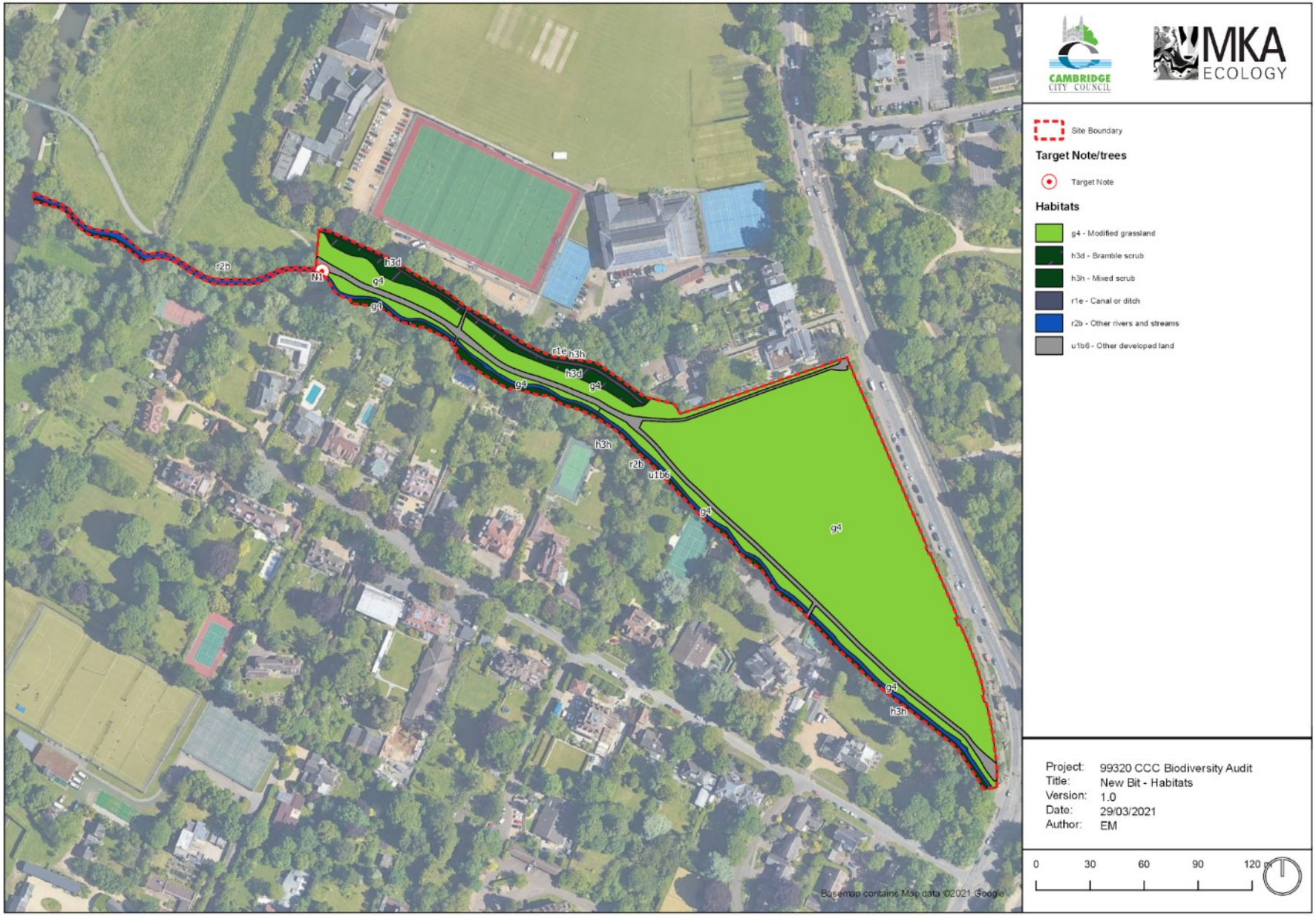
r1a Eutrophic standing waters: The ditch opposite Vicar's Brook is in poor condition, with non-native duckweed present and with turbid water and no flow.

r2b Other rivers and streams: Vicar's Brook was classed as moderate condition, as some sections had very little flow and were heavily shaded. There were also sections where cattle could enter the brook and poaching had occurred on the bank.

Priority habitats

The following Priority Habitats are present at this location;

- Eutrophic standing waters
- Rivers and streams


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site Boundary
Target Note/trees
Target Note
Habitats
g4 - Modified grassland
h3d - Bramble scrub
h3h - Mixed scrub
r1e - Canal or ditch
r2b - Other rivers and streams
u1b6 - Other developed land
r2b
N1
h3d
g4
g4
r1e
h3h
h3d
g4
g4
h3h
r2b
u1b6
g4
g4
g4
h3h
Basemap contains Map data ©2021 Google
Project: 99320 CCC Biodiversity Audit
Title: New Bit - Habitats
Version: 1.0
Date: 29/03/2021
Author: EM
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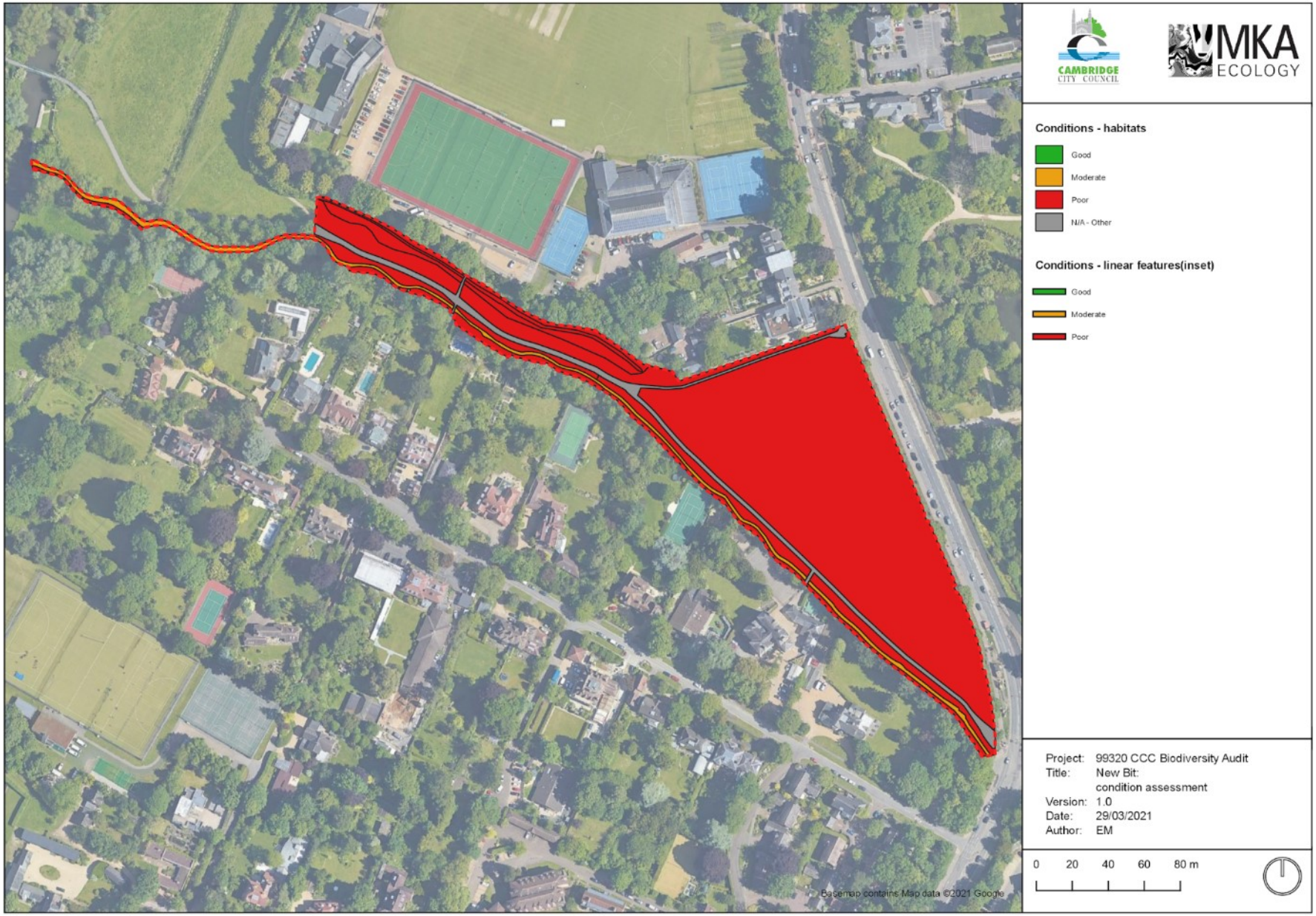

CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features(inset)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: New Bit: condition assessment
Version: 1.0
Date: 29/03/2021
Author: EM
0 20 40 60 80 m
Basemap contains Map data ©2021 Google

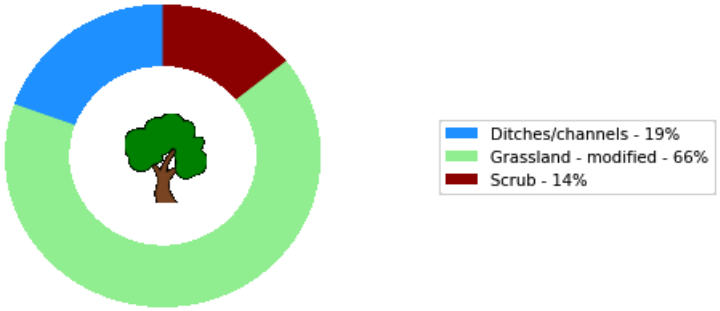
Target Notes:

1. Bamboo garden escape

Biodiversity units

The following chart shows the percentage of biodiversity units for each habitat/linear feature type at New Bit.

Habitats



Habitat type	*Biodiversity units*
Ditches/channels	1.33
Grassland - modified	4.52
Scrub	0.97

Management

Review of exiting management

A management plan for Coe Fen, Sheep's Green, Vicar's Brook and New Bit for 2009-2019 was produced by The Bedfordshire, Cambridgeshire & Northampton (BCN) Wildlife Trust. Objectives are grouped by habitat type and are as follows:

Pollard willows

1. The number of Pollard Willows on the site is kept at the 2009 level.
2. The lifetime of each Willow is maximised by management through pollarding.
3. The Willows across the site are of a diverse age structure, which includes viable saplings and veteran trees.
4. The majority of trees on Sheep's Green and Coe Fen are pollarded Willows, with any others of native species.

5. All the Willows will be from local stock.
6. The Willows will provide standing and fallen dead wood.
7. The Willows will support the full range of associated species.

Woodland

1. Retain the 2009 area of woodland on the islands on the site
2. Woodland has predominantly native tree species only
3. Woodland has understorey of native species
4. Woodland contains some dead wood

Whorl-grass

1. Ensure Whorl-grass has regular presence at both Sheep's Green and Coe Fen
2. Maintain or increase distribution of Whorl-grass across the site
3. Maintain or increase areas of suitable habitat across the site
4. Ensure populations of Whorl-grass are not adversely affected by presence of cattle or people
5. Suitable habitat for Whorl-grass is available on site

Grassland

1. The area of grassland on the site is at least as large as in 2008 (see habitat map)
2. Enhance the species richness of the grassland to achieve a more natural floodplain grassland habitat with presence of NVC communities MG5 on New Bit and MG8, MG11 and MG13 on Sheep's Green and Coe Fen and increase the abundance to frequent of at least five neutral grassland indicator species in each area of the site.
3. Grassland on each area of the site qualifies for City Wildlife Status.
4. Retain the present proportion of grassland to trees to keep the 'common' feel of the site.
5. Presence of invasive weeds, creeping thistle, nettle, docks, ragwort and cow parsley will be reduced to no more than 5% of grassland.

Waterways and pools

1. The waterways will provide high quality habitat and corridor routes for aquatic animals and plants within and through the site.
2. The waterways will support a typical range of the associated animal and bird species.
3. The waterways will support a rich variety of aquatic plant species with at least 15 species listed in the box below present in each area of the site, of which at least 5 will be frequent.
4. There will be a varying level of flow of water in the ditches.
5. The banks of waterways will provide habitat suitable for a diversity of wildlife, including for Water voles.
6. The areas of seasonally wet depressions on Sheep's Green will be maintained.
7. The waterways and their bank sides will support the population of Whorl-grass (see above).

The management plan promoted the use of grazing across the sites in order to increase the species diversity of the grassland. Unfortunately, the grazing management has not yet resulted in an improvement in the condition of the grassland. In 2014 as part of the coronation meadows scheme, New Bit was seeded by hand with seeds collected from Chettisham Meadow, a donor meadow. This aligned with the grassland Objective 2, however, in the 2020 survey no neutral or wet grassland indicator species were present and the reseeded area was not obvious in terms of a change in species composition across the sward. The tree planting within New Bit grassland was raised as a concern because as these trees mature they will shade out the grassland.

As part of the waterways and pools objectives, the management plan outlined scrub clearance activities on the east side of Vicar's Brook and along the ditch at Coe Fen Strait. Parts of this area have been opened up but scrub is still present along parts of the brook's length, with significant shading occurring in places, particularly along Coe Fen Strait. However, the condition of this waterway is much improved in recent years.

Assessment against selection criteria

The site is classed as a City Wildlife Site under criterion 2.4, with Vicar's Brook being a chalk stream with adjacent semi-natural habitat.

Direction of travel

Habitat	Comments
Grassland	Poor condition which is likely to be stable
Scrub	Poor condition which is likely to be stable
Ditch	Poor condition which is likely to be stable
Vicar's Brook	Moderate condition which is likely to be improving

A Cambridge City Wildlife Site Survey was undertaken on this site in 2005, with an extensive botanical survey also undertaken.

Vicar's Brook has undergone some scrub clearance and canopy lifting works since 2005, which has led to a reduction in overshading. However, non-native species such as bamboo were recorded both in 2005 and at present.

New Bit and Coe Fen Strait are also similar in their species composition and condition as recorded in 2005. Therefore, the grassland on site is deemed "poor – stable", the scrub "poor – stable", the ditch "poor – stable" and Vicar's Brook "moderate – improving".

Future risks to condition

Potential risks which may impact upon habitat condition and features include:

- Overshading of grassland from tree planting;
- Continued spread of non-native species;
- Pressure on grassland habitats resulting from cattle at pinch points on Coe Fen Strait;
- Pressure on aquatic habitats from recreational uses, cattle and dogs; and
- Scrub encroachment on marginal vegetation and on grasslands.

Opportunities

Key features of ecological interest (and constraints if any)

The grazing pasture and the Vicar's Brook are the key ecological features at New Bit. Vicar's Brook provides connectivity to the east and south to the corridor that is formed by Hobson's Brook that reaches from the countryside in the south of Cambridge into the city centre. Vicar's Brook also connects to the River Cam corridor and therefore the New Bit site represents an important link between these two corridors in the City. Some protected species may be present including water vole, and recent work has recorded bats using this area regularly.

Opportunities

Management activities and biodiversity interventions should largely be focussed on improving the condition of, or enhancing, existing features. This should focus on improving grassland diversity and condition. Measures for improving condition are detailed in the current management plan for the site although it currently appears that the grazing pressures are high. The success of the wildflower planting should be reviewed within the grassland and if necessary further measures taken to promote diversity here. Concern over tree planting in the grassland was raised in the management plan for the site and the effect of this should be monitored. Ideally any further tree planting should be limited.

There are planned improvement works for Vicar's Brook in 2021 and these are endorsed here. They include creation of new deadwood features, creation of pools and riffles with dig and dump, and the deposition of further gravels.

Creation of features	
Habitats	n/a
Species	Biodiversity toolkit: Bird boxes, bat boxes
Management/restoration of existing features	
Habitats	Improve condition of Vicar's Brook Improved management of grassland through continued application of management plan.
Species	Improve condition of Vicar's Brook for water vole

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Improving the floristic diversity of the grassland though changes in management (both for grazing and public access) with a view to achieving moderate condition
- Maintaining population of whorl-grass
- Improve the condition of the ditches from poor to good condition
- Continued improvement of Vicar's Brook

Further monitoring work

Monitoring of the grassland habitats against the management plan target NVC communities MG8, MG11 and MG13, and also assessment to ensure the grassland on each area qualifies for City Wildlife Site status.

Barnwell East

Results

Site description and status

Barnwell East LNR is a City Wildlife Site and consists of a mosaic of grassland with scattered and dense scrub, and woodlands. Paths are maintained by mowing and cutting, as are areas of scrub within the larger mosaic. The site is designated on the basis of its calcareous grassland; (CityWS selection criterion 2.10d) and presence of habitat mosaics (2.18).

This site lies within the River Cam Corridor Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g2a5 Dry grasslands and scrub on chalk or limestone (10 Scattered scrub, 11 Scattered trees, 16 Tall herb, 17 Ruderal/ ephemeral, 75 Active Management, 130 ecotone)** **g4 Modified grassland (56 Young trees – planted, 64 Mown)**
Description **g2a5 Dry grasslands and scrub on chalk or limestone.** Areas of calcareous grassland are concentrated north-east and south of the pond. Calcareous grassland indicators were present no more than frequently, with agrimony *Agrimonia eupatoria,* common bird's-foot-trefoil *Lotus corniculatus* and eyebright *Euphrasia agg.* occurring most frequently, both within the more open areas of grassland, but also within the scrub glades. Cock's-foot *Dactylis glomerata* and false oat-grass *Arrhenatherum elatius* were the most frequently occurring grass species. Canadian goldenrod *Solidago canadensis* forms large stands within the grassland and is the subject of ongoing management, though it is recognised that

these stands are likely to provide a valuable nectar resource to pollinators. The grassland was well used by butterflies, including small heath *Coenonympha pamphilus.*

g4 Modified grassland: The main grassy track is the sole location of this habitat type, containing perennial rye-grass *Lolium perenne* and other common grasses. Some of the neutral and calcareous indicators found elsewhere at the site were present within the less managed/trampled fringes.

Condition

g2a5 Dry grasslands and scrub on chalk or limestone. With the exception of an area to the north-east of the pond, all areas of calcareous grassland are considered to be in 'poor' condition. In the cases of areas north of the access path, these are not clearly recognisable as this habitat type and are present in part as a result of recent scrub clearance. Wildflowers are not widespread, scrub cover is >5% and invasive non-native species cover is >5%. As such, most of the condition criteria are being failed. A single area to the north-east of the pond is considered to be in 'moderate' condition, this having a reduced scrub and bramble cover compared to other areas and non-native species absent. Wildflowers were not widespread and frequent.

g4 Modified grassland. On account of being a sward of perennial rye-grass, the path is considered to be in 'poor' condition.

Woodland

UKHabs habitat types present (secondary codes in brackets)

w1g7 Other broadleaved woodland types (10 Scattered scrub, 11 Scattered trees, 36 Plantation)

Description

Making nearly half of the site (1.44ha, 44%) is woodland and exists in two distinct sub-types on the basis of structure. The south of the site is formed of a mature stand of hawthorn and was evidently considered within the wider scrub mosaic on previous surveys (Cambridge City Wildlife Site Survey, 2005). Two woodland indicators were found at rare frequencies: wood-sedge *Carex sylvatica* and

pendulous sedge *Carex pendula,* along with a number of other woodland understorey species such as frequent lords-and-ladies *Arum maculatum*, wood avens *Geum urbanum* and false-brome *Brachypodium sylvaticum*. More mature specimens of hybrid black poplar *Populus nigra x deltoides = P. x canadensis* and walnut *Juglans regia* were also present, particularly along the south-west boundary, with ash *Fraxinus excelsior* more prevalent within the western portion. A second block exists to the east, dividing two main areas of grassland. Here, hawthorn was again dominant, but also with significant cover of elder and occasional ash.

Condition

All woodland areas are considered to be in 'moderate' condition. In all cases, the near absence of fallen or standing deadwood leads to this assessment, as well as the presence of some isolated damage from dog walking and litter. In the north of the site, the absence of deadwood, lack of diversity of age and height and absence of evidence of successful tree regeneration give rise to a 'poor' condition assessment.

Scrub

UKHabs habitat types present (secondary codes in brackets)

h3a Blackthorn scrub

h3d Bramble scrub

h3f Hawthorn scrub

h3h Mixed scrub (16 tall herb, 130 ecotone)

Description

h3a/d/f/h Scrub: Scrub makes up around 40% of the total site area and is perhaps the greatest asset at the site. The scrub varies in character from dense stands of hawthorn *Crataegus monogyna* (north-west of pond) and blackthorn *Prunus spinosa* (west of path) to mixed scrub elsewhere. The best example of this habitat lies to the east of the access path where a structurally and botanical diverse area exists. The principal woody species are hawthorn, blackthorn, dogwood *Cornus sanguinea* and elder, *Sambucus nigra*. The tall herb layer is comprised of frequent

rosebay willowherb *Chamerion angustifolium* with locally dominant stands of Canadian goldenrod and Michaelmas-daisy *Aster.* The herb layer is made up of many of the calcareous and neutral grassland species described above, with common bird's-foot-trefoil being locally abundant and false brome *Brachypodium sylvaticum* frequent. Mature goat willow *Salix caprea* add to the structural diversity of these areas.

Condition

Scrub at Barnwell East is in all three condition categories. The largest areas considered to be in 'good' condition are to the east of the main path. Here there is diversity in species composition and structure; both young shrubs and mature trees are present with glades of tall herb and grassland. There is a well-developed grassland/herb layer and the invasive *Aster* and Canadian goldenrod are presently at or slightly less than 5% of the ground cover. Where individual stands of hawthorn or blackthorn scrub have been separately mapped and have a less diverse structure, these are nevertheless considered as 'good' by virtue of their proximity to neighbouring grassland. Those areas in 'moderate' condition are confined to the north or west of the main path and are relatively linear stands of either hawthorn or blackthorn. Here, there is little woody species diversity and an absence of a good age range of plants. In the area of poor condition scrub in the north, this is taken to extreme where uniformly mature, dense hawthorn with no understorey or structural variation exists.

Freshwater

UKHabs habitat types present (secondary codes in brackets)

r1a Ponds (eutrophic standing waters; 19 Ponds - Priority Habitat)

f2d Aquatic marginal vegetation (17 Ruderal/ ephemeral)

Description

A pond is situated close to the Barnwell Road entrance. This is lined by scrub and trees to the north and east, but clear to the south and west allowing sufficient light input. Emergent species included frequent reedmace *Typha*, great willowherb *Epilobium hirsutum* gypsywort *Lycopus europaeus* with occasional brookweed

Samolus valerandi and hard rush *Juncus inflexus*. Several dragonflies and damselflies were observed during the survey. A platform with ramp was installed in the early 2000s and remains in good condition.
Condition The pond was assessed as having a 'good' condition. Submerged and floating plants were present, though the pond was not dominated by them. Michaelmas-daisy in the pondside vegetation resulted in the failure this condition criterion, but overall the majority of criteria are being met.

Tree lines

UKHabs habitat types present (secondary codes in brackets) **w1g6 Line of trees (71 Earthbank , 341 Woodland; broadleaved)**
Description A line of trees clearly distinct in origin, yet now part of the woodland, is present on the north-west boundary. It is likely to represent a grown-out hedgerow and is associated along part of its length with an earth bank. Cherry *Prunus* was frequent along with field maple *Acer campestre.*
Condition This tree line is assessed as having 'good' condition on account of there being a continuous line or mature with no gaps.

Priority habitats

The following Priority Habitats are present at this location;

- Lowland calcareous grassland
- Lowland mixed deciduous woodland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Site boundary
Habitats
f2d - Aquatic marginal vegetation
g2a5 - Dry grasslands and scrub on chalk or limestone
g4 - Modified grassland
h3a - Blackthorn scrub
h3d - Bramble scrub
h3f - Hawthorn scrub
h3h - Mixed scrub
r1a - Eutrophic standing water
u1b6 - Other developed land
w1g7 - Other broadleaved woodland types
Linear features
w1g6 - Line of trees
Point features
Target Note
Project: 99320 CCC Biodiversity Audit
Title: Barnwell East - habitats
Version: 0.1
Date: 23/03/2021
Author: JH
10 0 10 20 30 40 50 m
Basemap contains Map data ©2021 Google

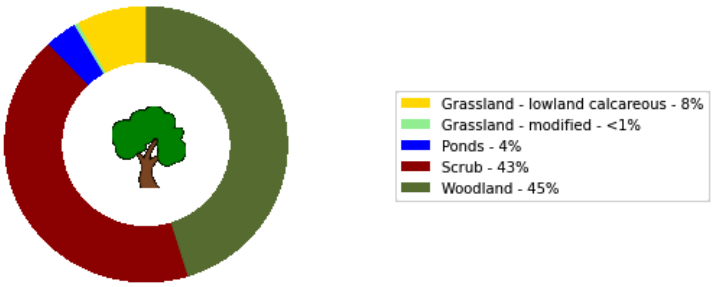

CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Conditions - habiats
Good
Moderate
Poor
N/A - Other
Conditions - linear features
Good
Moderate
Poor
N/A - Other
Project: 99320 CCC Biodiversity Audit
Title: Barnwell East: condition assessment
Version: 0.1
Date: 23/03/2021
Author: JH
10 0 10 20 30 40 50 m
Basemap contains Map data ©2021 Google

Target Notes:

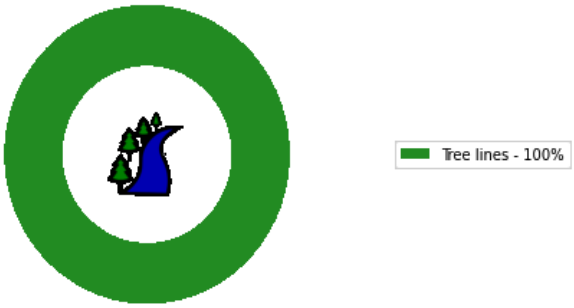
1. Recent fire.
2. Stand of Canadian goldenrod.
3. Stand of Canadian goldenrod.
4. Log and rubble pile.

Biodiversity units

The following charts shows the percentage of biodiversity units for each habitat/linear feature type at Barnwell East.



Habitat type	*Biodiversity units*
Grassland - lowland calcareous	2.35
Grassland - modified	0.13
Ponds	1.08
Scrub	12.54
Woodland	13.28



Habitat type	*Biodiversity units*
Tree lines	1.11

Management

Review of exiting management

The site's management objectives are as follows:

1. To improve the diversity of the grassland and increase the coverage of bee orchid, calcareous herb species, and grasses associated with chalk grassland (LHAP for Cambridgeshire – Lowland Calcareous Grassland).
2. To enhance the traditional woodland/scrub species and encourage diverse age structure and diversity of ground flora (LHAP for Cambridgeshire – Scrub).
3. To ensure that scrub does not encroach into the grassland to the detriment of the overall site biodiversity.
4. To maintain current shade/open water status of the pond and prevent it becoming too shaded and silting up (LHAP for Cambridgeshire – Ponds).
5. To manage ancient hedgerow and newly planted hedge (LHAP for Cambridgeshire – Hedgerows).
6. To survey for notable species – Bee Orchid, Great Crested Newt and Harvest Mouse. If found, to maintain and enhance populations. If not, to actively manage habitats to encourage colonisation.
7. To enhance access opportunities and use of site by Cambridge people.
8. To enhance the educational value of the site.

A review of species-specific objectives (i.e., orchids and fauna) cannot be achieved in this audit. Management of the grassland to both discourage invasive species and prevent scrub encroachment is evident - at least three areas within the site had been recently cut, however, Canadian goldenrod is still widespread and scrub encroachment within the grassland is an ongoing challenge. One consequence of the management regime as evident at the site is the tendency for patches of scrub to be created that are of a relatively uniform age and structure as is prevalent on the west side of the path. By comparison the east side of the path, the scrub is much more diverse in both species and structure.

Traditional wood and scrub species are also present though in many places (particularly in the north) a diverse ground flora is not present. The pond is in good condition and light levels are being maintained.

Assessment against selection criteria

The site is designated on the basis of its calcareous grassland and mosaic. The site would still appear to qualify under its calcareous grassland, with at least six indicators observed within the present survey. However, not all were considered to be frequent *within* the grassland areas themselves (present, instead within the herb layer of the scrub). The mosaic of scrub and grassland, particularly in the areas to the east of the path appear still to qualify.

Direction of travel

Habitat	Comments
Grassland	Moderate – declining. More diverse swards are present as described in 2005, but invasive species remain present at similar levels, with early growth scrub also apparent.
Grassland	Poor – declining. Invasive species and scrub cover at greater abundance in these areas.
Scrub	Good – stable. Areas of scrub within the centre of the site are as described in 2005, with several glades and varied structure.
Scrub	Moderate – stable. Scrub belts present on the site perimeter remain as largely described in 2005.
Scrub	Poor – stable. Dense scrub to the north remains as largely described in 2005, though trees are of greater maturity.
Pond	Good – stable.

Habitat	Comments
Woodland	Moderate – improving. Characteristics of the understorey indicate the development of a woodland character.

A Cambridge City Wildlife Site Survey was undertaken at Barnwell East in 1998 and 2005. In the case of grassland, given the prevalence of invasive species and lesser frequencies of calcareous indicators compared with the 2005 survey, these areas are considered to be either stable or declining; those areas of more diverse swards in the centre of the site within the good condition scrub mosaic are largely as described in 2005. However, this comes with the caveat that the field survey was conducted in August and therefore not at the ideal period for botanical field work.

All scrub is considered to be 'stable', with descriptions of this habitat matching that in 2005. In the cases where these are 'poor' or 'moderate', the uniformity of age is apparently unchanged, though in 2020 these areas are naturally more mature.

The pond is considered to be 'good – stable', with all surveys indicating that the water quality and light regime are being maintained.

Woodland was not recorded as a habitat type in previous surveys and as such is assessed as 'moderate – improving', particularly given the continued presence of a range of specialist woodland species.

Future risks to condition

Potential risks which may impact upon habitat condition and features include:

- Continued spread of non-native species, though acknowledging the potentially valuable role these provide for invertebrates.
- Retaining structural diversity of scrub relies on human intervention. Cessation of this intervention will therefore have a negative impact on this habitat type.

- Whilst managing scrub for its structural diversity will lead to an improvement of its condition, allowing the spread of its extent at the expense of grassland areas will have negative impacts on this habitat.
- Impacts to ponds from scrub encroachment and natural succession, again relying on human intervention for this.
- Impact from human recreation, particularly dog walking, on the majority of habitats.

Opportunities

Key features of ecological interest (and constraints if any)

Whilst individual and valuable habitats of National and Local significance are present at the site, the overall value comes from the juxtaposition of these in a mosaic, particularly of scrub and grassland. Woodland that has developed at the site has its origins in this scrub and reduces this mosaic. A significant opportunity, particularly in the north of the site where this scrub is in poor condition, is to open out areas and recreate this mosaic.

Great crested newt *Triturus cristatus* have been reported from the site, though it is not known whether a population exists at present.

Opportunities

Creation of features	
Habitats	n/a
Species	Invertebrates – bee-banks. Open habitats with south facing aspects are already present and, if built with a chalky substrate, may also benefit calcareous plants (mimicking the micro-habitats seen in anthills).
Management/restoration of existing features	
Habitats	Woodland and scrub. Targeting the denser stands of hawthorn in the south and far north of the site with selective felling of trees creating: • More diverse structure.

	• Opportunities for seedlings and understorey plants. • Creation and maintenance of a wider area of mosaic habitat within the site. • Creation of deadwood within woodland (a major reason for only 'moderate' condition); creation of 'beetle towers'
Species	Biodiversity toolkit: Bat boxes, bird boxes, beetle towers (in woodland)

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Improving the condition of areas of calcareous grassland from poor to moderate
- Maintain condition of scrub through management to create better structure and age range

Further monitoring work

Maintain existing monitoring regime as set out in site management plan.

Barnwell West

Results

Site description and status

Barnwell West is a four-hectare Local Nature Reserve and City Wildlife Site to the east of the City centre. It lies between Barnwell East and Coldham's Common and as such forms part of a wider area of important wildlife within the City. The underlying geology is lower chalk. Coldham's Brook forms the western perimeter and the East Cambridge Main Drain runs along the east of the site. The present survey includes Coldham's Brook within the site boundary, these being previously separated in surveys in 2005. The site is divided roughly equally by a tarmac access track. To the north, hawthorn and elder dominate an emerging woodland area. Woody species become more diverse to the south, with white willow and alder also present.

Coldham's Brook is a significant corridor through the City and is understood to support water vole *Arvicola amphibius*. Kingfisher *Alcedo atthis* were also observed during the present survey, along with an abundance of woodland birds. Nightingale *Luscinia megarhynchos* has been recorded at the site and is a species to which management is targeted, though its present status is unknown. The East Cambridge Main Drain is heavily shaded and deeply canalised and offers much less wildlife value.

This site lies within the River Cam Corridor Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g4 Modified grassland (16 Tall herb, 17 Ruderal/ ephemeral)**
Description

Modified grassland appears at the site in very small areas around gates, roads and access areas. Low growing plants associated with disturbance are present, (e.g., knotgrass *Polygonum*). A single Japanese knotweed *Fallopia japonica* plant was recorded on the north side of the access road.
Condition These small areas of grassland are considered to be 'poor'.

Woodland

UKHabs habitat types present (secondary codes in brackets) **w1g7 Other broadleaved woodland types**
Description Woodland is considered to make up the majority of the site, occupying three-quarters of the total site. In previous surveys (e.g., Cambridge City Wildlife Site Register Survey, 2005), this has previously been classified as scrub. However, canopy structure is now largely complete and the height of the woody species is consistently over five meters with mature trees present. Two distinct blocks exist, each on either side of the main access road, and reflecting the various management operations. To the north is a hawthorn *Crataegus monogyna* and elder *Sambucus nigra* dominated area. Ash *Fraxinus excelsior* and walnut *Juglans regia* are occasional and common nettle *Urtica dioica* is abundant in the ground layer. Other woodland species present with local frequency in the field layer were false-brome *Brachypodium sylvaticum,* herb-robert *Geranium robertianum*, wood avens *Geum urbanum* and the Ancient Woodland indicator pendulous sedge *Carex pendula.* The ferns hart's tongue *Phyllitis scolopendrium* and soft shield-fern *Polystichum setiferum* were locally abundant along the East Cambridge Main Drain. Fallen deadwood was frequent, with a small number of stumps giving occasional standing deadwood. To the south, the woodland structure was similar, but with more mature trees present along the west boundary along Coldham's Brook. White willow *Salix alba* and alder *Alnus glutinosa* were the most prevalent species here. There were more

clearings, though little ground vegetation was present and deadwood was much less frequent than to the north. The Ancient Woodland indicator wood sedge *Carex sylvatica* was observed.
Condition The northern block of woodland is considered to be in 'good' condition. The only criterion to be failed is that relating to signs of nutrient enrichment. Common nettle was abundant in the ground layer. It is likely this enrichment comes from a seasonally elevated water table from periods of heavy rainfall and the East Cambridge Main Drain, from which nitrates and other pollutants are likely to be present. The southern block is considered to be in 'moderate' condition. Physical damage was observed (rubbish) in some clearings and standing and fallen deadwood (>20cm in width) was largely absent.

Scrub

UKHabs habitat types present (secondary codes in brackets)
Description **h3h Mixed scrub (17 Ruderal/ephemeral)** Three areas of scrub are described. An open area to the north of the site is similar to that described in 2005, with a range of tall herbs/ruderal species (e.g., hemlock *Conium maculatum* and creeping thistle *Cirsium arvense* present) amongst woody hawthorn. To the south of the access track is an area of mixed scrub composed of mature trees, lower growth and ruderal species. A band of bramble scrub runs along the majority of the east bank of Coldham's Brook south of the access road.
Condition The northern block is considered as 'moderate'; here the woody species is entirely hawthorn and the herb layer, whilst likely to provide benefit to invertebrates, makes up >5% of the ground cover. The area to the south of the access track is considered to be 'good'. Here represents a botanically and structurally diverse area of scrub with all criteria being passed. The linear band of bramble along the Brook is considered to be 'moderate'. Whilst potentially considered as poor on the

basis of limited age range and absence of clearings, this does have value as it acts as a buffer between the watercourse and path, preventing excessive incursion from dogs and people. Therefore, it is considered as 'moderate' as providing a structural barrier with its biodiversity value coming in its value to other habitats (i.e. "Scrub type of high biodiversity value in poor condition").

Freshwater

UKHabs habitat types present (secondary codes in brackets)
r1e Canals/ditches (17 Ruderal/ ephemeral, 144 Chalk rivers, 191 Ditch)

Description

Coldham's Brook runs along the west of the site. The height of the channel from water to bank top varied from less than half a metre (north) to 1-2 metres (south), at times with a heavily canalised appearance. Emergent vegetation was present, but in discrete sections dependent on the presence or absence of scrub on the west bank. In the north, short sections were dominated by common reed *Phragmites australis.* To the south of the bridge, small patches with locally abundant sedge *Carex* sp., gypsywort *Lycopus europaeus,* water mint *Mentha aquatica* and yellow iris *Iris pseudoacorus* were present. On the banksides, great willowherb *Epilobium hirsutum* and rosebay willowherb *Chamerion angustifolium* were also locally abundant. Meadowsweet *Filipendula ulmaria* and square-stalked St John's-wort *Hypericum tetrapterum* also occurred rarely nearer the bank top. Water quality appeared good. The southern and northern stretches correspond with Sections B and C of the 2005 City Wildlife Site Register Survey respectively.

The East Cambridge Main Drain is a straight, V-shaped channel of approximately 50° bank angle and 2m in depth running along the length of the eastern boundary. It is heavily shaded and supports no floating or emergent vegetation, though ferns are locally abundant near the top of the western bank along its length.

Condition

Coldham's Brook is divided into 'moderate' and 'poor' sections. 'Moderate' sections correlate with where the west bank is more open, giving the opportunity for

vegetation within and along the channel. Nevertheless, floating vegetation was absent and the range of species was poor, dominated by one or two species (reeds or sedges). Water levels were low (approximately 20cm). It is not known whether a significant fish assemblage is present; Mungovan & Hawksley (2020) report dace *Leuciscus leuciscus* and chub *Squalius cephalus* within the Brook, though it is not known in what stretches (Coldham's Brook runs from Barnwell West to the River Cam). These sections are considered as 'moderate' as only four condition criteria are failed. Where Coldham's Brook is considered as 'poor', heavy shading is up to 90%, preventing growth of any emergent vegetation.

The East Cambridge Main Drain is considered to be 'poor'. Nearly all condition criteria are failed, with heavy shading and complete absence of vegetation notable.

Priority habitats

The following Priority Habitats are present at this location;

- Lowland mixed deciduous woodland
- Rivers and streams


w1g7
h3h
r1e
w1g7
r1e
w1g7
N2
N3
u1b6
h3h
r1e
h3d
u1c
w1g7
w1g7
r1e
r1e
N1
w1g7
Basemap contains Map data ©2021 Google
CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Habitats
g4 - Modified grassland
h3d - Bramble scrub
h3h - Mixed scrub
r1e - Canal or ditch
u1b6 - Other developed land
u1c - Artificial unvegetated/unsealed surface
w1g7 - Other broadleaved woodland types
Point features
Target Note
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Title: Barnwell West- habitats
Version: 0.1
Date: 24/03/2021
Author: JH
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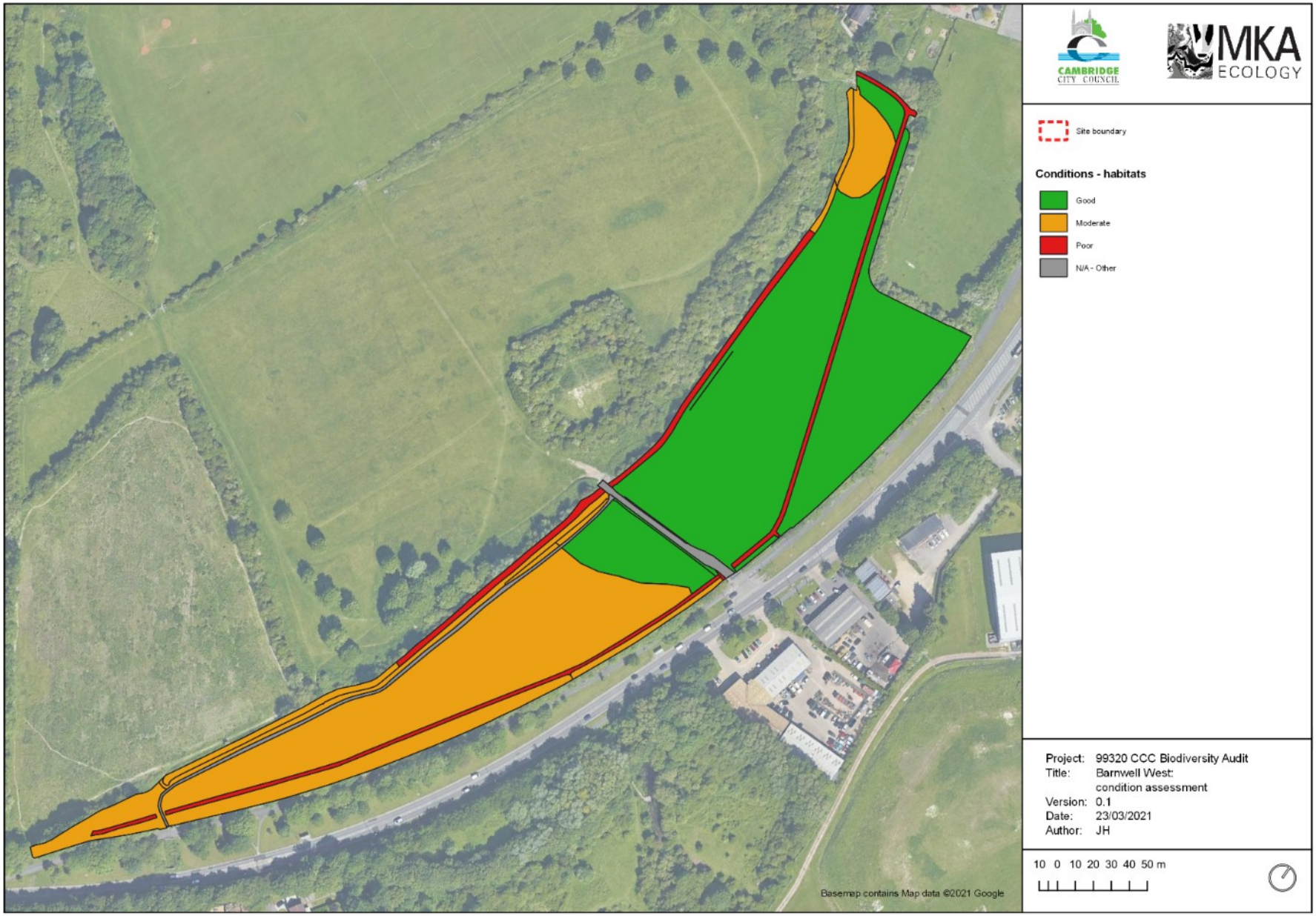
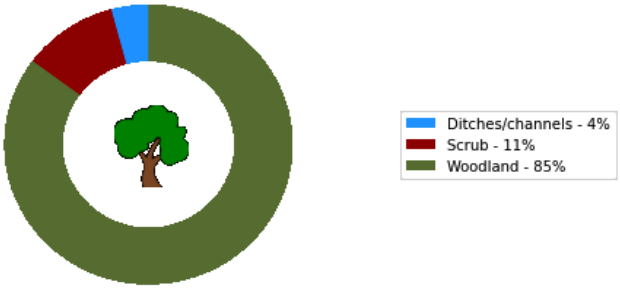

CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Project: 99320 CCC Biodiversity Audit
Title: Barnwell West: condition assessment
Version: 0.1
Date: 23/03/2021
Author: JH
10 0 10 20 30 40 50 m
Basemap contains Map data ©2021 Google

Target Notes:

1. Kingfisher observed.
2. Kingfisher heard.
3. Japanese knotweed.

Biodiversity units

The following chart shows the percentage of biodiversity units for each habitat/linear feature type at Barnwell West.



Habitat type	*Biodiversity units*
Ditches/channels	1.85
Scrub	4.72
Woodland	37.69

Management

Review of exiting management

The management objectives and site operations as described in the 2001 management plan are as follows.

Site objectives:

1. To convert some areas from a predominantly hawthorn scrub to a species rich scrub mosaic with around 10/12 standard maidens to the acre, so achieving diversity of habitat and encouraging passerine species such as Nightingale. LHAP for Cambridgeshire – Woodland.
2. To improve the diversity of the grassland in the open clearings. (LHAP for Cambridgeshire – Lowland Calcareous Grassland).

3. To maintain and improve Water Vole habitat. LSAP for Cambridgeshire – Water Vole.
4. To increase age diversity of scrub. (LHAP for Cambridgeshire – Scrub).
5. Diversify and manage existing tree groups.
6. To improve opportunities for public access.
7. To provide opportunities and facilities for educational use.

Site operations:

1. Clear hawthorn (30%) and plant with standard (north side) and coppice, repeating coppicing cycles and monitor.
2. Mow clearings and remove cuttings.
3. Test of chalk grassland creation.
4. Scrub cutting along Brook.
5. Encourage sympathetic management of water course.
6. Monitor water vole population and increase local awareness.
7. Cut scrub (10%) on south side (3 yearly) and maintain clearings.
8. Create and maintain cleared areas along Brook.
9. Pollarding and planting of willow.
10. A number of measures concerning access and visitor pressure.

That large areas of the site are classified as woodland and not scrub indicates that management targeting the maintenance of this habitat type is not succeeding. That is not to say the present habitats are not of value – far from it. Where greater clearance and scrub creation (versus woodland) would be valuable is along Coldham's Brook, particularly the northern section where complete shading is present. It does not appear that the creation of chalk grassland is feasible.

Assessment against selection criteria

The site qualifies on the basis of the presence of scrub (2.6) and woodland (2.4). If Coldham's Brook is considered within the boundary, it will also qualify under the presence of a chalk stream (2.14). Establishing whether a breeding population of water vole would also determine if criterion 2.27 can be reinstated.

Direction of travel

Habitat	Comments
Woodland	Good – improving. Whilst previous recorded as scrub, the overall condition compared with 2005 appears to be improving.
Woodland	Moderate – stable.
Freshwater	Moderate – stable. Conditions in and along Coldham's Brook are largely as described in 2005.
Freshwater	Poor – stable. Conditions in and along Coldham's Brook and East Cambridge Main Drain are largely as described in 2005.
Scrub	Good - stable – Where present, conditions largely as described in 2005.
Scrub	Moderate – declining. Reduction in extent.

Descriptions of the watercourses are similar to 2005, which these considered to be 'stable'. Indicating a direction of travel for scrub and woodland is more challenging; scrub has been considered to be the dominant habitat at the site, but it is presented as woodland here. Nevertheless, whilst the scrub may be considered to be in decline (in that it is much reduced in area), the woodland that takes its place, particularly in the north is in good condition and showing signs of improvement with increasing deadwood and a slightly richer ground flora with woodland species.

Future risks to condition

Potential risks which may impact upon habitat condition and features include:

- Impact from human recreation, particularly dog walking, on the majority of habitats.

- Spread of invasive species in both terrestrial and freshwater environments.
- Retaining structural diversity of scrub and/or clearing of certain areas (e.g., along Coldham's Brook) relies on human intervention. Cessation of this intervention will therefore have a negative impact on this habitat type, though may have positive impacts in woodland succession, as seen already.
- Impacts on Coldham's Brook from development upstream.
- Climate change: increased frequency/intensity of storm events and drainage on nitrate/pollutant levels.

Opportunities

Key features of ecological interest (and constraints if any)

The site appears to already support protected species: water vole has been recorded along Coldham's Brook and kingfisher were observed during field surveys. When compared to the target conditions and management regime, the site appears to be failing in so far as scrub is succeeding to woodland. However, this equally represents an opportunity. There is nevertheless a clear opportunity to substantially improve the condition of Coldham's Brook by reducing shading, particularly along its northern reach.

Opportunities

Creation of features	
Habitats	n/a
Species	*Biodiversity toolkit:* Bird boxes, bat boxes.
Management/restoration of existing features	
Habitats	*Scrub/woodland:* Depending on the desired direction, habitat management will either be targeted to creating more glades and structural diversity (i.e reversion to scrub) or allowing natural processes to take place (woodland). This decision may be driven by the desired status of Priority Species, e.g. nightingale.

	Freshwater: Clearance of scrub along bankside, especially along the north section. Other recommendations as per Mungovan & Hawksley (2020), e.g., connection to Cherry Hinton Brook and bank profiling, perhaps on south-western section with boundary with Coldham's Common where benefits will apply to both sites. Other micro-habitat features (brash bundles, flow deflectors). *Biodiveristy toolkit*: woodpiles and hibernacula.
Species	*Kingfisher:* Kingfisher tunnels.

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Improve condition of Coldham's Brook to good and East Main Drain from poor to moderate
- Maintain condition of some areas of scrub through management to create better structure and age range

Further monitoring work

Largely targeted at Coldham's Brook:

- Bi-annual water vole surveys, perhaps to combine with those on Cherry Hinton Brook run by the Cambridgeshire Mammal Group.
- Invasive species monitoring and control where necessary (Himalayan balsam *Impatiens glandulifera* and floating pennywort *Hydrocotyle ranunculoides* were reported as potentially present along certain sections of the Brook by Mungovan & Hawksley, 2020).

Paradise

Results

Site description and status

Paradise is 2.3 hectares in size and is predominantly wet woodland which lies adjacent to the River Cam. Wet woodland is a Habitat of Principal Importance and it is scarce within the city. Paradise represents the largest block of this habitat type in Cambridge. Its value is enhanced further by its situation on the River Cam corridor where it sits right on the fringe of the city with the Grantchester meadow complex to the south and Coe Fen/Sheep's Green to the north. Other habitats are present including ponds with associated marginal vegetation, and grassland with ruderal species. Paradise is open to the public and, due to its position on the Cam corridor on the edge of the city, the path through the woodland is well used. A boardwalk has been installed along the western edge of the wood to manage access/trampling pressures in this area.

Paradise is a LNR, CiWS and CWS. It achieves CWS designation for woodland (criterion 1.diii - supporting at least 0.5ha of NVC community W6 Alder - stinging nettle woodland), and the site also forms part of the River Cam CWS (criterion 4a). Paradise qualifies for CiWS status for Greater Pond-sedge swamp (criteria 2.11ai).

This site lies within the River Cam Corridor Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g4 Modified grassland (16 Tall herb)**
Description **g4 Modified grassland:** Grassland occurs between the main path and the River Cam along the majority of the site. Sections of grassland occur on both sides of the path, and there are also areas where common nettle *Urtica dioica* dominate.

The main grass species present are false oat-grass *Arrhenatherum elatius* and perennial rye-grass *Lolium perenne.* There are two larger sections of grassland, in the north of the site between the path and the pond and further south, that have a long sward of tall herbaceous plants. Species included common knapweed *Centaurea nigra*, hedge bindweed *Calystegia sepium* and wild angelica *Angelica sylvestris.* These areas of grassland are managed by cutting. These areas of tall herbs are likely to be of significant biodiversity value for a variety of invertebrates, particularly in combination with the surrounding aquatic habitats and wet woodland.
Condition **g4 Modified grassland:** The grassland is in poor condition, with the exception of the grass approaching the swamp/pond area which is in moderate condition. This tall herb grass had >30% wildflower and sedge species, and was free from damage or encroachment of bramble. The other grassland sections had perennial rye-grass at >25% cover and lacked species diversity. This is probably due to the regular walkers in this area, the effects of which only a few species such as perennial rye-grass, are able to withstand.

Woodland

UKHabs habitat types present (secondary codes in brackets) **w1d Wet woodland**
Description **w1d Wet woodland:** Woodland dominated the site and is classed as wet woodland due to the prevalence of standing water and species composition across the site. The area is seasonally wet and standing water is not always present. At the time of survey the woodland was entirely dry however later visits revealed widespread standing water. White willow *Salix alba* is frequent in the wetter parts of the woodland, and there are also openings within the woodland such as a section of butterbur *Petasites hybridus* in the south east part of the site. The stand of this species is valued both ecologically and culturally, having been first recorded at this location by John Ray over 400 years ago. In certain locations, bonfires have been lit and there were sections of bare ground indicating signs of disturbance and

damage. The understorey in sections was dominated by common nettle *Urtica dioica,* but there were also denser scrub sections with dog rose *Rosa canina*, dogwood *Cornus sanguinea* and elder *Sambucus nigra.* Chicken of the woods *Laetiporus sulphureus* grew on a mature white willow by the River Cam, and hop *Humulus lupulus* was also present in the woodland understorey.
Condition **w1d Wet woodland:** The woodland is in good condition, with a diverse age and height structure, standing and fallen deadwood, and natural wetland habitat. However, there are some signs of damage such as bonfires, and also signs of nutrient enrichment with sections that are dominated by nettle.

Wetland and ponds

UKHabs habitat types present (secondary codes in brackets) **r1a Eutrophic standing waters (19 Ponds (Priority Habitat))** **f2d Aquatic marginal vegetation**
Description **r1a Eutrophic standing waters (19 Ponds (Priority Habitat)):** A large pond is located in the central north section of Paradise. **f2d Aquatic marginal vegetation:** The pond is surrounded by swamp aquatic marginal vegetation, with species such as bulrush *Typha latifolia,* reed sweet-grass *Glyceria maxima,* yellow iris *Iris pseudacorus,* and water mint *Mentha aquatica* present. The swamp graded into woodland with alder *Alnus glutinosa* and white willow *Salix alba* abundant on the swamp margins.
Condition **r1a Eutrophic standing waters (19 Ponds (Priority Habitat)):** The pond is in good condition: there were no signs of artificial drainage, and the pond appeared permanent with good water quality. **f2d Aquatic marginal vegetation:** The aquatic marginal vegetation was in good condition with frequent reeds and a natural gradation into other habitat types.

Priority habitats

The following Priority Habitats are present at this location;

- Wet woodland
- Ponds


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site Boundary
Target Note/trees
Target Note
Habitats
f2d - Aquatic marginal vegetation
g4 - Modified grassland
r1a - Eutrophic standing water
u1b6 - Other developed land
w1d - Wet woodland
N1
g4
f2d
r1a
w1d
g4
u1b6
g4
g4
w1d
Basemap contains Map data ©2021 Google
Project: 99320 CCC Biodiversity Audit
Title: Paradise - Habitats
Version: 2.0
Date: 31/03/2021
Author: EM
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CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features(inset)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: Paradise: condition assessment
Version: 1.0
Date: 29/03/2021
Author: EM
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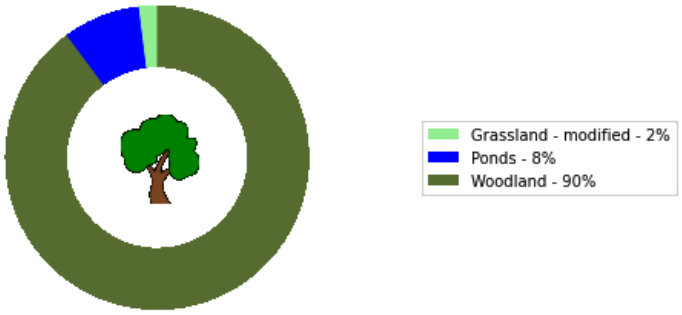
Target Notes

1. Bird box
2. Butterbur stand

Biodiversity units

The following chart shows the percentage of biodiversity units for each habitat/linear feature type at Paradise.

Habitats



Habitat type	*Biodiversity units*
Grassland - modified	0.77
Ponds	3.21
Woodland	35.15

Management

Review of exiting management

A management plan was prepared for Paradise by Cambridge City Council in 2001 for the period 2001 – 2010. The site objectives outlined in this plan are:

1. To enhance the marshland habitat and ensure that it does not dry out. (LHAP for Cambridgeshire -Fens)
2. To enhance the ditches which form the site boundary and run through the site. (LHAP for Cambridgeshire – Drainage Ditches)
3. To maintain areas of Willow carr. (LHAP for Cambridgeshire – Wet Woodlands)

4. To enhance the woodland areas and encourage diverse structure in the ground flora. (LHAP for Cambridgeshire – Wet Woodlands)
5. To enhance grassland/tall herb habitats. (LHAP for Cambridgeshire – Meadows and Pastures)
6. To maintain and if possible enhance populations of notable species, such as Butterbur and Musk Beetle.
7. To survey for notable species – Orchid species, Harvest Mouse etc. and to enhance opportunities for these species.
8. To maintain existing and where possible enhance infrastructure
9. To enhance access opportunities and use of site by Cambridge people.
10. To enhance the educational value of the site.

Whilst a review of species-specific objectives 6 and 7 cannot be achieved in this audit, the other objectives appear largely to have been met, since the marshland habitat is in good condition and areas specifically for tall herb grassland have been maintained. The management of Paradise has been very successful.

Some of the problems highlighted in this management plan still persist, such as areas where people stray off paths, causing issues with damage and littering. Recent interventions, such as the raised path through the area of butterbur, appear to have had positive impacts in reducing these pressures in key areas. In general the recreational pressures on this woodland area seem less extreme than other woodland areas in the City such as Byron's Pool. This may be due to the fact that people pass through Paradise on their way to Granchester whereas Byron's Pool is a destination in itself for walking. It may also be a consequence of the habitat type with wet muddy conditions preventing excessive access away from paths. Finally it may be in part due to the location within the City. Areas such as Byron's Pool are close to significant new residential developments and the recreational pressures that they cause.

Assessment against selection criteria

Paradise qualifies as a County Wildlife site under section 2.15a, as semi-natural habitat that lies adjacent to the River Cam. The site also qualifies as CWS for supporting a least 0.5 ha of NVC community W6 (Alder-stinging nettle woodland).

Paradise also qualifies as a City Wildlife Site under criterion 2.4, woodlands larger than 1ha with five or more woodland plants. Fifteen woodland plants and one ancient woodland indicator plant were recorded during the survey. It also qualifies as a City Wildlife Site for Greater Pond Sedge swamp NVC community S6.

Direction of travel

Habitat	Comments
Grassland	Poor/moderate condition which is likely to be stable
Woodland	Good condition which is likely to be stable
Pond	Good condition which is likely to be stable
Aquatic marginal vegetation	Good condition which is likely to be stable

A Cambridge City Wildlife Site Survey was undertaken in 2005, with an extensive botanical survey also undertaken at the same time.

The swamp area is clearly still maintained to a good condition, and the butterbur stand remains unchanged since the previous survey. The woodland also appears to have the same structure and condition. For these reasons, the habitats on site overall are classed as “good – stable” excepting the grassland which is “poor/moderate - stable”.

Future risks to condition

Potential risks which may impact upon habitat condition and features include:

- Recreational pressure on sensitive habitats. The increased use of the River Cam in this location by bathers could have a detrimental effect on the bankside habitats.
- Invasive species establishing in the woodland, including few-flowered leek. This species was observed on the eastern boundary of Lammas Land car park close to the woods.

Opportunities

Key features of ecological interest (and constraints if any)

The wet woodland habitat is the principal feature of interest at Paradise, it being an uncommon habitat in the City and wider area. The combination of the wet woodland and ponds, marginal, ruderal and grassland habitats all contribute to an important biodiversity resource in the City. This value is further enhanced by its setting within the River Cam corridor and the fact that Paradise forms the link between the Granchester Meadows complex of sites and Coe Fen/Sheep's Green which stretch right into the City.

Other features of interest include the stand of butterbur and the mature willows which hold significant value for invertebrate populations. The pond is also likely to be of importance for invertebrates as well as amphibians. Bats are likely to roost and forage at Paradise, as well as commute through the area using the Cam Corridor. The stretch of the Cam alongside Paradise is used intensively by foraging bats, such as soprano pipistrelle and Daubenton's bats, through the summer months.

Opportunities

The habitats at Paradise are generally all in good condition. There is an opportunity to control some of the damage to the woodland such as bonfires, with more path maintenance and signage. Dead-hedging may prevent some of the access away from paths in the north of Paradise. Provision of bird and bat boxes could be considered. Species such as tawny owl would be a good target. Larger cavity boxes close to the river would be appropriate for bat species.

Creation of features	
Habitats	n/a
Species	*Biodiversity toolkit:* Bird boxes, bat boxes.
Management/restoration of existing features	
Habitats	Maintain strict pathways to prevent damage to surrounding habitats.
Species	n/a

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Maintain current good conditions of priority habitat
- Effectively manage recreational pressures

Further monitoring work

Monitoring for orchids and harvest mouse as suggested within the management plan should be enacted. Regular monitoring for invasive species should be conducted and appropriate action taken should any be discovered at Paradise.

Lammas Land

Results

Site description and status

Lammas land is urban greenspace dominated by closely mown amenity grassland with several tarmac paths, a public toilets building, tennis courts, a paddling pool and a variety of children's play spaces. It is 5.4 hectares in size, and is located in the south west of Cambridge. The northern boundary is Fen Causeway, and the west boundary is Newnham Road. The eastern boundary of the site lies adjacent to the River Cam, with Sheep's Green located opposite the River. Paradise also lies just to the south of Lammas Land.

This site partially lies within the River Cam Corridor Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g4a Amenity grassland (66 Frequently mown, 210 Urban park)** **g4 Modified grassland (16 Tall herb)**
Description The grass is kept to a short sward and is species poor, with abundant perennial rye-grass *Lolium perenne* and white clover *Trifolium repens*. Small groups of trees, including ash *Fraxinus excelsior*, cherry *Prunus sp.* and horse-chestnut *Aesculus hippocastanum* give an indication of parkland, and the grass is less frequently mown under the trees in these areas and includes species such as false oat-grass *Arrhenatherum elatius* and wall barley *Hordeum murinum.* There is a section of tall herb grassland which contains abundant nettle and thistle located along the north eastern boundary.
Condition

The grassland is in poor condition, as it is amenity grassland dominated by perennial rye-grass and with ~~no~~ few wildflowers present.

Woodland and Line of trees

UKHabs habitat types present (secondary codes in brackets) **w1g6 Line of trees**
Description A line of trees, predominantly horse-chestnut, flanks the path running east of the tennis courts and another line, predominantly lime *Tilia cordata x platyphyllos (T. x vulgaris),* runs parallel to the other side of the play areas.
Condition The line of trees by the tennis courts is in good condition, as it has a continuous canopy of mature trees. The other line is in moderate condition, as the trees are more spaced out leading to some canopy gaps >5m.

Hedgerow (heathland and scrub)

UKHabs habitat types present (secondary codes in brackets) **h2a11 Native Species Rich Hedgerow with trees**
Description A hedgerow forms the southern boundary of Lammas Land. It contains a variety of woody species, such as hawthorn *Crataegus monogyna*, ash *Fraxinus excelsior*, dogwood *Cornus sanguinea* and elder *Sambucus nigra*, and there is a small transition area with taller herbs such as great willowherb *Epilobium hirsutum* and green alkanet *Pentaglottis sempervirens* before grading into the amenity grassland. Historic maps indicate the hedgerow is of substantial age.
Condition Despite containing a variety of species, the hedgerow is in moderate condition, as it is rather short and narrow, and the Driftway Road runs directly adjacent to the other side meaning that there isn't a section of undisturbed ground either side of the hedgerow.

Urban

UKHabs habitat types present (secondary codes in brackets)

u1d Suburban/ mosaic of developed/ natural surface (1160 Introduced shrub)
Description Areas of planted introduced shrubs are present surrounding the tennis courts and bowling green, with species such as bay *Laurus nobilis* and cherry laurel *Prunus laurocerasus.*
Condition Condition assessments were not carried out on formal planting.

Priority habitats

The following Priority Habitats are present at this location;

- Hedgerow


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site Boundary
Target Note/trees
Target Note
Linear Features
h2a11 - Native Species Rich Hedgerow with trees
w1g6 - Line of trees
Habitats
g4 - Modified grassland
u1b5 - Buildings
u1b6 - Other developed land
u1d - Suburban/mosaic of developed/natural surface
Project: 99320 CCC Biodiversity Audit
Title: Lammas Land - Habitats
Version: 1.0
Date: 18/03/2021
Author: EM
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CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features(inset)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: Lammas Land: condition assessment
Version: 1.0
Date: 18/03/2021
Author: EM
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Basemap contains Map data ©2021 Google

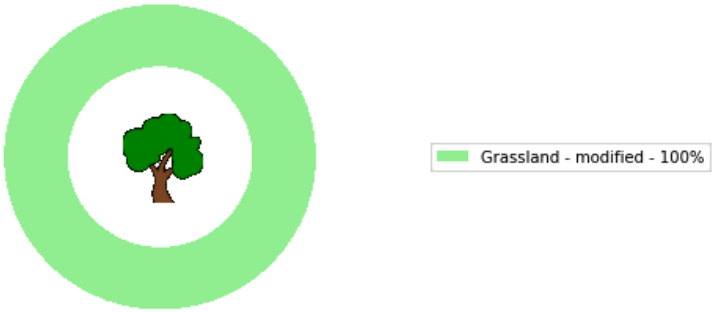
Target Notes:

1. Building with bat roost potential

Biodiversity units

The following charts show the percentage of biodiversity units for each habitat/linear feature type at Lammas Land.

Habitats



Habitat type	*Biodiversity units*
Grassland - modified	9.67

Linear Features

Habitat type	*Biodiversity units*
Hedgerows	2.37
Tree lines	1.42

Management

Review of exiting management

A management plan for Lammas Land was not found. The majority of grassland was closely mown, with sections under trees left with a longer sward. The hedgerow is regularly managed to a height of 6 foot, and has a longer sward grassland transition zone. This area of grassland has been identified for a single cut and collect through the year. The willow pollards alongside Snob's Brook are managed on rotation.

Assessment against selection criteria

Lammas Land does not qualify for City Wildlife Site designation, however, it is close to achieving designation for its hedgerow. The hedgerow on the southern boundary is nearly 270m long, and contains six woody species. However, the designation requires hedgerows more than 100m long and wider than 2m, with part of the hedge allowed to flower and fruit. The hedgerow is not quite wide enough to achieve designation but if it were allowed to grow wider, and to flower and fruit, then designation will be achieved.

Lammas Land does not meet designations for grassland as it is too species poor.

Direction of travel

Habitat	Comments
Grassland	Poor yet stable condition
Hedgerow	Moderate condition which is likely to be stable
Lines of trees	Good/moderate stable condition

There is no 2005 City Wildlife Site Survey for Lammas Land, so no baseline comparison exists to determine direction of travel.

However, since the habitats present on site are regularly maintained, it is likely that they are stable. The grassland is ranked "poor – stable", the hedgerow "moderate – stable", and the lines of trees "moderate/good – stable".

Future risks to condition

Potential risks which may impact upon habitat condition and features include:

- Recreational pressure on sensitive habitats. The eastern edge of Lamas Land is very well used due to the location of the play areas and paddling pool. This use constitutes a significant amount of disturbance.

Opportunities

Key features of ecological interest (and constraints if any)

The buildings that are present on site may be suitable for roosting bats. In addition the treelines and greenspace to the east of Lammas Land may provide an important commuting corridor for bats between Paradise to the south and Sheep's Green to the north.

Opportunities

Due to the existing nature of Lammas Land there is significant potential for biodiversity enhancements. However, these will need to recognise the amenity value of the site, and notably to the east which is very well used by residents.

A range of options for enhancing biodiversity could be available from simple measures, such as bird and bat boxes, to major alteration and enhancement of habitats, such as creating a new area of grazing pasture in the city. This area of grazing pasture would augment similar habitats nearby in Coe Fen and Sheep's Green, and would have the potential to mirror the amenity and landscape value of New Bit which provides characteristic views on a main route into the City. The introduction of grazing would also be of historical value as Lammas Land would

traditionally have been an area of Lammas grazing. Under this system grazing would have been allowed on Lammas Day (1 August) following the hay cut. The development of this area of wood pasture to the west of Lammas Land would provide a significant uplift in biodiversity for the site.

In the absence of grazing further areas of grassland could have a relaxed mowing regime, with removal of arisings, to promote species diversity. This process is taking place alongside the hedgerow which forms the southern perimeter. Other techniques to increase diversity could be applied including scarification and overseeding. This process appears to have already started under some of the trees and the structural diversity provided by a varied sward under the trees will benefit biodiversity.

The width of the hedgerow could be allowed to increase with a view to designation as a City Wildlife Site. The edge habitats along this southern boundary hedgerow could be enhanced significantly with a wider hedgerow with scalloped edges, providing microclimates, and a more gradual transition to the amenity grassland. This variety of habitats would provide value for invertebrates and many other species.

The nettle and thistle stand on the east part of the site could be enhanced as a species rich tall herb area and maintained under a reduced mowing regime. This would provide a link in this habitat type between Sheep's Green and Paradise.

Creation of features	
Habitats	Creating new areas of wood pasture with grazing
Species	Biodiversity Toolkit (bug hotels, hibernacula, hedgehog highways, bat boxes, bird boxes)
Management/restoration of existing features	
Habitats	Measures to improve the species diversity and condition of the grassland habitats Improve condition of hedgerow through widening and better adjacent habitats.
Species	n/a

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Create biodiverse habitats with native species (perennial meadow grassland, scrub, hedgerow) across at least 20% of the location

Further monitoring work

Where it is feasible to enhance the hedgerow further monitoring of this feature should be undertaken to assess it against the City Wildlife Site selection criteria.

Byron's Pool

Results

Site description and status

Byron's Pool is situated in Trumpington in south east Cambridge. It is 4.4 hectares in size, and is largely comprised of woodland with the River Cam on its western boundary, with ponds and a fish pass also present. Trumpington Meadow Country Park lies adjacent to the site. The site forms an important part of the River Cam corridor and is widely used for recreational purposes.

Byron's Pool is a LNR.

This site lies within the River Cam Corridor Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g4 Modified grassland**
Description **g4 Modified grassland:** The main section of grassland was located just west of the car park at the northern part of the site. This neutral grassland contained a variety of species such as cut-leaved crane's-bill *Geranium dissectum* and field scabious *Knautia arvensis.*
Condition **g4 Modified grassland:** The grassland is in moderate condition, with wildflowers and sedges present but at <30% coverage, and also contained patches where thistle species had become dominant.

Woodland

UKHabs habitat types present (secondary codes in brackets)

w1f7 Other Lowland mixed deciduous woodland
Description **w1f7 Other Lowland mixed deciduous woodland:** Woodland dominates the site and is comprised of a variety of species, including sycamore *Acer pseudoplatanus,* ash *Fraxinus excelsior* and beech *Fagus sylvatica.* The section of wood closest to the car park has a more open canopy and diverse ground flora, including species such as white dead-nettle *Lamium album* and hedge woundwort *Stachys sylvatica*, whereas the main section of woodland is dominated by ivy *Hedera helix* as an understorey but also contains sections with dog's mercury *Mercurialis perennis*. Unpaved paths weave through the woodland but a closed canopy is still maintained.
Condition **w1f7 Other Lowland mixed deciduous woodland:** The woodland is in good condition, however, the main section of woodland dominated by ivy has signs of damage (eg small bonfires) and the many intersecting pathways through the woodland result in a poorer ground flora. In this area the impacts from recreational use are significant.

Hedgerow (heathland and shrub)

UKHabs habitat types present (secondary codes in brackets) **h2a11 Native Species Rich Hedgerow with trees**
Description **h2a11 Native Species Rich Hedgerow with trees:** A species-rich hedgerow with trees flanks the entrance to the site. The hedgerow has been re-laid with enhanced planting in a small section midway down the western hedgerow. Ash *Fraxinus excelsior*, dog rose *Rosa canina* and field maple *Acer campestre* are common throughout the hedgerow.
Condition **h2a11 Native Species Rich Hedgerow with trees:** The hedgerow is in good condition, meeting all of the condition criteria for satisfactory height, width and species diversity.

Cropland

UKHabs habitat types present (secondary codes in brackets)
c1a6: Arable margins sown with wildflowers or a pollen and nectar mix
Description
c1a6: Arable margins sown with wildflowers or a pollen and nectar mix: A section through the middle of the main grassland area had been seeded as a wildflower meadow with an abundance of oxeye daisy *Leucanthemum vulgare* and wild carrot *Daucus carota*.
Condition
c1a6: Arable margins sown with wildflowers or a pollen and nectar mix: Wildflower areas are not condition assessed.

Standing and running water

UKHabs habitat types present (secondary codes in brackets)
r1a Eutrophic standing waters (117 Dry, 19 Ponds (Priority Habitat)) **r2b Other rivers and streams**
Description
r1a Eutrophic standing waters: There are four ponds adjacent to the River Cam, which are dominated by duckweed species *Lemna minuta* and *Lemna minor*. Three additional ponds exist further north in the site, one of which is situated in open woodland with the other two bordering the grassland section. These ponds are surrounded by aquatic marginal vegetation including wild angelica *Angelica sylvestris,* purple-loosestrife *Lythrum salicaria* and Indian balsam *Impatiens glandulifera*, a Schedule 9 listed species. **r2b Other rivers and streams:** A fish pass has been created north east of the ponds and connects to the river just above the weir.
Condition
r1a Eutrophic standing waters: The ponds adjacent to the river are in moderate condition, but they have a very high surface cover of duckweed, and they have a high percentage shade cover. Two of the northern ponds are in good condition, with one being in poor condition as it was dry and lacked marginal vegetation. The presence of invasive non-native species surrounding all ponds is an issue.

r2b Other rivers and streams: The fish pass lacks a diversity of submerged and marginal vegetation but is overall in moderate condition.

Priority habitats

The following Priority Habitats are present at this location;

- Lowland mixed deciduous woodland
- Rivers and streams
- Ponds


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site Boundary
Target Note/trees
Target Note
Linear Features
h2a11 - Native Species Rich Hedgerow with trees
Habitats
c1a6 - Arable margins sown with wild flowers or a pollen and nectar
g3c - Other neutral grassland
g4 - Modified grassland
r1a - Eutrophic standing water
r2b - Other rivers and streams
u1b6 - Other developed land
w1f7 - Other Lowland mixed deciduous woodland
Project: 99320 CCC Biodiversity Audit
Title: Byron's Pool - Habitats
Version: 1.0
Date: 18/03/2021
Author: EM
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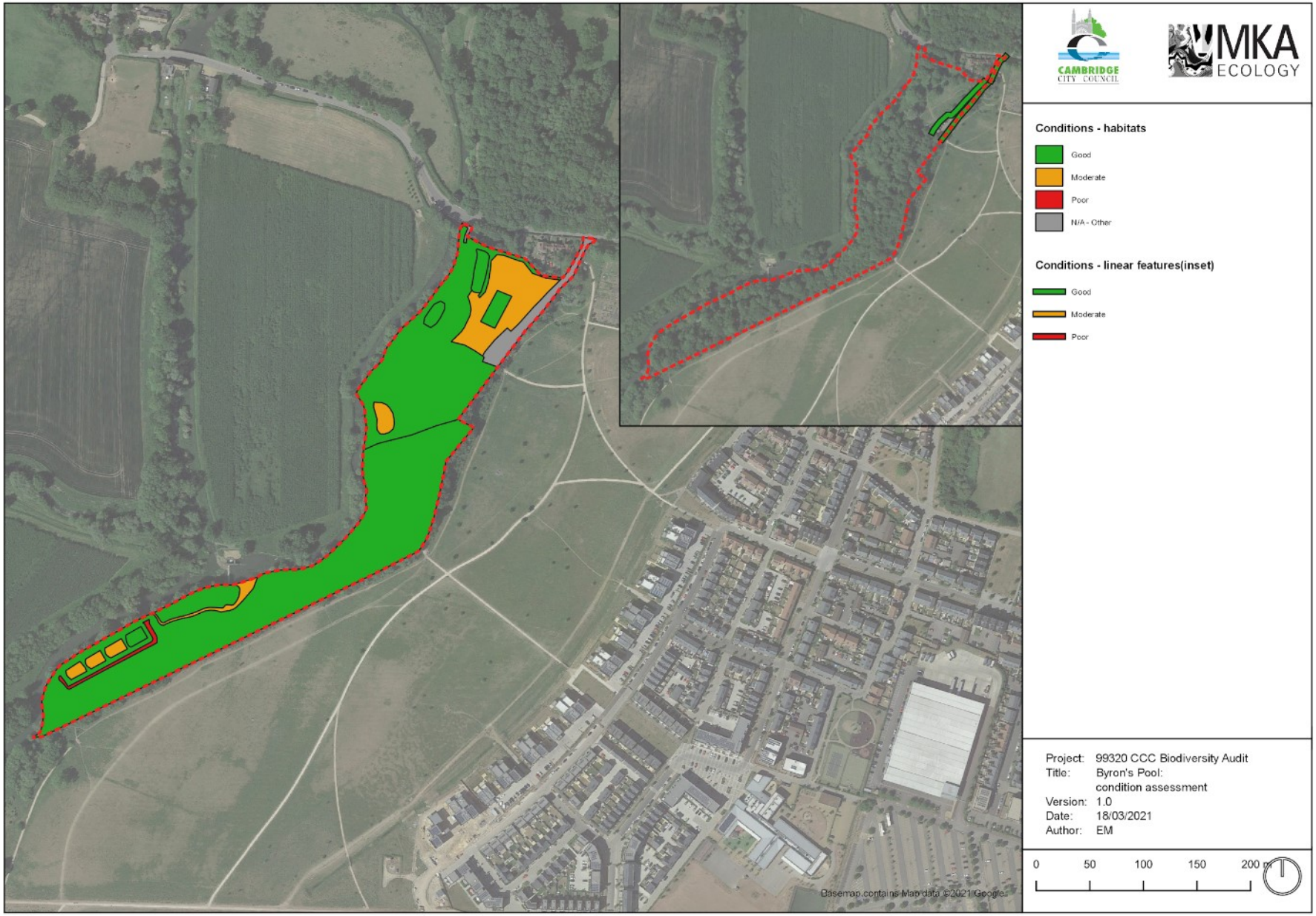
CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features(inset)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: Byron's Pool:
condition assessment
Version: 1.0
Date: 18/03/2021
Author: EM
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Basemap contains Map data ©2021 Google

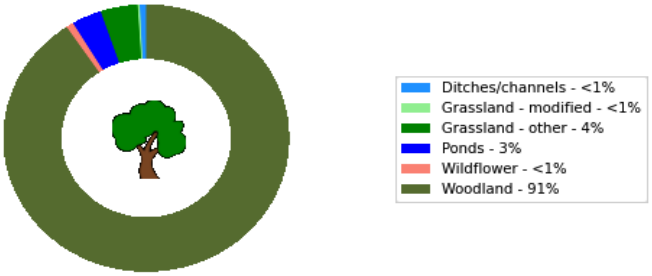
Target Notes:

1. Sycamore tree with bat roosting features
2. Indian balsam
3. Dead oak tree with bat roosting features
4. Bat box
5. Bird box
6. Bat boxes with evidence of use
7. Deadwood piles

Biodiversity units

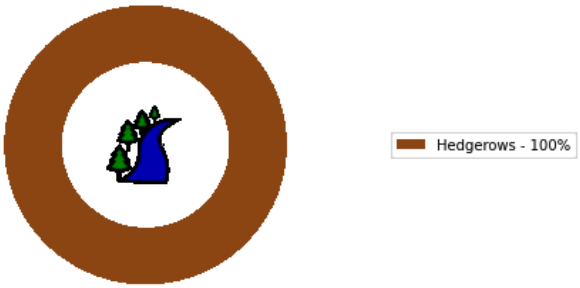
The following charts show the percentage of biodiversity units for each habitat/linear feature type at Byron's Pool.

Habitats



Habitat type	*Biodiversity units*
Ditches/channels	0.60
Grassland - modified	0.19
Grassland - other neutral	3.38
Ponds	2.72
Wildflower	0.67
Woodland	72.73

Linear Features



Habitat type	*Biodiversity units*
Hedgerows	3.60

Management

Review of exiting management

There is no biodiversity management plan for Byron's Pool but the area is clearly managed with a view to promoting biodiversity. This is apparent in the management of the hedgerow and grasslands in particular. The hedgerow has been laid and the areas of grassland are cut and seeded in order to enhance biodiversity. These measures are having positive impacts on those habitat types, and notably the grasslands with the diversity of wildflowers which are found there.

It is not clear what management activities are taking place within the woodland. In parts there are significant recreational impacts with multiple, splitting paths resulting in poor ground flora coverage. The woodland may benefit from a more direct approach to managing these recreational impacts although it is recognised that this could be challenging with the demands that are placed on the area. Dead-hedging could be used to discourage access to sensitive areas, whilst also serving to create habitat in its own right for invertebrates, small mammals and birds. Reducing the number of access points to Trumpington Meadow Country Park may also help to reduce some of these impacts. Some management activities are apparent with the retention of standing deadwood, and enhancing these with bat and bird boxes.

Assessment against selection criteria

Byron's Pool is a Local Nature Reserve, but it also meets criteria for City Wildlife Site designation under woodland (2.4). Twenty-six woodland plants were recorded, which is just short of the 30 required to achieve County Wildlife Site status. Two ancient woodland indicator species, spindle *Euonymus europaeus* and dog's mercury, were recorded.

Direction of travel

Habitat	Comments
Grassland	Moderate stable
Cropland	There are no condition assessments for this habitat type.
Woodland	Good declining due to recreational pressure
Hedgerow	Good improving
Ponds	Good declining due to invasive non-native species
Fish pass	Moderate declining due to recreational pressure

The estimates of direction of travel are based upon this 2020 survey and condition assessment only.

- Grassland – moderate stable – species diversity could be improved but the reduced mowing regime and wildflower planting has improved this.

- Woodland – good declining – management of the ivy and footpaths is required, otherwise the diversity of the ground flora will be lost.
- Hedgerow - good improving - parts of the hedgerow have been recently laid suggesting positive management practices.
- Pond – good declining – management of Indian balsam is required to prevent further spread.
- Fish pass – moderate declining – marginal vegetation lacks diversity and has failed to establish in areas that are heavily used.

Future risks to condition

Potential risks which may impact upon habitat condition and features include;

- Recreational pressure in the woodland in the form of trampling may increase as the area becomes more popular for walking and more development occurs in the vicinity.
- There was evidence of dogs accessing the fish pass resulting in a muddy unvegetated bank. If possible, access to this area could be restricted to encourage the growth of marginal aquatic vegetation along the channel.
- Further shading of the ponds could result in a deterioration of condition in these habitat types.
- Spread of invasive species in both terrestrial and freshwater environments.

Opportunities

Key features of ecological interest (and constraints if any)

The principal value of Byron's Pool lies in the woodland and setting, which is on a key green corridor within the landscape. This corridor links Cambridge City to the surrounding countryside. However there are other features of biodiversity interest, and notably the aquatic habitats including the ponds and fish pass. The woodland is accessible for people to enjoy however this does have consequences for the conditions of the habitats. Over time with such heavy use the condition of the woodland habitats could deteriorate.

Byron's Pool is likely to provide opportunities for a wide range of species and notably bats for roosting, foraging and commuting. The foraging habitat provided by the woodland and aquatic features is excellent, as is the connectivity to the surrounding landscape provided by the river. The mature trees are likely to provide multiple bat roosting opportunities, as are the bat boxes that are already in position. Other species of note that may use the site include otter and water vole.

Invasive species are potentially an issue at Byron's Pool with Himalayan balsam already present, and with the river there is scope for the arrival of new aquatic invasive species.

Opportunities

The key focus of management activities at Byron's Pool should be focussed on improving and maintaining the condition of the existing features that are there. The woodland condition could be improved by controlling path formation, particularly in the southern section. This should help to ensure that ground flora can flourish, and that there is successful natural regeneration within the woodland. This could be achieved with signage or dead-hedging around sensitive or target areas. Some control of the ivy in the woodland may be appropriate whilst recognising that this is also an important food plant, nectar source and cover for many species.

The aquatic habitat could benefit from focussed management. As with the woodland the fish pass is deteriorating due to recreational pressure, largely from dogs. Here dead-hedging could be used to protect sensitive areas and promote marginal and aquatic growth. The ponds are generally in good condition although some invasive species would require management. Clearance of vegetation around the ponds will occasionally be necessary to ensure that there is sufficient light for aquatic plant species. This clearance should be undertaken with care to make sure that gaps are not created which could further compound recreational pressures, such as access by dogs.

Creation of features	
Habitats	n/a

Species	*Biodiversity toolkit:* Bird boxes, bat boxes. Creation of artificial otter holt if a secluded location can be identified
Management/restoration of existing features	
Habitats	More active management in the woodland to reduce recreational pressures and enhance ground flora Further seeding and management for wildflowers in the grassland area next to the car park
Species	Managing recreational pressures on the fish pass to promote marginal vegetation for water vole

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Increase wildflower coverage within grassland habitats to maintain at moderate condition
- Manage recreational pressures to ensure no further deterioration of woodland condition
- Manage non-native invasive species, particularly in pond habitats
- Manage recreational pressures on the fish pass with a view to achieving good condition

Further monitoring work

The Himalayan balsam growth should be monitored to ensure that they do not spread elsewhere onsite and to inform appropriate clearance activities. If management of recreational pressure is put in place in the woodland the success of these activities should be monitored.

Nine Wells

Results

Site description and status

Nine Wells is a Local Nature Reserve and is the most southerly of the thirty-three sites surveyed; it lies just to the south of the Cambridge City boundary within South Cambridgeshire. It is comprised almost entirely of woodland and represents the head of the chalk stream system that flows into Hobson's Brook, Vicars' Brook and Hobson's Conduit City – all City Wildlife Sites. The rectangular woodland is bound by hedgerows and is isolated by arable farmland on all sides. The site was formerly a biological SSSI, but lost this status following the droughts of 1976 and the adverse impact upon the freshwater invertebrates on which this designation was based. It is understood that a flow support scheme has recently been installed (Hawksley & Mungovan, 2020).

This site lies within the River Cam Corridor Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g3c5 *Arrhenatherum* neutral grassland (10 Scattered scrub)**
Description A small corner of the site around the southern-most stream head is formed of a grassland and forms one of the access routes into the site. The understorey is much as described for the hedgerow margins, with other woodland species present (e.g., false brome, hedge woundwort). Common nettle *Urtica dioica* is also locally abundant at the base of the hedgerow.
Condition

This area is considered to be in 'moderate' condition on account of being grass dominated, with few wildflowers present in the sward. Not all of the condition criteria are failed, however, with scrub cover and bare ground being above the relevant thresholds.

Woodland

UKHabs habitat types present (secondary codes in brackets)
w1c Lowland beech and yew woodland (49 Veteran Trees, 128 Spring)

Description

The majority of the site is formed by a beech *Fagus sylvaticus* woodland, this being the most abundant tree species. Many of the trees present were of veteran status and with several features to support other wildlife, particularly bats and invertebrates. Ash *Fraxinus excelsior* and field maple *Acer campestre* were the other tree species to occur occasionally. Other tree species occurring single include yew *Taxus baccata* whitebeam *Sorbus* and silver birch *Betula pendula*. A species rich shrub layer contains Guelder rose *Viburnum opulus,* hawthorn *Crataegus monogyna* and holly *Ilex aquifolium*. False brome *Brachypodium sylvaticum* was the most frequent understorey plant, along with bramble *Rubus fruticosus agg.* Other 'woodland plants' found in the understorey occasionally or rarely were stinking iris *Iris foetidissima,* deadly nightshade *Atropa belladonna* and hedge woundwort *Stachys sylvatica.* Ivy *Hedera helix* was otherwise the most abundant understorey plant. The area to the south-west of the site is of greatest interest where a grassland/woodland mosaic is present near the stream head.

Condition

The woodland is considered to be in 'moderate' condition. Evidence of bark stripping (likely to be from deer), the near absence of standing or fallen deadwood and the relative lack of tree species diversity all contribute to a failure of three conditions. Deadwood is restricted to the northern boundary.

Hedgerows

UKHabs habitat types present (aspect in brackets)
h2a5 Native Hedgerow (south-west)
h2a6 Native Hedgerow - associated with bank or ditch (north-west)
h2a7 Native Hedgerow with trees (south-east)
h2a9 Native Species Rich Hedgerow (north-east)
Description
Hedgerows encircle the woodland on all four sides. In the case of the south-west and north-west boundaries, these are clearly distinct features separated from the woodland. On the other two aspects, the hedgerow are merged with the woodland shrub layer. Hawthorn is the most abundant species present, with bramble, hazel *Corylus avellana* more frequent. Wild privet *Ligustrum vulgare,* field maple *Acer campestre* and elder *Sambucus nigra* make up the other woody species. Cock's-foot *Dactylis glomerata,* false oat-grass *Arrhenatherum elatius* are the most prevalent grasses.
Condition
h2a5 Native Hedgerow (south-west): Good. This passes all condition criteria, being structurally well developed and with the presence of grassy margins on the south-side. **h2a6 Native Hedgerow - associated with bank or ditch (north-west).** Moderate. Passes all conditions except those associated with height, width and canopy height. **h2a7 Native Hedgerow with trees (south-east).** Good. Passes all condition criteria, with a wide grassy margin to the north-east. **h2a9 Native Species Rich Hedgerow (north-east).** Moderate. This is a tall and 'straggly' hedge, with a high canopy. Whilst a margin is present to the north, this is largely comprised of undesirable species and the hedgerow has suffered from adjacent agricultural activity.

Freshwater

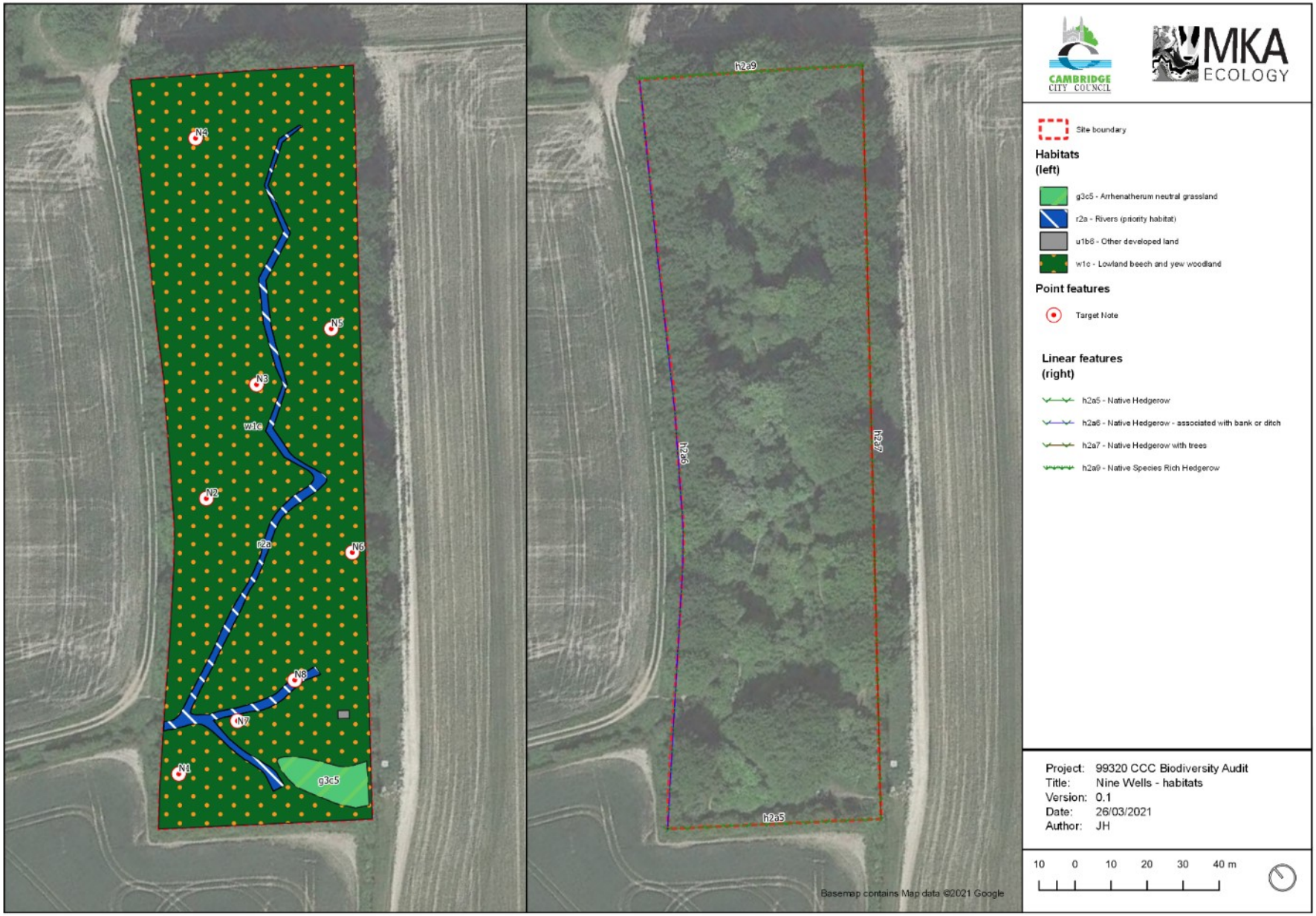
UKHabs habitat types present (secondary codes in brackets)

r2a6 Other priority habitat rivers (128 Spring, 144 Chalk rivers)
Description The chalk streams that give rise to Hobson's Brook, Hobson's Conduit and Vicars' Brook arise in Nine Wells, where four stream heads exist. At the southern end of the site, the stream heads are wide and open, with a low bank. Further into the woodland, the stream carves a steep and deep v-shaped channel. There is almost no floating vegetation, except in the south, where water-cress *Rorippa nasturtium-aquaticum* is frequent and emergent vegetation is limited to great willowherb *Epilobium hirsutum,* rosebay willowherb *Chamerion angustifolium* and yellow iris *Iris pseudacorus*, though these are largely restricted to the bank side, with little vegetation within the channel. At certain points throughout the site there is significant damage to the bankside, with ingress from dogs and/or deer evident.
Condition Considered to be in 'moderate' condition on account of failing all three conditions relating to aquatic vegetation.

Priority habitats

The following Priority Habitats are present at this location;

- Lowland beech and yew woodland
- Hedgerow
- Rivers and streams


N4
N5
N3
w1c
N2
r2a
N6
N8
N7
N1
g3c5
h2a9
h2a6
h2a7
h2a5
CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Habitats (left)
g3c5 - Arrhenatherum neutral grassland
r2a - Rivers (priority habitat)
u1b8 - Other developed land
w1c - Lowland beech and yew woodland
Point features
Target Note
Linear features (right)
h2a5 - Native Hedgerow
h2a6 - Native Hedgerow - associated with bank or ditch
h2a7 - Native Hedgerow with trees
h2a9 - Native Species Rich Hedgerow
Project: 99320 CCC Biodiversity Audit
Title: Nine Wells - habitats
Version: 0.1
Date: 26/03/2021
Author: JH
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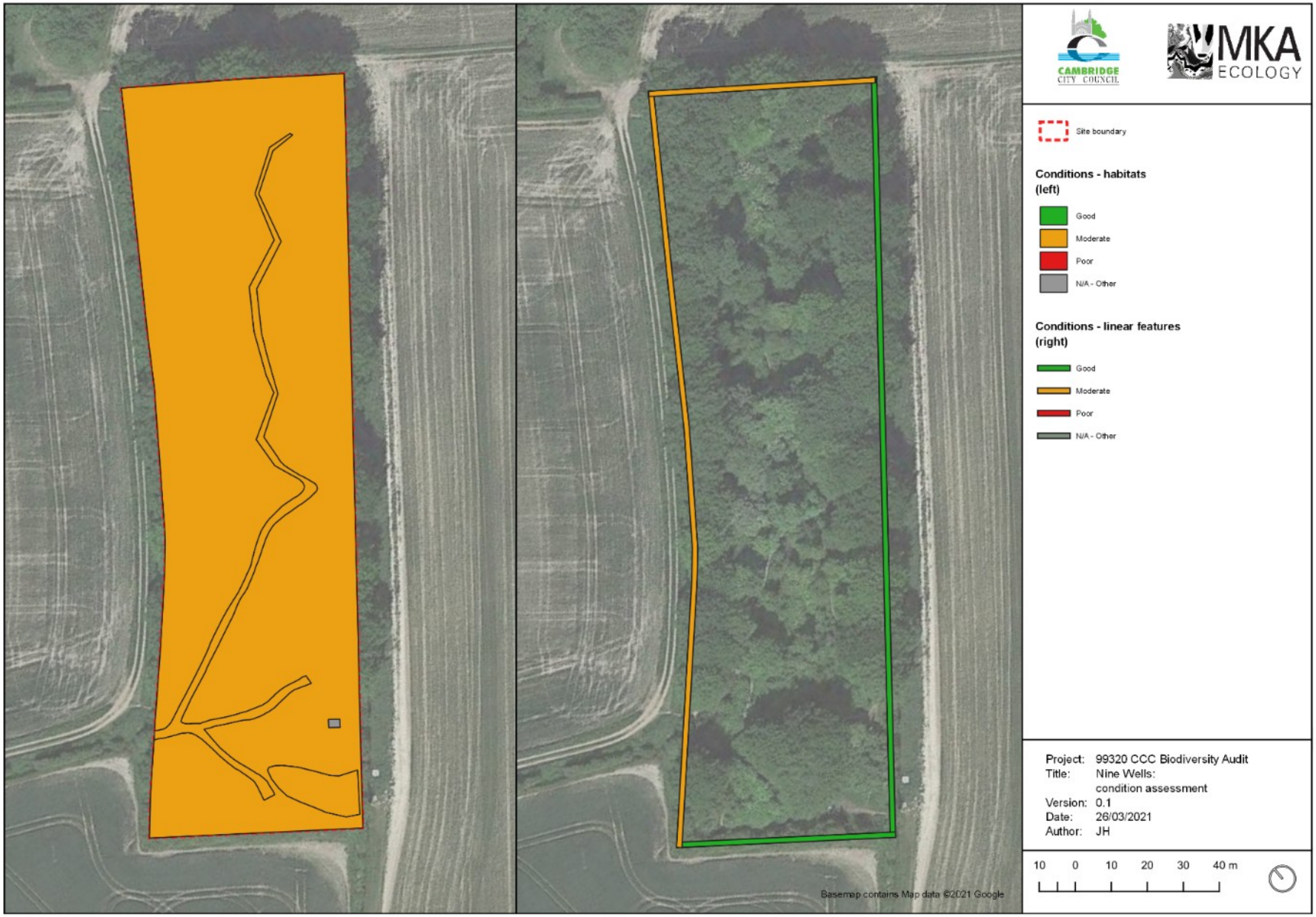
Basemap contains Map data ©2021 Google


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Conditions - habitats (left)
Good
Moderate
Poor
N/A - Other
Conditions - linear features (right)
Good
Moderate
Poor
N/A - Other
Project: 99320 CCC Biodiversity Audit
Title: Nine Wells: condition assessment
Version: 0.1
Date: 26/03/2021
Author: JH
10 0 10 20 30 40 m
Basemap contains Map data ©2021 Google

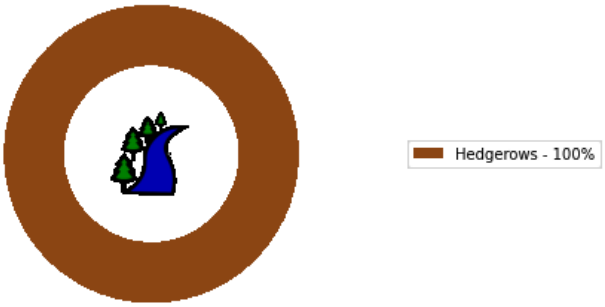
Target Notes:

1. Bird boxes.
2. Piles of brash and grass cutting.
3. Damage to stream bank - deer or dog ingress.
4. Earth mound with potential for badger.
5. Tawny only box.
6. Ivy on beech with large stem.
7. Sap runs - invertebrates – beech.
8. Bat potential - cross limbs – beech.

Biodiversity units

The following charts show the percentage of biodiversity units for each habitat/linear feature type at Nine Wells.

Habitat type	*Biodiversity units*
Ditches/channels	0.46
Grassland - other neutral	0.22
Woodland	15.29



Habitat type	*Biodiversity units*
Hedgerows	4.34

Management

Review of exiting management

The objectives of the site's management plan are as follows (Friends of Nine Wells LNR, 2004):

1) To enhance the chalk streams. (LHAP for Cambridgeshire- Rivers & Wetlands)
2) To enhance the woodland areas and encourage a diverse structure in the ground flora. (LHAP for Cambridgeshire - Trees & Woodlands)
3) To enhance the ditch which forms the NW boundary. (LHAP for Cambridgeshire - Drainage Ditches)
4) To enhance the hedgerow as a boundary feature. (LHAP for Cambridgeshire - Farmland)
5) Investigate the potential expansion of the site to incorporate new features such as meadows and/or buffer zones.
6) To undertake various survey works for notable site species to ascertain habitat management priorities.
7) To improve and enhance access within the site
8) Investigate the potential to improve footpath access to the site with links from the City.
9) To develop the interpretation and educational value of the site.
10) To maintain the site under Health & Safety regulations.
11) To involve the local community/users of the site in its management and protection.

Where known, a review of these objectives, is as follows:

1) The chalk stream is largely devoid of emergent and floating vegetation and as such there is significant room for continued enhancement. Damage from

dogs and/or deer may well be restricting these efforts. Grading back the bank head (as suggested as a 'potential management option' would aid this. The recently installed flow support scheme is in agreement with another 'potential management option'.

2) The woodland is mature with several veteran trees, which provide ample opportunities for a range of fauna. The ground flora however is relatively limited. Whilst brash piles are present, larger volume deadwood is largely present only along the north boundary.
3) The north-west ditch was not formally surveyed as part of the survey, however emergent vegetation was noted and the feature, along with its continuation north-west, would appear to be of value for water vole *Arvicola amphibius*.
4) Two hedgerows are in good condition, two in moderate. There is continued scope for enhancement of the long north-western hedgerow which is weaker. However, all management operations
5) Presently not known, though this requirement continues to be highlighted in other reports; it forms a stepping stone between the Gog Magog Hills and River Cam Priority Areas (Cambridge Nature Network, 2021).
6) N/A.
7) Access within the site is easy, with obvious footpaths present.
8) Access from the Biomedical Campus and wider City is facilitated by the 'DNA path'.
9) N/A.
10) N/A.
11) N/A.

Assessment against selection criteria

Nine Wells qualifies as a City Wildlife Site on the basis of the presence of chalk streams (2.14). It also qualifies under criterion 2.4 (Woodland – all recent woodlands 1ha or more in area and with five or more woodland plants).

Direction of travel

Habitat	Comments
Woodland	Moderate – stable. Conditions match the site description from the 2004 management plan (Friends of Nine Wells LNR, 2004).
Freshwater (Chalk stream)	Moderate – stable. Conditions match the site description from the 2004 management plan (Friends of Nine Wells LNR, 2004).
Hedgerows	Good – stable.
Hedgerows	Moderate – stable.

The site conditions from the 2020 survey are largely as described in the 2004 management plan and so all habitats are considered to be 'stable'. No discrete description of the grassland is made therein and so no attempt at a direction of travel is made.

Future risks to condition

Potential risks which may impact upon habitat condition and features include;

- Impact from human recreation, particularly dog walking, on the majority of habitats.
- Continued growth of the south of the City, particularly that associated with the adjacent Biomedical Campus and potential for Cambridge South Railway Station.
- Continued isolation within the landscape.
- Sensitive agricultural practices are apparent on most boundaries, as seen by the wide margins and good condition hedgerows. Cessation of these practices

(e.g., through changes in tenancy or ownership) may lead to a deterioration of these habitats.

- Climate change and impact on chalk stream flow.
- Loss of volunteer support.

Opportunities

Key features of ecological interest (and constraints if any)

As highlighted in the Cambridge Nature Network Report (2021), Nine Wells is a stepping stone between two Priority Areas within the region. As such, features of interest lie as much beyond as well as within the site and may be viewed equally as both opportunities and constraints. Given its position as the head of the chalk stream system that feeds the City, there is opportunity to improve a wider wildlife network.

Many of the opportunities and recommendations below are already listed as actual or potential management options within the site's management plan or as listed within the Greater Cambridge Chalk Streams Project Report. Their reiteration here serves to highlight their importance.

Opportunities

Creation of features	
Habitats	**Habitat buffers or corridors surrounding the site:** Connecting to Hobson's Park (north-west) and Gog Magog (south-east), endorsing the 'potential management' options of the site management plan: • Inclusion of the triangular parcel of land between the railway line and the Southern boundary as a meadow within LNR status. • Incorporation the Canalised section of Hobson Conduit up to the Railway line under LNR Status and

	introduce the ditch management regime currently adopted on the NW boundary. • Inclusion of additional parcels of land under conservation management including the field on the NW boundary up to the City boundary. • Provision of additional copses within the landscape character along the existing footpath running SE to NE and to incorporate them within LNR status. Encourage the adjoining Landowner(s) to submit existing arable fields under agri-environment scheme and/or to incorporate elements of other conservation schemes.
Species	Biodiversity toolkit: Bat boxes, bird boxes, beetle towers (see below).
Management/restoration of existing features	
Habitats	**Woodland** Selective felling and or 'artificial aging' of trees to create both more open areas within the woodland for ground flora (c.f. objective 2) and create more deadwood (both fallen and standing) to leave within the woodland floor. Undertake all 'potential options' within the site management plan for woodland: • Selectively thin beech trees to reduce shading and leaf accumulation • Develop understorey by planting native species of local provenance • Through planting a new area, introduce a coppicing regime to create a diversity of habitat • Create a small glade through the removal of Ivy and existing trees **Chalk stream** Endorsing GC Chalk Rivers Project (Hawksley & Mungovan, 2020): "*Vegetation management … to open-up the spring heads, allow monitoring, and possibly create an*

	area of chalk grassland". Reprofiling of spring heads (grading back). **Hedgerow** Laying of north hedgerow.
Species	"Through management of springheads and channels re-create conditions favourable for the re-introduction of *Crenobia alpina* and *Agapetus fuscipes [both freshwater invertebrates]".*

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Improve the condition of the woodland from moderate to good with creation of deadwood habitats
- Improve the condition of the chalk streams from moderate to good through vegetation management
- Avoid isolation of the site within development through establishing effective buffers and corridors

Further monitoring work

Endorsing/reiterating recommendations/potential options as described in the site's management plan:

- Determine the present of reptile and amphibian populations.
- Further study of small mammals and bats, particularly before undertaking any proposed felling or coppicing works (both to satisfy legal requirements, but also to provide a baseline on how such interventions may affect these groups).
- Water vole surveys in boundary ditch and downstream (if not already undertaken – 'water vole rafts' were casually observed in the ditch leading from the site.

Histon Road Recreation Ground

Results

Site description and status

Histon Road Recreation Ground is a 1.8 ha area of amenity grassland surrounded by strips of woodland and scrub, intersected by paths, fences and lines of mature trees. In the north of the site is a children's play area which includes a small artificial sports pitch. Access is from three gates on each of the west, south and east sides.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g4a Amenity grassland (66 Frequently mown, 210 Urban park)** **c1a6 Margins sown with wild flowers or a pollen and nectar mix**
Description Nearly 60% of the site area is covered by amenity grassland. Perennial rye-grass *Lolium perenne* is the dominant species, with white clover *Trifolium repens* abundant. Other species present include members of the genus *Plantago* and wall barley *Hordeum murinum* is locally frequent. An approximately 50m^2 triangle of annual wildflower mix is present at the western entrance, with common poppy *Papaver rhoeas,* cornflower *Centaurea cyanus* and a sage *Salvia* all present.
Condition The amenity grassland is considered as 'poor'.

Woodland

UKHabs habitat types present (secondary codes in brackets) **w1g7 Other broadleaf woodland (36 Plantation, 37 Semi-natural woodland, 48 Non-native, 341 Woodland; broadleaved**
Description

The amenity spaces are surrounded by four strips of woodland. Willow *Salix* and Italian alder *Alnus cordata* are the two most frequent species. Other tree species present at either frequent or occasional levels are ash *Fraxinus excelsior,* aspen *Populus tremula,* grey poplar *P. alba x tremula = P. x canescens* and sycamore *Acer psuedoplanatus*. Individual specimens of pedunculate oak *Quercus robur* are also present. The understorey of all blocks is dominated by ivy *Hedera helix.* Bramble *Rubus fruticosus agg.* and snowberry *Symphoricarpos albus* are also frequent. Other non-native species were present, including green alkanet *Pentaglottis sempervirens* and dame's violet *Hesperis matronalis* at the edges.
Condition Four sections of woodland are present approximately occupying each of the four corners of the site. The north-west and south-east areas are considered to be 'moderate', the remaining two as 'poor'. In the case of the former, the blocks are largely dominated by native species, though not below 5%. There is also a near absence of standing and fallen deadwood. The 'poor' areas are dominated by Italian alder and/or have significant patches of snowberry in their understorey. Where Italian alder dominates (north-east), the trees are also of a relatively uniform height and age. These areas are both more subject to damage from people, with wide tracks running through. These, along with the same absence of deadwood gives rise to five or more condition criteria being failed.

Scrub

UKHabs habitat types present (secondary codes in brackets) **h3b Hazel scrub; h3d Bramble scrub; h3h Mixed scrub (210 Urban park)**
Description Small patches of scrub are present within the play area, on the north boundary (hazel *Corylus avellana*) and along the west boundary. A single age stand of bramble is present along the western edge.
Condition

The central area of scrub and hazel boundary strip are both in 'good' condition, both having diversity of structure and age range. They fail the condition criterion relating to the presence of a tall herb edge, but all others are passed. Along the west boundary, the single age stand of bramble fails all criteria and so is 'poor'.

Urban habitats

UKHabs habitat types present (secondary codes in brackets) **u1d Suburban/ mosaic of developed/ natural surface (1160 Introduced shrub)**
Description Introduced shrubs are present in two blocks either side of a dividing fence. Cherry laurel *Prunus laurocerasus* is the dominant shrub species.
Condition All habitats under the 'urban' habitat classification are considered as 'poor'. Urban habitats rarely score as 'moderate' or 'good', unless as part of 'open mosaic on previously developed land' habitats, where a range of successional vegetation stages, including bare substrate is present and principally of value to invertebrates.

Tree lines

UKHabs habitat types present (secondary codes in brackets) **w1g6 Line of trees (66 Frequently mown, 210 Urban parks, 1173 Tree avenue/alley)**
Description Two tree lines grow in the centre of the site. Horse-chestnut *Aesculus hippocastanum* and Norway maple *Acer platanoides* add to the tree species already present in the woodland.
Condition Both tree lines are in 'good' condition – they both consist of mature trees in a near continuous canopy cover.

Priority habitats

The following Priority Habitats are present at this location;

- Lowland mixed deciduous woodland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MKA ECOLOGY
Site boundary
Habitats
c1a6 - Arable margins sown with wild flowers or a pollen and nect
g4a - Modified grassland (amenity)
h3b - Hazel scrub
h3d - Bramble scrub
h3h - Mixed scrub
u1b6 - Other developed land
u1d - Suburban/mosaic of developed/natural surface
w1g7 - Other broadleaved woodland types
Linear features
u1e2 - fence
w1g6 - Line of trees
Point features
Target Note
Project: 99320 CCC Biodiversity Audit
Title: Histon Road Recreation Ground - habitats
Version: 0.2
Date: 14/04/2021
Author: JH
10 0 10 20 30 m
Basemap contains Map data ©2021 Google
u1e2
w1g7
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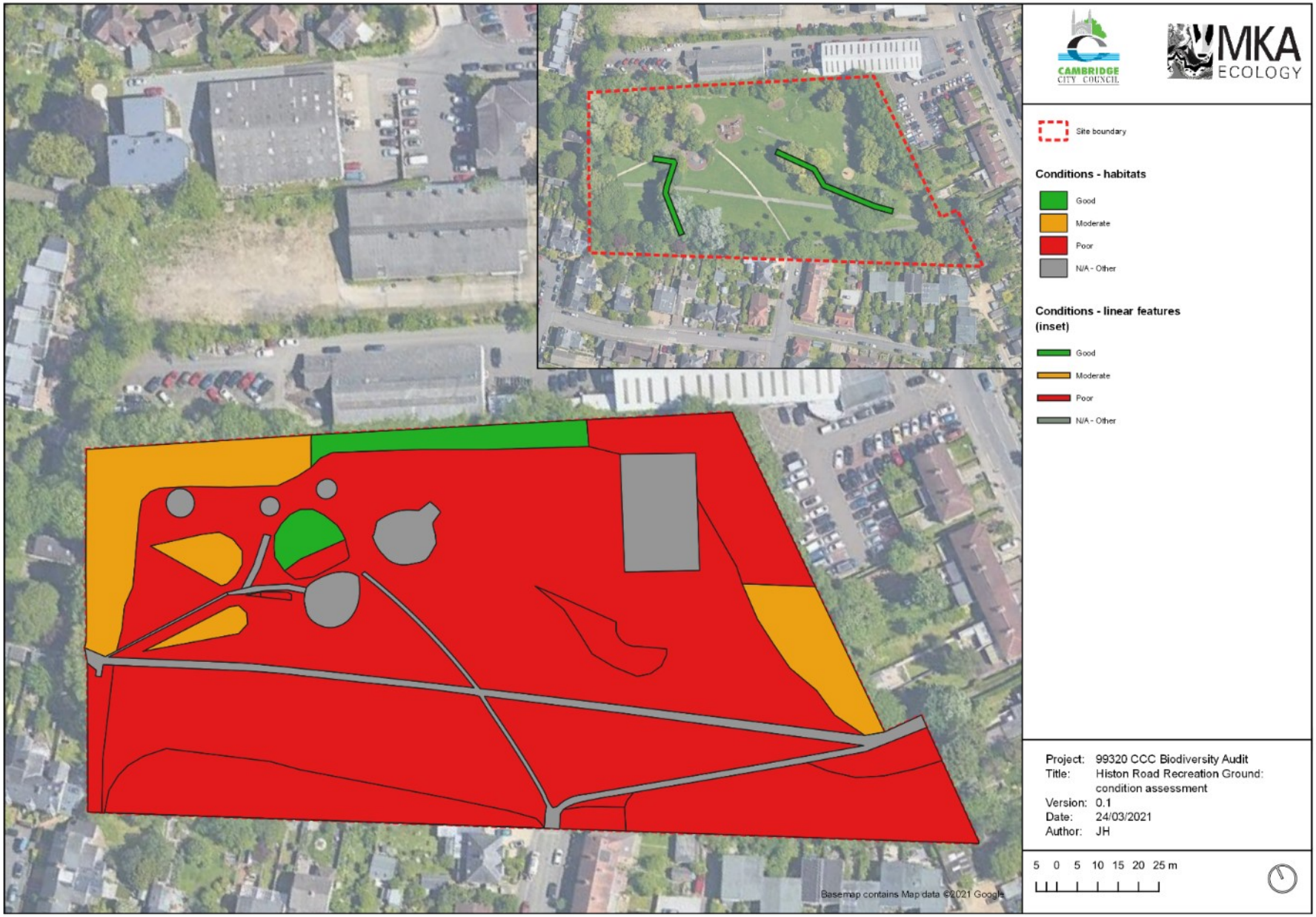
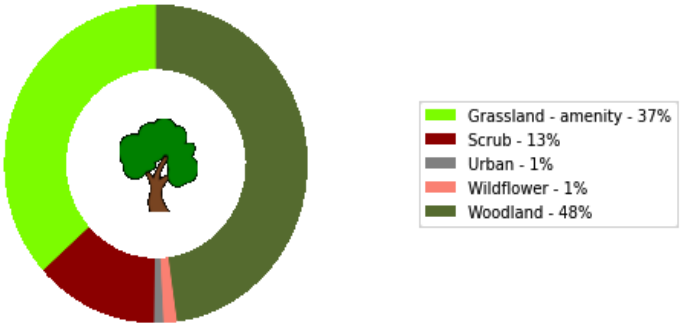

CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features (inset)
Good
Moderate
Poor
N/A - Other
Project: 99320 CCC Biodiversity Audit
Title: Histon Road Recreation Ground: condition assessment
Version: 0.1
Date: 24/03/2021
Author: JH
5 0 5 10 15 20 25 m
Basemap contains Map data ©2021 Google

Target Notes:

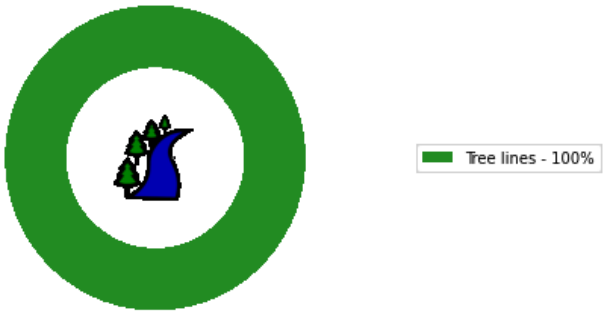
1. Bat box.
2. Bird box.
3. Bird box.
4. Large volume deadwood.
5. Bird box.

Biodiversity units

The following charts show the percentage of biodiversity units for each habitat/linear feature type at Histon Road Recreation Ground.



Habitat type	*Biodiversity units*
Grassland - amenity	2.05
Scrub	0.74
Urban	0.06
Wildflower	0.08
Woodland	2.68



Habitat type	*Biodiversity units*
Tree lines	0.74

Management

Review of exiting management

The management of the site is primarily targeted at the maintenance of the amenity spaces and shrubs. There is no known conservation management in place.

Assessment against selection criteria

The site does not qualify as a City Wildlife Site for woodlands. The woodland does occupy 0.5ha, but there are fewer than five *woodland plants* present. Whilst hazel, ash, elder *Sambucus nigra*, hawthorn *Crataegus monogyna*, bramble and ivy are all present at the site, not all species are present within the woodland areas. There may be grounds for applying criteria 2.1(d – human value) and 2.1(h – potential value) as supporting criteria.

Direction of travel

No direction of travel is attempted for this site as no known survey data exists. Given that the site is frequently managed as an amenity space, it is likely that the habitats are all 'stable'.

Future risks to condition

Potential risks which may impact upon habitat condition and features include;

- Continued establishment and spread of non-native invasive plant species.
- Impact from human recreation, particularly dog walking, on the majority of habitats.

Opportunities

Key features of ecological interest (and constraints if any)

Given the likely value of the site for human recreation, conversion of large areas of the amenity grassland into more valuable grassland is unlikely. However, there is scope for additional annual wildflower planting in other corners of the site, as found near the western gateway. Areas of perennial wildflower meadow could also be considered. The woodland contains several mature trees and, with the selective felling of some individual trees, there is scope to increase the structural diversity of the woodland and create standing and fallen deadwood simultaneously.

Opportunities

Many of the options in the Biodiversity Toolkit could be installed or deployed at the site.

Creation of features	
Habitats	Biodiversity toolkit: annual meadows/wildflower areas; ponds
Species	Biodiversity toolkit: Bat boxes, bird boxes (replace/maintain), bee hotels and bee banks (northern boundary, with south facing aspects), beetle towers (within woodland and/or as part of play spaces), hedgehog habitats,
Management/restoration of existing features	
Habitats	Woodland: Creation of structural diversity (especially planted Italian alder stands) with selective felling and retention of deadwood.
Species	N/A

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Improve condition of woodland habitats to good by replacement of non-native species with native species and creation of deadwood habitats
- Create biodiverse habitats with native species (perennial meadow grassland, scrub, hedgerow) across at least an additional 15% of the location

Further monitoring work

Given that the present survey was conducted outside of the optimal period for woodland flora, a dedicated survey for this habitat against the City Wildlife Site criteria is recommended to formally identify how close the site is to meeting the criterion for this habitat type and what, if any, supporting criteria may be applied.

Midsummer Common

Results

Site description and status

Midsummer Common is an area of common land on the south bank of the River Cam. It is nearly 14 hectares, and lies north east of Cambridge City. Midsummer Common comprises a large area of grassland with several tarmac pathways crossing the site situated close to the city centre. The grassland is grazed with cattle whilst still providing an important amenity space for the public. The area is used for a number of large events through the year, such as firework displays, festivals and sporting events.

Midsummer Common qualifies as a City Wildlife Site since it is an area of undeveloped floodplain directly associated with the River Cam CWS.

This site lies within the River Cam Corridor Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g4 Modified grassland (16 Tall herb, 59 Cattle grazed)** **g4a Amenity grassland**
Description **g4 Modified grassland:** The grassland has poor species diversity, and contains frequent perennial rye-grass *Lolium perenne*. It is heavily grazed and patches of thistle and nettle are abundant in areas of previous disturbance, such as for the annual bonfire. There is a low percentage of wildflowers and sedges, and the grassland is too species poor to be classed as neutral grassland. Areas of ruderal vegetation are also present, particularly to the east.

g4a Amenity grassland: Managed amenity grassland exists adjacent to residential development in a subsection of the site where an orchard has been planted. .
Condition **g4 Modified grassland:** The grassland on site is in poor condition, lacking species diversity, wildflowers or sedges and also showing signs of damage from previous activity. **g4a Amenity grassland:** The amenity grassland is in poor condition.

Line of trees

UKHabs habitat types present (secondary codes in brackets) **w1g6 Line of trees**
Description **w1g6 Line of trees:** A line of mostly willow trees lies parallel to the River Cam. These are mature trees, many of which have been pollarded. Other lines of trees are present in the south of the site; these are mainly horse-chestnut *Aesculus hippocastanum* which is present along Victoria Avenue.
Condition **w1g6 Line of trees:** The line of willow trees is in good condition, with a connected canopy. The trees along Victoria Avenue are mature, but are spaced further apart leading to a moderate condition. Newly planted lines of trees, such as along the tarmac path in the south of the site, are in poor condition since there are several immature trees which are spaced far apart.

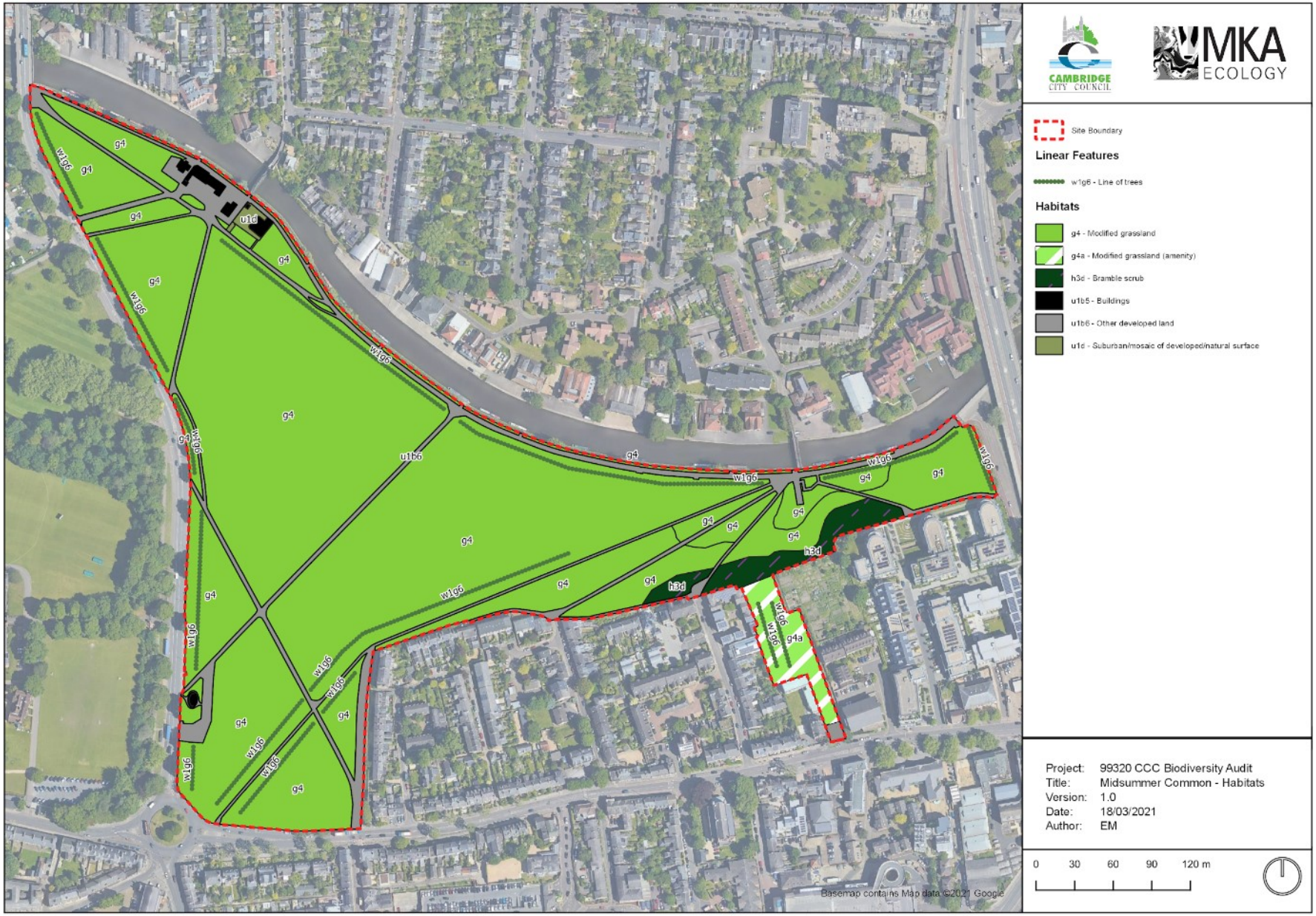
Heathland and scrub

UKHabs habitat types present (secondary codes in brackets) **h3d Bramble scrub**
Description **h3d Bramble scrub:** A patch of shrub has developed just north of the pathway that connects Midsummer Common to Newmarket Road, adjacent to the allotments. This shrub is dominated by bramble and encroaches onto the grassland.
Condition

h3d Bramble scrub: The scrub is in poor condition, lacking an age range and being dominated by bramble.

Priority habitats

No Priority Habitats are present at this location.


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site Boundary
Linear Features
w1g6 - Line of trees
Habitats
g4 - Modified grassland
g4a - Modified grassland (amenity)
h3d - Bramble scrub
u1b5 - Buildings
u1b6 - Other developed land
u1d - Suburban/mosaic of developed/natural surface
Project: 99320 CCC Biodiversity Audit
Title: Midsummer Common - Habitats
Version: 1.0
Date: 18/03/2021
Author: EM
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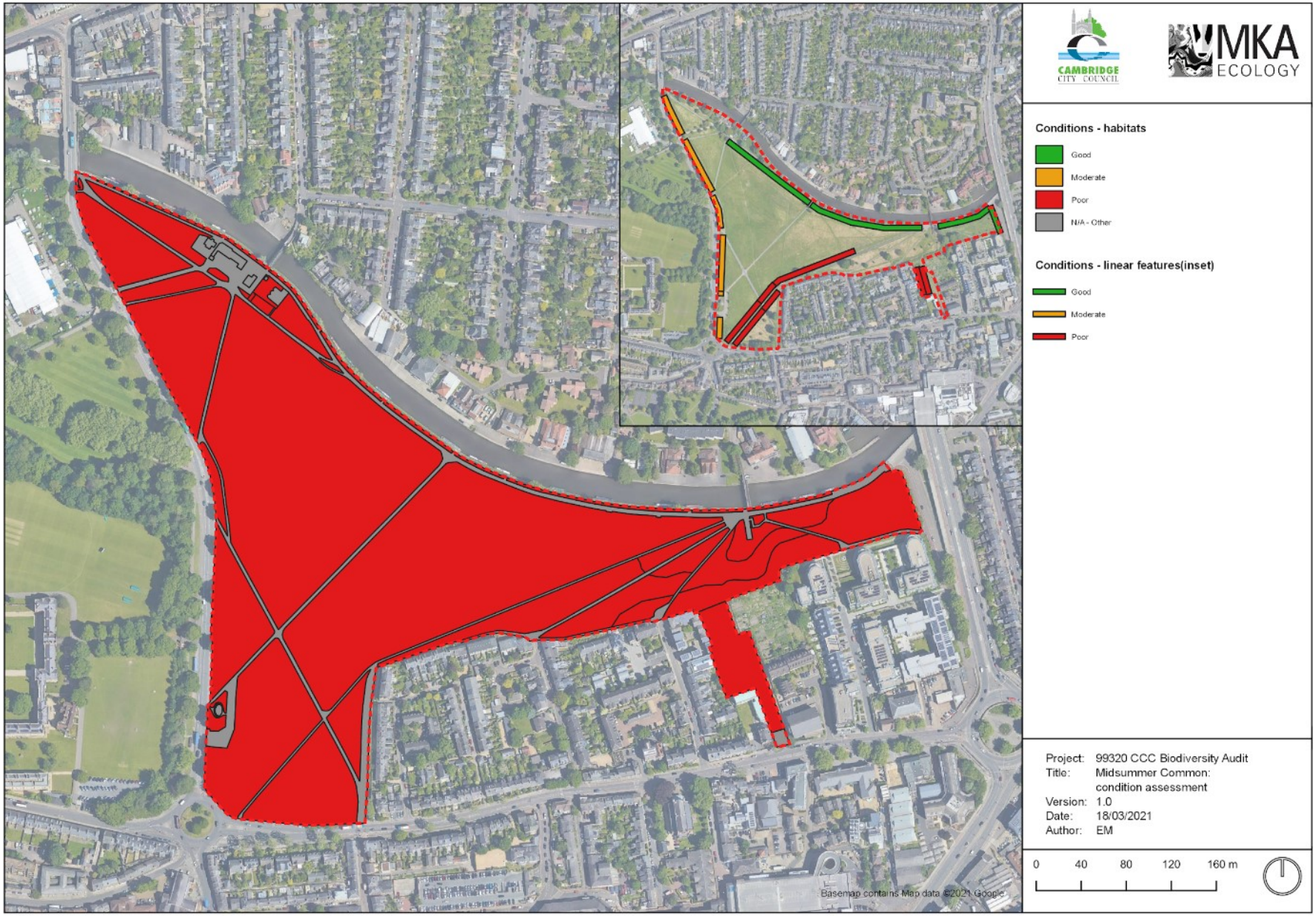
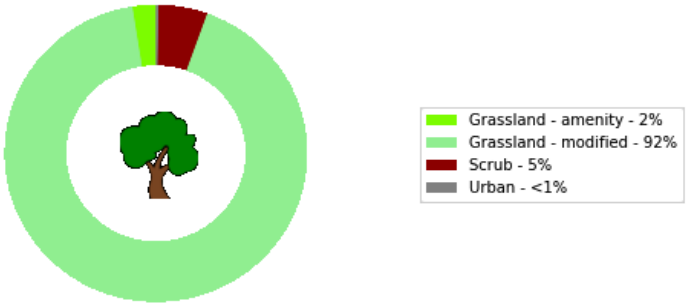
Basemap contains Map data ©2021 Google


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features(inset)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: Midsummer Common: condition assessment
Version: 1.0
Date: 18/03/2021
Author: EM
0 40 80 120 160 m
Basemap contains Map data ©2021 Google

Biodiversity units

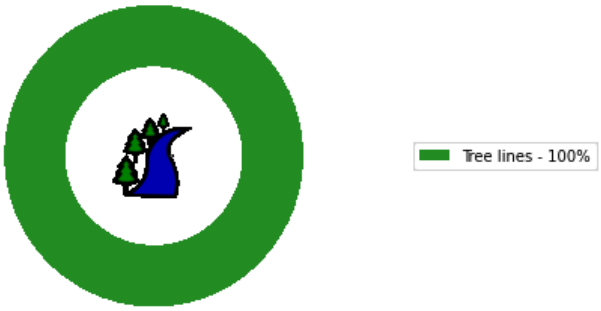
The following charts show the percentage of biodiversity units for each habitat/linear feature type at Midsummer Common.

Habitats



Habitat type	*Biodiversity units*
Grassland - amenity	0.73
Grassland - modified	26.95
Scrub	1.53
Urban	0.08

Linear Features



Habitat type	*Biodiversity units*
Tree lines	7.56

Management

Review of exiting management

An Open Space Management Plan for 2019 - 2024 has been prepared by Friends of Midsummer Common (FoMC) with a vision statement of "*Midsummer Common has*

a long respected history which should be maintained whilst looking at ways to enhance the overall habitat diversity of the green space to bring greater enjoyment to the people of Cambridge." The following objectives were identified:

1. Put in place the necessary administrative arrangements to ensure the coordinated implementation of this Management Plan. Make public, through the Cambridge City website, the timing of regular maintenance activities such as grass cutting, the set-up and duration of all events and the start of any major developments planned for the Common. Consult and engage all stakeholders in the process and take notice of ongoing planning developments.
2. Maintain and improve the physical infrastructure on the Common whilst maintaining its informal character. Consult stakeholders on any proposed developments on the Common and tightly manage on-going works.
3. Maintain and improve the environment and biodiversity on the Common. Keep the grassland and trees in good condition so as to contribute to the character of the Common and its value for biodiversity. Encourage participation by volunteers from the local community.
4. Maintain and improve the Community Orchard. The 2009-14 Management Plan called for the "creation of a Community Orchard". FoMC agreed to take on this task and presented the Council with a proposal.
5. Enforce the law and policy in controlling the movement of vehicles, bicycles and other wheeled carriers over the Common.
6. Work with all stakeholders in drawing up the annual programme of events on the Common and ensure that these are well advertised. Work with organisers to ensure that events have minimal impact on the Common and cause no nuisance to local residents. Gather and report grievances made by those attending events and by those living nearby.
7. Follow national policy by increasing the number and variety of trees on the Common.
8. Enhance the species richness and diversity of the grassland to achieve a more natural floodplain habitat. Consider opening up a drainage ditch running under the Common.

The objectives not solely related to biodiversity cannot be assessed under this audit. However, the objectives for maintaining and enhancing biodiversity, and specifically improving the species richness of the grassland, are echoed in this report. There is potential for conflict with the promotion of events and the conservation and enhancement of biodiversity. This dynamic will require a careful balance to ensure success. At present the poor condition of the grassland suggests that the current management regime will require some adaptation to ensure it can be described as being in good condition. Monitoring to establish the drivers for poor grassland condition should be developed. This could be a result of overgrazing, everyday recreational pressures or large events. Most likely it is a combination of all three impacts.

The management plan also highlights the historic ditches that used to cross Midsummer Common as a potential opportunity for restoration of floodplain habitats in the site, promoting habitat for water vole, dragonfly and damselfly species, and bats. These enhancements would help to bring biodiversity right into the heart of the City. This opportunity is discussed in further detail in the case studies section.

Assessment against selection criteria

Midsummer Common qualifies as a City Wildlife Site since it is an area of undeveloped floodplain directly associated with the River Cam.

The site does also qualify for pollard willows in association with semi-natural habitats.

Direction of travel

Habitat	Comments
Grassland	Poor and likely to be stable

Habitat	Comments
Line of trees	Good/moderate condition which is likely to be stable.
Scrub	Poor improving.

A Cambridge City Wildlife Site Survey was undertaken in 2005. At that time, the grassland was also species poor, with no indicator species recorded. The lines of trees appear to also be in a similar condition. The scrub was not noted in the 2005 survey, so it is possible this has grown up since work was done on the footbridge nearby.

Since there has been little change since the 2005 survey, the grassland is classed as "poor – stable", lines of trees as "good/moderate – stable" and scrub as "poor – improving" since it has arisen recently, and if left unmanaged could result in increased woody species cover over time.

Future risks to condition

Potential risks which may impact upon habitat condition and features include;

- Grazing pressure on the grassland may result in a reduced species diversity.
- Recreational pressure reducing species diversity in the grasslands through trampling and nutrient deposition from dog fouling.

Opportunities

Key features of ecological interest (and constraints if any)

The biodiversity value of Midsummer Common lies in the fact that it is undeveloped floodplain adjacent to the River Cam, and the scale of the open green space it provides, particularly in the context of its proximity to the city centre. The pollard willows are likely to provide habitat for a range of invertebrates, such as the musk beetle. These, combined with the other mature trees could provide roosting

opportunities for bats. Bats are likely to forage over the area, which is well connected to the wider landscape via the River Cam. The bramble scrub, whilst it is in poor condition, will regardless be of value for nesting birds, as well an important source of nectar and pollen for invertebrates. The recent addition of the orchard will provide significant opportunities for biodiversity as it matures over time.

Opportunities

Midsummer Common presents opportunities for significant biodiversity interventions with the potential to make a major contribution to biodiversity in the city, and to do this in a prominent and visible location. This could send a clear message regarding the desire to promote biodiversity in the city.

Major works such at the reinstatement of former ditch systems and the creation of associated wetland habitats would bring biodiversity right into the heart of Cambridge from the east of the City. Such measures would also create more opportunities for rows of pollard willows, a key biodiversity and landscape feature in this location. More subtle changes, such as altering the grazing and cutting regime to promote grassland species diversity, should also be considered. Due to the size of this area of grassland this would also have significant biodiversity benefits.

Enhancing the urban orchard at the east of the site, by creating a longer sward species rich grassland with mown pathways through for residents would provide significant biodiversity benefits as well as a highly attractive recreational feature. Traditional Orchards are Habitats of Principal Importance.

Creation of features	
Habitats	Create floodplain grassland with ditches and other aquatic habitats
Species	*Biodiversity toolkit:* Bird boxes, bat boxes.
Management/restoration of existing features	
Habitats	Improve existing grassland through improved management Enhance grassland in the orchard area

Species	n/a

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Improve condition of grassland from poor to moderate through improved management
- Create area of species rich grassland in the orchard with a view to developing a Priority Habitat (Traditional Orchard)
- Create floodplain grassland with new aquatic habitats such as ditches and seasonally wet areas

Further monitoring work

Monitoring to establish the factors which are currently causing the grassland to be in poor condition is recommended. This should be used to guide future management.

Bramblefields

Results

Site description and status

Bramblefields is situated in north east Cambridge, north of the River Cam and adjacent to the new Cambridge North train station. It is 2 hectares in area, and contains a variety of habitats including woodland, scrub, grassland and ponds. A path follows the perimeter of the main area, and access is restricted in the woodland in the north east part of the site.

Bramblefields is a LNR.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g4 Modified grassland** **g4a Amenity grassland**
Description **g4 Modified grassland:** Grassland is concentrated in the centre of the site. The grassland is dominated by cock's foot *Dactylis glomerata* and common couch *Elymus repens*, and has a small diversity of wildflowers such as rosebay willowherb *Chamaenerion angustifolium*, spearmint *Mentha spicata*, wild carrot *Daucus carota* and dove's-foot crane's-bill *Geranium mole.* Paths for visitors had been mown through the grass, which otherwise had a long sward. **g4a Amenity grassland:** Small sections of amenity grassland occur adjacent to paths across the site.
Condition **g4 Modified grassland:** The grassland in the centre of the site is in moderate condition, with >30% wildflower and sedge species present.

g4a Amenity grassland: The amenity grassland areas which occur in small patches across the site are in poor condition, since they are dominated by perennial rye-grass.

Woodland

UKHabs habitat types present (secondary codes in brackets) **w1f7 Other Lowland mixed deciduous woodland** **w1g7 Other broadleaved woodland types**
Description **w1f7 Other Lowland mixed deciduous woodland:** Mature semi-natural woodland exists in the west part of the main site, and the triangular area to the east. This triangular area is not accessible from the main Bramblefields site, and has a wet grassland understorey with a higher density of sedges, however still contained rubbish and fly-tipping. The woodland in the west part of the site contained species such as ash *Fraxinus excelsior*, birch *Betula sp*., pedunculate oak *Quercus robur* and cherry *Prunus sp..* **w1g7 Other broadleaved woodland types:** A large section of mature hawthorn *Crataegus monogyna* trees is situated in the centre of the site. This area originated as scrub but now resembles woodland with a distinct canopy of hawthorn and understorey of ivy *Hedera helix*, with sections of bare ground.
Condition **w1f7 Other Lowland mixed deciduous woodland:** This woodland is in good condition, with complete canopy cover, a diverse age and height structure, and with restricted access preventing damage. **w1g7 Other broadleaved woodland types:** The hawthorn dominated woodland in the centre of the site is in moderate condition, as there are no saplings coming through, and species diversity is low overall.

Scrub

UKHabs habitat types present (secondary codes in brackets) **h3h Mixed scrub**
Description

h3h Mixed scrub: The majority of the eastern part of the site is comprised of species-rich scrub, including bramble sp. *Rubus fruticosus agg.*, butterfly-bush *Buddleja davidii*, traveller's joy *Clematis vitalba*, blackthorn *Prunus spinosa*, field maple *Acer campestre* and firethorn *Pyracantha coccinea* forming a dense and varied habitat.
Condition **h3h Mixed scrub:** The scrub across the site is in good condition with a variety of woody species, a good age range, and small clearings/glades.

Urban - Invertebrate area

UKHabs habitat types present (secondary codes in brackets) **u1d Suburban/ mosaic of developed/ natural surface (16 Tall herb, 73 Bare ground)**
Description **u1d Suburban/ mosaic of developed/ natural surface:** This area provided a high density of wildflowers and a variety of substrates such as gravel, stones and broken pottery, and has been created for pollinators and other invertebrates. Species in this area included field scabious *Knautia arvensis*, lady's bedstraw *Galium verum*, oxeye daisy *Leucanthemum vulgare* and wild marjoram *Origanum vulgare.*
Condition **u1d Suburban/ mosaic of developed/ natural surface:** A condition assessment was not undertaken on this habitat type.

Ponds

UKHabs habitat types present (secondary codes in brackets) **r1a Eutrophic standing waters (19 Ponds (Priority Habitat))**
Description **r1a Eutrophic standing waters:** Two ponds are situated on the eastern side of the site and are managed for wildlife. There is marginal vegetation surrounding the ponds, with species such as bittersweet *Solanum dulcamara*, canadian fleabane *Erigeron canadensis* and great willowherb *Epilobium hirsutum*, and there is also submerged vegetation. However, one of the ponds had litter in it. New Zealand pygmyweed *Crassula helmsii* is present in both ponds.

Condition

r1a Eutrophic standing waters: The ponds are both in good condition, with a large radius of natural habitats surrounding them, and clear water with submerged and marginal vegetation.

Priority habitats

The following Priority Habitats are present at this location;

- Lowland mixed deciduous woodland
- Ponds


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site Boundary
Target Note/trees
Target Note
Linear Features
w1g6 - Line of trees
Habitats
g4 - Modified grassland
g4a - Modified grassland (amenity)
h3h - Mixed scrub
r1a - Eutrophic standing water
u1b6 - Other developed land
u1d - Suburban/mosaic of developed/natural surface
w1f7 - Other Lowland mixed deciduous woodland
w1g7 - Other broadleaved woodland types
Project: 99320 CCC Biodiversity Audit
Title: Bramblefield - Habitats
Version: 1.0
Date: 18/03/2021
Author: EM
0 15 30 45 60 m
Basemap contains Map data ©2021 Google
h3h
g4a
w1f7
w1g7
u1d
g4
u1b6
r1a
N1
w1g6


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features(inset)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: Bramblefields: condition assessment
Version: 1.0
Date: 18/03/2021
Author: EM
0 20 40 60 80 m
Basemap contains Map data ©2021 Google

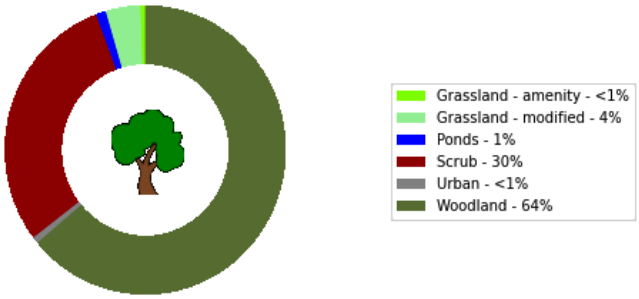
Target Notes:

1. Animal desire line

Biodiversity units

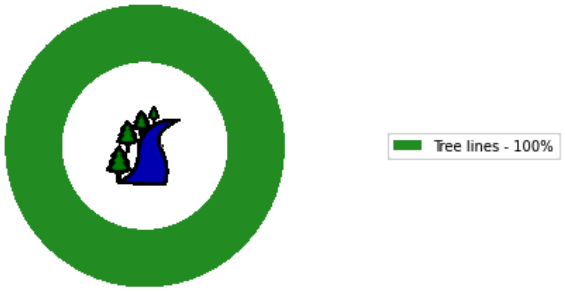
The following charts show the percentage of biodiversity units for each habitat/linear feature type at Bramblefields.

Habitats



Habitat type	*Biodiversity units*
Grassland - amenity	0.15
Grassland - modified	1.09
Ponds	0.31
Scrub	8.10
Urban	0.20
Woodland	17.45

Linear Features



Habitat type	*Biodiversity units*
Tree lines	0.13

Management

Review of exiting management

There is no biodiversity management plan for Bramblefields.

Assessment against selection criteria

Eight woodland plants were recorded in the woodlands on site, meaning that Bramblefields qualifies as a City Wildlife Site on the basis of woodland >1ha with five or more woodland plants. In addition, it satisfies the criteria for blocks of scrub over 0.5 ha with four or more woody species, if all the scrub is counted together across the site. Overall, the site would also qualify under criteria 2.18 for habitat mosaics for having grassland, woodland, scrub and ponds.

Direction of travel

Habitat	Comments
Grassland	Moderate stable because of recreational management
Woodland	Good stable
Hawthorn scrub/woodland	Moderate condition likely to be declining
Ponds	Good condition which is likely to be stable
Scrub	Good condition which is likely to be stable

A Cambridge City Wildlife Site Survey in 2005 was not undertaken for Bramblefields, and so there is no baseline data upon which to base a direction of travel.

However, estimates based upon the 2020 survey would conclude the following:

- Grassland: moderate – stable, since the grassland appears to be regularly managed;
- Woodland: good – stable
- Hawthorn scrub/woodland: moderate – declining
- Ponds: good – stable
- Scrub: good – stable

The hawthorn area is described as declining as since the hawthorn shrubs are now trees, the habitat provides neither a good condition woodland nor good condition scrub. Management should focus on choosing which ideal habitat is desired, and then undertaking actions to create this.

Future risks to condition

Potential risks which may impact upon habitat condition and features include;

- Recreational pressure reducing species diversity in the grasslands through trampling and nutrient deposition from dog fouling.

Opportunities

Key features of ecological interest (and constraints if any)

Bramblefields provides an important area of scrub and woodland within the City. The invertebrate area also provides an ecologically interesting feature. The ponds within the site are likely to be of value for amphibians in the area, particularly in combination with the suitable terrestrial habitat which surrounds it. High numbers of smooth newt *Lissotriton vulgaris,* common lizard *Zootoca vivipara,* and grass snake *Natrix helvetica* have been recorded.

Opportunities

There is an opportunity to manage the over-mature hawthorn section in the centre of the site, either by phased cutting back to a scrub type habitat, or through

enhancement towards a woodland with phased felling and planting of a variety of other woody species.

One of the ponds had a litter problem, which may be exacerbated by the fact that the main path runs close to this pond. Path realignment may mean this pond is less visited and therefore provides more benefit to wildlife. Hibernacula could be installed around the ponds to enhance their value to amphibians during their terrestrial phase. Crassula is currently managed through hand-pulling although more intense management may be required should it spread further.

Even though access to the woodland is restricted, litter problems still persist so signage or other management should be employed to reduce this.

Creation of features	
Habitats	n/a
Species	Hibernacula could be installed around the ponds to enhance their value to amphibians during their terrestrial phase. Biodiversity toolkit (bat boxes, bee banks, bee hotels, beetle towers, bird boxes, bug hotels)
Management/restoration of existing features	
Habitats	Improved management to the hawthorn scrub/woodland Improved management to ponds
Species	n/a

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Maintain good condition of scrub and woodland habitats
- Removal of rubbish and invasive species from ponds
- Improve floristic diversity of grassland

Further monitoring work

The site should be formally assessed against the City Wildlife Site Criteria.

The Spinney

Results

Site description and status

The Spinney is an L-shaped 0.6 hectare City Wildlife Site comprised of woodland, scrub and grassland in Cherry Hinton. It is due east of and is separated from the Norman Cement Pits City Wildlife Site by a narrow band of dense scrub and woodland. A dry ditch runs through the site and a dried-out pond is set within the woodland. The Spinney is due south of a primary school; the site is used by the school for 'Forest School' classes and activities. 2005 surveys also included areas to the south and south-west (Hayster Open Space & south of Hayster Open Space). These latter two areas do not form part of the present assessment.

This site lies within the River Cam Corridor Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g3c5 *Arrhenatherum* neutral grassland (16 Tall herb, 17 Ruderal/ ephemeral)**
Description An approximately 700m^2 area of grassland occupies the southern boundary of the site. False oat-grass was the dominant grass species, with patches of common couch *Elytrigia repens* and creeping bent *Agrostis stolonifera* occurring in local abundance. Some of the species are those also present within the woodland understorey, but cock's-foot *Dactylis glomerata* and *Epilobium* sp. were also frequent. Common valerian *Valeriana officinalis* and a patch of locally dominant common reed *Phragmites australis* were an indication of locally damp conditions to the south west. Ploughman's spikenard *Inula conyzae*, a calcareous grassland indicator was also observed. As reported above, Canadian goldenrod is spreading.

A glade of grassland in the south eastern corner of the site is also present. This is characterised by large patches if creeping thistle and common nettle.
Condition The area to the south-west is considered to be 'moderate'. The grassland does not match the description of a given priority habitat and wildflowers are not widespread. However, damage is minimal and scrub cover is mapped discretely as a separate habitat. Canadian goldenrod is similarly mapped within scrub, and so is less than 5%. As such it clearly fails at least one criterion, but not most. The area to the south east is 'poor', this being dominated by undesirable species, in addition to other failed criteria as above.

Woodland

UKHabs habitat types present (secondary codes in brackets) **w1f7 Other Lowland mixed deciduous woodland (16 Tall herb, 17 Ruderal/ephemeral)**
Description The woodland is formed of two blocks. To the east is a mature but relatively open canopy woodland with abundant ash *Fraxinus excelsior* and hawthorn *Crataegus monogyna.* Very few English elm *Ulmus procera* remain, as reported in 2005. Bramble *Rubus fruticosus agg.* is abundant in the shrub layer, with elder *Sambucus nigra* occasional. The field layer has abundant creeping thistle *Cirsium arvense*, false oat-grass *Arrhenatherum elatius*, false-brome *Brachypodium sylvaticum* and ivy *Hedera helix*. The Ancient Woodland Indicator hairy St John's-wort *Hypericum hirsutum* was found occasionally, as too were other typical woodland understorey plants: wood meadow-grass *Poa nemoralis*, lords-and-ladies *Arum maculatum* and sweet violet *Viola odorata*. Larger volume standing and fallen deadwood were evident, though some damage and rubbish tipping were visible. Snowberry *Symphoricarpos albus* is locally abundant in adjacent scrub and clearings.

The western block is a hawthorn dominated section, formerly described as dense scrub but considered here as woodland on account of structure and height. The understorey was largely devoid of plants and original planting lines are visible. The area is particularly prone to rubbish dumping, with informal access routes having been created through the space from the south and leading to Norman Cement Pits.
Condition The eastern block is considered to be 'moderate'. Whilst deadwood is an important feature of the site, some damage from trespassing/tipping was observed and there was little evidence of new tree growth. The presence of snowberry (an invasive non-native) and the abundance of common nettle in the understorey gives rise to four failed condition assessment criteria. The western block is considered as 'poor'. There is no standing deadwood present and the area is formed of a uniform block of similarly aged trees and subject to damage. As such, along with other failures, five condition assessment criteria are failed.

Scrub

UKHabs habitat types present (secondary codes in brackets) **h3d/h Bramble/mixed scrub (16, Tall herb, 17 Ruderal/ ephemeral)**
Description Twenty percent of the site is comprised of scrub. A snowberry dominated clearing along the eastern boundary is present. Of much greater value are areas of mixed scrub in the western half of the site, forming a buffer between the hawthorn woodland and grassland. Bramble was abundant, with blackthorn *Prunus spinosa* and dogwood *Cornus sanguinea* frequent. Ash was occasional, with hazel *Corylus avellana* also present. The herb layer is as described for grassland below, though Canadian goldenrod *Solidago canadensis* was present at over 10% coverage.

Condition The snowberry dominated area is considered as 'poor', this being dominated by an invasive species with little structural or botanical diversity. Those areas to the west are 'moderate'. Whilst the scrub is botanically and structurally diverse, the condition relating to invasive species is failed.

Hedgerow

UKHabs habitat types present (secondary codes in brackets) **h2b5 Hedge Ornamental Non-Native**
Description & Condition A short stretch of ornamental hedge is present along the north-east corner.
Condition This fails most of the condition criteria and is considered 'poor'.

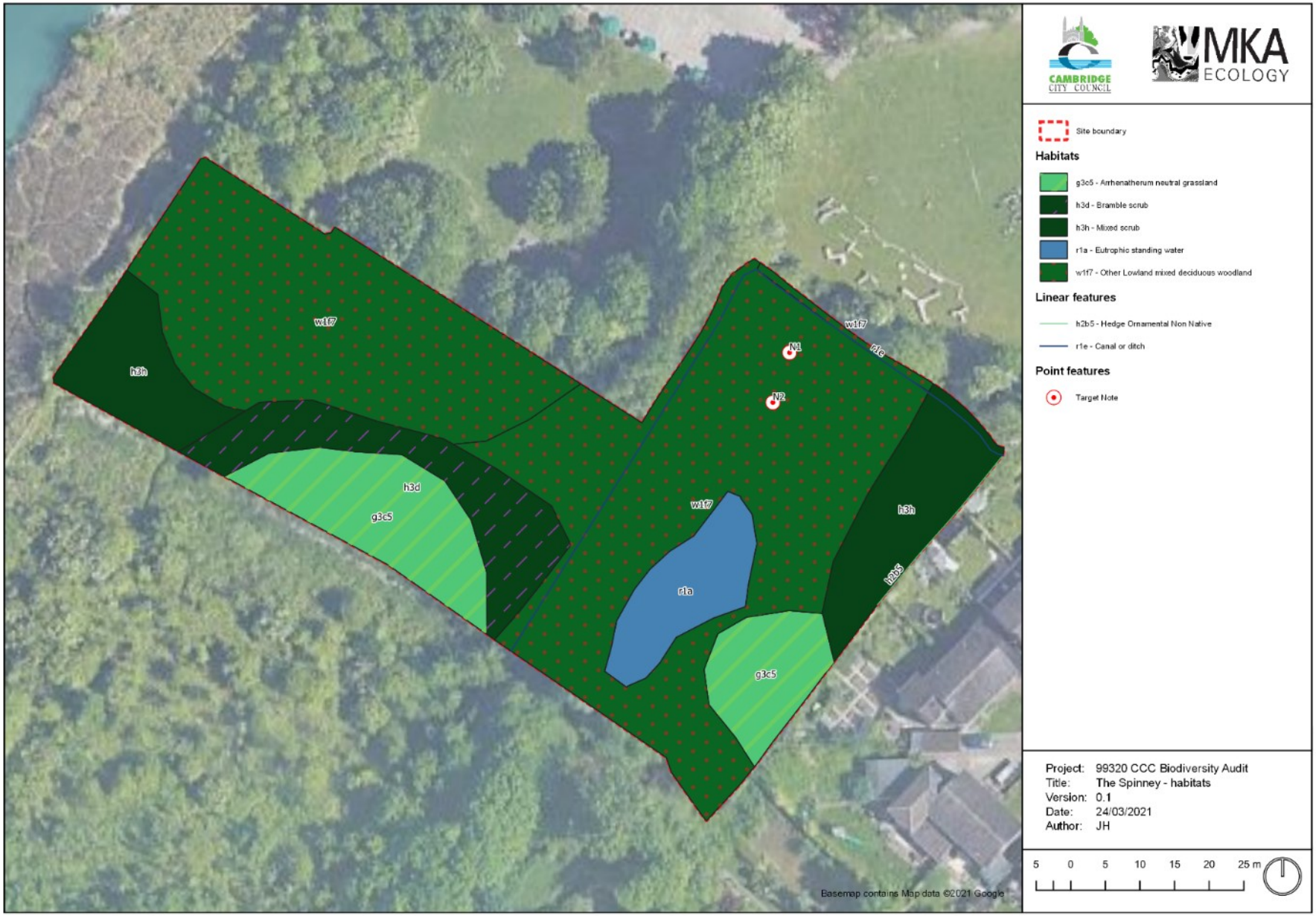
Freshwater

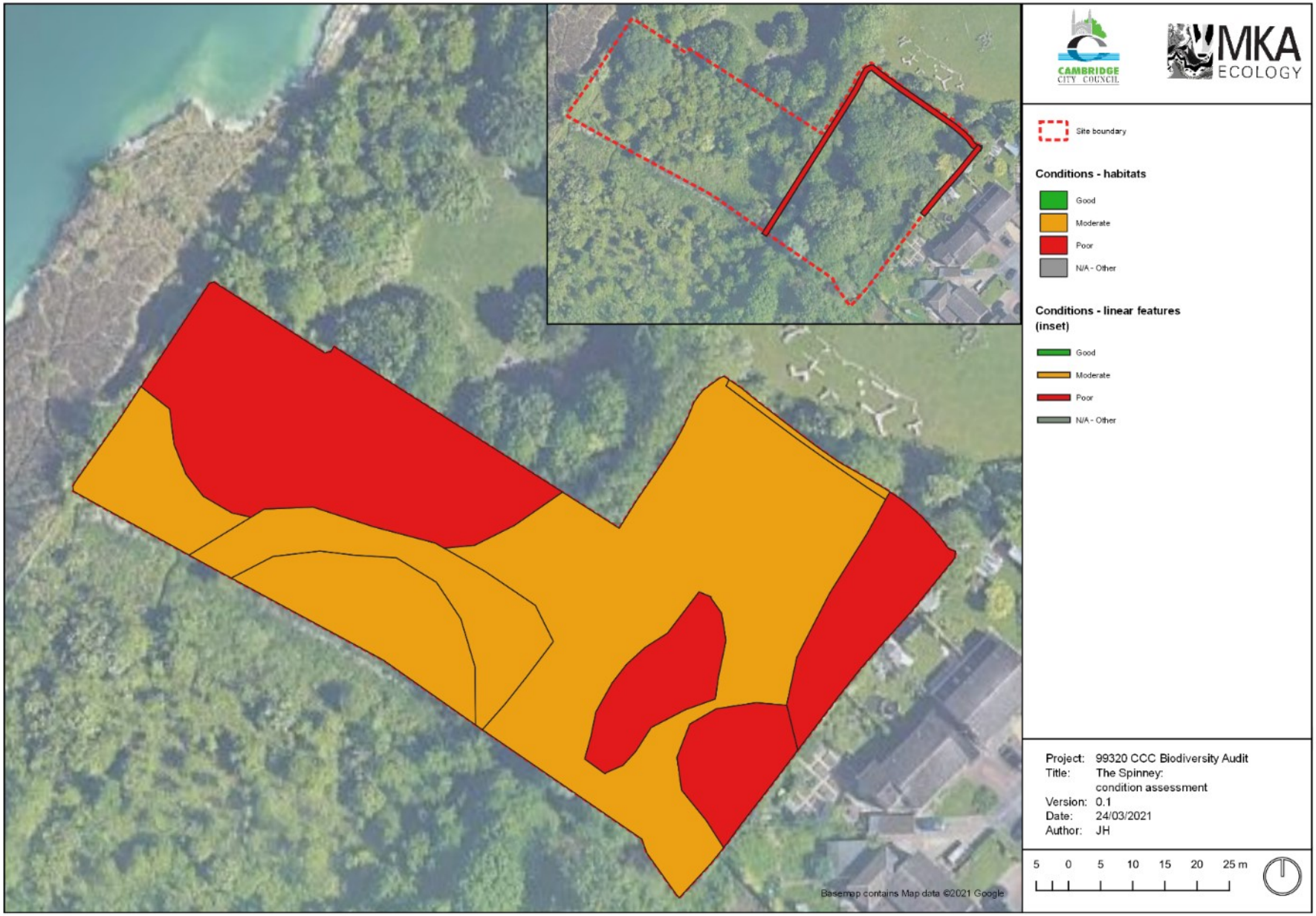
UKHabs habitat types present (secondary codes in brackets) **r1a Eutrophic standing waters (19 Ponds)** **r1e Canals/ditches (191 Ditches)**
Description A dried-out pond lies at the centre of the woodland and dry ditch runs through the site. These conditions are as described in 2005 and there is no indication that they hold water at any time.
Condition Both features are considered to be 'poor' on account of not holding water. In the case of the pond, and where evidence persists that this rarely - if at all - holds water, an argument could be made to map this as part of the woodland. However, we continue to classify this as a pond by way of driving future management at the site.

Priority habitats

The following Priority Habitats are present at this location;

- Lowland mixed deciduous woodland
- Hedgerow
- Ponds


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Habitats
g3c5 - Arrhenatherum neutral grassland
h3d - Bramble scrub
h3h - Mixed scrub
r1a - Eutrophic standing water
w1f7 - Other Lowland mixed deciduous woodland
Linear features
h2b5 - Hedge Ornamental Non Native
r1e - Canal or ditch
Point features
Target Note
w1f7
h3h
h3d
g3c5
r1a
r1e
h2b5
N1
N2
Project: 99320 CCC Biodiversity Audit
Title: The Spinney - habitats
Version: 0.1
Date: 24/03/2021
Author: JH
5 0 5 10 15 20 25 m
Basemap contains Map data ©2021 Google

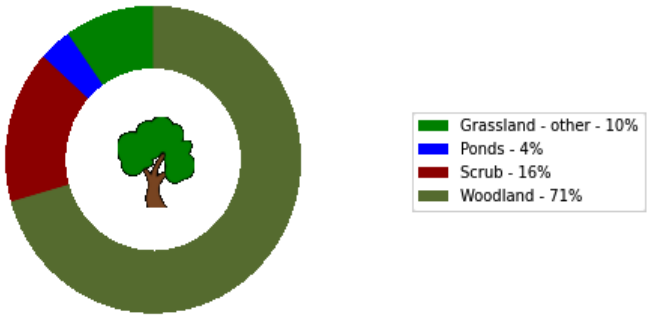

CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features (inset)
Good
Moderate
Poor
N/A - Other
Project: 99320 CCC Biodiversity Audit
Title: The Spinney: condition assessment
Version: 0.1
Date: 24/03/2021
Author: JH
5 0 5 10 15 20 25 m
Basemap contains Map data ©2021 Google

Target Notes:

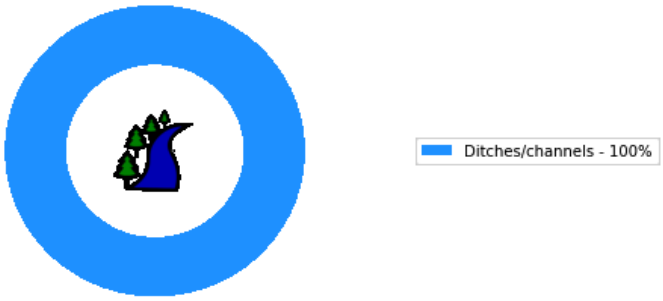
1. Forest School seating area.
2. Tree Planting.

Biodiversity units

The following charts show the percentage of biodiversity units for each habitat/linear feature type at The Spinney.



Habitat type	*Biodiversity units*
Grassland - other neutral	0.54
Ponds	0.20
Scrub	0.89
Woodland	3.92



Habitat type	*Biodiversity units*
Ditches/channels	0.51

Management

Review of exiting management

A management plan is not known to exist for the site.

Assessment against selection criteria

A proposal in 2005 was for a new City Wildlife Site to be created to include the Spinney and associated semi-natural grasslands, tall herb vegetation and scrub. This larger site was deemed to qualify under the Habitat Mosaic criteria (2.18), as a site over one hectare in extent with two or more of the appropriate habitats (woodland, scrub, mature trees, semi-improved grassland and tall ruderal communities) and which by virtue of its "Position in an ecological unit" (2.39-2.40), "Human value" in the form of use for recreation by children and dog walkers (2.41), and "Potential value" (2.42-2.45), is judged to score highly against the supplementary criteria.

The present surveyed site is too small qualify under the Habitat Mosaic criterion (2.18), though if including areas of grassland to the south, some of which were observable during the field survey, this criterion is likely to apply, as supplemented by additional criteria as above.

Direction of travel

Habitat	Comments
Woodland	Moderate - stable
Grassland	Moderate - declining

Habitat	Comments
Scrub	Moderate - declining
Freshwater	Poor - stable

The woodland is of a comparable structure and floral composition to that described in 2005. The grassland is considered to be declining due to the reduced herbaceous diversity, with only one calcareous indicator observed (though acknowledging the 2005 survey encompassed a wider area than surveyed presently). Scrub is considered to be declining also, largely on the basis of invasive species. The freshwater habitats are also as described in 2005.

Future risks to condition

Potential risks which may impact upon habitat condition and features include;

- Impact from human (illegal) recreation on the majority of habitats and damage therefrom.
- Further development, population growth and potential demand from the neighbouring school for land.
- Demand for greater access.

Opportunities

Key features of ecological interest (and constraints if any)

A more targeted management of the western half of the site is likely to bring the largest gains: creation of glades within the hawthorn dominated block will improve the overall structure of this area and promote a greater extent of the grassland. Overall, a greater feeling of a mosaic will result. If possible, reinstating/encouraging water within the pond and ditch are also likely to bring benefits.

Opportunities

Creation of features	
Habitats	n/a
Species	Biodiversity toolkit: Bird boxes, bat boxes, hibernacula, beetle towers, bee banks (in grassland to west), hedgehog habitats. White-letter hairstreak. Whilst elm at the site has declined, it appears to be stable. The presence of elm, with potential to increase the structural variability of the site more generally opens the possibility for this species.
Management/restoration of existing features	
Habitats	Scrub. The western woodland is a poor example of woodland and may be better managed as scrub. Creating clearings here will increase deadwood within the site and increase the extent of the grassland. Pond and ditch. Reinstate these features, subject to local hydrological constraints. Grassland. Manage the grassland to improve herbaceous species diversity.
Species	n/a

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Improve condition of woodland from poor/moderate to good by managing damage and increasing deadwood resources
- Reinstating pond and ditch habitats

Further monitoring work

The site has previously been notified on the basis of its saproxylic invertebrate fauna. It is recommended that an assessment of the site be updated.

West Pit

Results

Site description and status

West Pit LNR is part of the larger Cherry Hinton Pit biological SSSI (which also encompasses East Pit and sections of Limekiln Road Verge, all being subject of this audit). West Pit is on the site of a former chalk pit and consists predominantly of calcareous grassland on the cliff tops, with scrub and ash *Fraxinus excelsior* woodland on the slopes and base. A caravan park occupies the majority of the pit floor, with small areas thereof contained within the site boundary.

This site lies within the Gog Magog Hills Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) x **g2a5 Dry grasslands and scrub on chalk or limestone (10 Scattered scrub, 134 Base-rich substrate, 99 Nature reserve)** **g4 Modified grassland (431 Road island/verge)** **g4a Amenity grassland (66 Frequently mown, 73 Bare ground)**
Description **g2a5 Dry grasslands and scrub on chalk or limestone:** Calcareous grassland makes up nearly 10% of the site and is situated to the south on the cliff top. Calcareous grassland indicators were frequent and obvious within the sward with 11 species of strong calcareous indicators and four species of calcareous indicators present at either frequent or occasional cover. Dwarf thistle *Cirsium acaule,* glaucous sedge *Carex flacca* and moon carrot *Seseli libanotis* were also observed at lower frequency, with the latter observed in the south-east corner adjacent to the cliff top. No species were dominant, though common

knapweed *Centaurea nigra* and yarrow *Achillea millefolium* were abundant, particularly at the foot of hedgerows on the south and south-east. The grassland is considered to be a good example of this habitat type, with adjacent areas of scrub, bare ground and raised mounds/anthills contributing to the presence of varied microtopography and habitat. A small section below the cliff top, recently cleared of non-native scrub is also considered within this habitat type, though bare chalk predominates.

g4/g4a Modified/amenity grassland:

Small sections of modified or amenity grassland are present within the site boundary, though are understood to be within the management of the associated caravan park. Nevertheless, that lady's bedstraw *Galium verum* was visible within a sward otherwise dominated by perennial rye-grass *Lolium perenne* give an indication of the underlying geology.

Condition

g2a5 Dry grasslands and scrub on chalk or limestone:

With the exception of a small patch in the far west, the calcareous grassland is considered to be in 'good' condition, with all good condition criteria being passed. An area of approximately 100m^2 in the south-west is rated as being poor on account of suffering physical damage (rubbish), incursion of *Buddliea* and the presence of bare ground. All of the poor condition criteria are therefore failed. A similar sized area just below the cliff top is also rated as 'poor', with bare rock still predominant following scrub clearance.

g4 and g4a Modified/amenity grassland. Considered poor on account of grassland type ('amenity or road verge') and 'rye-grass cover >25% and white clover'

Woodland

UKHabs habitat types present (secondary codes in brackets)

w1f7 Other Lowland mixed deciduous woodland (16 Tall herb, 105 Quarry - hard rock, 134 Base-rich substrate)

Description

Ash woodland makes up the majority of the site, accounting for nearly 2ha (66%) of the area surveyed. Ash was the dominant tree species, with occasional sycamore *Acer campestre.* Within the shrub layer, hawthorn *Crataegus monogyna* was abundant, with dogwood *Cornus sanguinea*, elder *Sambucus nigra,* elm *Ulmus* sp. all abundant. Within the herb layer false-brome *Brachypodium sylvaticum,* garlic mustard *Alliaria petiolate* and wood avens *Geum urbanum* were frequent, with ploughman's-spikenard *Inula conyzae* – another strong calcareous indicator – also occasional in clearings. As with the associated scrub *Cotoneaster* was also present, including the invasive non-native wall cotoneaster *Cotoneaster horizontalis* (WCA, 1981, Sch. 9). Both standing and fallen deadwood were abundant, in part due to the presence of signs of ash dieback. Signs of damage were restricted to areas immediately adjacent to paths and litter was only present in a small number of isolated areas.

Condition

The majority of the woodland (90%) is in 'good' condition, only failing on the presence of invasive non-native species, as described above. Small sections on the south and north-west cliff faces are considered as moderate, having less than three woody and shrub species per 10m, having little or no deadwood and little evidence of tree regeneration.

Scrub

UKHabs habitat types present (secondary codes in brackets)

h3f Hawthorn scrub (16 Tall herb, 105 Quarry - hard rock, 134 Base-rich substrate)

h3h Mixed scrub (10 Scattered scrub, 99 Nature reserve, 134 Base-rich substrate)

Description

Scrub forms the interface between the grassland and woodland, particularly at the cliff tops. The area along the north-west boundary could only be surveyed from a distance. Species composition is similar to the shrub layer as described above for woodland, with herbs as for the chalk grassland. A significant feature of the scrub

at the site is the presence of invasive non-native species, with both *Buddleia* and *Cotoneaster* frequent. In some sections it appeared that *Buddliea* was the dominant woody species.
Condition With the exception of a block of scrub in the south-east corner, all scrub is either in 'moderate' or 'poor' condition. Where scrub was at the boundary with the caravan park, these were *Buddliea* dominated stands with little structural diversity. On the cliff top, the scrub on either side of the grassland was considered moderate on account of the presence of invasive species and the absence of clearings/glades. Along the western edge a moderate condition is due to the absence of any glades or clearing and absence of a well-developed edge.

Hedgerow

UKHabs habitat types present (secondary codes in brackets) **h2a5 Native Hedgerow** **h2a9 Native Species Rich Hedgerow** **h2a11 Native Species Rich Hedgerow with trees**
Description Three hedgerows are present within the site. The longest along the south-western boundary is a native species rich hedgerow with trees; hawthorn, blackthorn *Prunus spinosa* and dogwood *Cornus sanguinea* all frequent. Larger standards of ash are present, along with rare buckthorn *Rhamnus cathartica* and wayfaring-tree *Viburnum lantana*. A second native species rich hedgerow runs for a short distance along the south-east boundary, merging with adjacent hawthorn scrub. A third hedgerow is within the caravan park and is a single species (hawthorn) and highly managed feature.
Condition Both hedgerows on the south and south-east boundaries are in 'good' condition. Only the criterion relating to canopy-base height is failed in the former, with all condition criteria met in the latter. The hedgerow within the caravan park is

considered 'moderate' on the basis of the absence of any margin, though it passes all structural criteria.

Other inland rock and scree

UKHabs habitat types present (secondary codes in brackets) **s1d Other inland rock and scree (16 Tall herb, 105 Quarry - hard rock, 134 Base-rich substrate)**
Description The north facing cliff face of the original chalk pit is considered here under inland rock habitat. For the most part, this is bare, exposed chalk, with woody species (predominantly *Buddliea*) growing on ledges or in cracks. At the foot of the cliff face where scree is aggregated, tall herb and ruderal species are present with common nettle *Urtica dioica* being abundant. The area is subject to disturbance, is used as storage for brash and has litter piles (either dumped deliberately, or naturally accumulating from above).
Condition This is assessed as poor on account of the presence of undesirable species and evidence of human disturbance and damage.

Priority habitats

The following Priority Habitats are present at this location;

- Lowland calcareous grassland
- Lowland mixed deciduous woodland
- Hedgerow


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Habitats
g2a5 - Dry grasslands and scrub on chalk or limestone
g4a - Modified grassland (amenity)
h3f - Hawthorn scrub
h3h - Mixed scrub
u1b5 - Buildings
u1b6 - Other developed land
w1f7 - Other Lowland mixed deciduous woodland
s1d - Other inland rock and scree
Linear features
h2a5 - Native Hedgerow
h2a9 - Native Species Rich Hedgerow
h2a11 - Native Species Rich Hedgerow with trees
Point features
Target Note
Scattered tree
Project: 99320 CCC Biodiversity Audit
Title: West Pit - habitats
Version: 0.2
Date: 04/05/2021
Author: JH
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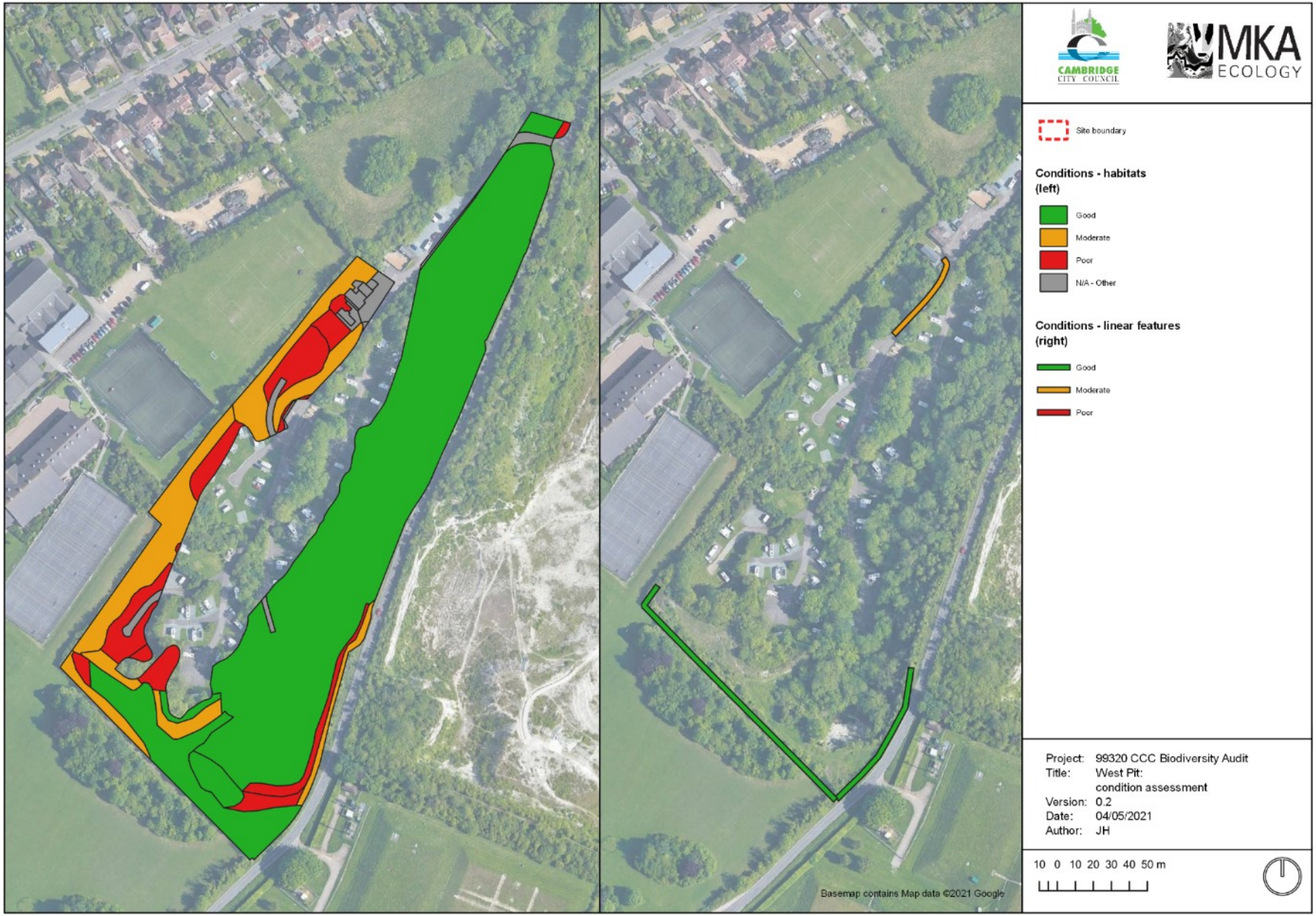
Basemap contains Map data ©2021 Google

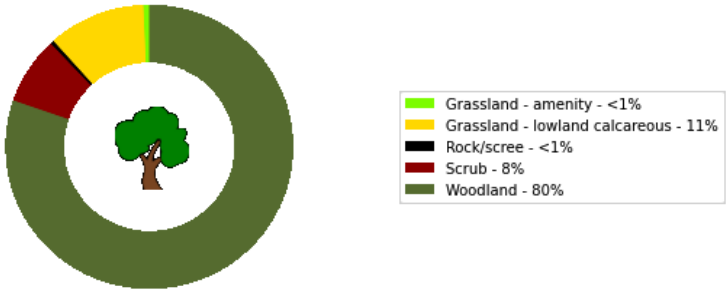

CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Conditions - habitats (left)
Good
Moderate
Poor
N/A - Other
Conditions - linear features (right)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: West Pit: condition assessment
Version: 0.2
Date: 04/05/2021
Author: JH
10 0 10 20 30 40 50 m
Basemap contains Map data ©2021 Google

Target Notes:

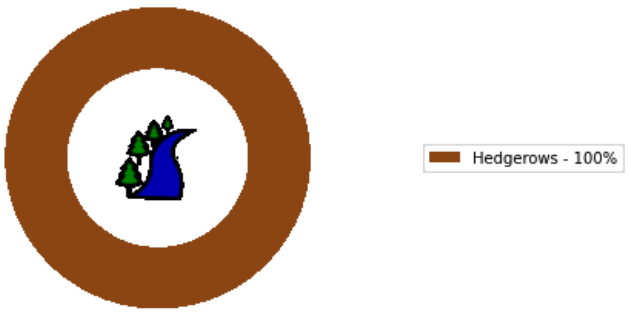
1. Wall cotoneaster.
2. Cotoneaster sp.
3. Tipped cuttings and other rubbish.
4. Kiln.
5. Pit.
6. Stand of wall and other sp. of cotoneaster.
7. *Buddleia*.
8. Scrub encroachment.

Biodiversity units

The following charts show the percentage of biodiversity units for each habitat/linear feature type at West Pit.



Habitat type	*Biodiversity units*
Grassland - amenity	0.34
Grassland - lowland calcareous	5.48
Rock/scree	0.21
Scrub	3.84
Woodland	40.15



Habitat type	*Biodiversity units*
Hedgerows	3.61

Management

Review of exiting management

Management objectives – set out for the entire Cherry Hinton Pit SSSI site include the following:

- Maintenance of sufficient scrub, particularly as a screen to the main chalk grassland habitat, but without encroachment.
- Monitoring and removal of invasive species.
- Maintaining chalk grassland composition, which varies across the two sites (predominantly CG1 & CG3 grassland in West Pit and CG7 grassland in East Pit).
- Monitoring of rare species and role of human disturbance on retention at the sites.
- Creation of areas of bare chalk.
- Retaining the locally important ash woodland and creation and retention of deadwood.
- Retaining the regional importance of the sites for invertebrates.
- Education and engagement.

Within West Pit these objectives are being achieved. Only the presence of invasive shrub species is a potential cause of concern, acknowledging the challenge of controlling both *Buddliea* and *Cotoneaster.*

Assessment against selection criteria

The presence of a herb rich chalk grassland in good condition is in keeping with one of the primary reasons for designation. The site also designated for the presence of four nationally rare species; of these, only moon carrot was found during the survey, though it is important to note that this criterion applies to the entire SSSI area (West and East Pit).

Direction of travel

Habitat	Comments
Woodland	Good – stable. SSSI is regarded to be in 'Favourable' condition.
Grassland	Good – stable. SSSI is regarded to be in 'Favourable' condition.
Grassland	Poor - improving. Area cleared below cliff face once scrub covered, now cleared to allow opportunity for grassland regeneration.
Scrub	Good – stable. SSSI is regarded to be in 'Favourable' condition.
Scrub	Moderate – declining. Areas in moderate condition are taken to be a departure from the overall 'Favourable' condition of the site. Invasive species is the primary cause for this departure.
Scrub	Poor – declining. Areas in moderate condition are taken to be a departure from the overall 'Favourable' condition of the site. Invasive species and structural uniformity the primary causes for this departure.
Hedgerows	Good – stable. SSSI is regarded to be in 'Favourable' condition.

The SSSI Unit (West Pit) is assessed to be 'Favourable' condition by Natural England. This applies to the whole site.

Future risks to condition

Potential risks which may impact upon habitat condition and features include;

- Impact from human recreation, particularly dog-walking and litter, on the majority of habitats.
- Continued establishment of non-native invasive plant species within scrub and chalk grassland.
- Continued spread of non-native species.
- Ash dieback and the potential impact on woodland structure.

Opportunities

Key features of ecological interest (and constraints if any)

Given the sites designated status, the entire site can be regarded as a feature of ecological interest, particularly in its role in connecting the city with the countryside to the south-east. Opportunities exist to create features within the caravan park, particularly for invertebrates where simple features can be installed on existing amenity areas without constraint to caravan plots.

Opportunities

Creation of features	
Habitats	n/a
Species	Invertebrates – Biodiversity toolkit: bee hotels, bee towers and bee banks within caravan park.
Management/restoration of existing features	
Habitats	Scrub: continued monitoring and removal of invasive species. In areas along the pit faces which are of moderate condition, further opening up to create more glades and potential for tall herb edge.
Species	n/a

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Maintaining good condition of woodland and grassland
- Improving condition of scrub habitat from moderate to good
- Monitoring and removal of invasive species

Further monitoring work

None beyond that already outlined in existing management plans.

Limekiln Road Verge

Results

Site description and status

The site consists of grassland verges and hedgerows both sides of Lime Kiln Hill. Part of the road verge lies within the wider Cherry Hinton Pit biological SSSI (which also encompasses West and East Pits). The site is designated as a City Wildlife Site on the basis of its neutral and chalk grasslands, and hedgerows, and is also a Protected Road Verge. The site as surveyed is identical to that surveyed in the 2005 City Wildlife Site survey and runs on both sides of Limekiln Hill from the junction with Worts' Causeway in the south to the south-east corner of the West Pit SSSI Unit. It measures approximately 0.8ha. It does not include the easterly projection of the SSSI Unit which bounds the reservoirs.

This site lies within the Gog Magog Hills Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g2a5 Dry grasslands and scrub on chalk or limestone. (10 Scattered scrub, 161 Tall or tussocky sward, 330 Scrub, 431 Road island/verge)** **g3c5 *Arrhenatherum* neutral grassland. (10 Scattered scrub, 64 Mown, 123 Neutral grassland with calcicoles, 161 Tall or tussocky sward, 330 Scrub, 431 Road island/verge)** **g4 Modified grassland (16 Tall herb, 17 Ruderal/ ephemeral, 64 Mown, 431 Road island/verge)**
Description **g2a5 Dry grasslands and scrub on chalk or limestone:**

Areas considered as calcareous grassland are limited to narrow sections (between 1-2m) along the western verge approximately halfway down the length of the site. Other, wider sections are present as isolated blocks on the eastern verge. Upright brome *Bromopsis erecta* was abundant throughout the sward, in contrast to the 2005 survey where its occurrence was considered to be limited. This species was most prevalent on the eastern verge. Four calcareous grassland indicators were also frequent: agrimony *Agrimonia eupatoria*, burnet-saxifrage *Pimpinella saxifrage*, common knapweed *Centaurea nigra* and lady's bedstraw *Galium verum*. Field scabious *Knautia arvensis* was also frequent and greater knapweed occasional, both strong calcareous indicators. The calcareous grassland areas occupy a relatively small area of the overall CiWS (5%), in part due to the encroachment of the hedgerow, particularly by suckering blackthorn *Prunus spinosa.*

g3c5 *Arrhenatherum* neutral grassland:

Neutral grassland forms the largest grassland component of the site, occupying approximately 0.14ha (16%) of the total area and occupies areas at the top and bottom of Lime Kiln Hill. The area at the top of the hill forms the largest component of the neutral grassland, north of the reservoir layby. This was characterised by an abundance of common knapweed, false oat-grass *Arrhenatherum elatius* and yarrow *Achillea millefolium,* with frequent cock's-foot *Dactylis glomerata* and couch *Elytrigia* sp. giving the grassland a rank appearance. Burnet saxifrage and agrimony, both neutral/calcareous indicators were frequent and occasional respectively. The section at the Worts' Causeway end was in two distinct areas: a closely mown area nearer the road, with grasses dominating, with a less frequently mown area at the hedgerow base.

g4 Modified grassland:

Two areas of modified grassland were present. On the north side of the verge near the hill top is an area dominated by grasses and ruderal and nitrophilous species (e.g., common mallow *Malva Sylvestris,* common nettle *Urtica dioica* and broad-leaved dock *Rumex obtusifolius*) with abundant couch *Elytrigia sp.* and false oat-grass. At the foot of the hill, an area of closely mown road verge is present, with locally abundant perennial rye-grass *Lolium perenne*

All sections of road verge show the likely impacts of salt-spreading, with species more typical of coastal areas present: buck's-horn plantain *Plantago coronopus* and grass-leaved orache *Atriplex littoralis* both being found at the hill top. It cannot be ruled out that the couch grass species recorded may include sea couch *Elytrigia athericus.*

Condition

g2a5 Dry grasslands and scrub on chalk or limestone.

The small areas of calcareous grassland are rated as being either in 'moderate' or 'poor' condition. On the western side. 'Moderate' areas are those where the grassland is considered to be a good example of the habitat type, but where wildflowers are at <30% (east side) or where scrub cover is clearly >5% and rubbish accumulation is high (west side, higher elevation). Areas of 'poor' condition are where scrub/hedgerow encroachment is widespread, undesirable species and damage is >5% and the grassland is losing the characteristics of this habitat type. At times, it was challenging to identify the boundary between the hedgerow and grassland verge.

g3c5 *Arrhenatherum* neutral grassland:

Condition assessments for neutral grassland are identical in nature to that described above. Where 'moderate' (e.g., hill top), wildflowers were much reduced in the sward, with rank grassy species dominating and as such is close to the moderate condition criterion of '*Semi-improved grassland which may be derived from higher quality Priority Habitat grassland habitats in poor condition'*. Where this grassland type is in poor condition (e.g, at the hill base), the habitat takes on a tightly mown 'amenity/road verge' function. In other, thinner sections along the road, scrub encroachment is the biggest factor in determining poor condition.

g4 Modified grassland:

These areas are considered as 'poor' either on account of the presence of undesirable species being >15% (north) or reflecting the amenity/road verge poor criterion (south).

Hedgerow

UKHabs habitat types present (secondary codes in brackets)

h2a5 Native Hedgerow (75 Active Management, 431 Road island/verge) **h2a7 Native Hedgerow with trees (431 Road island/verge)** **h2a9 Native Species Rich Hedgerow (75 Active Management, 431 Road island/verge)** **h2a12 Native Species Rich Hedgerow with trees - Associated with bank or ditch (431 Road island/verge)**
Description Hedgerows take up the majority of the site, occupying 75% of the area. This is likely to be greater than observed in 2005 where increasing widening of the woody component is occurring, largely through blackthorn suckering. In several places, there is no grass verge at all. Hawthorn *Crataegus monogyna* and blackthorn are the two abundant species, with a range of other species also present at frequent or occasional levels: dog-rose *Rosa canina*, cherry plum *Prunus cerasifera*, elder *Sambucus nigra* and wild privet *Ligustrum vulgare* all present. Where standard trees were present, ash *Fraxinus excelsior* was the most common species – this section being present on the road bend and south of West Pit.
Condition All hedgerows are in either 'good' or 'moderate' condition. Those areas in 'good' condition are on either side of the road at the main bend. In the section to the north, all condition criteria are passed. To the south, there are failures on account of horizontal gaps making >10% and there being significant windblown rubbish. 'Moderate' hedgerows either fail both categories in one or more functional group, or fail up to four criteria. Hedgerows in the former category generally fail both criteria relating to the width and content of undisturbed ground: in several places, the hedge is so wide that it abuts the road, and farming activities on the other side are adjacent to the hedge base. Elsewhere, hedgerows have gaps >10%, along with failures in ground flora.

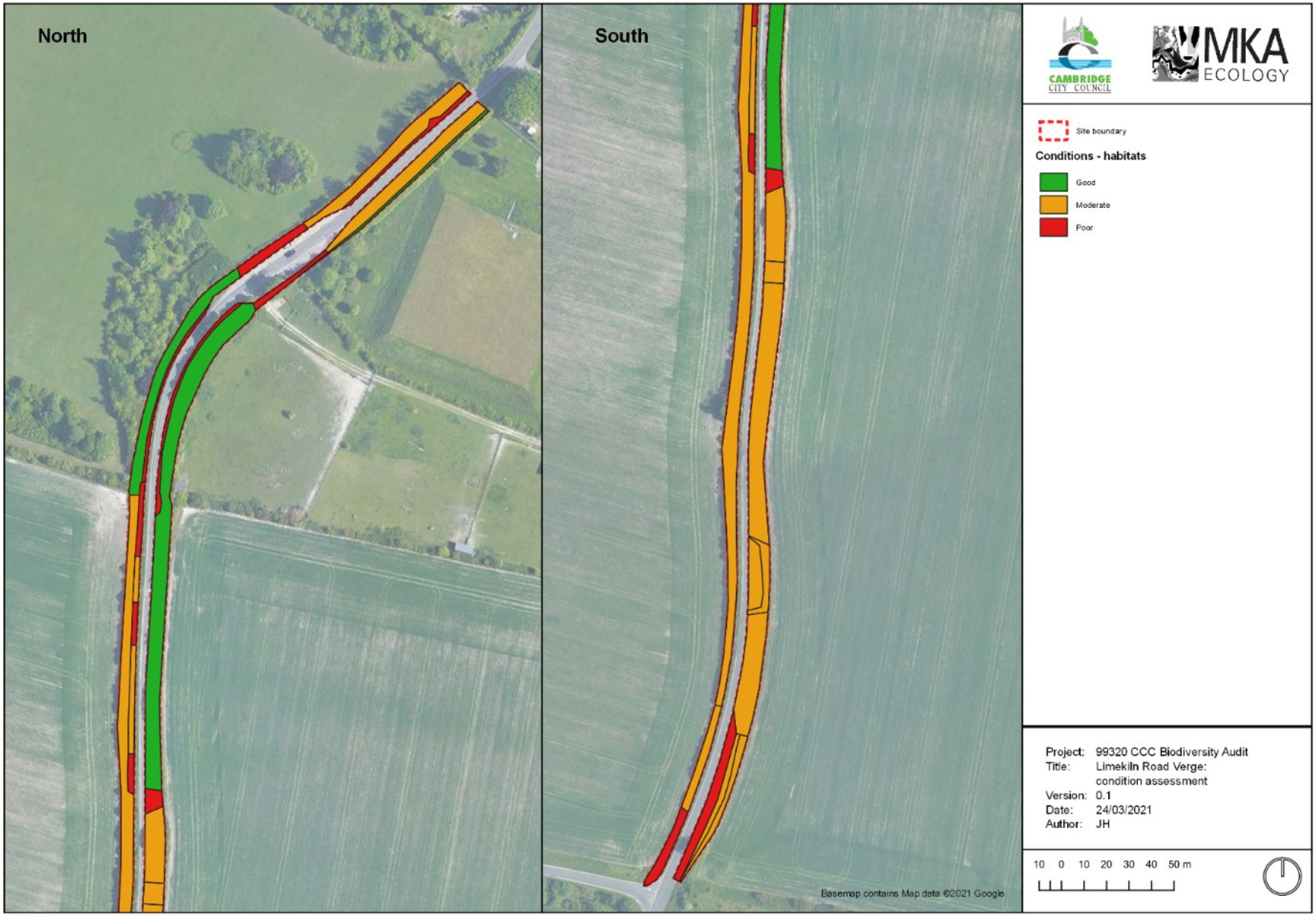
Priority habitats

The following Priority Habitats are present at this location;

- Lowland calcareous grassland

- Hedgerow


North
South
h2a7
g3c5
g3c5
g4
h2a12
N1
h2a5
g2a5
h2a9
g2a5
h2a5
h2a5
h2a9
h2a5
N2
g2a5
h2a5
h2a5
h2a5
g3c5
g4
Basemap contains Map data ©2021 Google
CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Habitats
g2a5 - Dry grasslands and scrub on chalk or limestone
g3c5 - Arrhenatherum neutral grassland
g4 - Modified grassland
h2a5 - Native Hedgerow
h2a7 - Native Hedgerow with trees
h2a9 - Native Species Rich Hedgerow
h2a12 - Native Species Rich Hedgerow with trees Associated with bank or ditch
Point features
Target Note
Project: 99320 CCC Biodiversity Audit
Title: Limekiln Road Verge - habitats
Version: 0.1
Date: 24/03/2021
Author: JH
10 0 10 20 30 40 50 m

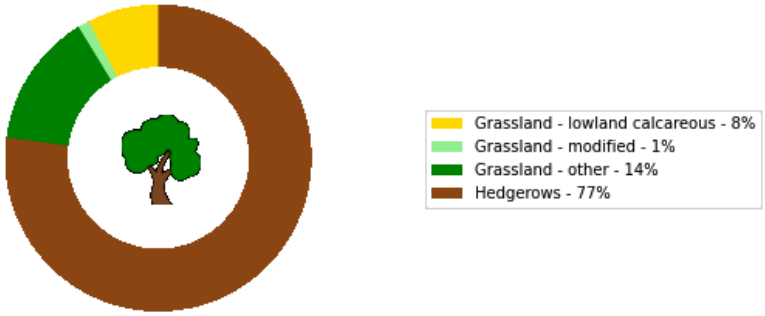

North
South
CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Conditions - habitats
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: Limekiln Road Verge: condition assessment
Version: 0.1
Date: 24/03/2021
Author: JH
10 0 10 20 30 40 50 m
Basemap contains Map data ©2021 Google

Target Notes:

1. High densities of road side/wind blown rubbish
2. Badger sett

Biodiversity units

The following charts show the percentage of biodiversity units for each habitat/linear feature type at Limekiln Road Verge.



Habitat type	*Biodiversity units*
Grassland - lowland calcareous	0.49
Grassland - modified	0.08
Grassland - other neutral	0.93
Hedgerows	5.05

Management

Review of exiting management

A summary of the English Nature Views About Management (VAM) are summarised as follows:

- The road verge supports the nationally rare moon carrot and grape hyacinth. Annual management by cutting and arising removal should be completed.
- Monitoring of and appropriate cutting of scrub/hedgerow will be necessary.
- Protection measures should be in place to limit rubbish and damage from other activities.

Management of the site as above appears to not be applied across the whole site, at least not on the annual basis as recommended. Volunteer work parties run by the Wildlife Trust BCN do undertake annual autumn cut and collect management on certain parts of the verge. Alexanders has also been dug out in certain areas to reduce their impact on grape hyacinth and other indicator species. Hedgerow cutting to relieve the grass verge was undertaken in January 2021 and arising raked by hand.

Scrub encroachment is a significant problem and areas of grassland (both calcareous and neutral) are increasingly dominated by grasses, a potential symptom that arising are not being removed following cutting and/or cutting is occurring at an inappropriate time of year.

Assessment against selection criteria

In 2005, the site qualified under criteria 2.10c (neutral grassland), borderline 2.10d (calcareous grassland) and 2.9 (hedgerow). The calcareous grassland qualifies under 2.10d, with six calcareous indicators found in frequent numbers. The neutral grassland is now borderline on criterion 2.10c. The site continues to qualify on the basis of its hedgerows.

The biological interest for the road verge unit of the SSSI is the presence of grape hyacinth *Muscari neglectum* and, following the most recent assessment of 2011 is deemed to be in 'Unfavourable – no change'.

Direction of travel

Habitat	Comments
Grassland	Moderate - declining
Grassland	Poor - declining

Habitat	Comments
Hedgerow	Good - stable
Hedgerow	Moderate - stable

The SSSI Unit to which the road verge is associated within the larger Cherry Hinton is considered to be 'Unfavourable – no change', though this relates to the qualifying feature of the verge, namely the presence of grape hyacinth.

Survey data from 2005 indicates that the grassland habitats were declining in quality. Further declines are evident in 2020, in most part due to the encroachment of scrub/hedgerow and the reduction in wildflower cover; upright brome was seen to be increasing in cover for calcareous areas and false-oat grass and cock's-foot elsewhere.

Future risks to condition

Potential risks which may impact upon habitat condition and features include;

- Further loss of grassland to scrub encroachment.
- Loss of all notable grassland species to scrub encroachment.
- Continued spread of coastal species from salt spreading.
- Increased traffic volume and nitrogen deposition.
- Changes in agricultural practices to the west and east and the potential negative impacts to hedgerows.

Opportunities

Key features of ecological interest (and constraints if any)

With the exception of some sections of hedgerow, the site is either in 'moderate' or 'poor' condition. The verge, along with the other 'chalk pit sites' forms part of the wider Gog Magog Priority area and forms an important corridor within this area,

linking the larger pits to the north with the Gog Magog golf course and Wandlebury to the south-east. As such, improving the condition of these habitats is critical to re-establishing and maintaining its role in wider landscape connectivity.

Recommendations follow those as set out in the 2005 City Wildlife Register Survey and the Cambridge Nature Conservation Strategy (2006):

- Extension of the City Wildlife Site (and Protected Road Verge) to the north and south.
- Implement a conservation management regime for Lime Kiln Hill SSSI road verge to maintain the populations of moon carrot *Seseli libanotis* and grape-hyacinth and monitor their status and to Wort's Causeway RSV to recover the population of perennial flax *Linum perenne* [CG2].

A badger sett is present within the hedge and extending west into neighbouring farmland.

Opportunities

Creation of features	
Habitats	n/a
Species	n/a
Management/restoration of existing features	
Habitats	Grassland: Implementation of annual management regime, following best practices as recently published by Plantlife (Bromley *et al.,* 2019).
Species	Grape-hyacinth, moon carrot, perennial flax. Management for road verges will benefit these species.

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Achieve good condition of calcareous grassland habitats through improved management of scrub and rubbish

Further monitoring work

Given the precarious nature of the grassland habitats at the site, it is recommended that annual or bi-annual vegetation surveys of the grassland and hedgerow extents are undertaken to chart the success of any management practices undertaken.

East Pit

Results

Site description and status

East Pit LNR is part of a larger Cherry Hinton Pit biological SSSI (which also encompasses West Pit and sections of Limekiln Road Verge, all being subject of this audit). East Pit is on the site of a former chalk pit and is comprised predominantly of calcareous grassland in the pit base, with scrub to the north and on the cliff tops.

This site lies within the Gog Magog Hills Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g2a5 Dry grasslands and scrub on chalk or limestone (10 Scattered scrub, 105 Quarry - hard rock, 73 Bare ground)**
Description Calcareous grassland makes up 54% of the 8.1ha site and is located within the pit base. Calcareous grassland indicators were frequent and obvious within the sward with seven strong calcareous indicators observed as either abundant or frequent, with fairy flax *Linum catharticum* the most abundant. Moon carrot was also observed – a single plant within the centre of the grassland. The sward was short (no more than 30cm) except where taller grasses (e.g., cock's-foot *Dactylis glomerata* and false oat-grass *Arrhenatherum elatius*) were locally abundant. Bare chalk was a significant feature of the area, particularly in the south and where the pit is banked at its southern end (either side of newly installed steps). Scrub was present throughout, though particularly in the northern end where a gradient from the area of dense scrub to the north merges into an area of scattered scrub to the

south. Invasive *Cotoneaster,* including wall contoneaster *C. horizontalis* was present throughout the site, but particularly in the area of scattered scrub.
Condition The majority of the grassland is considered to be in 'good' condition. It is clearly recognisable as the Priority Habitat and has a diverse flora. Whilst invasive shrubs are present, this is less than 5%. Whilst bare ground is likely to be greater than 10%, this is seen as an important feature of this habitat and so is ignored. The only area to be considered as 'poor' is the area of scattered scrub to the north of the circular path. This is considered as calcareous grassland in poor condition, rather than scrub with potentially moderate condition in order to drive future habitat management. This area is considered to be poor on account of the scrub and invasive species cover greater than 5%.

Scrub

UKHabs habitat types present (secondary codes in brackets) **h3h Mixed scrub (105 Quarry - hard rock, 134 Base-rich substrate)**
Description Areas mapped as scrub are limited to the exterior of the site, though it is recognised that scattered scrub is also present throughout. The principal area is at the north of the site, where dogwood *Cornus sanguinea* is abundant and hawthorn *Crataegus monogyna*, dog-rose *Rosa canina* and wild privet *Ligustrum vulgare* frequent. *Buddleia* was also more present here, as well as along the southern edge, including within the base of the pit.
Condition The northern block of scrub is assessed as being in 'good' condition. Invasive species were more prevalent at the exterior, but overall, at less than 5%, with all condition criteria being passed. The scrub along the west bank/cliff is rated as 'moderate', failing only the condition relating to invasive species, this otherwise being a diverse area (both structurally and botanically). Scrub found at the cliff base in the south-west corner is also considered 'moderate' on a similar basis,

though also lacks more mature woody species (other age classes are present). The strip of scrub along the south and east cliff tops is considered to be poor in that these lack diversity of age and structure.

Other inland rock and scree

UKHabs habitat types present (secondary codes in brackets) **s1 Inland rock and scree (105 Quarry - hard rock, 134 Base-rich substrate)**
Description The bare cliff faces of the original chalk pit is considered here under inland rock habitat. For the most part, this is bare, exposed chalk, with *Cotonoeaster* and *Buddliea* growing on ledges or in cracks and herbs.
Condition This is assessed as poor on account of the presence of undesirable species.

Priority habitats

The following Priority Habitats are present at this location;

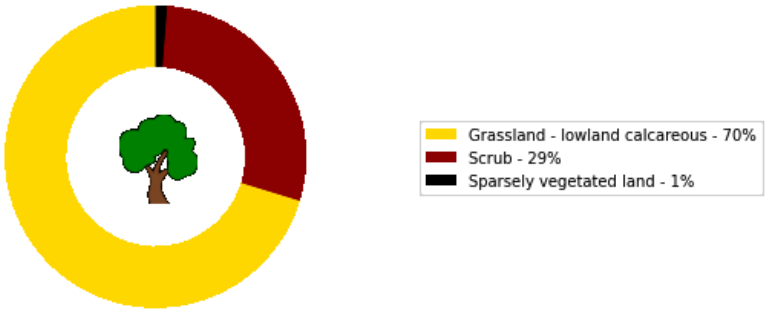
- Lowland calcareous grassland


h3h
g2a5
h3h
h3h
h3h
g2a5
u1c
g2a5
s1
g2a5
g2a5
h3h
h3h
s1
g2a5
Basemap contains Map data ©2021 Google
CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Habitats
g2a5 - Dry grasslands and scrub on chalk or limestone
h3h - Mixed scrub
u1b6 - Other developed land
u1c - Artificial unvegetated/unsealed surface
s1 - Inland rock
Project: 99320 CCC Biodiversity Audit
Title: East Pit - habitats
Version: 0.1
Date: 24/03/2021
Author: JH
10 0 10 20 30 40 50 m


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Project: 99320 CCC Biodiversity Audit
Title: East Pit: condition assessment
Version: 0.1
Date: 23/03/2021
Author: JH
10 0 10 20 30 40 50 m
Basemap contains Map data ©2021 Google

Biodiversity units

The following charts show the percentage of biodiversity units for each habitat/linear feature type at East Pit.



Habitat type	*Biodiversity units*
Grassland - lowland calcareous	77.12
Rock/scree	1.33
Scrub	31.27

Management

Review of exiting management

The site is owned and managed by the Wildlife Trust BCN. Management objectives – set out for the entire Cherry Hinton Pit SSSI site include the following:

- Maintenance of sufficient scrub, particularly as a screen to the main chalk grassland habitat, but without encroachment.
- Monitoring and removal of invasive species.
- Maintaining chalk grassland composition, which varies across the two sites (predominantly CG1 & CG3 grassland in West Pit and CG7 grassland in East Pit).
- Monitoring of rare species and role of human disturbance on retention at the sites.
- Creation of areas of bare chalk.
- Retaining the locally important ash woodland and creation and retention of deadwood.
- Retaining the regional importance of the sites for invertebrates.

- Education and engagement.

Within East Pit these objectives are being achieved. Only the presence of invasive shrub species is a potential cause of concern, acknowledging the challenge of controlling both *Buddliea* and *Cotoneaster.*

Assessment against selection criteria

The presence of a herb rich chalk grassland in good condition is in keeping with one of the primary reasons for designation. The site also designated for the presence of four nationally rare species; of these, only moon carrot was found during the survey, though it is important to note that this criterion applies to the entire SSSI area (West and East Pit).

Direction of travel

Habitat	Comments
Grassland	Good – improving. Good condition and indications from SSSI assessment that main grassland is recovering.
Grassland	Poor – declining. Following SSSI assessment of 'Unfavourable recovering', the block north of the paths is reverting to scrub with invasive *Cotoneaster*.
Scrub	Good – stable. SSSI assessment indicates recovery of the grassland; the scrub in the north is considered to have changed relatively little.
Scrub	Moderate – declining (cliff-base). Invasive species likely to have increased in cover since 2011.
Scrub	Poor – stable (cliff-top). Age classes likely to have matured uniformly since 2011.

Habitat	Comments
Other rock and scree	No direction of travel attempted.

The SSSI Unit (East Pit) is assessed to be 'Unfavourable recovering' condition in 2011. This followed a major operation to clear scrub, where the 'sward was considered to be developing well, although much bare chalk remains'. Much of the grassland appears to still be in this condition and therefore is considered to be stable. Scrub is returning to the grassland block to the north of the path system, indicating a decline. For other scrub areas, which were not part of the SSSI assessment, an estimate of the likely direction is made. In the cliff-bottom areas, the primary reason for a 'moderate' condition is invasive species, which is likely to have increased in cover since 2011, and therefore considered 'declining'. The cliff-top scrub is 'poor' on account of the uniformity of age. This uniformity is unlikely to have changed.

Future risks to condition

Potential risks which may impact upon habitat condition and features include;

- Impact from human recreation, particularly trampling and nutrient enrichment from dog fowling.
- Establishment of non-native invasive plant species within scrub and chalk grassland.
- Continued spread of non-native species.

Opportunities

Key features of ecological interest (and constraints if any)

Given the site's designated status, the entire site can be regarded as a feature of ecological interest, particularly in its role in connecting the city with the countryside to the south-east. Peregrine falcon *Falco peregrinus* is understood to have previously

nested at the site. Its present breeding status is not known. This is an iconic species that is returning to breed in towns and cities

Opportunities

Creation of features	
Habitats	n/a
Species	n/a
Management/restoration of existing features	
Habitats	Scrub: continued monitoring and removal of invasive species. In areas along the pit faces which are of moderate condition, further opening up to create more glades and potential for tall herb edge.
Species	Peregrine falcon: Creation of a buffer area in the breeding season around potential nesting sites.

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Maintain good condition of calcareous grassland habitats and monitoring impacts of recreation

Further monitoring work

None beyond that already outlined in existing management plans.

Limekiln Close LNR

Results

Site description and status

Limekiln Close is a Local Nature Reserve and City Wildlife Site at the northern end of the Cherry Hinton Chalk Pits. It is not formally designated within the Cherry Hinton Pit SSSI, but does fall within the remit of the Wildlife Trust, with management of the site falling under the wider management of the East and West Pits, also the subject of this audit. The site is an ash woodland formed within a former chalk pit, not unlike that seen in West Pit, but with more open glades of grassland in the pit base.

This site lies within the Gog Magog Hills Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g3 Neutral grassland (17 Ruderal/ ephemeral, 64 Mown, 66 Frequently mown)**
Description Glades of more open grassland run through the woodland, affording the bulk of the access through the site from Limekiln Road to Queen Edith's Way. The herbaceous species present were largely neutral in character, with some species (e.g., agrimony *Agrimonia eupatoria* and wild basil *Clinopodium vulgare)* also indicative of the underlying calcareous geology and often found on spoil mounds. False oat-grass *Arrhenattherum elatius* and false brome were the two most abundant grass species, along with frequent cock's-foot *Dactylis glomerata,* with common knapweed *Centaurea nigra* and meadow crane's-bill *Geranium pratense* also frequent (the latter, locally abundant in the north of the site). Other, more ruderal species were present at the edges of the glades, with patches of common nettle *Urtica dioica* and creeping thistle *Cirsium arvense* locally dominant.

Condition

The grassland is considered to be in 'moderate' condition. The grasslands are not characteristic of specific Priority Habitats and wildflowers are not widespread or obvious. However, cover of scrub is low and undesirable species are localised.

Woodland

UKHabs habitat types present (secondary codes in brackets)

w1f7 Other Lowland mixed deciduous woodland (53 Felled, 105 Quarry - hard rock, 147 Fallen dead wood abundant)

Description

The site is predominantly (84%) ash *Fraxinus excelsior* woodland, with field maple *Acer campestre* also abundant. The shrub layer contains frequent elder *Sambucus nigra,* blackthorn *Prunus spinosa,* hawthorn *Crataegus monogyna* and wild privet *Ligustrum vulgare* with bramble *Rubus fruticosus agg.* abundant. The introduced *Buddleia* and *Cotoneaster* are also present at very low frequencies. False brome *Brachypodium sylvaticum* and ground ivy *Glechoma hederacea* were the two most abundant plants in the field layer, excluding the grassland glades (see below). Other woodland species present in the herb layer included herb-robert *Geranium robertianum*, and the ancient woodland indicator hairy St John's-wort *Hypericum hirsutum*. The woodland is also noteworthy for the presence of cherries *Prunus,* understood to be the descendants of the original trees that gave this part of Cambridge its name. A second, smaller area of recently felled woodland was observed in the north of the site.

Condition

The woodland is in 'good' condition. Fallen deadwood is abundant. The only criterion to be failed relates to damage, where bark-stripping (presumed from muntjac) is present in localised areas.

Scrub

UKHabs habitat types present (secondary codes in brackets)

h3d/h Bramble/mixed scrub (16 Tall herb)
Description Localised patches of scrub are present in the north-west and north-east corners of the site. In the north-west is a stand of bramble, possibly indicating recent clearance. Snowberry *Symphoricarpos albus* was also abundant, with ivy *Hedera helix* and *Clematis* abundant in the understorey and towards the perimeter respectively. In the north-east, both wild teasel *Dipsacus fullonum* and small teasel *Dipsacus pilosus* are present.
Condition The area to the north-west is considered as 'moderate', this being a relatively uniform stand; both moderate criteria '*the single woody species cover is greater than 75%'* and '*the age range is missing some size classes'* both applying. The scrub in the north-east is considered to be in 'good' condition, this having a more diverse structure and with a more well developed herb layer present.

Priority habitats

The following Priority Habitats are present at this location;

- Lowland mixed deciduous woodland


u1e1
h3d
w1f7
h3h
g3c
g3
u1e2
w1f7
g3
u1e2
N1
Basemap contains Map data ©2021 Google
CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Habitats
g3 - Neutral grassland
g3c - Other neutral grassland
h3d - Bramble scrub
h3h - Mixed scrub
w1f7 - Other Lowland mixed deciduous woodland
Linear features
u1e1 - wall
u1e2 - fence
Point features
Target Note
Project: 99320 CCC Biodiversity Audit
Title: Limekiln Close - habitats
Version: 0.1
Date: 26/03/2021
Author: JH
10 0 10 20 30 40 m


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Project: 99320 CCC Biodiversity Audit
Title: Limekiln Close: condition assessment
Version: 0.1
Date: 23/03/2021
Author: JH
10 0 10 20 30 40 m
Basemap contains Map data ©2021 Google

Target Notes:

1. *Cotoneaster*

Biodiversity units

The following charts show the percentage of biodiversity units for each habitat/linear feature type at Limekiln Close LNR.

Habitat type	*Biodiversity units*
Grassland - other neutral	2.45
Scrub	2.06
Woodland	49.29

Management

Review of exiting management

Objectives:

- *There will be an area of native ash woodland where natural processes are occurring.*

Rationale:

- *Ideally, natural processes should be able to maintain a woodland, however this site may be too small for this to occur. Intervention should be kept to a minimum, just to ensure that natural processes, such as gap formation, seedling growth, etc. can occur (or to simulate them if necessary) and to ensure public safety on the paths.*

- *Dead wood is a valuable habitat, especially for invertebrates and should be left on site where possible.*
- *Some glades or paths should be maintained to allow for growth of associated ground flora and to provide habitat variety. Woodland structure alongside the rides should be managed to allow light to reach the rides and encourage grassland plants. This is mostly relevant to Limekiln Close.*
- *The presence of a few non-native trees, e.g. sycamore, will not be harmful, but they should not be allowed to exceed present levels.*

Monitoring:

- *Monitor woodland for general indicators of favourable condition, e.g. age structure, natural regeneration, etc.*
- *Check for successful seedling establishment.*
- *Check for presence of standing and fallen dead wood.*
- *Estimate canopy density. Check that there are occasional gaps in the canopy.*
- *Check for non-native tree species, e.g. sycamore.*

All habitat descriptions above are evident within the woodland, particularly the fallen deadwood which was notable.

Assessment against selection criteria

This site qualifies as a County Wildlife Site (CWS) because it supports a population of a Nationally Rare non-vascular plant (CWS criterion 7a – see City Wildlife Site Register, 2005). Additionally, it qualifies as a City Wildlife Site (CityWS) for woodland (criterion 2.4). In 2005 the site narrowly failed to qualify as a CityWS for neutral (2.10a) and calcareous (2.10b) grassland. The same is true of the 2020 survey results, but again is highly likely to do so given the historical species record and continuing management.

Direction of travel

Habitat	Comments
Woodland	Good - stable
Grassland	Moderate – stable
Scrub	Good - stable
Scrub	Moderate – stable

Descriptions of habitats and botanical composition in 2005 and 2020 are broadly similar for all habitat types. Consequently, the direction of travel for each of the three habitats is considered to be 'stable'.

Future risks to condition

Potential risks which may impact upon habitat condition and features include;

- Impact from human recreation, particularly dog-walking and litter, on the majority of habitats.
- Continued establishment of non-native invasive plant species within scrub and chalk grassland.
- Continued spread of non-native species.
- Ash dieback and the potential impact on woodland structure.

Opportunities

Key features of ecological interest (and constraints if any)

Deadwood features are a strength of the woodland. Much of the deadwood present is fallen, with a small portion of this as standing. This may change with ash dieback, but where tree felling is planned, it should be considered that some portion be left standing and in situ (e.g., up to 2-3m).

Opportunities

Creation of features	
Habitats	n/a
Species	Biodiversity toolkit: Bird boxes, bat boxes
Management/restoration of existing features	
Habitats	Grassland. Work to reduce scrub and widen grassland glades is evident, but should continue, with an aim to increase cover of appropriate indicator species. Consideration of temporary protection to areas of grassland to minimise damage. Review of dog walking restrictions within the reserve. Woodland. Increasing standing as well as fallen deadwood volume.
Species	Management of conditions suitable for rare bryophytes.

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Maintaining moderate condition of grassland but increase floristic diversity, create further areas of grassland by continuing to widen glades
- Monitor damage through deer grazing and recreational pressures

Further monitoring work

None beyond that already outlined in existing management plans.

Cherry Hinton Hall Bird Sanctuary

Results

Site description and status

Cherry Hinton Hall Bird Sanctuary is 2.3ha in size and is located within the suburb of Cherry Hinton, with Cherry Hinton Chalk Pits SSSI situated nearby to the south. The site is largely dominated by woodland, but also has sections of scrub and amenity grass and children's playground areas. Cherry Hinton Brook flows across the site and also feeds a lake situated centrally. A number of paved and unpaved pathways exist across the site.

Cherry Hinton Hall Bird Sanctuary is a CiWS for its woodland (criterion 2.4 - woodlands >1ha with five or more woodland plants).

This site lies within the River Cam Corridor Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g4a Amenity grassland** **g4 Modified grassland (16 Tall herb)**
Description **g4a Amenity grassland:** Mown amenity grass areas were located adjacent to the children's play area and sand pit in the central part of the site. **g4 Modified grassland:** Elsewhere across the site, grassland was located in areas of woodland that had an open canopy. There is generally low species diversity which included cock's-foot *Dactylis glomerata*, common couch *Elymus repens*, false oat-grass *Arrhenatherum elatius* and perennial rye-grass *Lolium perenne*. In the northern section of the site, large patches of common nettle *Urtica*

dioica had grown up on what previously looked like amenity grassland that had been cleared.
Condition **g4a Amenity grassland:** The mown amenity grassland was in poor condition. **g4 Modified grassland:** The rank grassland was in poor condition, being dominated by common nettle. The grassland under the open canopy woodland was not assessed as it fell under the woodland condition assessment.

Woodland

UKHabs habitat types present (secondary codes in brackets) **w1f7 Other Lowland mixed deciduous woodland**
Description **w1f7 Other Lowland mixed deciduous woodland:** Woodland occupied most of the site, comprising a mixed canopy of ash *Fraxinus excelsior* cherry *Prunus sp.*, lime *Tilia cordata x platyphyllos (T. x vulgaris)* and pedunculate oak *Quercus robur* amongst other species, some of which were non-native. Understory vegetation included frequent dogwood *Cornus sanguinea* and field maple *Acer campestre*. The woodland possessed a varied canopy structure, with areas of regenerating younger saplings and a grassy understory in the central and west sections, and areas of denser closed canopy woodland in the south. Snowberry *Symphoricarpos sp.* was recorded in the bird sanctuary section in the south east of the site.
Condition **w1f7 Other Lowland mixed deciduous woodland:** The woodland is largely in good condition, however there were signs of human damage present and nutrient enrichment had led to a high frequency of nettle and other undesirable species comprising the ground flora.

Scrub

UKHabs habitat types present (secondary codes in brackets) **h3d Bramble scrub** **h3h Mixed scrub**
Description Scrub was found in various locations across the site.

h3d Bramble scrub: Scrub dominated by bramble *Rubus fruticosus agg.* grew in the northern section of the site. **h3h Mixed scrub:** On the west side of Cherry Hinton Brook there was mixed scrub with species such as blackthorn *Prunus spinosa* and elder *Sambucus nigra*. The small island within the lake contained scrub vegetation.
Condition **h3d Bramble scrub:** The bramble scrub habitats on site are in poor condition as they fail the majority of the condition criteria. **h3h Mixed scrub:** The mixed scrub is in moderate condition, with a bramble understory and a diversity of woody species.

Standing and running water

UKHabs habitat types present (secondary codes in brackets) **r2b Other rivers and streams**
Description **r2b Other rivers and streams:** Cherry Hinton Brook flows through the site, branching at the south east corner then merging again in the north west. The Brook feeds a lake situated at the centre of the site which contains a small island of scrub. Vegetation recorded in and alongside the brook included brooklime *Veronica beccabunga*, purple-loosestrife *Lythrum salicaria*, reed sweet-grass *Glyceria maxima* and water mint *Mentha aquatica.* New Zealand pygmyweed *Crassula helmsii* is also present both in the Brook and the lake.
Condition **r2b Other rivers and streams:** Cherry Hinton Brook lacks a diversity of submerged, floating or emergent vegetation and is shaded along the majority of its length. The lake was turbid and also lacked a diversity of vegetation, resulting in an overall moderate condition for both the brook and the lake.

Priority habitats

The following Priority Habitats are present at this location;

- Lowland mixed deciduous woodland
- Rivers and streams


h3d
g4
r2b
w1f7
u1b6
h3d
r2b
h3h
r2b
w1f7
N3
h3h
u1b6
g4a
h3h
u1b6
r2b
N2
w1f7
w1f7
N1
w1f7
Basemap contains Map data ©2021 Google
CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site Boundary
Target Note/trees
Target Note
Habitats
g4 - Modified grassland
g4a - Modified grassland (amenity)
h3d - Bramble scrub
h3h - Mixed scrub
r2b - Other rivers and streams
u1b6 - Other developed land
w1f7 - Other Lowland mixed deciduous woodland
Project: 99320 CCC Biodiversity Audit
Title: Cherry Hinton Hall Bird Sanctuary - Habitats
Version: 1.0
Date: 18/03/2021
Author: EM
0 10 20 30 40 50 60 m


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features(inset)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: Cherry Hinton Hall Bird Sanctuary: condition assessment
Version: 1.0
Date: 18/03/2021
Author: EM
0 15 30 45 60 m
Basemap contains Map data ©2021 Google

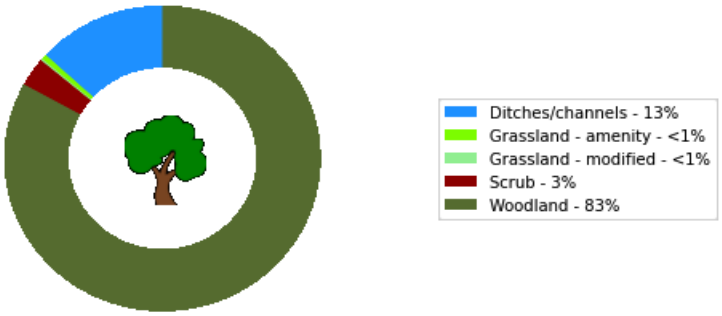
Target Notes:

1. Snowberry
2. Bat features on mature oak
3. Bat roosting feature in mature field maple

Biodiversity units

The following chart shows the percentage of biodiversity units for each habitat/linear feature type at Cherry Hinton Hall Bird Sanctuary.

Habitats



Habitat type	*Biodiversity units*
Ditches/channels	4.81
Grassland - amenity	0.20
Grassland - modified	0.07
Scrub	1.11
Woodland	30.25

Management

Review of exiting management

There is no biodiversity management plan for Cherry Hinton Hall Bird Sanctuary.

Assessment against selection criteria

The site qualifies as a City Wildlife Site under criteria 2.4 (woodland more than 1ha in area and with five or more woodland plants). Eleven woodland plants were recorded, with one ancient woodland indicator, spindle *Euonymus europaeus,* also noted.

The site does not qualify under freshwater habitat criteria as these require more than five species of submerged and floating species. As such, improved management to these areas could result in satisfying these criteria in the future.

Direction of travel

Habitat	Comments
Grassland	Moderate declining in the north of the site
Woodland	Good condition which is likely to be stable
Scrub	Moderate condition which is likely to be stable
Freshwater	Moderate condition and declining

A survey of Cherry Hinton Hall Bird Sanctuary was undertaken in 2005 as part of the Cambridge City Wildlife Site Survey project. Habitats have remained broadly the same since this survey, and it is also notable that the lake supported little marginal or emergent vegetation at that time. The varied structure of the woodland, with both open and closed canopy areas, was noted in 2005 and is still a key feature of the site presently.

Consequently, the direction of travel of this site overall is deemed stable, however, the grassland to the north is classed as moderate declining due to the dominance of bramble and nettle overgrowing previous habitats, and the freshwater habitats are classed as moderate declining as their condition has not improved since the previous survey.

Future risks to condition

Potential risks which may impact upon habitat condition and features include;

- Dogs accessing parts of the brook have resulted in areas of muddy unvegetated banks. If possible, access to this area could be restricted to encourage the growth of marginal aquatic vegetation along the brook.
- Continued spread of invasive species such as snowberry could reduce condition over time. Furthermore Cherry Hinton Brook provides a pathway for further invasive species, such as floating pennywort.

Opportunities

Key features of ecological interest (and constraints if any)

The woodland within the site clearly provides an important biodiversity feature in this part of Cambridge, and the wider City. This value is further enhanced by the connectivity that the Cherry Hinton Brook provides, linking the central Cambridge commons to the wider countryside to the south. The brook itself is also of biodiversity significance, being both an important habitat type and an important corridor. The lack of aquatic vegetation and relatively poor water quality do offer opportunities for enhancements.

There is scope for several protected species and notably bats, with the site offering opportunities for roosting, foraging and commuting bats. Cherry Hinton Bird Sanctuary will also provide important habitat for breeding birds in this part of Cambridge. There are invasive species risks at this site, with potential for species such as snowberry to impact on the woodland, and the risk of aquatic invasive species becoming a problem on the brook.

Opportunities

Sections of the Brook could be enhanced for biodiversity. Raising the canopy would provide the brook with more light, and allow for a greater diversity of emergent vegetation. Furthermore, sections of the brook could be protected from public and dog use which would result in less disturbance to marginal vegetation.

Snowberry should be removed in a phased manner from the south east of the site as this non-native species can rapidly overgrow native understorey vegetation. Regular management of crassula in the Brook and lake occurs to ensure it does not dominate.

The northern part of the site would benefit from improved management to the grass and scrub, improving species diversity and reducing bramble and nettle encroachment. This area is ripe for habitat enhancement, and activities could involve tree planting to expand the woodland cover at the site.

The fact that parts of the site are inaccessible to the public presents an opportunity for more sensitive ecological interventions at the ground level. A bat hibernation site could be created within one of the open areas of the woodland. If root growth from neighbouring trees permitted this could be a subterranean structure. The likely damp nature of this location may lend itself to the higher humidity conditions that are required in bat hibernation sites.

Creation of features	
Habitats	Expand the woodland into the northern section of the site
Species	Enhancing vegetation for water vole populations. *Biodiversity toolkit:* Bird boxes, bat boxes Bat hibernation site.
Management/restoration of existing features	
Habitats	Improving condition of waterways by reducing shading and enhancing aquatic vegetation Clearance of invasive and non-native species from the woodland, and brook if required.
Species	Retain standing deadwood where feasible for bat roosting habitat Improving conditions on the brook for water vole

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Maintain good condition of the woodland but monitor recreation pressures and remove non-native species
- Improve condition of Cherry Hinton Brook from moderate to good though improved management of vegetation and removal of non-native invasive species

Further monitoring work

Additional surveys on the biodiversity potential of Cherry Hinton Brook and the lake could be undertaken to better inform management of these habitats. This could include monitoring of the water vole populations. Regular monitoring for invasive species on Cherry Hinton Brook should be considered.

Logan's Meadow

Results

Site description and status

Logan's Meadow (including sports pitches and Vie site - hereafter Logan's Meadow), is comprised of three blocks of habitat: A woodland alongside the River Cam (south-west) forms the existing Local Nature Reserve (LNR) extent, a central area of amenity grassland/sports pitches, and grassland and drainage features associated with a neighbouring housing development (north-east). The River Cam forms the entire southern boundary, with housing and light industry in the north. A raised walkway and footbridge divides the site, adjacent to which stands a locally well known 'swift tower'.

This site lies within the River Cam Corridor Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g3c5 *Arrhenatherum* neutral grassland (17 Ruderal/ephemeral)** **g4 Modified grassland** **g4a Amenity grassland (520 Recreation ground)**
Description **g3c5 *Arrhenatherum* neutral grassland:** The majority of the surveyed site (1.71ha, 33%) is comprised of a non-Priority neutral grassland and forms the bulk of the northern section, as well as a section surrounding the sports pitches. The section to the north is characterised by the abundance of cock's-foot *Dactylis glomerata* and false oat-grass *Arrhenatherum elatius*. Tufted hair-grass *Deschampsia cespitosa* was occasional to locally frequent in the central area bound by pathways and a stand of *Carex* exists in the north-east corner. The strips

surrounding the sports pitches are rank and dominated by patches of common nettle and creeping thistle *Cirsium arvense*. Small patches of wildflowers have been planted within these strips.

g4 Modified and amenity grassland: Occupying 1.07 ha (21%) of the site, sports pitches and other areas of closely mown grassland (e.g., adjacent to paths) is the second most abundant habitat. Perennial rye-grass *Lolium perenne* is dominant.

Condition

g3c5 *Arrhenatherum* neutral grassland: All areas of "other neutral grassland" are considered to be in 'poor' condition on the basis of the frequency of undesirable species being high (between 30% and 40%), with the exception of an area to the north of the new ditch system, where herbaceous species were more frequent.

g4 Modified and amenity grassland: These areas are also considered to be 'poor' on account of their function, qualifying as such by virtue of being "Amenity and road verge grasslands".

Woodland

UKHabs habitat types present (secondary codes in brackets)

w1d Wet woodland (16 Tall herb)

Description

Wet woodland makes up the majority of the formally designated LNR site, with a second block to the east forming a boundary strip between the River Cam and the playing fields. These woodlands are comprised mainly of willows *Salix* sp. and poplars *Populus* sp. with non-native Italian alder *Alnus cordata* also frequent. The understorey was characterised by stands of common nettle *Urtica dioica* and cow parsley *Anthriscus sylvestris* which were locally dominant. Close to paths and in glades, grasses such as wood meadow-grass *Poa nemoralis* (an Ancient Woodland Indicator) were abundant and in damper areas velvet bent *Agrostis canina* was locally frequent. Pendulous sedge *Carex pendula,* another Ancient Woodland Indicator was also occasional. Woody species that make up the shrub layer include abundant hawthorn *Crataegus monogyna* and elder *Sambucus nigra*

as well as rare occurrences of buckthorn *Rhamnus cathartica* and alder buckthorn *Frangula alnus.* Disturbance in the LNR section is relatively limited, except to paths and around benches. Disturbance in the eastern section of woodland was much more prevalent and bare ground more frequent. Deadwood is present, though rarely standing.
Condition Both sections are considered to be in 'moderate' condition. In the case of the eastern section, the conditions relating to frequency of damage and lack of protection therefrom are failed. In all areas, there is evidence of significant nutrient enrichment, as shown by the dominance of nettles, although it is recognised that this is [a] difficult to address, given that the River Cam is the ultimate source of nutrient input and [b] that these patches are of value in themselves. Physical damage is a growing concern across the wider woodland and is heavy in concentrated areas.

Scrub

UKHabs habitat types present (secondary codes in brackets) **h3d Bramble scrub** **h3h Mixed scrub**
Description **h3d Bramble scrub:** Bands of scrub line the ditch leading parallel to the footbridge and along the riverside. Bramble dominates, with more open areas present along the river. **h3h Mixed scrub.** The majority of scrub present at the site is mixed and associated with the waterbodies and woodland in the south. Hawthorn *Crataegus monogyna* and goat willow *Salix caprea* are the abundant woody species, with occasional hazel *Corylus avellana.* As with the grassland, species indicative of nutrient enrichment dominate the herb layer.
Condition

The scrub bounding the 'boardwalk' ditch is considered to be in good condition on account of a diversity of species and structure. The same applies in the area surrounding the pond. Elsewhere, scrub is considered to be in moderate condition; whilst botanical and structural diversity are maintained, these remaining areas have herb layers dominated by nettle and other pernicious weeds.

Lines of trees

UKHabs habitat types present (secondary codes in brackets)
w1g6 Line of trees (45 Canalside, 56 Young trees – planted, 57 Young trees - self set, 69 Fence, 70 Hedgebank)

Description
Tree lines form the north-west and north-east boundaries, along with shorter sections along the River Cam and ditches. Elder *Sambucus nigra* and field maple *Acer campestre* are the abundant species in the more obviously planted lines of trees between the sports pitches and buildings to the north. The line of willow along the north-east boundary is likely to be more ecologically valuable, being associated with a dry ditch to its north side.

Condition
Tree lines of all three condition categories are present. Large gaps are present in both the main line along the north boundary and on the river side north of the footbridge, these being of 'poor' condition. Tree lines of 'moderate' condition include a short stretch north of the footbridge where mature trees do not form continuous canopy cover and immature coppice willows alongside the SUDS feature – this failing the condition relating to tree maturity. Those of 'good' condition include the north-east boundary where mature willow exists in near continuous cover. A line of elder along the west end of the sports pitches also passes all conditions.

Freshwater

UKHabs habitat types present (secondary codes in brackets)

r1e Canals and ditches (133 Nutrient-enriched; 412 Artificial watercourse; 1190 Sustainable urban drainage feature)
r1a Eutrophic standing waters (19 – Pond)
f2d Aquatic marginal vegetation (412 Artificial watercourse; 1190 Sustainable urban drainage feature)

Description

r1e Canals and ditches: Two ditches exist within the LNR portion of the site, one more recent (ca. 2004/05) connecting the pond with the main ditch that runs north-west into the site from the River Cam. A third ditch, creating a loop to the north of this area, with boardwalks, an open water area with pond-dipping station has been created subsequently. Water levels were low (south) or absent (north) in the original ditch system and with scrub cover on the north-east side. The newer 'loop' was characterised by more open water and more emergent species, with great willowherb *Epilobium hirsutum,* purple-loosestrife *Lythrum salicaria* and reed sweet-grass *Glyceria maxima* frequent. All ditches in the southern half of the site were characterised by a dominance of duckweed *Lemna* sp. More newly created ditches in the north of the site, understood to be partly SUDS features relating to the Vie development were less dominated by duckweed and with emergent species of reed canary-grass *Phalaris arundinacea,* greater pond sedge *Carex riparia* and hard rush *Juncus inflexus.*

r1a Eutrophic standing waters (19 – Pond): A pond of approximately 250m^2 is found to the north of the main woodland block. At the time of the survey and similar to the adjoining ditches, it was entirely covered with duckweed. A second pond is indicated within management plans for the site, but this was not present in the present survey, nor in March 2021. Instead, a grassy depression was observed within the woodland, indicating the pond does not likely hold water for long.

Condition

r1e Canals and ditches: All ditches in the southern section of the site are considered to be in 'poor' condition on account of the dominance of duckweed and eutrophication. An exception is the straight section south of the ditch junctions which is 'moderate'. Here, duckweed was absent. In the north of the site, the SUDS feature along the north boundary is in 'moderate' condition, this having clear

water and a range of emergent species along its length, but no floating or submerged species. The ditch failed three condition criteria. The section connecting the SUDS feature to the main river channel is in 'poor' condition, failing five of the condition criteria (absence of and limited range of floating plants, no emergent plants, insufficient water levels and >10% shading from adjacent scrub). **r1a Eutrophic standing waters – Pond:** The pond is considered to be in 'poor' condition on account of a total covering of duckweed, as well as failing on the condition criteria relating to the absence of floating or submerged plants. The second pond is considered as part of the woodland and not mapped.

Reedbed

UKHabs habitat types present (secondary codes in brackets) **f2e Reedbed**
Description Small areas of reedbeds (approximately 200m^2) created in the last decade are present either side of the boardwalk at its southern end. Common reed *Phragmites australis* is the dominant plant closest to the water, but there is some introgression of more terrestrial species on the western flanks, with some patches of creeping thistle. Reed canary-grass was also locally abundant, particularly in the southern stand.
Condition The reedbed is considered here to be 'moderate', though is close to being poor on account of the introgression of non-reed plants and the presence of undesirable species such as creeping thistle where it borders the grassland. Water quality is always likely to put a constraint on this reedbed from achieving 'good' quality.

Priority habitats

The following Priority Habitats are present at this location;

- Wet woodland
- Rivers and streams

- Reedbed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MKA ECOLOGY
Habitats
f2d - Aquatic marginal vegetation
f2e - Reedbeds
g3c5 - Arrhenatherum neutral grassland
g4 - Modified grassland
g4a - Modified grassland (amenity)
h3d - Bramble scrub
h3h - Mixed scrub
r1a - Eutrophic standing water
r1e - Canal or ditch
u1b6 - Other developed land
u1c - Artificial unvegetated/unsealed surface
w1d - Wet woodland
Linear features
h2a5 - Native Hedgerow
w1g6 - Line of trees
Point features
Target Note
Project: 99320 CCC Biodiversity Audit
Title: Logan's Meadow - habitats
Version: 0.2
Date: 04/05/2021
Author: JH
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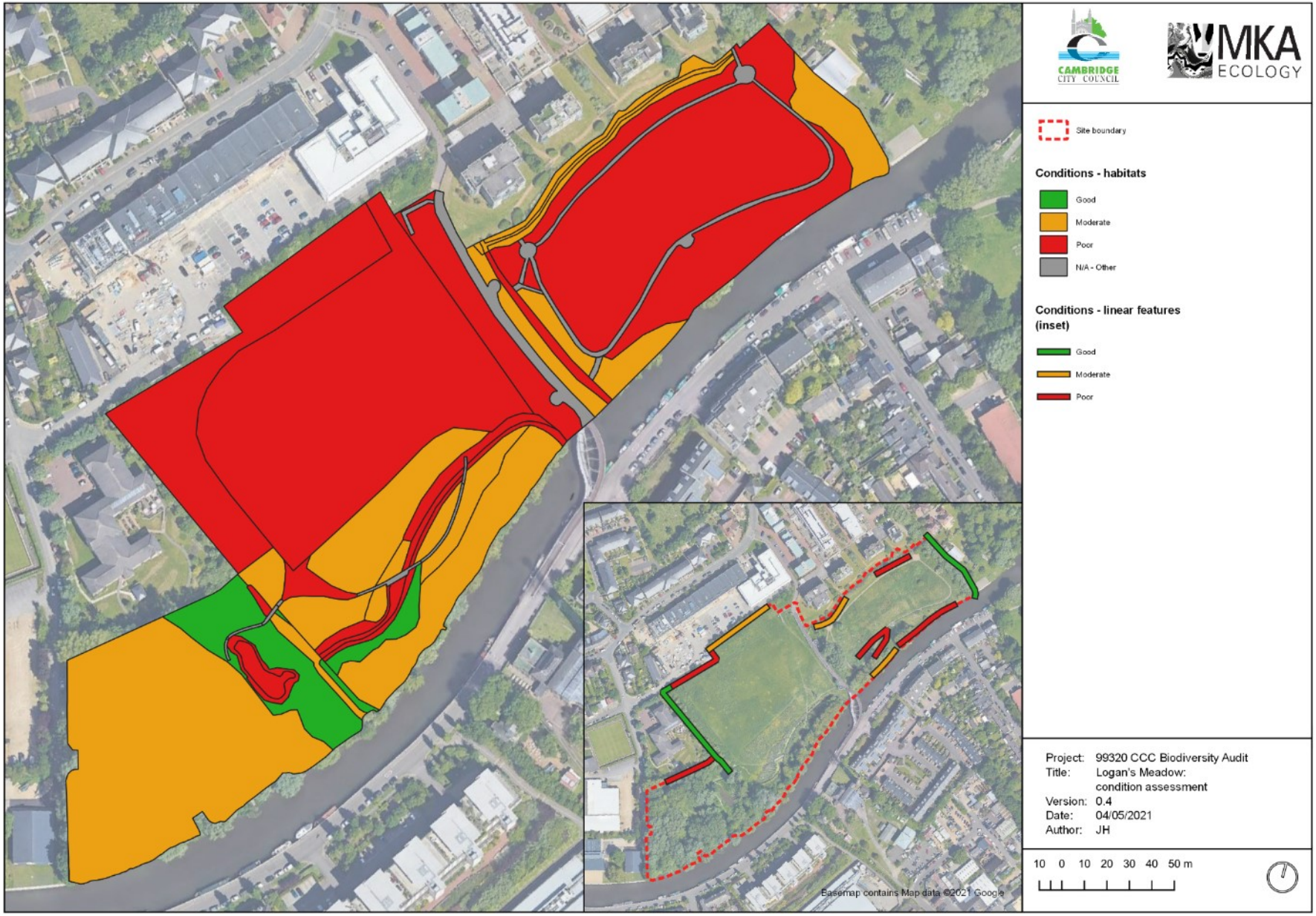
Basemap contains Map data ©2021 Google

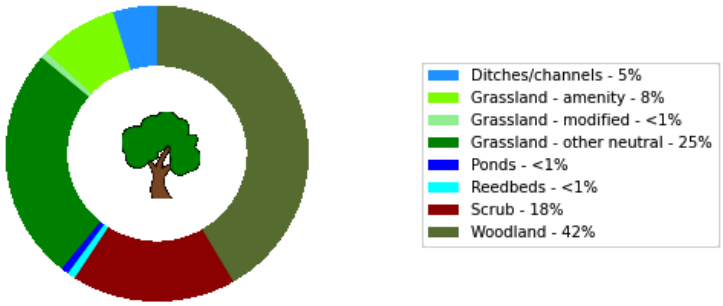

CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features (inset)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: Logan's Meadow: condition assessment
Version: 0.4
Date: 04/05/2021
Author: JH
10 0 10 20 30 40 50 m
Basemap contains Map data ©2021 Google

Target Notes:

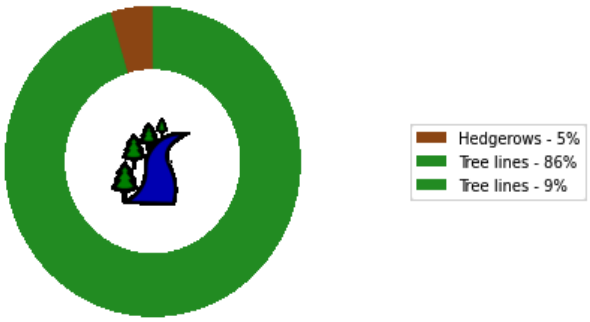
1. Swift tower
2. Water vole observed entering burrow.
3. Grass snake/other reptile hibernacula.
4. Suitable water vole habitat.
5. Bat roost potential in trees.

Biodiversity units

The following chart shows the percentage of biodiversity units for each habitat/linear feature type at Logan's Meadow.



Habitat type	*Biodiversity units*
Ditches/channels	1.68
Grassland - amenity	2.94
Grassland - modified	0.27
Grassland - other neutral	9.02
Ponds	0.29
Reedbeds	0.31
Scrub	6.22
Woodland	14.76



Habitat type	*Biodiversity units*
Hedgerows	0.13
Tree lines	2.79

Management

Review of exiting management

The existing management plan, relevant to the LNR designated area lists its objectives as:

1. To create and maintain areas of open water. (LHAP for Cambridgeshire-Rivers & Wetlands).
2. To enhance and maintain the riparian habitat including the pollarding of trees. (LHAP for Cambridgeshire-Rivers & Wetlands)
3. To enhance and maintain the scrub/grassland mosaic.
4. To install and improve access/interpretation on the reserve

Management operations to meet these objectives include:

1. De-silting, reprofiling and rotational clearance of bank vegetation of ditches at the site. New ditches have also been created at the site. Both aim to create and maintain areas of open water. Removal of invasive non-native species.
2. Selective pollarding of bankside trees.
3. Twice cut areas of grassland in May and July with cutting removal. Maintaining glades in scrub.
4. Path maintenance and other methods to improve/guide access.

In all cases, the objectives of the management objectives are being met. The value of the site for wildlife has been and is continuing to be enhanced with the addition of enhancement features (e.g., swift tower, kingfisher bank and otter holt) with an extension of valuable habitat to the north-east and potential for further enhancements within the sports pitches.

Assessment against selection criteria

The site continues to qualify as a City Wildlife Site under criterion 2.17, an area of undeveloped floodplain directly associated with the River Cam County Wildlife Site. This currently only applies, however, to the area previously designated, though could also be considered to apply to the area of woodland between the new 'boardwalk' ditch system and River Cam. Water vole *Arvicola amphibius* was observed directly during the survey visit, with the potential for a breeding population to be present and therefore potentially supporting the qualification of the central area under criterion 2.27.

Direction of travel

Habitat	Comments
Woodland	Moderate – stable. Conditions reported in 2005, particularly with regard to ground flora indicate a strong nutrient influence from the River Cam.
Pond	Poor – stable. Ponds in 2005 were newly dug.
Scrub	Good – stable. No formal survey of this area.

Direction of travel assessments for this site apply only to the designated portion of the wider site. A Cambridge City Wildlife Site Survey was undertaken at Logan's Meadow in 1998 and 2005. The woodland is considered to be "moderate – stable". The understorey storey in particular in both 2005 and 2020 suggest a strong

influence of the River Cam floodplain and nutrient enrichment, which may constrain further enhancement of this feature. The ponds at the site had only been newly created at the time of the 2005 survey and so it is difficult to make a proper comparison. Scrub is considered to be "good – stable", with good structural diversity observed in 2020. The reedbeds either side of the boardwalk and outside of the existing LNR may be considered to be 'moderate - declining'. Whilst water quality is unlikely to have changed greatly since their creation, there are signs of introgression from non-reedbed flora.

Future risks to condition

Potential risks which may impact upon habitat condition and features include;

- Impact from human recreation on the majority of habitats, particularly associated with dog-walking and the impacts on protected species and woodland ground flora.
- Retaining structural diversity of scrub relies on human intervention. Cessation of this intervention will therefore have a negative impact on this habitat type.

Opportunities

Key features of ecological interest (and constraints if any)

As well as the habitats described, the site also supports protected and notable species. As well as the swift tower and observation of water vole, kingfisher *Alcedo atthis* was also heard during the field surveys. A 'beetle tower' has also been installed at the site.

Opportunities

The largest opportunity at the site lies within the currently low value amenity grassland of the sports pitches. Notwithstanding the potential social and health benefits to retaining playing fields, creating any number of new habitats in its place will have considerable value for biodiversity. Indeed, the site is already the subject of plans for an extension to increase the boundary of the LNR to include the entire of the surveyed site. The proposals include the creation of new wetland or wet grassland habitat on the present location of the sports pitches, with increasing tree

planting and woodland generation around the perimeter. Wildflower and meadow creation and enhancement are proposed for the northern section, along with some wetland features.

Creation of features	
Habitats	Wetland and/or wet grassland. Wet woodland to north. Lowland meadow (east of footbridge).
Species	Biodiversity toolkit: Bat boxes, bird boxes, beetle towers
Management/restoration of existing features	
Habitats	Woodland: An increase the volume of large volume deadwood at the site. e.g. selective felling of a single mature tree has already occurred (following a site visit in March 2021), if suitable will also provide additional structural diversity within the woodland as well as providing material. Restricting access to certain portions of the woodland, perhaps for a portion of the year, to limit physical damage. Pond: The second pond created in 2005 appears continually dry. Restoration of this feature. Reedbed: Removal of litter and other 'weedy' grassland species. Expansion of extent to the west.
Species	Increasing the volume of deadwood (principally standing) will benefit several taxonomic groups, particularly invertebrates.

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Enact current plans for wetland habitat creation
- Improve condition of wet woodland from moderate to good condition by managing recreational pressures and damage
- Improve the condition of the pond from poor to good through management of vegetation

Further monitoring work

It is recommended that future monitoring is guided on the basis of proposals for the extension of the LNR boundary. Given the potential for the remainder of the site to qualify as a City or County Wildlife Site on the basis of these new habitats, monitoring is likely to be principally botanical.

Monitoring of water vole along the new ditch systems would provide further evidence for an extension of the City Wildlife Site boundary.

Mill Road Cemetery

Results

Site description and status

Mill Road Cemetery is nearly 4ha in size and is located off Mill Road and behind Anglia Ruskin University, in Petersfield area west of the city centre. The cemetery is protected as a Grade II Listed site and City Wildlife Site. It is owned by the Church of England and managed as a closed cemetery by the Council on behalf of the Parish Committee.

The site qualifies for CiWS standard for neutral grassland (criterion 2.10c - five or more neutral grassland indicator species in frequent numbers) and calcareous grassland (2.10d - six or more calcareous grassland indicator species in frequent numbers).

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g2 Calcareous grassland** **g3c5 Arrhenatherum neutral grassland (64 Mown)** **g4a Amenity grassland (66 Frequently mown)**
Description **g2 Calcareous grassland:** The north eastern part of the circular path around the main cemetery site is indicative of calcareous grassland, with indicator species such as field scabious *Knautia arvensis*, burnet-saxifrage *Pimpinella saxifrage* and hoary plantain *Plantago media* present. **g3c5 Arrhenatherum neutral grassland:**The majority of the site comprises neutral grassland, with species such as false oat-grass *Arrhenatherum elatius* and red fescue *Festuca rubra* frequently occurring. The grassland to the north of the main cemetery site is more open and lacks guided paths. The rest of the grassland on site is less regularly mown or managed, allowing for wildflowers to flower and

set seed. The grassland has grown over many older graves, providing variation in height and structure and at times a tussocky impression. Ash *Fraxinus excelsior*, beech *Fagus sylvatica* and sycamore *Acer pseudoplatanus* trees are scattered across the northern part of the site. **g4a Amenity grassland:** A small circle of amenity grassland occurs in the centre of the circular path, this is regularly mown and has abundant perennial rye grass.
Condition **g2 Calcareous grassland:** The calcareous grassland sections are potentially restorable to grassland Priority Habitat with improved management, have wildflowers, sedges and indicator species present within the sward, and have perennial rye grass cover <25%. Overall, it is in moderate condition. **g3c5 Arrhenatherum neutral grassland:** The neutral grassland met similar conditions to the calcareous grassland, and is also in moderate condition. **g4a Amenity grassland:** The amenity grassland is in poor condition as it fails most of the condition criteria.

Scrub

UKHabs habitat types present (secondary codes in brackets) **h3h Mixed scrub**
Description **h3h Mixed scrub:** Scrub grows around the main cemetery site perimeter, and is also encroaching onto the grassland in the southern part of the site. Species include blackthorn *Prunus spinosa*, butterfly-bush *Buddleja davidii* and rose *Rosa sp.*
Condition **h3h Mixed scrub:** The scrub is in good condition, with high species diversity, and the mosaic of grassland/scrub provides clearings and glades in this habitat.

Priority habitats

The following Priority Habitats are present at this location;

- Lowland calcareous grassland

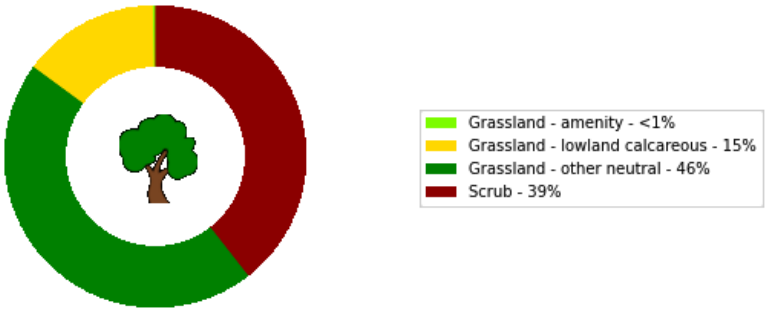

CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Habitats
g2 - Calcareous grassland
g3c5 - Arrhenatherum neutral grassland
g4a - Modified grassland (amenity)
h3h - Mixed scrub
u1b5 - Buildings
u1b6 - Other developed land
Target notes
Target Note
g3c5
g3c5
g3c5
g3c5
g2
h3h
g4a
u1b6
g3c5
g3c5
h3h
u1b5
h3h
N1
h3h
h3h
Basemap contains Map data ©2021 Google
Project: 99320 CCC Biodiversity Audit
Title: Mill Road Cemetery - habitats
Version: 1.0
Date: 24/02/2021
Author: WOC
0 10 20 30 40 50 60 70 m


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Project: 99320 CCC Biodiversity Audit
Title: Mill Road Cemetery: condition assessment
Version: 1.0
Date: 16/03/2021
Author: WOC
0 10 20 30 40 50 60 70 m
Basemap contains Map data ©2021 Google

Biodiversity units

The following charts show the percentage of biodiversity units for each habitat/linear feature type at Mill Road Cemetery.

Habitat areas



Habitat type	*Biodiversity units*
Grassland - amenity	0.12
Grassland - lowland calcareous	6.10
Grassland - other neutral	19.02
Scrub	16.44

Management

Review of exiting management

Mill Road Cemetery is maintained by the Council as a closed cemetery on behalf of the Parish Committee. A rotational system of scrub clearance has been developed in 2021 and this is combined with cut and collect on the grassland habitats. Given the recent introduction of these activities it is not possible to assess their effectiveness however they are endorsed here as they will be beneficial to the biodiversity features of the site.

Assessment against selection criteria

Five neutral grassland indicator species and five calcareous grassland indicator species were recorded, with one strong indicator species also recorded for both neutral and calcareous grassland. The site therefore qualifies as a City Wildlife Site under criteria 2.10, with six or more calcareous grassland indicator species in

frequent numbers and five or more neutral grassland indicator species in frequent numbers.

Direction of travel

Habitat	Comments
Calcareous grassland	Moderate declining due to scrub encroachment
Neutral grassland	Moderate condition and likely to be stable
Scrub	Good condition and improving

A Cambridge City Wildlife Site Survey was undertaken at Mill Road Cemetery in 2005. The habitats onsite remain broadly similar, but the scrub encroachment around the site perimeter and particularly in the southern part of the site has occurred since this previous survey and is therefore notable.

The grassland has a similar structure to that recorded in 2005, with a less managed section in the north and more regularly mown sections in the main part of the cemetery. However, calcareous indicator species seem to have diminished across the site.

Overall, the scrub is described as “good – improving” and the grassland as “moderate – declining” since there is a direct trade-off between the scrub encroachment and the loss of an important section of calcareous grassland.

Future risks to condition

Potential risks which may impact upon habitat condition and features include:

- Scrub encroachment: Further encroachment of scrub may lead to a deterioration of calcareous grassland condition.
- Recreational pressures: Mill Road Cemetery functions as a recreational space as well as a cemetery. Unmanaged and excessive recreational pressures could lead to a deterioration of the grassland habitats through trampling and nutrient deposition as a result of dog fouling.

Opportunities

Key features of ecological interest (and constraints if any)

The Calcareous grassland, listed as a Habitat of Principal Importance, is of importance at Mill Road Cemetery, as is the scrub habitat in the urban setting. Also of note ivy broomrape *Orobanche hederae* occurs in the scrub in the south east part of the site.

Opportunities

Even though the scrub/grassland mosaic provides glades and clearings leading to a good condition assessment for the scrub, the encroachment onto calcareous grassland means that this habitat will eventually be lost if management does not occur. Calcareous grassland is rare so close to the city centre, and so protecting and enhancing this habitat is important.

It is recommended that scrub encroachment is controlled on the eastern half of the site, where the calcareous grassland is located, but scrub elsewhere on site is allowed to encroach to provide the habitat mosaic.

The calcareous grassland could be expanded across the site by spreading green hay onto some of the neutral grassland areas. The northern section could be better managed with pathways through longer sward grassland to improve the chances of wildflowers and sedges growing.

It may be appropriate to review the cutting regime of the grassland to assess whether this could be altered to improve species richness.

Creation of features	
Habitats	Annual/perennial wildflower mix within the centre of the circular path. Biodiversity toolkit (bramble patches, composting, nettle patches, woodpiles)
Species	Biodiversity toolkit (bat boxes, bee banks, bee hotels, beetle towers, bird boxes, hedgehog highways, hibernacula and bug hotels)
Management/restoration of existing features	
Habitats	Conserve, improve and expand calcareous grassland areas. Enact recent management plan for improving grassland habitats and managing scrub
Species	n/a

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Stabilise condition of neutral and calcareous grassland habitats to moderate and improving.
- Enact new management plan to manage scrub.

Further monitoring work

Botanical assessment is recommended to monitor the success of the new management regime.

Ascension Burial Ground

Results

Site description and status

Ascension Burial Ground is located off Huntingdon Road in west Cambridge. It is 0.8 hectares in size, and has a small chapel in the centre. The site is mainly surrounded by residential housing and gardens, but the western boundary lies adjacent to an abandoned arable field. It is managed by Cambridge City Council as a closed cemetery, and Arkley Nursery are in charge of regular maintenance.

In 2005, Ascension Burial Ground qualified for CiWS status for neutral grassland (2.10a - two or more strong neutral grassland indicator species in frequent numbers).

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g3c Other neutral grassland (161 Tall or tussocky sward)** **g4 Modified grassland (64 Mown)**
Description **g3c Other neutral grassland:** Grassland occupies the majority of the site, and is neutral in character. It is infrequently mown, allowing for a range of wildflower species such as field scabious *Knautia arvensis*, germander speedwell *Veronica chamaedrys* and oxeye daisy *Leucanthemum vulgare* to flower and set seed. Overall this section of grassland has false oat-grass *Arrhenatherum elatius* as the most abundant grass species. **g4 Modified grassland:** A less diverse modified grassland is found in the extension area of the site. This is more regularly mown and has an abundance of perennial rye-grass *Lolium perenne* and common bent *Agrostis capillaris,* with fewer wildflowers.
Condition

g3c Other neutral grassland: The neutral grassland is classified as moderate condition. **g4 Modified grassland:** This section also had a moderate condition overall, however, wildflowers, sedges and neutral grassland indicator species were more prevalent in the main area of neutral grassland than in the northern extension area modified grassland section.

Lines of trees and scattered trees

UKHabs habitat types present (secondary codes in brackets) **w1g6 Line of trees**
Description **w1g6 Line of trees:** Several lines of trees are planted across the site. In total there are six lines of yew *Taxus baccata* trees on the eastern and western boundaries of the site. The understorey here is heavily shaded and as a result is bare ground. In the extension part of the site, to the north west, there is a line of mature beech *Fagus sylvatica* and lime *Tilia cordata x platyphyllos (T. x vulgaris)* trees, and a line of younger beech, holly *Ilex aquifolium* and lime trees also comprises the southern boundary of the site. Mature Scots pine *Pinus sylvestris* trees also surrounded the central pathway from the chapel.
Condition **w1g6 Line of trees:** The line of trees at the southern border is in moderate condition, due to having gaps along its length and containing younger trees. The other tree lines are in good condition, but the lack of understorey vegetation below the yew trees was noted.

Scrub

UKHabs habitat types present (secondary codes in brackets) **h3h Mixed scrub**
Description **h3h Mixed scrub:** A patch of scrub has grown up in the southern half of the site, with frequent bramble *Rubus fruticosus agg.*. This is gradually encroaching into the line of yew trees on the west side and onto the grassland surrounding the scrub. It also contains species such as elder *Sambucus nigra* and hazel *Corylus*

avellana. Scrub also grew along the northern boundary and had a similar species composition.
Condition **h3h Mixed scrub:**The scrub is in good condition, although the northern section of scrub lacked a well developed edge as the grass had been mown right up to the base.

Priority habitats

No Priority Habitats are present at this location.


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site Boundary
Habitats
g3c - Other neutral grassland
g4 - Modified grassland
h3h - Mixed scrub
u1b5 - Buildings
u1b6 - Other developed land
Linear Features
w1g6 - Line of trees
Target Notes/Trees
Target Note
Project: 99320 CCC Biodiversity Audit
Title: Ascension Burial Ground - Habitats
Version: 1.0
Date: 17/03/2021
Author: EM
0 10 20 30 40 m
Basemap contains Map data ©2021 Google
h3h
g4
w1g6
N1
u1b5
u1b6
g3c
N3
N2


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features(inset)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: Ascension Burial Ground: condition assessment
Version: 0.1
Date: 17/03/2021
Author: EM
0 10 20 30 40 m
Basemap contains Map data ©2021 Google

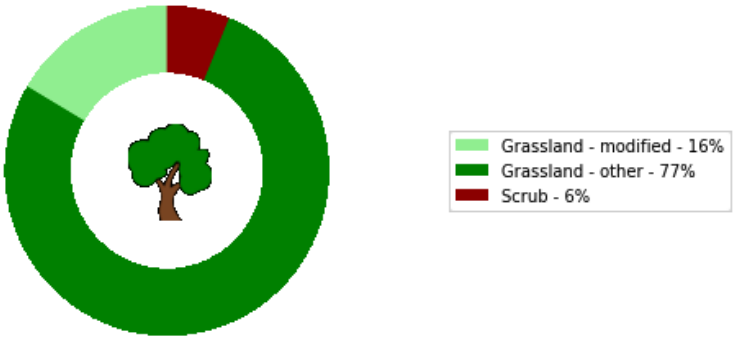
Target Notes:

1. Bat roost potential in the chapel
2. Partially used Badger sett with latrine
3. Partially used badger outlier sett

Biodiversity units

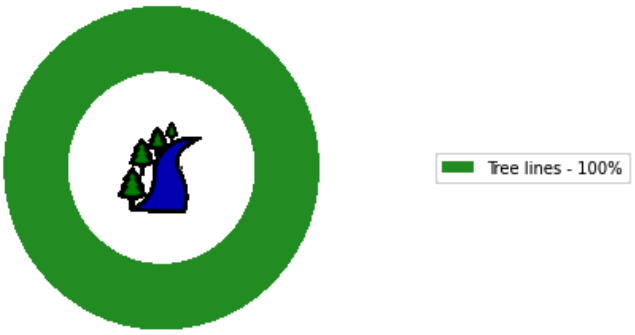
The following charts show the percentage of biodiversity units for each habitat/linear feature type at Ascension Burial Ground.

Habitats



Habitat type	*Biodiversity units*
Grassland - modified	1.02
Grassland - other neutral	4.80
Scrub	0.39

Linear Features



Habitat type	*Biodiversity units*
Tree lines	4.42

Management

Review of exiting management

A Management Plan has been prepared by Rod Ailes and Andrew Birkett which contains detailed instructions about managing the site for biodiversity. The overall objective is to manage and maintain the whole site "in such a way as to encourage the highest capacity and variety of plants and wildlife possible". Specific management actions include:

- Wildflower seed heads are left in-situ until late winter/early spring to promote seed shedding and to provide shelter for overwintering insects.
- Mown paths are created to reduce foot traffic over wildflower areas, and will be diverted each year to prevent excess compaction in one area.
- All grass cuttings, leaves and prunings are removed off site in order to lower soil fertility to encourage wildflower growth.
- Ivy removal from graves, scrub management and crown-raising of some beech trees to prevent obstruction or damage to graves and the surrounding areas.

To provide further detail, the management plan has divided the burial ground into plots with bespoke maintenance recommendations for grass cutting, boundary management and other activities.

In summary, this management plan outlines many effective strategies for increasing the value of the site for biodiversity and also outlines areas for future consideration, such as tree replacement as they reach overmaturity. Management of the grassland to promote species diversity and a meadow-style regime has been successful, and ongoing management occurs to lessen the spread of less desirable species such as common nettle and docks. A more intensive mowing/cutting regime could be considered on a rotational basis to ensure that the grass species don't become over dominant. For example one year in three areas could be cut in late summer after flowering, and again in early spring to allow flowers to flourish. Care would be required to ensure arisings are allowed to rest for a number of days before removal to allow seeds to fall and set.

Assessment against selection criteria

During the 2020 survey, not enough neutral or calcareous grassland indicator species were recorded Ascension Burial Ground to meet City Wildlife Site designation criteria.

Indicator species that were recorded in 2005 but not recorded in 2020 include hoary plantain *Plantago media*, primrose *Primula vulgaris*, common sorrel *Rumex acetosa* and salad burnet *Poterium sanguisorba.*

Direction of travel

Habitat	Comments
Grassland	Moderate declining due to lower species diversity.
Line of trees	Good condition which is likely to be stable.
Scrub	Good condition which is likely to be stable.

A Cambridge City Wildlife Site Survey of Ascension Burial Ground was undertaken in 2005. The habitats on site remain the same, however as mentioned above the species diversity of the grassland appears to have declined. The grassland is therefore classed as “moderate – declining”. The lines of trees and the scrub are classed as “good – stable” since their condition does not appear to have changed since the 2005 survey.

Future risks to condition

Potential risks which may impact upon habitat condition and features include:

- Visitor pressures: Increased footfall through the burial ground may result in trampling of the grassland and could lead to a decline in the species diversity.
- Some of the Scots pine trees are very mature and may pose a risk in the future. These should be replaced with similar species over time.

Opportunities

Key features of ecological interest (and constraints if any)

The secluded nature of this location makes it a valuable island for biodiversity, and a quiet place where people can enjoy it. These attributes may increase in value over time with further development taking place to the west in Cambridge. There are a number of potential protected species issues at Ascension Burial Ground. A partially used badger sett was recorded in the scrub in the south of the site and along the line of yew trees in the south east part of the site. The chapel contains several features of bat roosting potential and the trees may also support roosting bats. The area is also likely to be of significance for foraging bats.

Ivy broomrape *Orobanche hederae* has been recorded under the line of trees situated east of the chapel.

Opportunities

There is already the prescribed management of the site as outlined in the management plan (see section 3.1), and so continuation of sensitive grassland management should be beneficial in the long term. It may be appropriate to undertake a slightly more rigorous cut and remove regime on a rotation basis to ensure that the grasses do not become overly dominant and to ensure there is space for wildflowers to flourish.

The extension part of the graveyard appears to be more recently established. Some areas would benefit from having restricted access with reduced mowing to further promote wildflower species. If over time the species diversity was not recovering well a simple option may be to use green hay from the older part of the graveyard to try and encourage wildflower establishment and at the same time ensuring local provenance of any seeds.

The edge between the scrub and the grass on the northern boundary could be scalloped and made more gradual, to provide a wealth of different micro-habitats for pollinators and other invertebrates.

Small scale enhancements could also be established, such as bat boxes on the chapel and trees, or small invertebrate shelters.

Creation of features	
Habitats	Biodiversity toolkit (woodpiles)
Species	Biodiversity toolkit (bat boxes, bee banks, bee hotels, beetle towers, bird boxes, bug hotels)
Management/restoration of existing features	
Habitats	Grassland (reduced mowing regime, over seeding, species-rich grassland creation) Hedgerow (increase native species diversity)
Species	Ensure chapel continues to provide bat roosting features

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Improve condition of grassland from moderate to good. This may be achievable at this location which does not suffer significantly from recreational pressures at this time.
- Position bird and bat boxes.

Further monitoring work

Continued monitoring for assessment of the grassland against the City Wildlife Site selection criteria should be considered. The species diversity in the grassland could be monitored to ensure that grasses do not become dominant over time.

Histon Road Cemetery

Results

Site description and status

Histon Road Cemetery is a 1.4 hectare rectilinear area of greenspace to the east of Histon Road. It is formed predominantly of grassland, bound by ornamental hedges and treelines. Trees have been planted throughout and smaller areas of scrub are developing. This is a closed cemetery which is managed by Cambridge City Council.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g3c5 *Arrhenatherum* neutral grassland (64 Mown, 66 Frequently mown, 161 Tall or tussocky sward)** **g4 Modified grassland (66 Frequently mown)** **g4a Amenity grassland (10 Scattered scrub, 66 Frequently mown)**
Description **g3c5 *Arrhenatherum* neutral grassland.** Three-quarters (1.04ha) of the total site area is considered as an *Arrhenatherum* neutral grassland. For the most part, the sward was short and evidently frequently mown. Abundant species were black medick *Medicago lupulina*, false oat-grass *Arrhenatherum elatius*, red fescue *Festuca rubra,* and ribwort plantain *Plantago lanceolata*. Three neutral/calcareous indicator species were recorded; common bird's-foot-trefoil *Lotus corniculatus* and common knapweed *Centaurea nigra* at frequent levels and lady's bedstraw *Galium verum* occasionally, though all occurred with local abundance, particularly in the northern half. Species indicative of the intensive management regime where still evident in the sward, with common ragwort *Jacobaea vulgaris,* creeping buttercup *Ranunculus repens*, dandelion *Taraxacum officinale agg.* and perennial rye-grass *Lolium perenne* all frequent. Patches of scrub have been allowed to develop, but take up <5% of the total area.

Occasional fenced-off triangles/rectangles of longer sward have been encouraged, though represent a relatively small portion of the total grassland area (3%). Here, false oat-grass became the dominant species and, in places, these took on a tussocky character. Green alkanet *Pentaglottis sempervirens* was becoming the dominant species in some of these unmown areas, particularly along the south boundary.

Condition

The majority of the grassland and therefore the site is considered to be 'poor'; the intensively mown sward coming under the 'Amenity and road verge grasslands' criterion. Some of the unmown areas also are categorised as poor on account of the frequency of invasive species (principally green alkanet). Others are considered as 'moderate'; wildflowers are not present at high frequencies in the sward, but there is no physical damage or scrub cover.

Tree lines and hedgerows

UKHabs habitat types present (secondary codes in brackets)

h2b5 Hedge Ornamental Non-Native

w1g6 Line of trees

Description

Hedgerows are present on the west boundary and surrounding the buildings. Whilst some of these are yew *Taxus baccata,* they are nonetheless considered as 'Hedge Ornamental Non-Native' on account of their intensively managed and ornamental nature. Garden privet *Ligustrum ovalifolium* is the dominant hedge species surrounding the buildings.

A line of mature lime *Tilia platyphyllos x cordata = T. x europaea* and sycamore *Acer pseudoplatanus* forms the southern boundary. Elsewhere, avenues of ornamental trees align the paths, particularly yew, which was the most common planted tree. Holm oak *Quecus ilex* was also abundant, with some specimens on the north side being mature.

Condition Hedgerows are either 'poor' or 'moderate'. Those marked as 'poor' are the non-native privet hedges. The western boundary fails both height and width conditions. All hedges are considered to fail the criterion on the presence of non-native species on the basis that they are ornamental hedgerows. Tree lines within the centre of the site are considered as 'poor', these being of immature specimens with large and frequent gaps. The southern boundary tree line is considered as 'moderate'; whilst trees are mature, gaps greater than 5m do exist.

Urban habitats

UKHabs habitat types present (secondary codes in brackets) **u1d Suburban/mosaic of developed/natural surface (231 Vegetated garden, 232 Un-vegetated garden, 1160 Introduced shrub)**
Description In the western half of the site are smaller areas of introduced shrub and garden habitats. Cherry laurel *Prunus laurocerasus* and yew were the most abundant species. *Cotoneasters* were present across the entire site including wall cotoneaster *C. horizontalis* along with a number of other species originating as garden escapes or deliberately planted.
Condition All habitats under the 'urban' habitat classification are considered as 'poor'. Urban habitats rarely score as 'moderate' or 'good', unless as part of 'open mosaic on previously developed land' habitats, were a range of successional vegetation stages, including bare substrate is present and principally of value to invertebrates.

Priority habitats

No Priority Habitats are present at this location.


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Habitats
g3c5 - Arrhenatherum neutral grassland
g4 - Modified grassland
g4a - Modified grassland (amenity)
h3d - Bramble scrub
u1b5 - Buildings
u1b6 - Other developed land
u1d - Suburban/mosaic of developed/natural surface
Linear features
h2b5 - Hedge Ornamental Non Native
w1g6 - Line of trees
Point features
Target Note
Scattered tree
Project: 99320 CCC Biodiversity Audit
Title: Histon Road Cemetery - habitats
Version: 0.1
Date: 24/03/2021
Author: JH
10 0 10 20 30 m
Basemap contains Map data ©2021 Google

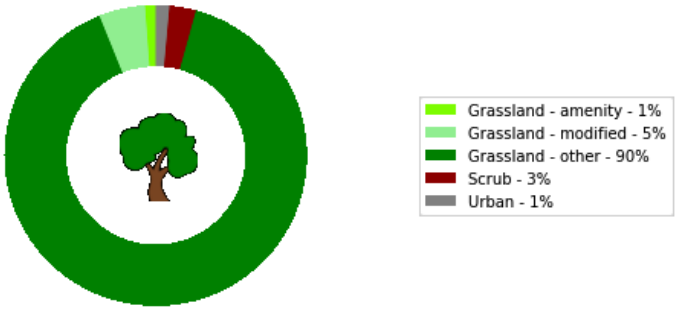

CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Conditions - habitats (top)
Good
Moderate
Poor
N/A - Other
Conditions - linear features (bottom)
Good
Moderate
Poor
N/A - Other
Project: 99320 CCC Biodiversity Audit
Title: Histon Road Cemetery: condition assessment
Version: 0.1
Date: 26/03/2021
Author: JH
10 0 10 20 30 40 m
Basemap contains Map data ©2021 Google

Target Notes:

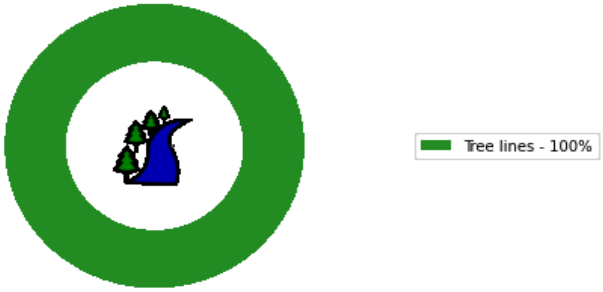
1. Birdbox
2. Bird box
3. Wall cotoneaster
4. Bird box
5. Bird box
6. Bird box
7. Bird box
8. Bird box
9. *Cotoneaster* sp.

Biodiversity units

The following charts show the percentage of biodiversity units for each habitat/linear feature type at Histon Road Cemetery.



Habitat type	*Biodiversity units*
Grassland - amenity	0.06
Grassland - modified	0.26
Grassland - other neutral	4.70
Scrub	0.15
Urban	0.08



Habitat type	*Biodiversity units*
Tree lines	1.02

Management

Review of exiting management

A deliberate conservation management plan is evident at the site, given the presence of fenced and unmown areas. Some areas of grassland have been scarified and a wild flower seed mix has been sown. Areas are left to flower and then cut late in the summer and arisings removed. Dead hedge habitats have been created as have innovative wet habitats on kerbed graves. These management activities are endorsed here and should be continued.

Assessment against selection criteria

The site does not qualify as a City Wildlife Site under the present grassland criterion. However, the finding of three neutral/calcareous grassland indicators at frequent or occasional coverage and two strong calcareous grassland indicators (albeit at rare frequencies) indicates that, with improved management, there is potential for the site to achieve this status.

Direction of travel

Habitat	Comments
Grassland	Poor - stable

Habitat	Comments
Grassland	Moderate – improving

A wildlife survey for Cambridge's churchyards was undertaken by the Cambridgeshire and Peterborough Biological Records Centre in 2006. The list of herbaceous species is similar to that reported here, though is marginally more diverse. No information on the frequency of these species is given. The bulk of the grassland is therefore tentatively considered to be 'stable'. Those small areas of moderate condition are assumed to be relatively recent features and therefore considered as 'improving'. No other habitats are considered.

Future risks to condition

Potential risks which may impact upon habitat condition and features include:

- Impact from human recreation, particularly dog walking, on the majority of habitats.
- Establishment of non-native invasive plant species.

Opportunities

Key features of ecological interest (and constraints if any)

The principal interest of the site lies in the latent value held by the grassland. Churchyards and cemeteries are considered a Local Priority Habitat largely for this reason. There is a balance to strike between the public perception of neatness and care, and reducing management intensity to the benefit of wildlife. It is evident that the beginnings of this balance towards the latter are being implemented at Histon Road Cemetery. However, and given the presence of some Priority grassland indicators, there is real potential for this site to be managed as a good quality neutral grassland. How much and where will depend on a number of factors not within the

scope of this report (e.g. historical and social). However, it is encouraged that as much of the grassland as possible is allowed to be restored.

A WCA 1981 (as amended) Schedule 9 invasive non-native species is present at the site.

Opportunities

Creation of features	
Habitats	Biodiversity toolkit: Pond. Given the actual or latent potential of the site to invertebrates and amphibians, a pond, however small will also add considerable value; Woodpiles.
Species	Biodiversity toolkit: Bat boxes (especially along southern tree line and buildings). Hedgehog habitat; hibernacula (especially if near pond).
Management/restoration of existing features	
Habitats	Grassland. Reduction of mowing intensity should be encouraged for as much of the site as is possible.
Species	n/a

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Develop further areas of moderate condition grassland with a higher floristic diversity.
- Create further aquatic habitats and particularly a pond.

Further monitoring work

The site has the potential to be formally designated as City Wildlife Site on the basis of its grassland. As such, a dedicated survey in the optimal surveying period should be conducted (perhaps on bi-annual basis) and following any changes to

management regimes to a) confirm any site selection and b) monitor the restoration of the grassland.

Cherry Hinton Churchyard

Results

Site description and status

Cherry Hinton Churchyard is located in the suburb of Cherry Hinton, south east of Cambridge. The site comprises St Andrews Church and a graveyard, and is just over 1 hectare in size.

Cherry Hinton Churchyard is a CiWS for neutral grassland (criterion 2.10c - five or more neutral grassland indicator species in frequent numbers).

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g4 Modified grassland (11 Scattered trees, 17 Ruderal/ ephemeral)** **g4a Amenity grassland (66 Frequently mown)**
Description **g4 Modified grassland:** Grassland occupies the majority of the site and is managed with mowing, with an average sward height of 10cm or less. Some areas of longer grass are present. Typical grass species included cock's-foot *Dactylis glomerata*, false oat-grass *Arrhenatherum elatius*, red fescue *Festuca rubra agg*. and Yorkshire-fog *Holcus lanatus,* although perennial rye-grass *Lolium perenne* was the most abundant. Burnet-saxifrage *Pimpinella saxifrage* and lady's bedstraw *Galium verum* were recorded. There are scattered trees throughout the churchyard with a wide diversity of species including ash *Fraxinus excelsior* and holly *Ilex aquifolium*. In the more shaded area at the eastern corner dog's mercury *Mercurialis perennis* grows. **g4a Amenity grassland:** The grass surrounding the church is mown to a lower sward and is managed as amenity grassland.
Condition

g4 Modified grassland: The grassland is assessed as being in poor condition, since rye-grass cover was over 25%, white clover *Trifolium repens* was also abundant, and wildflowers and sedges were at less than 30% cover. **g4a Amenity grassland:** This is in poor condition, being of poor species diversity and regularly mown close to the ground.

Lines of trees

UKHabs habitat types present (secondary codes in brackets) **w1g6 Lines of trees**
Description **w1g6 Lines of trees:** A line of trees stretches along the eastern and southwestern boundaries, and comprises several species including ash, yew *Taxus baccata*, copper beech *Fagus sylvatica 'purpurea'* and horse-chestnut *Aesculus hippocastanum.* cherry *Prunus sp.* and pedunculate oak *Quercus robur* trees are also scattered across the site, amongst other species.
Condition **w1g6 Lines of trees:** The trees on site were in good condition, with the lines of trees being closely spaced creating a connected canopy.

Priority habitats

No Priority Habitats are present at this location.


g4
u1b6
w1g6
g4
u1b5
u1b6
g4a
g4a
g4a
w1g6
g4
Basemap contains Map data ©2021 Google
CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Habitats
g4 - Modified grassland
g4a - Modified grassland (amenity)
u1b5 - Buildings
u1b6 - Other developed land
Linear features
w1g6 - Line of trees
Point features
Scattered tree
Project: 99320 CCC Biodiversity Audit
Title: Cherry Hinton Churchyard
Version: 1.0
Date: 18/03/2021
Author: WOC
0 10 20 30 40 m


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Site boundary
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features (inset)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: Cherry Hinton Churchyard: condition assessment
Version: 1.0
Date: 18/03/2021
Author: WOC
0 10 20 30 40 m
Basemap contains Map data ©2021 Google

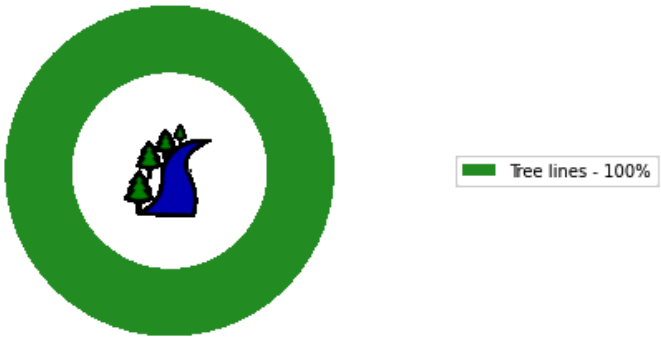
Biodiversity units

The following charts show the percentage of biodiversity units for each habitat/linear feature type at Cherry Hinton Churchyard.

Habitat areas

Habitat type	*Biodiversity units*
Grassland - amenity	0.07
Grassland - modified	2.17

Linear features



Habitat type	*Biodiversity units*
Tree lines	1.15

Management

Review of exiting management

There is no biodiversity management plan for Cherry Hinton Churchyard.

Assessment against selection criteria

The survey undertaken in 2020 did not record enough neutral grassland indicator species to achieve City Wildlife Site designation. Two indicator species were recorded, burnet-saxifrage *Pimpinella saxifrage* and lady's bedstraw *Galium verum,* but these were not frequent within the sward. City Wildlife Site designation requires at least five neutral grassland indicator species (or at least two strong indicators) in frequent numbers. Indicator species recorded during the 2005 survey that were not recorded in 2020 are: common knapweed *Centaurea nigra*, ploughman's-spikenard *Inula conyzae*, oxeye daisy *Leucanthemum vulgare*, hoary plantain *Plantago media* and common sorrel *Rumex acetosa.* These previously recorded species suggest the site should still qualify as a City Wildlife Site.

Direction of travel

Habitat	Comments
Grassland	Poor declining due to reducing species diversity
Line of trees	Good condition which is likely to be stable.

A Cambridge City Wildlife Site Survey was undertaken at Cherry Hinton Churchyard in 2005. A higher diversity of species within the grassland was recorded during the 2005 survey. Therefore, the grassland is classed as “poor – declining” due to the potential loss of indicator species from the sward. The trees present on site have not changed since 2005 and so their direction can be deemed “good – stable”.

Future risks to condition

Potential risks which may impact upon habitat condition and features include:

- Grassland management: Unsympathetic management of the grassland could lead to a deterioration in species-richness.

- Tree planting: Further tree planting may lead to further impacts on grassland condition through shading.

Opportunities

Key features of ecological interest (and constraints if any)

The grassland at Cherry Hinton Churchyard has potential to be a higher quality grassland with good species diversity.

Opportunities

The focus of opportunities at Cherry Hinton Churchyard should be on improving the quality of the grassland habitats through sensitive management. This approach should be taken before attempting to artificially enhance the diversity of the sward. All arisings from mowing should be removed and composted off site. This will gradually reduce the nutrients in the soil, hampering grass growth and therefore promoting the establishment of wildflowers. In addition, the site should be mown less frequently allowing wildflowers to fully flower and set seed whilst also trying to keep vigorous grasses down. City Wildlife Site status should be a target for this location.

Some sections could be purposefully planted as wildflower meadows, although since the majority of the site has been established for a long period of time it may be more beneficial to see which wildflowers may arise from the dormant seed stock in the soil first. However, nectar rich planting of annuals or perennial could be considered in the areas of amenity grassland around the church.

Small scale enhancements could also include establishing reptile refugia, invertebrate refugia and “bug hotels” and quiet areas of leaf litter for hibernating mammals such as hedgehog.

Creation of features	
Habitats	Annual meadow mixes to replace areas of amenity grassland directly around the church.

	Biodiversity toolkit (bramble patches, woodpiles, planting for pollinators)
Species	Biodiversity toolkit (bat boxes, bee banks, bee hotels, hedgehog houses, hibernacula, beetle towers, bird boxes, bug hotels)
Management/restoration of existing features	
Habitats	Grassland (reduced mowing regime with sensitive timing of cuts and cutting removal)
Species	n/a

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Develop areas of grassland which are in moderate condition with a higher floristic diversity through continued cut and collect management activities. The target should be for at least 50% of the grassland to be in moderate condition

Further monitoring work

Botanical monitoring of the churchyard should take place to ensure that the site is reaching City Wildlife Site status.

Hobsons Park

Results

Site description and status

Formerly known as Clay Farm, Hobson's Park is a country park that was developed in 2011 as a result of the development at Great Kneighton. It is predominantly grassland, with belts of planted woodland to the east and south, with ponds, tree planting and paths. At the heart of the Park lies a 'bird mitigation lake'/nature reserve centred around a lake with associated marginal vegetation and grassland. This lake does not form part of the audit; this will be adopted and managed by Angian Water. Also within the bounds of the Park, but outside of the scope of this audit are allotments. Hobson's Brook, a City Wildlife Site, forms the western boundary, as well as a series of SUDS features that form ditches or moats around the Nature Reserve and Allotment areas. Hobson's Park constitutes Phases 1 and 2 of the total planned Country Park (Countryside PLC, 2011).

This site lies within the River Cam Corridor Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g2 Calcareous grassland (16 tall herb 73 bare ground)** **g3c5 *Arrhenatherum* neutral grassland (62 other grazed; 73 bare ground; 123 neutral grassland with calcicoles)** **g4 Modified grassland (73 bare ground; 107 railway)** **g4a Amenity grassland (66 frequently mown)**
Description **g2 Calcareous grassland:** A small arc of grassland habitat in the southwest corner is tentatively regarded as calcareous grassland on the basis of the

presence of indicator species such as frequent marjoram *Origanum vulgare* and wild basil *Clinopodium vulgare*, and occasional kidney vetch *Anthyllis vulneraria*. The area appears to have once been a trackway, but with a chalky substrate either laid on top or as part of the original feature. Bare ground is visible throughout.

g3c5 *Arrhenatherum* neutral grassland: This is the dominant grassland habitat at Hobson's Park, making up 75% of the total site area. False oat-grass *Arrhenatherum elatius* and common knapweed *Centaurea nigra subsp. nigra* are abundant in nearly all areas, being locally dominant particularly in the north, and east of the main paths. In the areas of better condition, there was good floristic diversity, with a number of neutral and calcareous grassland indicators present either locally abundant (e.g., lady's bedstraw *Galium verum*, common bird's-foot-trefoil *Lotus corniculatus*) or locally frequent (e.g., field scabious, *Knautia arvensis*, wild carrot *Daucus carota*).

g4 Modified grassland. Two narrow strips of modified grassland arising from recent disturbance are present on both west and east sides of the site. Species indicative of this disturbance regime were abundant or frequent (e.g., ribwort plantain *Plantago lanceolata*, bristly oxtongue *Picris echioides* and common ragwort *Jacobaea vulgaris*).

g4a Amenity grassland: Within the central 'focal points' lies quadrants of more highly managed amenity grassland.

Condition

g2 Calcareous grassland: Poor. As well as calcareous indicators, the area has frequently occurring less-desirable species. Because of its origin and location, it does not directly match the description for this habitat type, though could do with time. Whilst present, the indicator species are not present throughout the sward in high frequencies.

g3c5 *Arrhenatherum* neutral grassland: The majority of this habitat type, representing 52% of the total area of the site, is considered to be in 'good' condition. Whilst not directly matching the Priority Habitat of Lowland Meadow & Pasture (in part also accounting for its recent age and history of the site), several indicator species of neutral grassland are present and at high frequencies (ranging between 20% and 50%). This area of good condition is present in the north and

east of the site, particularly all around the northern-most focal point. An area of nearly 4 ha (15% of site total) towards the south of the site is considered to be of moderate condition on account of a much reduced floristic diversity and dominated by grasses (false oat-grass, cock's-foot *Dactylis glomerata* and Yorkshire-fog *Holcus lanatus*). The remainder of the grassland is considered to be of poor condition. In the far north, bordering the busway, overgrazing by rabbits and damage from dog-walkers creates larger patches of bare ground. The latter also applies to the west of the eastern plantation woodland where an unofficial walking route exists. In other areas (e.g., south of the allotments), tall herbs (e.g., common ragwort and bristly oxtongue *Picris echioides*) are abundant.

g4 and g4a Modified/amenity grassland. Considered poor on account of grassland type (either amenity or road verge) or composition (undesirable species are frequent, especially along Hobson's Brook).

Woodland

UKHabs habitat types present (secondary codes in brackets)

w1g7 Other woodland; broadleaved (36 Plantation; 56 Young trees – planted)

Description

Two main belts of woodland have been planted along the east (railway line) and south (Addenbrooke's Road). A diverse range of tree species are present, with cherry *Prunus sp.* field maple *Acer campestre* and hawthorn *Crataegus monogyna* all frequent. Less frequent tree species such as pedunculate oak *Quercus robur* and ash *Fraxinus excelsior* are also present. The understorey was a grassland similar in type to the above described g3c5 neutral grassland and the height of tallest trees rarely exceeded four metres, with the majority between two and three metres.

Condition

The plantations fail primarily on account of its age and lack of structural diversity. In practical terms, it might be better considered as scrub, but is nevertheless considered here as woodland to reflect the target habitat. All areas are 'poor'.

Scrub

UKHabs habitat types present (secondary codes in brackets) **h3h Mixed scrub**
Description A small area of scrub is found on the busway embankment, appearing to take over a small area of tree planting. It is dominated by bramble *Rubus fruticosus agg.* though hawthorn and ash are also present.
Condition For a small area, this is a relatively diverse area of scrub, though lacks the structural diversity of good condition scrub. Pernicious weeds and invasive species are absent and as such is considered to be 'moderate'.

Freshwater

UKHabs habitat types present (secondary codes in brackets) **r1a Ponds (eutrophic standing waters; 19 Ponds - Priority Habitat)** **r1e Canals and ditches (39 Freshwater - man-made, 1190 Sustainable urban drainage feature)**
Description **r1a Ponds:** Two ponds are present. The pond in the north is dominated by reedmace *Typha* sp., with only approximately 15% of the total area available as open water. The pond is surrounded on all sides by a line of trees, predominantly willows *Salix* sp. and alder *Alnus glutinosa.* The pond is connected directly to Hobson's Brook. The pond to the south is more open, though again is also largely dominated by emergent reedmace, with approximately 10% left as open water. The pond is surrounded on the west and south sides by willow scrub. **r1e Canals/ditches – 191 Ditches:** Hobson's Brook – a chalk stream - forms the western boundary of the site for its entire length. It is designated as a City Wildlife Site (F1.2 Hobson's Brook South being the section within the site boundary).

The southern section for approximately 60% of its length within the site boundary is characterised by more open water with floating and emergent species present in patches throughout. These include fool's-water-cress *Apium nodiflorum* and lesser water-parsnip *Berula erecta* within the channel and willowherb *Epilobium* at the margins. Further north, the channel is dominated by common reed *Phragmites australis*. The channel is simple in structure with little diversity in bank profile. The water quality appears good, with clear water present and a visible substrate in the absence of vegetation. The Waterbody classification included within the Anglian Water Management Plan (source: *Hobson's Conduit Corridor, Cambridge City Council, 2018)* indicates that in 2015, Hobson's Brook was rated as being in 'good' chemical quality, but 'moderate' ecological and therefore overall quality. Monitoring since 2012 as a result of the Clay Farm development also indicates issues with nitrates and dissolved oxygen.

A second watercourse exists in the north-east corner of the site. This emanates from a culvert under the busway. The initial section is canalised with brick walls, whereupon a more open channel ensues. There was a more diverse array of floating species present than in Hobson's Brook, with fool's-water-cress again frequent, with occasional pink water-speedwell *Veronica catenate* and water-plantain *Alisma plantago-aquatica* present only in the deeper sections in the west. A small amount of rubbish and detritus accumulates at the eastern end before being culverted. With the exception of the west end of the ditch, water levels were very low (no more than 20cm deep).

Non-native invasive species were not observed in either watercourse, though Nuttall's waterweed *Elodea nuttalli* was recorded in 2018.

r1e Canals/ditches – 1190 SUDS: Two SUDS features surround the allotments and Nature Reserve and are similar in character. Shallow water was present in the western (lower) halves with some emergent plants present (hard rush *Juncus inflexus,* sedges *Carex* sp., water mint *Mentha aquatica*). The eastern halves were largely dry and, in some places, were taking on the character of the neighbouring grassland. Water depth, where present was rarely more than 30cm.

Condition

r1a Ponds: Both ponds are in 'moderate' condition. In both cases, water quality was not obviously good and, in both cases, the high cover of emergent reed and/or reedmace will accelerate succession. In the case of the northern pond, the condition criterion that considers artificial connection to other water courses is also failed. Shading is a potential future problem for the north pond.

r1e Canals/ditches – 191 Ditches: Both Hobson's Brook and the channel in the north-east are in 'moderate' condition. In the case of the former, where submerged and floating species are present (south) they do not exceed the recommended the 10 species per 20m. In certain areas (e.g., around bridges), the ditch is adversely affected by disturbance from dogs. In the north-east channel, water depth is too low (less than the recommended 50cm) and no floating species are present. In all cases, water quality was considered to be good, with no duckweed or filamentous algae observed.

r1e Canals/ditches – 1190 SUDS: Both sections are considered to be in 'poor' condition, reflecting the low water levels and the strong likelihood of drying out (indeed, the eastern halves appear to be dry most of the time, reverting to grassland). Where water was present, it was often turbid and, whilst emergent species were present, no floating species were identified.

Urban

UKHabs habitat types present (secondary codes in brackets)

u1d Suburban/mosaic of developed/natural surface (16 tall herb; 73 bare ground; 107 railway)

Description

The south-facing embankment of the busway is considered as an urban mosaic. It is not sufficiently large to constitute an area of Open Mosaic Land on Previously Developed Land (a Priority Habitat), but shares some of the characteristics: areas of bare ground, friable soil structure suitable for a range of invertebrates and flowering species of value to pollinators. Species typical of disturbed ground were frequent (e.g., bristly oxtongue, great mullein *Verbascum thapsus* and common stork's-bill *Erodium cicutarium*) as well some chalk grassland indicators favouring

areas of exposed chalk within the embankment (salad burnet *Poterium sanguisorba* and perforate St. John's-wort *Hypericum perforatum*). The non-native common evening-primrose *Oenothera biennis* was frequent throughout.

Condition

Whilst likely to be of significant value to invertebrates, pollinators (especially butterflies) were not frequent. Areas of bare ground were also extensive and it is unclear whether the 'vegetation provides multiple opportunities for a high number of species to live and breed (complete their life cycles) – G1'. Whilst further invertebrate surveys may identify this to in fact be the case, this area is tentatively considered as 'moderate'.

Hedgerows

UKHabs habitat types present (secondary codes in brackets)

h2a5 Native Hedgerow (36 Plantation)

Description

Two hedgerows are present; a recently planted feature surrounding the allotments and another, more mature hedge surrounding the southern pond. The former is still in the early stages of establishment, with hawthorn appearing to dominate. The second hedgerow had more botanical diversity and with more mature plants present. Significant gaps (>1m wide) were present, particularly on the western side adjacent to the path.

Condition

The hedgerow surrounding the allotments is 'poor'. It fails all structural criteria, with the exception of having no gaps, but also fails in having signs of nutrient enrichment (southern side) and disturbance (all around). The hedgerow around the southern pond is in 'moderate' condition, failing the conditions relating to width, canopy height and gapiness. However, no other conditions were failed, with moderate quality grassland present on the internal side.

Lines of trees

UKHabs habitat types present (secondary codes in brackets) **w1g6 Line of trees (36 Plantation)**
Description Planted trees around focal points and along paths are considered for the purposes of the audit as tree lines. Most trees, with the exception of some larger specimens on the west side of the site, were immature specimens. A willow screen to the north of the nature lake 'hide' is also considered as a tree-line.
Condition With the exception of the willow screen, all tree lines are considered to be in 'poor' condition. In all cases, canopy gaps >5m in length exist and gaps make up more than 10% of the total length. This merely reflects the age of the features. The willows are considered to be moderate, with fewer gaps. In no case were the trees sufficiently mature to be considered in 'good' condition.

Priority habitats

The following Priority Habitats are present at this location;

- Ponds
- Hedgerow


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Habitats
g2 - Calcareous grassland
g3c5 - Arrhenatherum neutral grassland
g4 - Modified grassland
g4a - Modified grassland (amenity)
h3h - Mixed scrub
r1a - Eutrophic standing water
r1e - Canal or ditch
u1b6 - Other developed land
u1c - Artificial unvegetated/unsealed surface
u1d - Suburban/mosaic of developed/natural surface
w1g7 - Other broadleaved woodland types
Linear features
h2a5 - Native Hedgerow
w1g6 - Line of trees
Point features
Target Note
Project: 99320 CCC Biodiversity Audit
Title: Hobsons Park - habitats
Version: 0.2
Date: 14/04/2021
Author: JH
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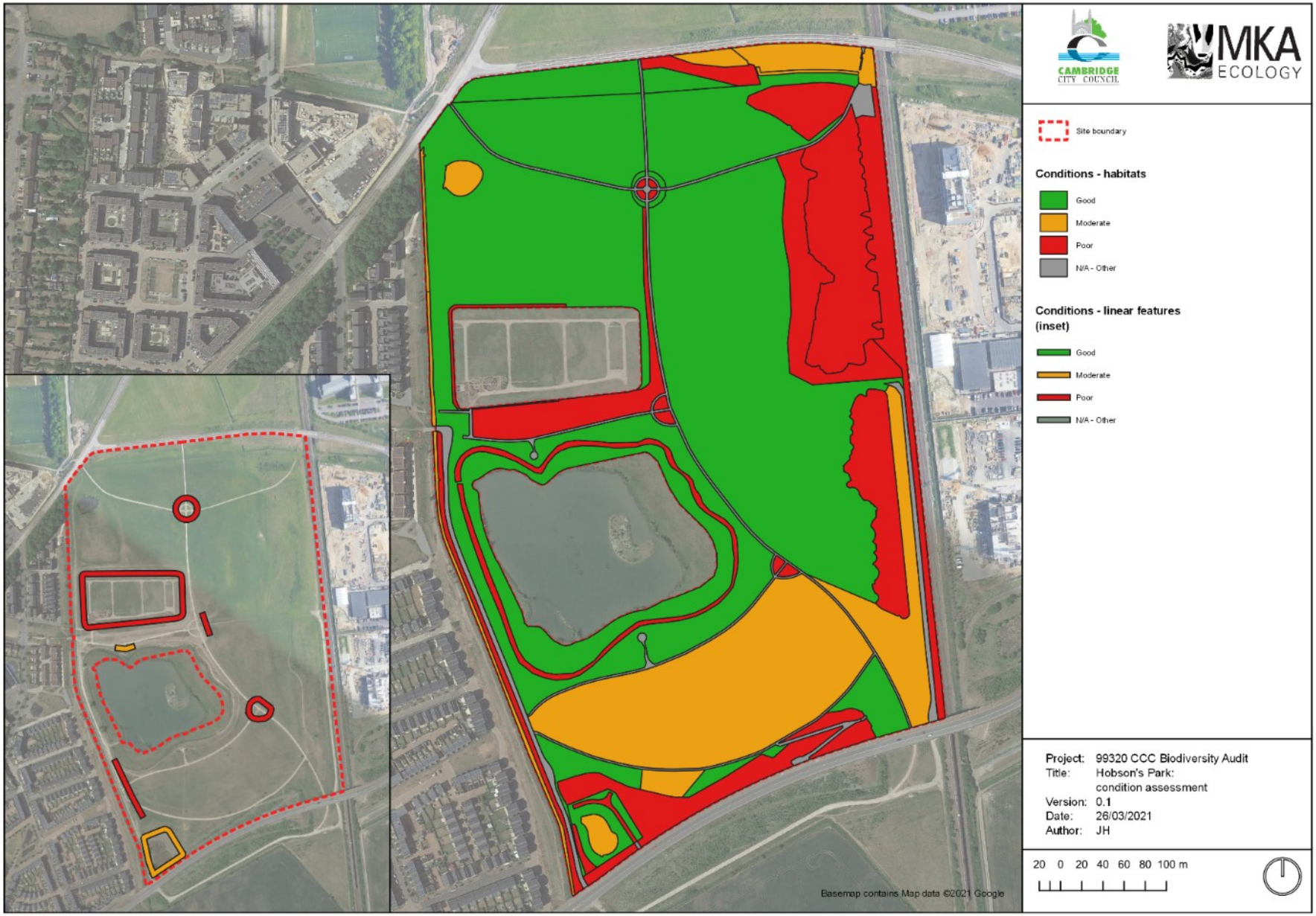
Basemap contains Map data ©2021 Google

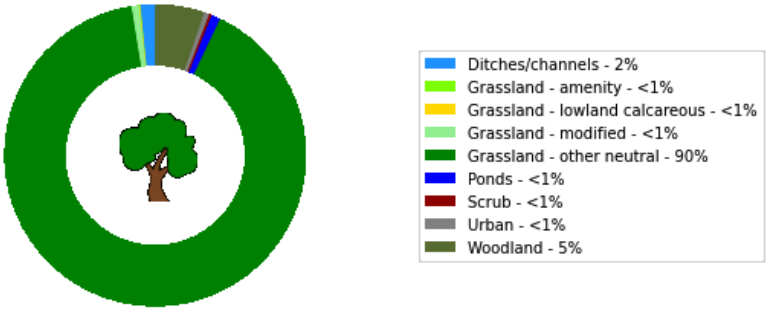

CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features (inset)
Good
Moderate
Poor
N/A - Other
Project: 99320 CCC Biodiversity Audit
Title: Hobson's Park: condition assessment
Version: 0.1
Date: 26/03/2021
Author: JH
20 0 20 40 60 80 100 m
Basemap contains Map data ©2021 Google

Target Notes:

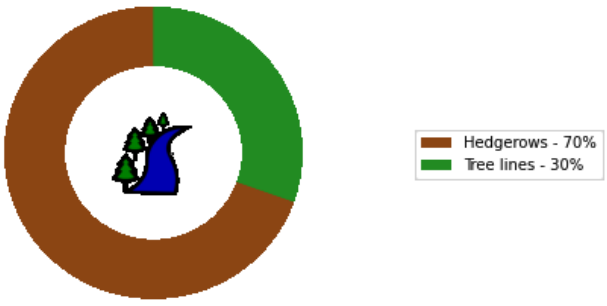
1. Stone mesh block – indication of pond as an additional SUDS feature (not marked on ecosulis, 2010 plans).
2. Badger dung pit.

Biodiversity units

The following charts show the percentage of biodiversity units for each habitat/linear feature type at Hobson's Park.



Habitat type	*Biodiversity units*
Ditches/channels	4.16
Grassland - amenity	0.18
Grassland - lowland calcareous	0.23
Grassland - modified	2.11
Grassland - other neutral	238.05
Ponds	2.52
Scrub	0.74
Urban	1.46
Woodland	13.64



Habitat type	*Biodiversity units*
Hedgerows	2.25
Tree lines	0.98

Management

Review of exiting management

The site is subject to a Conservation Management Plan (ecosulis Ltd, 2010). These are reviewed by habitat type as follows:

- **Grassland.** "*General management will aim to maintain a mosaic of different structures within the sward*." At present, sward (i.e., physical) diversity could be improved. Bare ground is present, though mostly as a result of disturbance adjacent to the railway and paths, rather than within the sward. The southern section of grassland does reflect the desire to contain a taller, tussocky sward, though this comes at the expense of its floristic diversity. Overall, the conditions at the site appear to follow the management prescriptions.
- **Water bodies**. One of the management aims is the creation of reedbed, though specifies that lesser bulrush *Typha angustifolia* should be the dominant plant species. *Typha* species were dominant in both standing water bodies, which are not classified as reedbeds (the UK Habitat Classification definition requires common reed as the dominant species). As such, reedbed habitat is not being maintained, though this may reflect more recent management decisions. Also detailed is the *"…[m]aintenance of open and shaded sections of the ponds: In ponds with permanent water area a minimum of one-third open water will be maintained*." and "*Marginal and aquatic vegetation will not be allowed to cover more than two thirds of the surface of the water bodies (no more than one-third will be reedbed)."* Both ponds surveyed have substantially less open water.
- **Woodland.** Woodland management specifications include relatively standard practices for ensuring the success of recently planted trees, in particular the maintenance of tree-guards, stakes and clearing of litter. The creation of

deadwood habitat within the woodland floor is also specified, but was not apparent.

- **Other habitat features.** "*A minimum of four hibernacula/refugia per water body (for example log piles) will be created around the water bodies to provide refuge and hibernacula for reptiles, amphibians and invertebrates.*" These features were not observed during the site visit, though the total perimeter of each waterbody was not surveyed and as such one or two features may have been missed. Nevertheless, it is unlikely that the number of features specified is present.

Assessment against selection criteria

Hobson's Park is not currently designated as a City or County Wildlife Site. However, on account of the presence of at least five neutral grassland indicators at levels frequent or above, it would qualify on criterion 2.10 (c). The indicators are:

- Common knapweed *Centaurea nigra subsp. nigra*
- Common bird's-foot-trefoil *Lotus corniculatus*
- Lady's bedstraw *Galium verum*
- Field scabious *Knautia arvensis*
- Oxeye daisy *Leucanthemum vulgare*
- Yellow-rattle *Rhinanthus minor*

However, as the origin of these species is almost certainly from sowing, these criteria and therefore designation, may not be applicable until it can demonstrated that the site can sustain these species and habitats in the long-term (e.g., 5-10 years).

Hobson's Brook (Mid and South) also qualifies as a City Wildlife Site under criterion 2.14 (chalk stream).

Direction of travel

Habitat	Comments
Grassland	Good – stable. Main areas to north and immediately east of path.
Grassland	Moderate – stable. Main blocks to south.
Grassland	Poor – declining. The grassland on the east boundary either side of the plantation woodland is in poor condition on account of disturbance from works (east) and recreation (west).
Hobson's Book	Moderate – stable. Conditions similar to 2005.

A Bioblitz conducted in 2018 (Queen Edith's Community Forum, 2018) reports a similar species composition of the grassland. The two main areas are therefore considered to be "good – stable" and "moderate – stable", depending on the area within the park. The management regime indicates that separate sward structures are maintained, so it is taken that these two areas have been managed deliberately in this way.

A Cambridge City Wildlife Site Survey was undertaken at Hobson' Brook in 2005 and previously in 1998. A similar diversity of plants was recorded in 1998 and 2005 compared with the present and the overall description from 2005, with only moderate channel vegetation with a largely muddy channel base, is similar to 2020. Hobson's Brook is therefore considered to be "moderate – stable".

Given the recent creation of all other habitats at the site, derived from arable land, no direction of travel is attempted.

Future risks to condition

Potential risks which may impact upon habitat condition and features include:

- Future development, in particular plans for a new Cambridge South railway station;
- Impacts on Hobson's Brook from development and agricultural activities beyond the site boundary (i.e, upstream), including water abstraction.
- Impacts on Hobson's Brook from human proximity within the site boundary;
- Impacts on the grassland and dependent species (particularly ground nesting birds) from human recreational use (especially dog walking);
- Impacts to ponds from scrub (south) and tree (north) encroachment and natural succession;
- Establishment of non-native invasive plant species within Hobson's Brook.

Opportunities

Key features of ecological interest (and constraints if any)

The location of Hobson's Park at the southern end (east branch) of the River Cam Corridor Priority Area and bordering the adjacent Gog Magog Hills Priority Area (Cambridge Nature Network, 2020) places it at a critical location in the City. As such, opportunities lie as much beyond the site as much as within. This is particularly relevant given the relatively isolated nature of the neighbouring Nine Wells LNR (see accompanying report on this site). Similar habitat creation projects south of Addenbrooke's Road and either side of Hobson's Brook (east branch) will promote greater connectivity and protection of existing habitats (woodland at Nine Wells, Hobson's Brook).

The 'urban mosaic' habitat identified on the south facing embankment of the busway bridge has potential to provide a relatively large and varied resource to invertebrates. To assess the current value of this area for invertebrates and therefore the scope for further enhancement, it is recommended that invertebrate surveys be carried out.

For the majority of its length Hobson's Brook is a straight channel with little diversity in bank profile or flow. Recommendations from the Greater Cambridge Chalk Streams Project Report are endorsed.

Opportunities

Creation of features	
Habitats	Deadwood habitat within planted woodland and adjacent to waterbodies.
Species	Biodiversity toolkit: Bat boxes – more mature trees along south-western track. Hibernacula alongside waterbodies – to be created.
Management/restoration of existing features	
Habitats	Urban mosaic habitat (busway bridge embankment) – maintenance of bare ground and suitable soil types. There may be benefit from the introduction of more concentrated chalkier substrate in patches. Enhancement to Hobson's Brook, particularly targeting increasing diversity in water flow; flow deflectors, gravel placement, bank re-profiling; replacement of hard edges sections with soft engineered solutions (Hawksley & Mungovan, 2020, Cambridge City Council 2018). Dog walking restrictions to reduce disturbance to grassland and dependent fauna. Introduction of grazing into the main grassland areas should be considered, though recognising the conflict that may arise with dog walking.
Species	n/a

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Maintain good condition of the grassland over the long-term and monitor with a view to establishing City Wildlife Site Status
- Improvement of Hobson's Brook from moderate to good condition
- Consideration of a grazing regime to promote floristic diversity

Further monitoring work

Further monitoring work at the site could include;

- A number of annual surveys for species and habitats is specified within the site's CEMP (ecosulis, 2010). It is not known whether these recommendations have been formally adopted. However, it is recommended that following are undertaken:
    - Bi-annual water vole surveys of Hobson' Brook (along similar lines to those undertaken at Cherry Hinton Brook by the Cambridgeshire Mammal Group).
    - Bi-annual grassland monitoring. This may take the form of a CSM or FEP survey. Its aim should be to ensure that grassland composition and quality are maintained as desired, in particular with reference to the City Wildlife Site criteria with a view to designation as a CiWS if the grassland is sustainable in the long-term.
    - Annual non-native invasive plant species monitoring of Hobson's Brook.
    - Continued monitoring of water quality of Hobson's Brook.
- Invertebrate surveys of the area of 'urban mosaic' on the south side of the busway bridge embankment.
- The close proximity of a population with immediate access to the site gives the possibility of a range of less formal species surveys, as evidenced by recent BioBlitzes (Queen Edith's Community Forum, 2018).

Jesus Green

Results

Site description and status

Jesus Green is a large urban greenspace located just north of central Cambridge and is bordered by the River Cam to the north and Jesus Ditch to the south. Midsummer Common lies adjacent to Jesus Green with Victoria Avenue separating the two. Several tarmac paths cross Jesus Green, and there are recreational facilities such as tennis courts and Jesus Green Lido also situated on site.

This site lies within the River Cam Corridor Priority Area of the Cambridge Nature Network.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets)
g4a Amenity grassland (64 Mown) **g4 Modified grassland** **c1a6 Arable margins sown with wild flowers or a pollen and nectar mix**
Description **g4a Amenity grassland:** Amenity grassland is present over the majority of the site, and is closely mown. Perennial rye grass *Lolium perenne* dominates the sward. **g4 Modified grassland:** One section adjacent to Victoria Avenue was less frequently mown and contained grass species such as cock's foot, creeping bent and more forb species such as cow parsley and hemlock. **c1a6 Arable margins sown with wild flowers or a pollen and nectar mix:** Two small areas adjacent to the tennis courts have been seeded as an annual wildflower meadow. A mixture of species were present including majoram *Origanum majorana*, yarrow *Achillea millefolium* and cornflower *Centaurea cyanus*.

Condition **g4a Amenity grassland:** Across the site, the grass is managed as amenity grassland, has a low species diversity, and is in poor condition. **g4 Modified grassland:** The grassland is rated in poor condition, as the majority of condition criteria are failed and it resembles amenity or road verge grassland. **c1a6 Arable margins sown with wild flowers or a pollen and nectar mix:** No condition assessment for cropland habitat types.

Cropland

UKHabs habitat types present (secondary codes in brackets) **c1a6 Arable margins sown with wild flowers or a pollen and nectar mix**
Description **c1a6 Arable margins sown with wild flowers or a pollen and nectar mix:** Two small areas adjacent to the tennis courts have been seeded as an annual wildflower meadow. A mixture of species were present including majoram, yarrow and cornflower.
Condition **c1a6 Arable margins sown with wild flowers or a pollen and nectar mix:** No condition assessment for cropland habitat types.

Line of trees

UKHabs habitat types present (secondary codes in brackets) **w1g6 Line of trees**
Description **w1g6 Line of trees:** Nearly every tarmac pathway is lined with mature trees of horse-chestnut *Aesculus hippocastanum*, lime *Tilia cordata x platyphyllos (T. x vulgaris)*, London plane *Platanus x hispanica (P. occidentalis x orientalis)* and others. The trees are closely spaced so as to create a connected canopy. The path linking the footbridge with Victoria Avenue is lined with mature plane and horse chestnut trees, some of which will need replacing in the future. Some trees have already been replaced with younger trees due to over-maturity or disease.
Condition

w1g6 Line of trees: The lines of trees range from poor condition (newly planted trees that are spaced >5m apart, such as the lines of cherry) to good condition with mature trees and no canopy gaps >5m, such as the row of London plane trees across the main pathway. The lines of lime trees along the river are categorised in moderate condition as they contained gaps >5m.

Hedgerow

UKHabs habitat types present (secondary codes in brackets) **h2a11 Native Species Rich Hedgerow with trees**
Description **h2a11 Native Species Rich Hedgerow with trees:** A native species-rich hedgerow with trees surrounds the outside of the Jesus Green Lido. This hedgerow contains a mix of broadleaved and conifer species including hawthorn *Crataegus monogyna*, holly *Ilex aquifolium*, Leyland cypress *Cupressus x leylandii* and yew *Taxus baccata.*
Condition **h2a11 Native Species Rich Hedgerow with trees:** The hedgerow is in good condition, with several native woody species and a width and height >1.5m.

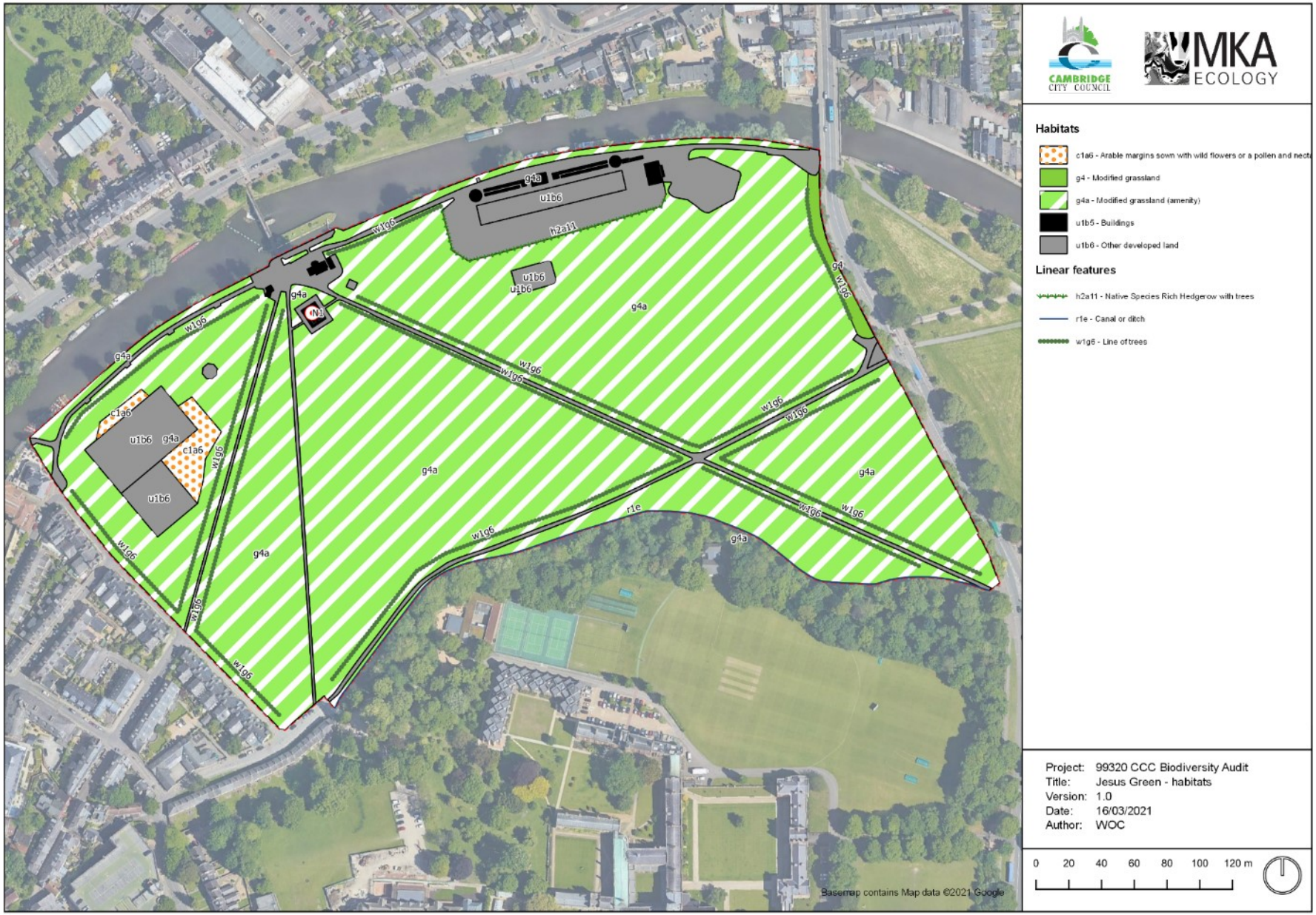
Ditch

UKHabs habitat types present (secondary codes in brackets) **r1e Canals (191 ditch)**
Description **r1e Canals (191 ditch):** Jesus Ditch forms the southern boundary of Jesus Green, and is reinforced along its length. It is dominated by non-native least duckweed *Lemna minuta* and also contains litter.
Condition **r1e Canals (191 ditch):** The ditch is in poor condition, due to the dominating presence of non-native least duckweed, litter, and being channelised. There is a lack of any emergent or marginal vegetation along its banks, and in sections it is heavily shaded by mature trees and choked with leaf litter.

Priority habitats

The following Priority Habitats are present at this location;

- Hedgerow


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Habitats
c1a6 - Arable margins sown with wild flowers or a pollen and nect
g4 - Modified grassland
g4a - Modified grassland (amenity)
u1b5 - Buildings
u1b6 - Other developed land
Linear features
h2a11 - Native Species Rich Hedgerow with trees
r1e - Canal or ditch
w1g6 - Line of trees
Project: 99320 CCC Biodiversity Audit
Title: Jesus Green - habitats
Version: 1.0
Date: 16/03/2021
Author: WOC
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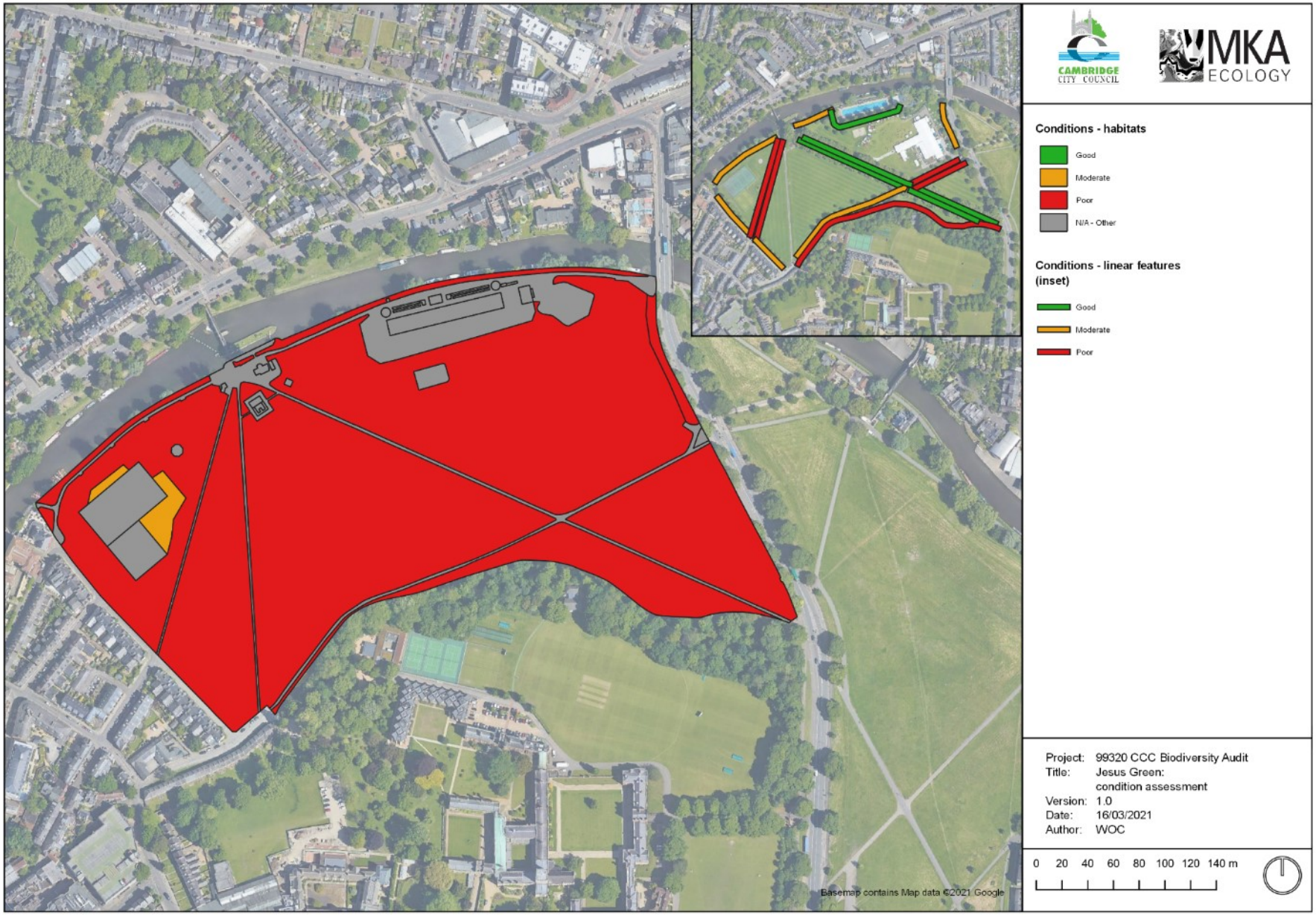
Basemap contains Map data ©2021 Google
g4a
u1b6
h2a11
w1g6
g4
N1
c1a6
r1e


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features (inset)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: Jesus Green: condition assessment
Version: 1.0
Date: 16/03/2021
Author: WOC
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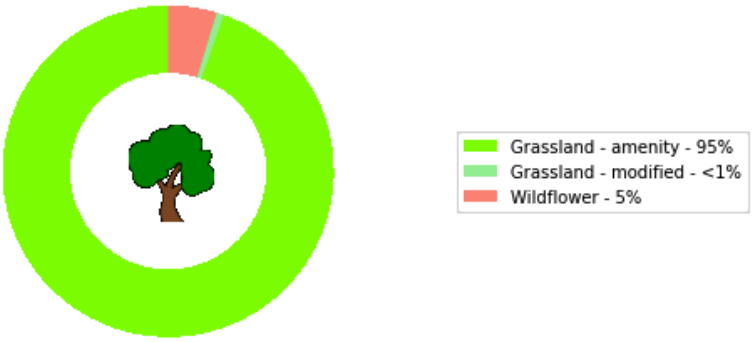
Basemap contains Map data ©2021 Google

Biodiversity units

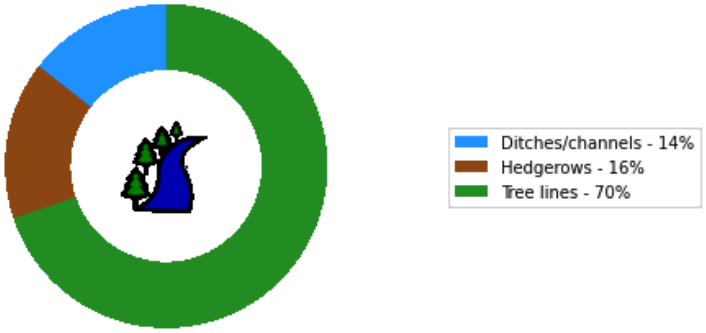
The following charts show the percentage of biodiversity units for each habitat/linear feature type at Jesus Green.

Habitat areas



Habitat type	*Biodiversity units*
Grassland - amenity	22.75
Grassland - modified	0.18
Wildflower	1.13

Linear features



Habitat type	*Biodiversity units*
Ditches/channels	2.11
Hedgerows	2.30
Tree lines	10.17

Management

Review of exiting management

There is no biodiversity management plan for Jesus Green.

Assessment against selection criteria

Jesus Green does not meet City Wildlife Site criteria. However, records of water vole *Arvicola amphibius* have been reported for Jesus Ditch, which may indicate qualification under CiWS criterion 2.27, a site supporting breeding populations of any protected species listed under the Wildlife and Countryside Act 1981 (as amended).

Direction of travel

Habitat	Comments
Grassland	Poor stable because of recreational management
Cropland	There are no condition assessments for this habitat type.
Line of trees	Good or moderate condition which is likely to be stable.
Hedgerows	Good condition which is likely to be stable.
Ditch	Poor condition and likely to be declining due to duckweed, silting and recreational pressures.

Jesus Green is managed intensively as public greenspace and it is likely to have received similar regular management for several years. Therefore conditions of habitats are likely to have remained stable.

Future risks to condition

Potential risks which may impact upon habitat condition and features include;

- Recreational pressures: The function of Jesus Green is largely to provide recreational opportunities. However, increased unmanaged recreational use is likely to have a detrimental impact on the condition of some habitats such as the ditch with more deposition of litter.
- Disease and decay: The lines of trees will over time age and there is a risk of disease and decay. Some decay would be advantageous for biodiversity however this may not be compatible with the high levels of public access at this location.

Opportunities

Key features of ecological interest (and constraints if any)

A large proportion of the mature trees that flank the pathways possess bat roosting features such as cracks or flaking bark in branches. The public toilet building also has bat roosting potential, with several cracked and loose roof tiles. Jesus ditch has a known population of water voles.

Opportunities

Jesus Green presents a number of opportunities for ecological enhancement although these may conflict with the primary function of this area as a recreational space. However, this does not necessarily need to be the case and developing biodiverse features for recreational use can have significant benefits for well-being. Furthermore biodiversity interventions in such a prominent location would demonstrate a clear commitment from the City Council to the biodiversity emergency and would allow the City Council to lead the way in biodiversity provisions in the City.

Opportunities for wetland creation alongside the existing Jesus Ditch would bring priority habitats (such as reedbeds) and wildlife right into the heart of the City. Expanding the provision of annual nectar mixes would provide further biodiversity benefits and also demonstrate a clear commitment to biodiversity enhancements.

Simple measures such as relaxed mowing regimes and over-seeding of grasslands, and bird/bat boxes would also be beneficial.

Creation of features	
Habitats	Annual/perennial wildflower mixes Wetland creation (opening out Jesus Ditch to create pools and reedbeds to the south of the green) Biodiversity toolkit (mixed native hedge, woodpiles)
Species	Water vole: further habitat enhancements should create additional foraging opportunities for this species Biodiversity toolkit (bat boxes, bee banks, bee hotels, beetle towers, bird boxes, bug hotels)
Management/restoration of existing features	
Habitats	Grassland (reduced mowing regime, over seeding, species-rich grassland creation) Jesus Ditch (naturalising banks, aquatic planting, dredging, more light) Hedgerow (increase native species diversity, improve edge habitat with higher quality grassland buffer)
Species	Water vole: further habitat enhancements should create additional foraging opportunities for this species

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Improvement of Jesus Ditch from poor to good condition through bankside and vegetation management. Develop wetland habitats in this area.
- Create biodiverse habitats with native species (perennial meadow grassland, scrub, hedgerow) across at least 20% of the location

Further monitoring work

It is recommended that monitoring of the water vole population is conducted.

Christ's Pieces

Results

Site description and status

Christ's Pieces is an urban park in the centre of the city of Cambridge. It has outdoor sports facilities, amenity grass, flowerbed planting and many crossing tarmac pathways that provide a link between the city centre, the Grafton centre, and residential areas. It therefore receives heavy footfall at all times of the year.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g4 Modified grassland (161 Tall or tussocky sward, 64 Mown)** **g4a Amenity grassland**
Description **g4 Modified grassland:**To the north, there were sections of longer sward grassland surrounding the wildflower meadow area. These sections were less frequently mown and contained higher frequencies of daisy *Bellis perennis*, spear thistle *Cirsium vulgare* and ragwort *Senecio jacobaea* than elsewhere on Christ's Pieces. **g4a Amenity grassland:** The majority of Christ's Pieces comprised amenity grassland, which at the time of survey had a very low sward height making identification of grass species difficult. There were numerous bare patches of ground and the grassland was heavily used by members of the public. Perennial rye-grass *Lolium perenne* dominated the sward.
Condition **g4 Modified grassland:**The grassland is ranked in poor condition, with patches of bare ground and poor species diversity. **g4a Amenity grassland:** The grassland is ranked in poor condition, with patches of bare ground, heavily mown areas and poor species diversity.

Line of trees

UKHabs habitat types present (secondary codes in brackets) **w1g6 Line of trees**
Description **w1g6 Line of trees:** Trees flanked nearly every footpath through Christ's Pieces, and vary in maturity. Mature horse chestnut *Aesculus hippocastanum* and lime *Tilia cordata x platyphyllos (T. x vulgaris)* trees surrounded the main two paths through Christ's Pieces, and the eastern border. Less mature crab apple *Malus sylvestris*, rowan *Sorbus aucuparia* and silver birch trees were situated in the northern part, parallel to the bus stop and adjacent to the central pathway.
Condition **w1g6 Line of trees:** Condition of the lines of trees varied from good to moderate depending on the maturity of the trees, with younger trees contributing less to a connected canopy across the site.

Introduced shrubs

UKHabs habitat types present (secondary codes in brackets) **u1d Suburban/ mosaic of developed/ natural surface (1160 Introduced shrub, 10 Scattered scrub)**
Description **u1d Suburban/ mosaic of developed/ natural surface:** There are several planted borders in Christ's Pieces. Those at the northern end between the tennis court and footpath contain semi-native shrubbery and young trees such as silver birch *Betula pendula*, holly *Ilex aquifolium* and spotted-laurel *Aucuba japonica*, whereas ornamental shrub flower beds are situated just west of centre surrounding a paved area with benches. Shrubs associated with mature trees also flanked the western end of Christ's Pieces in between the lawn area and the wildflower meadow section.
Condition **u1d Suburban/ mosaic of developed/ natural surface:** The semi-native shrub habitat surrounding the tennis court has poor condition, as there is not a large age range or diversity of shrubs. The flower beds were not condition assessed.

Cropland

UKHabs habitat types present (secondary codes in brackets)
c1a6: Arable margins sown with wildflowers or a pollen and nectar mix
Description
c1a6: Arable margins sown with wildflowers or a pollen and nectar mix: In the south east there is a small section of seeded wildflower meadow. A mixture of species were present including marjoram *Origanum majorana*, yarrow *Achillea millefolium* and cornflower *Centaurea cyanus*.
Condition
c1a6: Arable margins sown with wildflowers or a pollen and nectar mix: Wildflower areas are not condition assessed.

Priority habitats

No Priority Habitats are present at this location.


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site Boundary
Target Note/trees
Target Note
Scattered tree
Linear Features
h2b5 - Hedge Ornamental Non Native
w1g6 - Line of trees
Habitats
c1a6 - Arable margins sown with wild flowers or a pollen and nectar
g4 - Modified grassland
g4a - Modified grassland (amenity)
u1b5 - Buildings
u1b6 - Other developed land
u1d - Suburban/mosaic of developed/natural surface
Project: 99320 CCC Biodiversity Audit
Title: Christ's Pieces - Habitats
Version: 1.0
Date: 18/03/2021
Author: EM
0 15 30 45 60 m
Basemap contains Map data ©2021 Google
N1
N2


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features(inset)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: Christ's Pieces: condition assessment
Version: 1.0
Date: 18/03/2021
Author: EM
0 20 40 60 80 m
Basemap contains Map data ©2021 Google

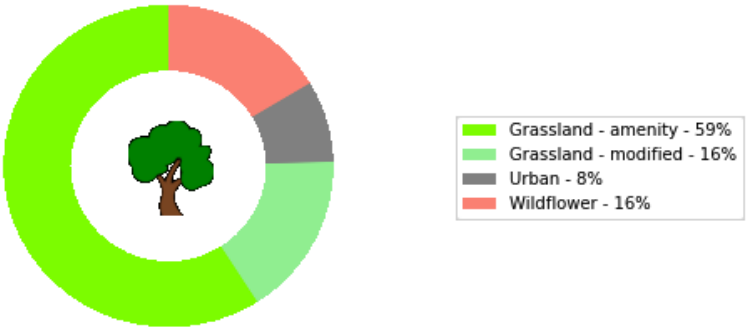
Target Notes:

1. Invertebrate “bug hotel”
2. Extinction Rebellion bird boxes affixed to mature horse chestnut trees

Biodiversity units

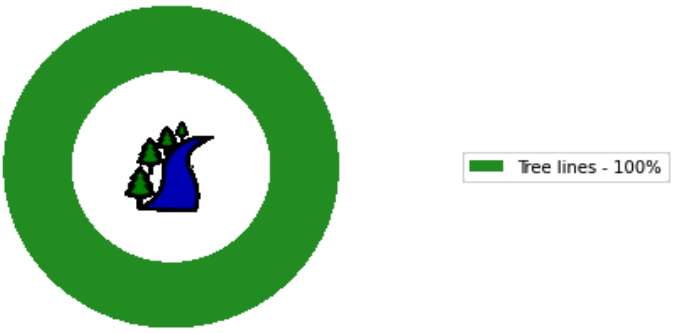
The following charts show the percentage of biodiversity units for each habitat/linear feature type at Christ’s Pieces.

Habitats



Habitat type	*Biodiversity units*
Grassland - amenity	4.09
Grassland - modified	1.13
Urban	0.57
Wildflower	1.13

Linear Features



Habitat type	*Biodiversity units*
Tree lines	5.84

Management

Review of exiting management

There is no biodiversity management plan for Christ's Pieces.

Assessment against selection criteria

Christ's Pieces does not meet City Wildlife Site criteria.

Direction of travel

Habitat	Comments
Grassland	Poor stable because of recreational management
Cropland	There are no condition assessments for this habitat type.
Line of trees	Moderate condition which is likely to be stable.
Shrubs	Poor condition which is likely to be stable.

Since Christ's Pieces is managed intensively as public greenspace, its condition is likely to be stable. The grassland is classed as "poor – stable", the shrubs as "poor – stable" and the lines of trees as "moderate – stable".

Future risks to condition

Potential risks which may impact upon habitat condition and features include;

- Recreational pressures: The function of Christ's Pieces is largely to provide recreational opportunities. However, increased unmanaged recreational use is

likely to have a detrimental impact on the condition of some habitats, as currently demonstrated with patches of worn grass.

Opportunities

Key features of ecological interest (and constraints if any)

The small meadow-style sections of wildflowers provide interest to invertebrates and pollinators, as does the invertebrate feature situated to the west. The bird boxes provide valuable nesting habitat for birds and the mature trees have value to birds for nesting. The mature lines of trees may have value to bats for commuting, foraging or roosting.

Opportunities

Christ's Pieces provides an important area for recreation in close proximity to the city centre, as such it is difficult to incorporate larger areas of biodiversity enhancement without a detrimental effect on this primary function. However, there are opportunities to explore biodiversity interventions which do not impinge on the suitability of this area for recreation.

Christ's College lies adjacent to the site, and has high quality gardens and habitats for hedgehogs. A "hedgehog highway" style gap could be installed along the wall that separates Christ's Pieces with Christ's College, or on the wooden door mid-way down.

The wildflower meadow sections provide a boost to biodiversity but are not widespread enough so as to detract from the site's recreational value. These sections should be retained and could be expanded further. In addition, the longer sward area in the north of the site should be retained and enhanced to promote species diversity, such as through plug planting, overseeding, green hay spreading or removal of cuttings after mowing.

The shrub areas to the north and north west of the site could be enhanced to provide understory vegetation with a more diverse species composition and structure. Improving the condition of these shrub areas could involve ensuring there is a good

age range – a mixture of seedlings, saplings, young shrubs and mature shrubs. The areas should have continuous cover of vegetation, with this generally being less than 5m tall (excepting trees). Relevant shrubs to plant include blackthorn *Prunus spinosa*, hazel *Coryllus avellana*, and hawthorn *Crataegus monogyna*.

There may be potential to create new biodiverse habitats through further tree planting and understorey grassland enhancement. For example the creation of an orchard with a diverse sward beneath would provide both a Habitat of Principal Importance, and an interesting recreation feature for residents.

Creation of features	
Habitats	Creation of orchard habitats with diverse grassland sward beneath
Species	Biodiversity Toolkit (Hedgehog houses, hedgehog highways, bird boxes, bat boxes)
Management/restoration of existing features	
Habitats	Increased wildflower areas and sections of more diverse and longer sward grassland. Improved shrub and planted areas (native species planting)
Species	n/a

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Create biodiverse habitats with native species (perennial meadow grassland, scrub, hedgerow) across at least 20% of the location

Further monitoring work

The bird boxes should be checked to ensure they are situated correctly so as to maximise their chances of occupation.

Parker's Piece

Results

Site description and status

Parker's Piece is a 9.6 hectare open urban greenspace within the city of Cambridge. Christ's Pieces lies to the north and the site is bordered by roads on each side, with Regent Street located on the south west border. This site contains amenity grassland, with lines of trees surrounding the boundary on all sides. Two tarmac paths are cross diagonally over the site. Parker's Piece is a well-used amenity space within the city and is often used for events and recreation.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g4a Amenity grassland** **g4 Modified grassland (17 Ruderal/ ephemeral)**
Description **g4a Amenity grassland:** The amenity grassland was very short, and there were patches of bare ground. Dominant species included perennial rye-grass *Lolium perenne*, white clover *Trifolium repens*, ribwort plantain *Plantago lanceolata* and wall barley *Hordeum murinum.* **g4 Modified grassland:** There was a large area of knotgrass *Polygonum aviculare* situated in the east of the site, where previous events had taken place reducing the grassland cover.
Condition **g4a Amenity grassland:** The grassland is in poor condition, with large patches of bare ground and a poor species diversity. **g4 Modified grassland:** This grassland is also in poor condition for the same reasons.

Lines of trees

UKHabs habitat types present (secondary codes in brackets) **w1g6 Line of trees**
Description **w1g6 Line of trees:** The lines of trees on all but the western boundary comprised mature horse chestnut *Aesculus hippocastanum* and small-leaved lime *Tilia cordata* trees. The western boundary had been more recently planted with plane *Platanus x hispanica (P. occidentalis x orientalis*) trees.
Condition **w1g6 Line of trees:** The lines of trees are in good condition, as they are mature and closely spaced allowing for a connected canopy. The newly planted line of trees is in moderate condition, since the trees are less mature.

Cropland

UKHabs habitat types present (secondary codes in brackets) **c1a6: Arable margins sown with wildflowers or a pollen and nectar mix**
Description **c1a6: Arable margins sown with wildflowers or a pollen and nectar mix:** Sections of seeded wildflower meadow were situated in the north west and north east parts of the site, but were very small in area. Wildflowers in the seed mix included cornflower *Centaurea cyanus*, californian poppy *Eschscholzia californica* and corn chamomile *Anthemis arvensis*.
Condition **c1a6: Arable margins sown with wildflowers or a pollen and nectar mix:** Wildflower areas are not condition assessed.

Priority habitats

No Priority Habitats are present at this location.


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site Boundary
Linear Features
w1g6 - Line of trees
Habitats
c1a6 - Arable margins sown with wild flowers or a pollen and nectar
g4 - Modified grassland
g4a - Modified grassland (amenity)
u1b5 - Buildings
u1b6 - Other developed land
Project: 99320 CCC Biodiversity Audit
Title: Parker's Piece - Habitats
Version: 1.0
Date: 18/03/2021
Author: EM
0 30 60 90 120 m
Basemap contains Map data ©2021 Google
w1g6
c1a6
g4a
u1b5
u1b6
g4


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features(inset)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: Parker's Piece: condition assessment
Version: 1.0
Date: 18/03/2021
Author: EM
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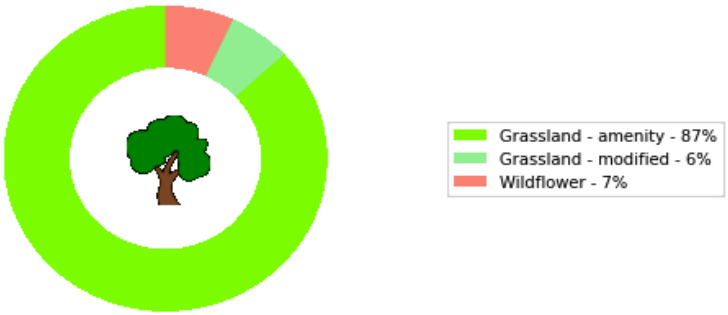
Basemap contains Map data ©2021 Google

Biodiversity units

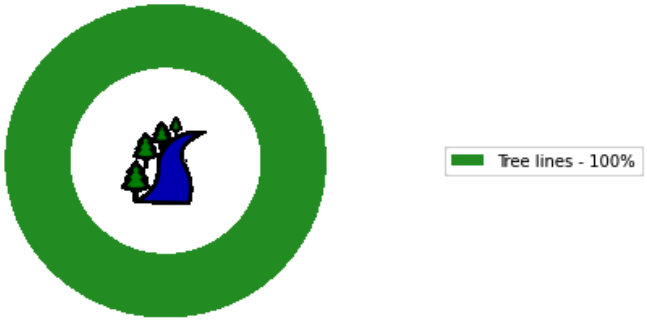
The following charts show the percentage of biodiversity units for each habitat/linear feature type at Parker's Piece.

Habitats



Habitat type	*Biodiversity units*
Grassland - amenity	16.33
Grassland - modified	1.17
Wildflower	1.28

Linear Features



Habitat type	*Biodiversity units*
Tree lines	5.47

Management

Review of exiting management

There is no biodiversity management plan for Parker's Piece.

Assessment against selection criteria

Parker's Piece does not reach City Wildlife Site designation.

Direction of travel

Habitat	Comments
Grassland	Poor stable because of recreational management
Cropland	There are no condition assessments for this habitat type.
Line of trees	Good/moderate condition which is likely to be stable.

Previous survey work has not been found for Parker's Piece. However, since the site is a busy urban greenspace it is likely to have been managed consistently for several years.

The grassland is heavily used by members of the public and for events every year. Therefore the grassland is anticipated to be "poor – stable". The lines of trees are classed as "good/moderate – stable".

Future risks to condition

Potential risks which may impact upon habitat condition and features include;

- Recreational pressures: The function of Parker's Piece is largely to provide recreational opportunities. However, increased unmanaged recreational use is likely to have a detrimental impact on the condition of some habitats, as currently demonstrated with patches of knotgrass colonising bare ground from previous events.

Opportunities

Key features of ecological interest (and constraints if any)

The small meadow-style sections of wildflowers provide interest to invertebrates and pollinators, as does the invertebrate feature situated to the west. The mature lines of trees may have value to bats for commuting, foraging or roosting, particularly given the relative paucity of greenspace in this part of the city.

Opportunities

The importance of Parker's Piece for amenity use makes the creation of larger areas of naturalised habitats challenging. The regular events that are held in the site present difficulties for maintaining the habitats in better condition. Opportunities could be sought to make the most of these challenges, for example if the area of grassland to the east is damaged through the winter on an annual basis as a result of the winter fair then perhaps through the summer months this could be seeded with an annual wildflower mix. Such a strategy would deliver biodiversity benefits as well as converting an unsightly area to a vibrant visual feature within the site.

The existing wildflower sections should be retained and ideally increased in size to provide more suitable habitats for pollinators and other invertebrates.

Some areas for enhancement of grassland could be considered around the margins of the site, particularly along the tree lines which are used less frequently for amenity use. Creation of areas of longer more diverse grass could be considered alongside the paths to help guide pedestrians and reduce erosion alongside them. Mowing regimes could be relaxed, with arisings removed to reduce nutrient levels over time. The process of diversifying these areas could be sped up by scarification and overseeding with an appropriate wildflower mix.

Bird and bat boxes could be established on the mature line of trees forming the northern boundary of the site parallel to Parkside Road. Other ground level enhancements for species (such as bug hotels and towers) may be subject to damage in such a busy location.

Creation of features	
Habitats	Creation of annual wildflower areas in section of damage as temporary cover
Species	Biodiversity Toolkit (Bird and bat boxes)
Management/restoration of existing features	
Habitats	Increased wildflower areas and sections of longer sward grassland on the periphery of the site.
Species	n/a

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Create biodiverse habitats with native species (perennial meadow grassland, hedgerow) across at least 20% of the location

Further monitoring work

None recommended.

Chesterton Recreation Ground

Results

Site description and status

Chesterton Recreation Ground (Chesterton Rec) is located in the suburb of Chesterton, in north east Cambridge. It is 2.3 hectares in size, and is adjacent to St Andrews cemetery. The site is predominantly amenity grassland, occasionally used as pitches, and the site also has playground facilities. A dirt path crosses the east portion of the site and becomes paved closer to the boundary.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g4a Amenity grassland (66 Frequently mown, 210 Urban park)**
Description **g4a Amenity grassland:** Amenity grassland dominates the site and is mown to a very short sward, with patches of bare ground also present. Perennial rye-grass *Lolium perenne* is dominant with other species occurring occasionally, such as ribwort plantain *Plantago lanceolata* and wall barley *Hordeum murinum*.
Condition **g4a Amenity grassland:** The grassland is in poor condition, being heavily mown and dominated by perennial rye-grass with very limited species diversity. At the northern boundary, a section of longer sward grassland contains several non-native garden escapes such as buddleia and bamboo.

Line of trees

UKHabs habitat types present (secondary codes in brackets) **w1g6 Line of trees**
Description **w1g6 Line of trees:** Lines of trees were situated along the southern border, the north west, and the north east sections of the site. Species included ash *Fraxinus*

excelsior and poplar *Populus sp*. Mature pear *Pyrus communis* trees are scattered in the eastern part of the site surrounding the playground.
Condition **w1g6 Line of trees:** The lines of trees were in either moderate or poor condition, as they contained juvenile trees which were spaced far apart resulting in a broken canopy.

Scrub

UKHabs habitat types present (secondary codes in brackets) **h3h Mixed scrub**
Description **h3h Mixed scrub:** A scrub border was present along the west boundary, and was predominantly comprised of bramble *Rubus fruticosus agg.* and buddleia *Buddleja davidii* with an understorey of common nettle *Urtica dioica* and green alkanet *Pentaglottis sempervirens.*
Condition **h3h Mixed scrub:** The scrub border is in poor condition as it lacks a well-developed edge and the ground flora was dominated by nettles and other undesirable species.

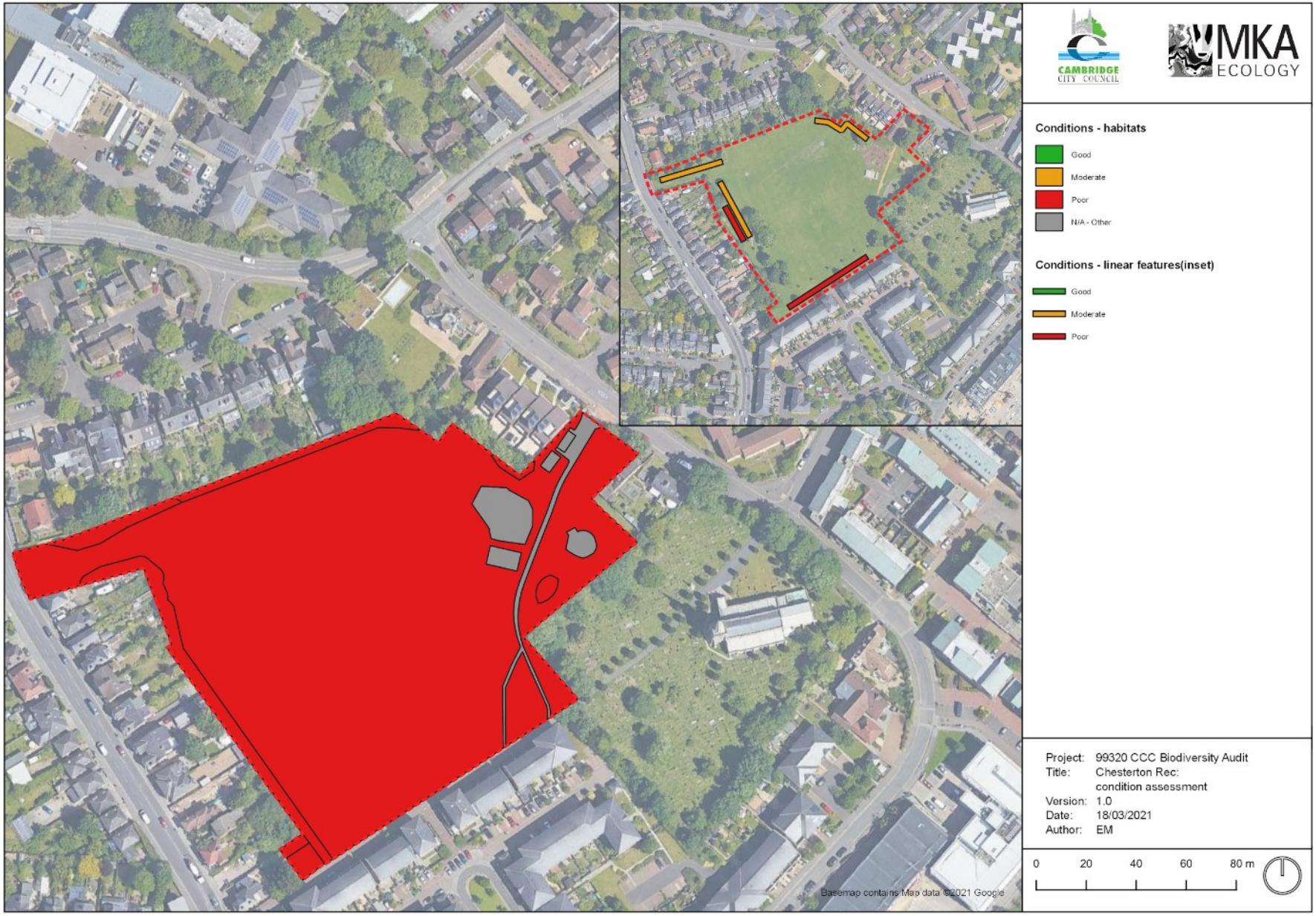
Cropland

UKHabs habitat types present (secondary codes in brackets) **c1a6: Arable margins sown with wildflowers or a pollen and nectar mix**
Description **c1a6: Arable margins sown with wildflowers or a pollen and nectar mix:** South of the playground was a small seeded wildflower meadow with a similar species composition and style to those elsewhere in Cambridge, such as at Christ's Piece and Parker's Piece.
Condition **c1a6: Arable margins sown with wildflowers or a pollen and nectar mix:** Wildflower areas are not condition assessed.

Priority habitats

No Priority Habitats are present at this location.

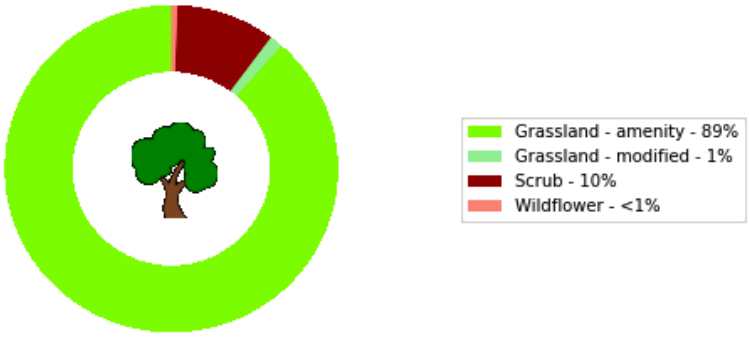

CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site Boundary
Target Note/trees
Scattered tree
Linear Features
w1g6 - Line of trees
Habitats
c1a6 - Arable margins sown with wild flowers or a pollen and nectar
g4 - Modified grassland
g4a - Modified grassland (amenity)
h3h - Mixed scrub
u1b5 - Buildings
u1b6 - Other developed land
Project: 99320 CCC Biodiversity Audit
Title: Chesterton Rec - Habitats
Version: 1.0
Date: 18/03/2021
Author: EM
0 10 20 30 40 m
Basemap contains Map data ©2021 Google
g4
w1g6
h3h
u1b6
g4a
c1a6


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features(inset)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: Chesterton Rec: condition assessment
Version: 1.0
Date: 18/03/2021
Author: EM
0 20 40 60 80 m
Basemap contains Map data ©2021 Google

Biodiversity units

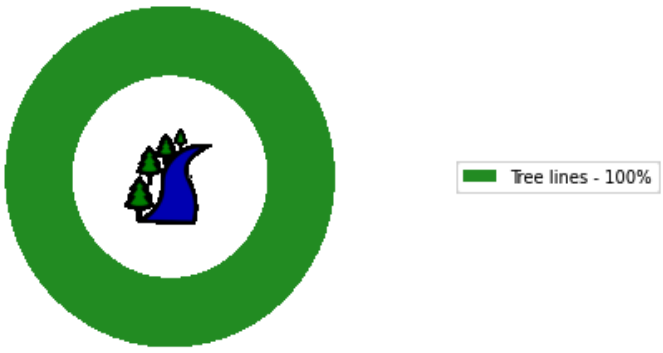
The following charts show the percentage of biodiversity units for each habitat/linear feature type at Chesterton Recreation Ground.

Habitats



Habitat type	*Biodiversity units*
Grassland - amenity	4.13
Grassland - modified	0.06
Scrub	0.45
Wildflower	0.03

Linear Features



Habitat type	*Biodiversity units*
Tree lines	0.83

Management

Review of exiting management

There is no biodiversity management plan for Chesterton Recreation Ground.

Assessment against selection criteria

This site does not meet selection criteria for City Wildlife Site designation.

Direction of travel

Habitat	Comments
Grassland	Poor stable because of recreational management
Cropland	There are no condition assessments for this habitat type.
Line of trees	Moderate/poor condition which is likely to be stable.
Scrub	Poor condition which is likely to be stable.

It is unknown if any previous surveys for wildlife have been undertaken at this site. As such, and due to the management of the site as a recreation ground, the condition is likely to remain stable. However, the majority of habitats present onsite are of low ecological value. The grassland is classed as “poor – stable”, the scrub as “poor – stable” and the trees as “moderate/poor – stable”.

Future risks to condition

Potential risks which may impact upon habitat condition and features include;

- Recreational pressures: The function of Chesterton Recreation Ground is largely to provide recreational opportunities. However, increased unmanaged recreational use is likely to have a detrimental impact on the condition of some habitats, as currently demonstrated with patches of worn grass.

Opportunities

Key features of ecological interest (and constraints if any)

The small meadow-style sections of wildflowers provide interest to invertebrates and pollinators.

Opportunities

Whilst recognising that Chesterton Recreation Ground performs an important function for recreational uses in the area, because of its scale it also presents significant opportunities for delivering biodiversity within the city. Opportunities for the creation of small sections of woodland, more diverse grassland and improving the condition of the scrub could drive significant positive change in the area.

Areas of grassland could be mown less frequently, allowing for a longer sward. In addition, cuttings should be removed and composted off site so as to gradually reduce the nutrient content of the soil over time, to encourage more wildflower growth. This process could be accelerated by scarification and over-seeding.

The scrub at the site is currently in poor condition. Diversifying the species composition and structure could have significant benefits for breeding birds and invertebrates. The combination of improved scrub, and grassland and woodland would create an interesting mosaic for invertebrates, and consequently other species.

Creation of features	
Habitats	Creation of small areas of woodland and scrub Biodiversity Toolkit (wildlife pond)
Species	Biodiversity Toolkit (bug hotels, hibernacula, hedgehog highways, bat boxes, bird boxes)
Management/restoration of existing features	
Habitats	The wildflower meadow section should be expanded.

	The scrub habitats could be improved with greater species diversity and structure. The removal of non-native species from the scrub would also be beneficial. Improved management of existing grassland habitats to raise diversity and condition levels
Species	n/a

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Create biodiverse habitats with native species (perennial meadow grassland, scrub, hedgerow) across at least 20% of the location
- Improve the condition of the scrub from poor to good
- Create a pond habitat

Further monitoring work

None recommended.

Trumpington Recreation Ground

Results

Site description and status

Trumpington Recreation Ground is a large open urban greenspace, situated in south Cambridge. It is 4 hectares in size, and is surrounded by suburban housing of Trumpington. The recreation ground contains play areas, tennis courts, a bowling green and a football pitch.

Habitat descriptions and conditions

Grassland

UKHabs grassland types present (secondary codes in brackets) **g4a Amenity grassland** **g4 Modified grassland (11 Scattered trees, 161 Tall or tussocky sward)**
Description **g4a Amenity grassland:** Amenity grassland is the dominant habitat type on site. This area is closely managed and dominated by perennial rye-grass. **g4 Modified grassland:** Elsewhere in the north, the grass was less regularly mown under collections of trees, and contained more abundant wall barley *Hordeum murinum*, cock's-foot *Dactylis glomerata* and red fescue *Festuca rubra agg.*. In addition, the grassland between the road and the fence separating football pitch was less frequently mown and had a greater species diversity.
Condition **g4a Amenity grassland:** The grassland is in poor condition across the site, with a dominance of perennial rye grass. **g4 Modified grassland:** This grassland is also in poor condition with a lack of neutral grassland indicators and a dominance of perennial rye grass.

Lines of trees and scattered trees

UKHabs trees present (secondary codes in brackets) **w1g6 Line of trees**

Description **w1g6 Line of trees:** There are several lines of trees across the site, notably flanking the main tarmac path across the site and also surrounding most of the site perimeter. Tree species included silver birch *Betula pendula*, horse-chestnut *Aesculus hippocastanum*, norway maple *Acer platanoides* and pedunculate oak *Quercus robur.* Most trees were nearing maturity.
Condition **w1g6 Line of trees:** The lines of trees vary in condition from poor to moderate, with those in poor condition being comprised of younger trees that are spaced out with canopy gaps >5m and those in moderate condition having more mature trees.

Urban – Introduced shrubs

UKHabs shrubs present (secondary codes in brackets) **u1d Suburban/ mosaic of developed/ natural surface (1160 Introduced shrub)**
Description **u1d Suburban/ mosaic of developed/ natural surface:** Sections of introduced shrubs bordered the path, the tennis courts and the bowling green. These areas contained a mixture of native and non-native plant species, such as buddleia *Buddleja davidii*, holly *Ilex aquifolium* and Canadian fleabane *Erigeron canadensis.*
Condition **u1d Suburban/ mosaic of developed/ natural surface:** The planted areas were not condition assessed.

Hedgerow

UKHabs hedgerows present (secondary codes in brackets) **h2b5 Hedgerow Ornamental Non-Native**
Description **h2b5 Hedgerow Ornamental Non-Native:** A hedgerow surrounds the bowling green. It is trimmed to shape, and is tall but narrow. Similar to the introduced shrubs, this hedgerow contained a variety of species such as cherry laurel *Prunus laurocerasus*, sycamore *Acer pseudoplatanus*, garden privet *Ligustrum ovalifolium* and hawthorn *Crataegus monogyna.*
Condition

h2b5 Hedgerow Ornamental Non-Native: The hedgerow is in moderate condition, as it lacks a >1m width of undisturbed ground either side of the hedgerow (the amenity grassland is mown right up to the hedgerow) and contains gaps for more than 10% of its total length.

Cropland

UKHabs habitat types present (secondary codes in brackets) **c1a6: Arable margins sown with wildflowers or a pollen and nectar mix (16 Tall herb)**
Description **c1a6: Arable margins sown with wildflowers or a pollen and nectar mix:** In the north of the site, a small area of seeded wildflower meadow exists with species such as mugwort *Artemisia vulgaris*, red campion *Silene dioica*, californian poppy *Eschscholzia californica* and pineapple weed *Matricaria discoidea.*
Condition **c1a6: Arable margins sown with wildflowers or a pollen and nectar mix:** Wildflower areas are not condition assessed.

Priority habitats

No Priority Habitats are present at this location.

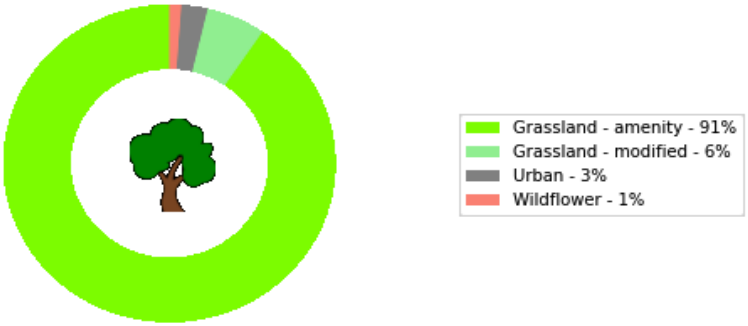

w1g6
u1d
g4
c1a6
g4a
u1b6
h2b5
u1b5
N1
Site Boundary
Target Note/trees
Target Note
Linear Features
h2b5 - Hedge Ornamental Non Native
w1g6 - Line of trees
Habitats
c1a6 - Arable margins sown with wild flowers or a pollen and nectar
g4 - Modified grassland
g4a - Modified grassland (amenity)
u1b5 - Buildings
u1b6 - Other developed land
u1d - Suburban/mosaic of developed/natural surface
Project: 99320 CCC Biodiversity Audit
Title: Trumpington Rec - Habitats
Version: 1.0
Date: 18/03/2021
Author: EM
0 10 20 30 40 m
Basemap contains Map data ©2021 Google


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features(inset)
Good
Moderate
Poor
Project: 99320 CCC Biodiversity Audit
Title: Trumpington Rec: condition assessment
Version: 1.0
Date: 18/03/2021
Author: EM
0 20 40 60 80 m
Basemap contains Map data ©2021 Google

Biodiversity units

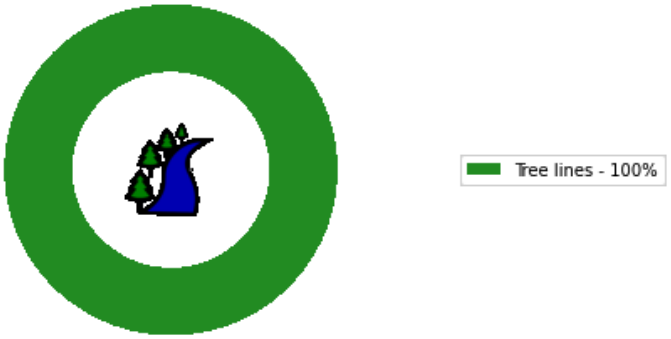
The following charts show the percentage of biodiversity units for each habitat/linear feature type at Trumpington Recreation Ground.

Habitats



Habitat type	*Biodiversity units*
Grassland - amenity	6.39
Grassland - modified	0.41
Urban	0.18
Wildflower	0.08

Linear Features



Habitat type	*Biodiversity units*
Tree lines	2.85

Management

Review of exiting management

There is no biodiversity management plan for Trumpington Recreation Ground.

Assessment against selection criteria

Trumpington Recreation Ground does not meet City Wildlife Site designation.

Direction of travel

Habitat	Comments
Grassland	Poor stable because of recreational management
Cropland	There are no condition assessments for this habitat type.
Line of trees	Poor/moderate condition which is likely to be stable.
Hedgerow	Moderate condition which is likely to be stable.

No previous survey data was found for Trumpington Rec, however, since this area is managed for playing fields and recreation, it is likely to have received identical regular management for several years. Therefore, the grassland is ranked as “poor – stable”, the hedgerow as “moderate – stable”, and the lines of trees as “poor/moderate – stable”.

Future risks to condition

Potential risks which may impact upon habitat condition and features include;

- Establishment and spread of non-native invasive plant species.
- Impact from human recreation, particularly dog walking, on the majority of habitats.

Opportunities

Key features of ecological interest (and constraints if any)

The small meadow-style sections of wildflowers provide interest to invertebrates and pollinators. The hedgerow and scrub habitats are likely to provide opportunities for invertebrates and nesting birds at this location.

Opportunities

Given the likely value of the site for human recreation, conversion of large areas of the amenity grassland into more valuable grassland is unlikely. However, there is scope for interventions away from areas of high use. Around the perimeter of the site, the grassland can be mown less frequently, allowing for a longer sward. In addition, cuttings should be removed and composted off site so as to gradually reduce the nutrient content of the soil over time, to encourage more wildflower growth. This process could be accelerated by scarification and over-seeding. This could also be applied under the planted tree areas which receive less footfall.

Areas of non-native scrub could be replaced with native species, which in combination with more diverse grassland could provide important habitat for invertebrates and help to create a more natural environment at Trumpington Recreation Ground. Opportunities to develop these habitats along the eastern and southern margin could also be considered.

The section of wildflower meadow can be expanded, along with introducing small scale enhancement features such as designated invertebrate areas. In addition bird boxes could be affixed to many of the mature trees across the site.

Creation of features	
Habitats	Biodiversity Toolkit (wildflower meadows) Creation of native scrub islands in enhanced grassland habitats
Species	Biodiversity Toolkit (Bird boxes, bee banks, bee hotels, beetle towers, bug hotel)
Management/restoration of existing features	

Habitats	Improved management of existing grassland habitats to raise condition levels Replacement of non-native scrub species with native species
Species	n/a

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Create biodiverse habitats with native species (perennial meadow grassland, scrub, hedgerow) across at least 20% of the location

Further monitoring work

None recommended.

King's Hedges Recreation Ground

Results

Site description and status

King's Hedges Recreation Ground is a 3.9 hectare area of open green space in the north of the City of Cambridge. It is dominated by large open amenity spaces and sports pitches in the centre, with a playground in the west. Planted tree lines run along paths and an area of introduced scrub encircles the playground and splash pad.

Habitat descriptions and conditions

Grassland

UKHabs habitat types present (secondary codes in brackets) **g4 Modified grassland (64 Mown)** **g4a Amenity grassland (66 Frequently mown)**
Description Open grassy areas make up 84% of the site, with formally maintained amenity areas making up 62%, largely within the centre of the site. Whilst no formal sports pitches are present, the southern section appears to be used for informal games; goal posts are present. Perennial rye-grass *Lolium perenne* dominates, along with other species typical of recreation grounds and sports pitches. There are embanked boundaries to the playing field, with planted tree lines. Here there is a relaxed mowing regime, with average sward height at approximately 30-40cm. Grasses still dominated in these areas, with wall barley *Hordeum murinum*. frequent and locally abundant. Herbs were more evident, but were restricted to species typical of urban green spaces: ribwort plantain *Plantago lanceolate,* autumn hawkbit *Scorzoneroides autumnalis,* common ragwort *Jacobaea vulgaris* and common mallow *Malva sylvestris* all evident throughout. A section within the more open area in the north has also been released from the more intensive management regime.

Condition The large expanses of grassland to the centre of the site are ranked as 'poor' under the 'Amenity/Road verge' criterion. Those areas to the flanks are rated as 'moderate'. Whilst the latter areas do not match any Priority Habitat descriptions, they are relatively free of damage, scrub and undesirable species. Rye-grass cover is also <25% here.

Scrub

UKHabs habitat types present (secondary codes in brackets) **h3h Mixed scrub (1160 Introduced shrub)**
Description A band of introduced shrub forms a barrier around the playground and splash pad. Planted cherry *Prunus* sp. and firethorn *Pyracantha coccinea* are the two most abundant species. Tree-of-heaven *Ailanthus altissima* was observed in the eastern portion and appears to be spreading.
Condition The scrub is in 'poor' condition. All condition criteria are being failed, with the exception that the scrub does have three or more woody species. It is otherwise uniform in structure, has a high invasive species composition and has no tall herb edge (amenity grassland being present all around).

Tree lines

UKHabs habitat types present (secondary codes in brackets) **w1g6 Line of trees (1171 Mature tree, 1172 Young tree)**
Description A total of 580m of tree lines is present at the site. Tree species planted are typical of parks and gardens, with cherry, *Prunus*, horse-chestnut *Aesculus hippocastanum*, Italian alder *Alnus cordata*, lime *Tilia platyphyllos x cordata = T. x europaea* and sycamore *Acer pseudoplatanus* all frequent. The trees range in age

from immature to mature; none have any features that are more common in veteran trees.
Condition The trees vary in age and canopy cover: Those in the south of the site are more mature, giving rise to tree lines of 'good' condition. Immediately north of the central path, the size and spacing of the canopy gaps give rise to a condition of 'poor' condition.

Priority habitats

No Priority Habitats are present at this location.


CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Habitats
g4 - Modified grassland
g4a - Modified grassland (amenity)
h3h - Mixed scrub
u1b6 - Other developed land
Linear features
w1g6 - Line of trees
Point features
Target Note
Project: 99320 CCC Biodiversity Audit
Title: Kings Hedges Recreation ground - habitats
Version: 0.1
Date: 24/03/2021
Author: JH
10 0 10 20 30 40 50 m
Basemap contains Map data ©2021 Google
N1

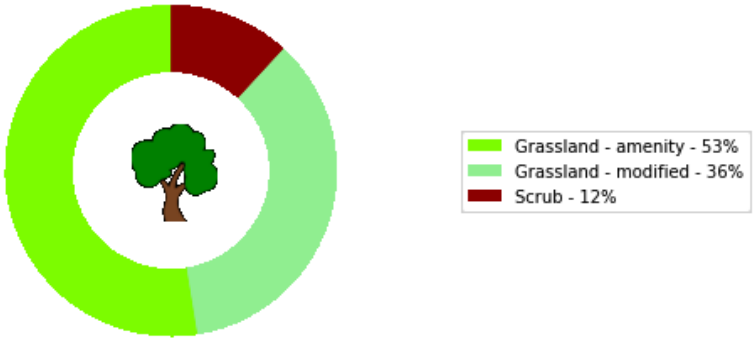

CAMBRIDGE CITY COUNCIL
MKA ECOLOGY
Site boundary
Conditions - habitats
Good
Moderate
Poor
N/A - Other
Conditions - linear features (inset)
Good
Moderate
Poor
N/A - Other
Project: 99320 CCC Biodiversity Audit
Title: Kings Hedges Recreation Ground:
Version: condition assessment
Date: 0.1
Author: 26/03/2021
JH
10 0 10 20 30 40 50 m
Basemap contains Map data ©2021 Google

Target Notes:

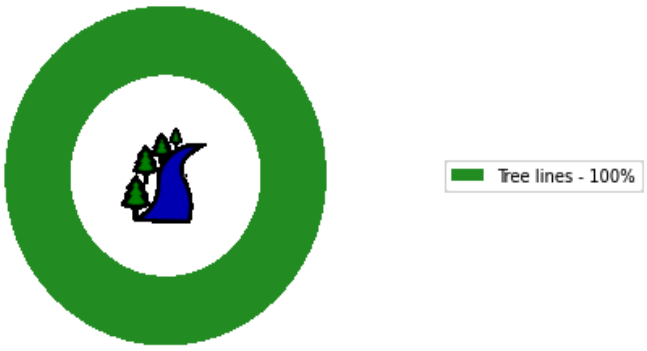
1. Tree of heaven - invasive species

Biodiversity units

The following charts show the percentage of biodiversity units for each habitat/linear feature type at Kings Hedges Recreation Ground.



Habitat type	*Biodiversity units*
Grassland - amenity	5.00
Grassland - modified	3.37
Scrub	1.12



Habitat type	*Biodiversity units*
Tree lines	2.84

Management

Review of exiting management

The site is managed by the City Council as a recreation ground and as such there is no formal conservation management to review.

Assessment against selection criteria

The site does not qualify under any of the City Wildlife Site criteria for habitats or vascular plant. No comment can be made as to whether the site qualifies under any non-vascular plant or faunal criterion, though it is considered unlikely.

Direction of travel

No direction of travel is attempted for this site.

Future risks to condition

Conditions for the majority of habitats are already largely poor, so there are few risks to a decline in condition. There are nevertheless risks to preventing future improvements to conditions:

- Impact from human recreation, particularly dog walking and fouling, on the majority of habitats.
- Establishment and continued spread of invasive non-native species.
- Impacts on fauna from inappropriate lighting.

Opportunities

Key features of ecological interest (and constraints if any)

The tree lines and scrub habitats are likely to provide opportunities for invertebrates and nesting birds at this location.

Opportunities

There are ample opportunities at the site, afforded in most part on account of its size. Even with maintaining the southern section for informal sports, approximately 2ha remain for habitat creation. The abundance of mature trees, particularly on the eastern boundary also offer potential for a range of taxonomic groups. Many of the features within the Biodiversity Toolkit can be employed at the site; some can be

used to benefit biodiversity as well as enhance the existing play facilities, e.g., beetle towers, if created into a 'Giant's Causeway' style stumpery.

Efforts are clearly already underway to enhance the existing grassland; much of the perimeter is left unmown for part of the year. There is an opportunity to both enlarge these areas and enhance them with the targeted planting of wildflowers. As these are partially shaded, a 'hedgerow' or 'woodland' seed mix would be most appropriate. The more traditional 'meadow' planting would be an appropriate target habitat for the more open section north of the playing field, with a pond an ideal new feature towards the north. The exact location of a pond in this area (i.e., north or south of the west-east treeline) should be carefully considered; locating north of the treeline will bring benefits of greater visibility to the public and the potential role that might play in more engagement with residents, against the potential negative impacts from increased disturbance - especially dogs - and shading.

Creation of features	
Habitats	Pond. An area within the grassland to the north. Biodiversity toolkit: Ponds; Bog garden; Planting; Woodpiles
Species	Biodiversity toolkit. Bat boxes; Bee banks; Bee hotels; Beetle tower; Bird boxes; Bramble/Nettle patches (especially at the base of the more open canopy treelines); hedgehog habitats; hibernacula (particularly around ponds)
Management/restoration of existing features	
Habitats	Grassland. Enhancement of grassland in as many areas as possible (including playing field, if deemed appropriate). Woodland/hedgerow wildflower seeding in areas under trees and a more traditional meadow mixes in open areas: Biodiversity toolkit: Grassland; Meadows.
Species	Removal of tree-of-heaven.

Key targets for the next 10-20 years

The following actions could be considered as key management targets for the next 10-20 at this location;

- Create biodiverse habitats with native species (perennial meadow grassland, scrub, hedgerow) across at least 20% of the location
- Create a pond and wetland habitat

Further monitoring work

The creation of large areas of new and/or enhanced habitats gives opportunities for combining monitoring the success of new/enhanced habitats with enhancing community engagement (e.g., a 'BioBlitz') as seen at other sites which have already undergone wholesale habitat restoration/creation (e.g., Hobson's Park).

Monitoring the spread of invasive non-native species.

Appendix 3

- Supplementary data.
    - Survey dates and metadata: **visit-metadata-all-sites.xlsx**
    - GIS data and metadata: **ccc-audit-gis.zip**
    - Condition assessments: **condition-assessment-all-sites.xlsx**
    - Condition descriptions: **conditions-descriptions-only.xlsx**
    - Site botanical species lists: **species-list-all-sites.xlsx**
    - Lookup lists: **ukhabs-bng-lookups.xlsx**
        - **List of UKHab types and codes.**
        - **Mapping of UKHab habitat types to Biodiversity Net Gain Habitat types.**
        - **Distinctiveness scores of each Biodiversity Net Gain Habitat type.**
        - **Condition scores.**
        - **List of sites, strategic significance values and designations.**
        - **Strategic significance multipliers**

MKA
ECOLOGY