Ecology and Geology

Baseline Survey Report

Community Pollinator Fund – West of England

Report date:	1st December 2023
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Commissioned by:	West of England Combined Authority

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Document History

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Please be aware that a report of this nature can only provide a snapshot of the site's ecological importance. The survey results and any recommendations contained within this report will remain valid for two years following the date of survey, assuming no significant change in the site.

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1. Introduction

1.1. Report Scope and Approach

1.1.1. This report has been prepared by Geckoella Ltd for the West of England Combined Authority (hereafter, 'the Authority'). This report has been written following the approach laid out in CIEEM's 'Guidelines for Ecological Report Writing' (CIEEM, 2017).

1.1.2. It provides the details of a baseline ecological assessment in relation to habitats and invertebrates, particularly pollinators, for land located at five sites. Each site is a part of a project aimed at providing ecological enhancement within the remit of the Authority. The project is called the Community Pollinator Fund (hereafter, 'the Fund'). Sites that are a part of the Fund each have bespoke management plans to deliver ecological enhancement. A summary of the sites involved is provided below.

- Yate Common Orchard, Yate, Bristol, BS37 4PR. This site is a community orchard that is present on the western extent of Yate Common.
- Newbridge Open Space, Bath, BA1 3HW. This site is a public park located off Newbridge Road adjacent to the River Avon.
- SGS College, Filton, Bristol, BS34 7AT. This site is a further and higher education college within Bristol and contains some greenspace immediately adjacent to the buildings that were formerly a wildlife garden.
- Brimsham Green School, Yate, Bristol, BS37 7LB. This site is a secondary school that has dedicated a large field within its grounds to ecological enhancement.
- Sodbury Wildflower Meadow, Chipping Sodbury, Bristol, BS37 6PT. This site is a former agricultural field that has been placed under an ecological enhancement management plan.

1.1.3. The objectives of the report are to:

- describe the baseline habitats present within each of the sites;
- describe the baseline invertebrate assemblages within each of the sites;
- map habitats within the survey area;
- produce a baseline ecological dataset that can be used during progress monitoring over the coming years.

1.1.4. To meet these objectives, a field survey of the site was conducted by suitably qualified and experienced ecologists (Table 1) in suitable conditions (Table 2). The report is separated into sections for each of the sites surveyed.

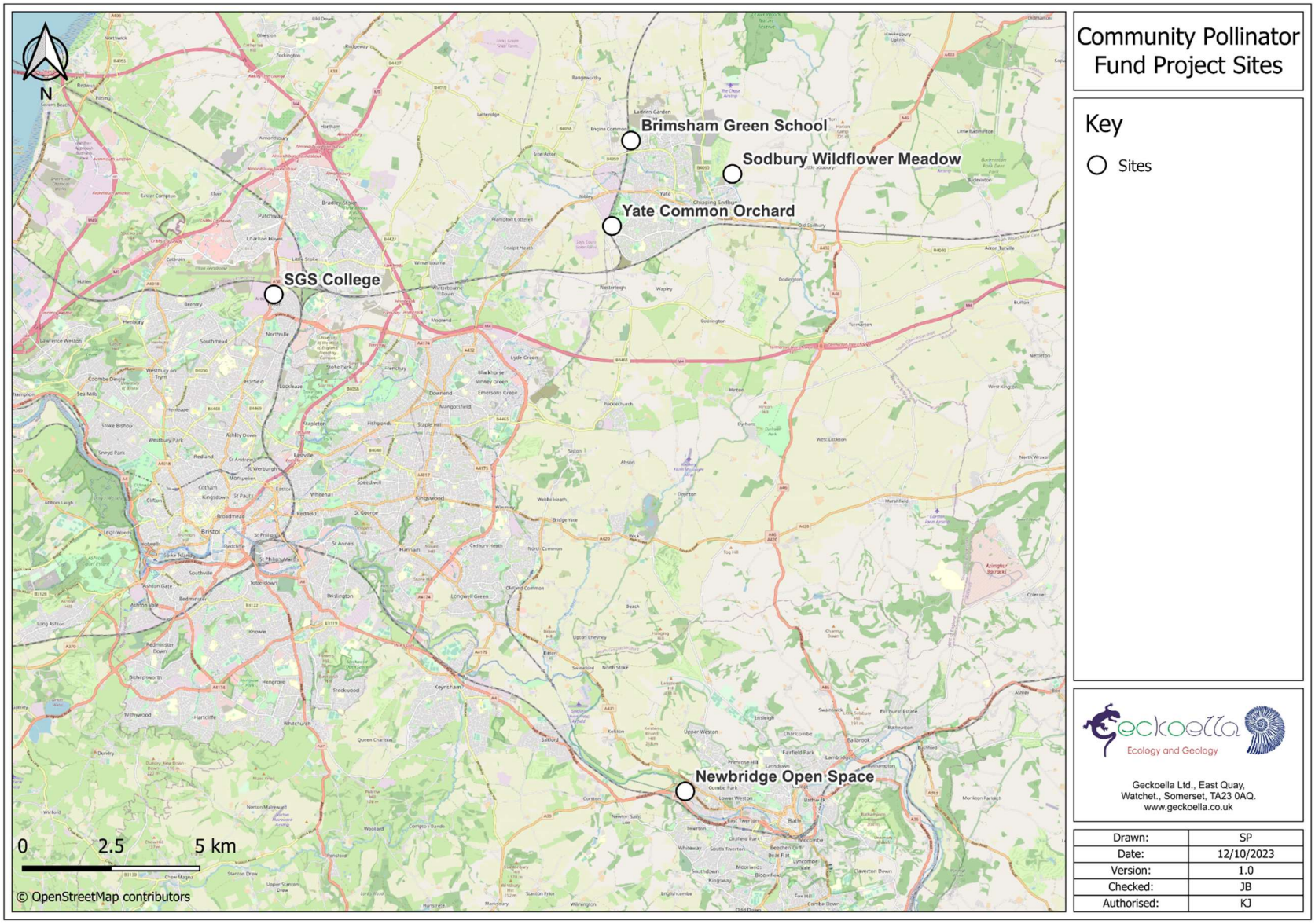

Figure 1. Overarching Location Plan of Sites Surveyed

2. Methodology

2.1. Field Survey

2.1.1. Ecological walkovers of the sites were undertaken between 26th – 27th July 2023. The field surveys were conducted by suitably qualified and experienced ecologists in suitable weather conditions (Table 1 and Table 2, respectively).

Table 1. Details and experience of survey personnel

Date	Activity	Sites	Ecologists	Qualifications/ Experience
26/07/2023	Ecological Assessment	SGS College Brimsham Green School Sodbury Wildflower Meadow	Josh Butterworth	BSc (Hons), MSc, ACIEEM FISC 5
			David Boyce	BSc (Hons) Invertebrate specialist with over 20 years' experience.
27/07/2023	Ecological Assessment	Newbridge Open Space Yate Common Orchard	Josh Butterworth	BSc (Hons), MSc, ACIEEM FISC 5
			David Boyce	BSc (Hons) Invertebrate specialist with over 20 years' experience.

Table 2. Weather

Date	Description	Temp (°C)	Rain (0-5)	Cloud cover (Oktas[1])	Wind (Bft[2])
26/07/2023	Dry, warm and overcast	18	1	5	0
27/07/2023	Occasional showers, warm and overcast	19	0	4	1

[1] An okta is a unit of measurement to describe the amount of cloud cover, it is measured on a scale ranging from 0 oktas (completely clear sky) through to 8 oktas (completely overcast).
[2] Beaufort is a measurement to describe wind speed, it is measured on a scale ranging from 0 (completely calm) to 12 (hurricane conditions).

2.2. Habitats Assessment

2.2.1. The broad vegetation and habitat types present within each of the sites were categorized and mapped in accordance with the UK Habitat Classification methodology with a minimum mapping unit of 25 m^2 (UKHab Ltd, 2023). A list of plant species were recorded for each habitat during a structured walk through the extent of the habitat. The abundance of plant species was recorded using the DAFOR system:

- **D**ominant;
- **A**bundant;
- **F**requent;
- **O**ccasional;
- **R**are.

2.3. Invertebrate Assessment

2.3.1. Methodologies employed to collect terrestrial invertebrates broadly followed those suggested by Natural England (NE) for carrying out invertebrate assessments (Drake, *et. al.*, 2007). They involve the use of a range of invertebrate sampling techniques, such as ground searching, sweeping and beating, with the aim being to collect samples representative of all the main habitats present on each site. Each site was divided into survey units, which are described and illustrated in the relevant habitat account and habitat Map (e.g. section 3.1 and Figure 2 for the SGS College site). These survey units have been the basis for recording invertebrates with the full data to be found in the Results Table prepared for each site (e.g. Table 3 for the SGS College).

2.3.2. The main focus of the survey was to record pollinator species, primarily butterflies, bumblebees and solitary bees. The timing of the survey was sub-optimal for the latter group, which have their peak activity period in late spring but was within the optimal period for recording the greatest diversity of butterflies and bumblebees. It is hoped to carry out future surveys of these sites in late May, which will focus on recording solitary bees and early-flying butterfly species that would have been missed this year.

2.3.3. A 'W-route' was walked slowly in each survey unit with any flower-rich patches of likely pollinator feeding/foraging resources being approached to within a distance of no more than two metres. Numbers of all butterflies and bumblebees in each survey unit were recorded. For all other invertebrates (including any late-flying solitary bees) only presence/absence was recorded. The workers of White-tailed *B. lucorum* and Buff-tailed *B. terrestris* Bumblebees, are indistinguishable and have been recorded as '*B. lucorum/terrestris*' worker'. Even where definite males or queens of the 'White-tailed Bumblebee' were observed, these comprise a complex of three very similar segregate species, only separable by microscopic examination, which were therefore recorded here as '*Bombus lucorum* agg.'

2.3.4. Butterflies and bumblebees have been named in the field but for many invertebrates, it is necessary to collect specimens for identification with a microscope in the lab. All specimens collected have been identified to species level. Examples of groups covered in this report include: beetles (Coleoptera); selected fly (Diptera) families such as robberflies and allies (Larger Brachycera) and hoverflies (Syrphidae) and ants, bees and wasps (Aculeate Hymenoptera). These invertebrate groups have been selected

because they are well represented in the habitat types present on these sites (e.g. grassland, ruderal vegetation and scrub). Records have also been kept of all invertebrates noted within easily identified groups such as butterflies (Lepidoptera), and grasshoppers, crickets and allies (Orthopteroidea). Both of these groups can also be a useful group for assessment of grassland habitats. Specimens of any important invertebrates recorded during the 2023 survey have been retained in the author's collection.

2.4. Limitations

2.4.1. The sites were each subject to a full survey, however, on 26th July 2023, there was a short period of rain during the survey of Sodbury Wildflower Meadows. This may have reduced the activity of invertebrates during that survey and therefore some may have been under recorded. This constraint is not considered to be significant as it was a light shower, however, it is considered during the interpretation of the results.

2.4.2. The absence of any particular species during the survey is not considered evidence of absence. The surveys were undertaken quite late in the year in relation to pollinators. This constraint is not considered significant as weather conditions were broadly favourable and the time of year is considered during the interpretation of the results.

3. SGS College

3.1. Background

3.1.1. SGS College have signed up to the Fund as they would like to teach students about habitat creation during the establishment of a 'Well-BEEing Garden'. The proposed Well-BEEing Garden will be located behind the main college buildings. Furthermore, there is a grass verge adjacent to the college's car park that is proposed to be planted up as a pollinator strip.

3.2. Habitats

3.2.1. The site is situated in an urban location, within greenspace surrounding the college campus, adjacent to a large car park and a main road. Therefore, there is high potential for nutrient enrichment from adjacent land-use. Particularly from the main road.

3.2.2. The habitats identified within the site included: other neutral grassland; modified grassland; other hedgerow; lines of trees; standing open water; buildings; polyculture (Figure 2, Table 3).

3.2.3. Other neutral grassland was restricted to the southwestern extent of the site (P1). The habitat was disturbed through regular access creating bare ground in its centre. There was also an area of historical polyculture present that is long-since active. The habitat in general was coarse, with tall ruderal species frequent throughout, likely owing to a lack of management. The species mix was relatively diverse with some positive indicators present, such as Common Knapweed *Centaurea nigra*.

3.2.4. Modified grassland was present in the west and the east of the site (P1 and P2, respectively). In the west of the site, it extended from the northern extent of the other neutral grassland, through to the edge of the car park. The habitat was heavily shaded with scattered trees throughout, such as Wild Cherry *Prunus avium*, Silver Birch *Betula pendula* and Black Pine *Pinus nigra* (P4). The grassland was regularly mown with a limited species diversity. In the east of the site, the habitat was similarly species-poor and heavily mown, although with some positive indicator species, such as Common Bird's-foot Trefoil *Lotus corniculatus*. In the northern extent of the grassland, two old compost heaps were present.

3.2.5. A hedgerow was present on the western border of the site, between the grasslands and the main road (P5). The hedgerow was species-poor and defunct, comprised almost entirely of an Oleaster species *Elaeagnus sp*. The hedgerow was heavily managed, and had been flailed to a height of 1.5 m.

3.2.6. On the eastern side of the hedgerow, a line of trees was present (P6). This line of trees comprised almost entirely European Pear *Pyrus communis* with some Sycamore *Acer pseudoplatanus*. Interestingly there was some regeneration of Ash *Fraxinus excelsior* but there were no mature Ash trees forming a part of this line of trees.

3.2.7. On the eastern side of the site, another line of trees was present within the strip of modified grassland (P7). This line of trees was comprised entirely of Broad-leaved Cockspur Thorn *Crataegus persimillis*.

3.2.8. Within the western modified grassland, two small ponds were present (standing open water, P8). These ponds were heavily shaded with limited suitability for botanical assemblages. One pond was covered with Common Duckweed *Lemna minor*, suggesting eutrophic conditions. Shrubs of Buddleia *Buddleja davidii* and Laurel *Laurus* sp. surrounded the ponds.

3.2.9. The building was an old polytunnel, within which was predominantly bare ground and was being used for the storage of gardening equipment (P9).

3.2.10. The polyculture in the northwestern extent of the site was overgrown with various species although most were horticultural (P10). Some of the species identified included those within the Squash genus *Cucurbita*.

3.3. Invertebrates

3.3.1. The most diverse invertebrate fauna was in survey unit SGS1, which was similarly the most diverse botanically – providing rich resources for foraging and feeding invertebrates. Other areas of the site were mostly cut amenity grasslands and exotic shrubs and hedges of low interest.

3.4. Recommendations

3.4.1. Some outline recommendations in relation to the SGS College are provided below, these should be considered in line with existing management plans to ensure their success.

- Sensitive cutting regime applied to all grassland areas. This should entail no cutting between March and August with regular cutting throughout Autumn and Winter.
- The shrubs surrounding the pond could be thinned to reduce shading and improve the availability of light for species within the ponds.
- Consideration of the use of local, native species-rich seed mixes in areas of poor modified grassland, such as SGS2. Suitable mixes include the EL1 Flowering Lawn Mixture from Emorsgate Seeds. If used, then the mixture should be applied and maintained in accordance with the associated instructions.

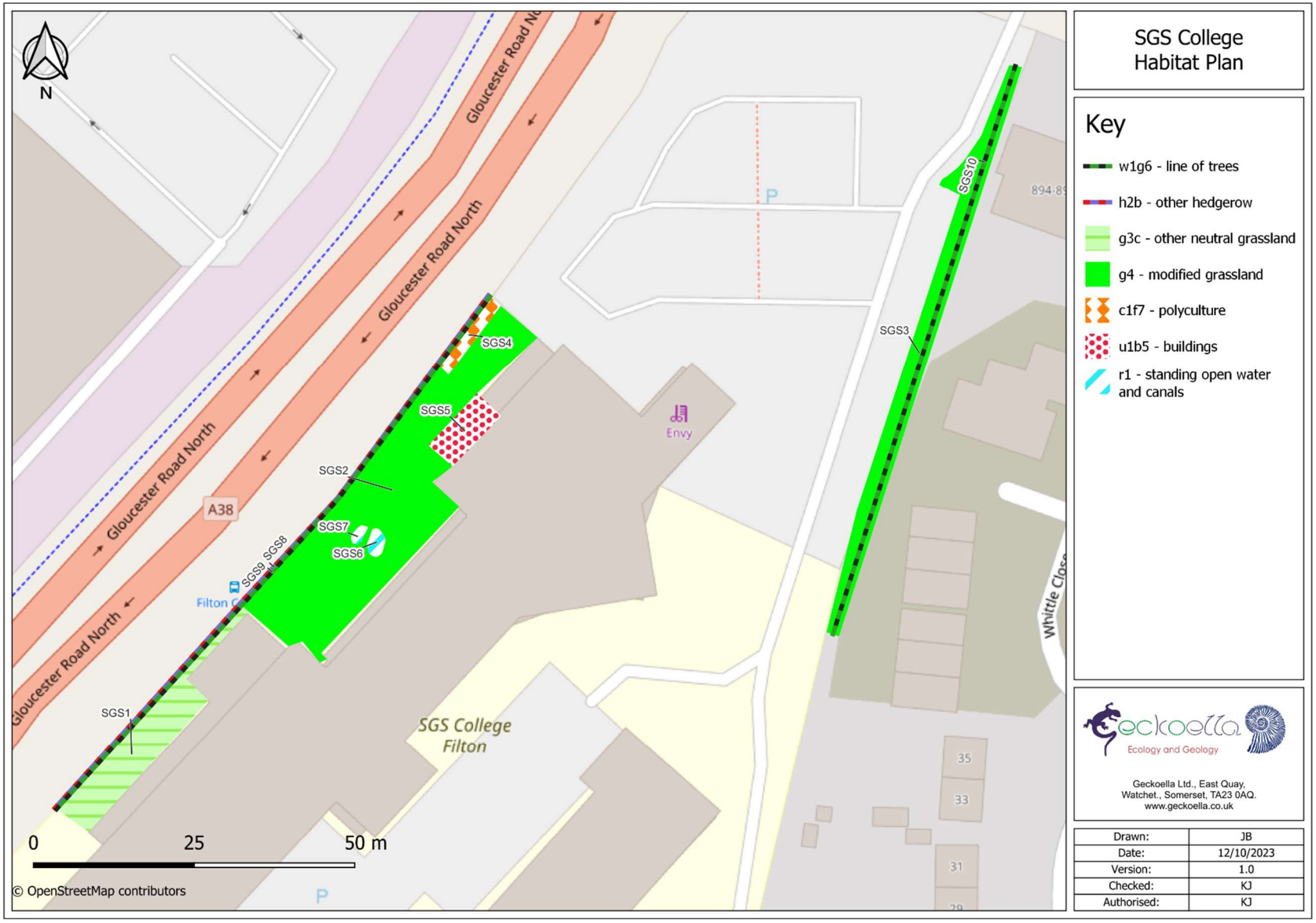

Figure 2. SGS College Habitat Plan

Table 3. SGS College Habitat and Invertebrate Data Table

Reference	Habitat	Plant Species (Scientific)	Plant Species (Common)	Invertebrate Species	Secondary Code(s)	Area / Length
SGS1	g3c – other neutral grassland	*Centaurea nigra F* *Hypericum perforatum F* *Galium album OLF* *Achillea millefolium F* *Daucus carota OLF* *Prunella vulgaris O* *Rhinanthus minor O* *Origanum majorana R* *Leucanthemum vulgare O* *Glechoma hederacea F* *Potentilla reptans F* *Convolvulus arvensis O* *Plantago lanceolata O* *Rubus fruticosus agg. F* *Epilobium hirsutum O* *Holcus lanatus A* *Dactylis glomerata A* *Lolium perenne A* *Rumex obtusifolius R* *Sonchus arvensis R* *Sonchus asper R* *Letuca sativa R* *Clinopodium vulgare R*	Common Knapweed F Perforate St. John's Wort F Hedge Bedstraw OLF Yarrow F Wild Carrot OLF Common Selfheal O Yellow Rattle O Marjoram R Oxe-eye Daisy O Ground Ivy F Creeping Cinquefoil F Field Bindweed O Ribwort Plantain O European Bramble Complex F Great Willowherb O Yorkshire Fog A Cock's-foot A Perennial Rye Grass A Broad-leaved Dock R Perennial Sow-thistle R Prickly Sow-thistle R Lettuce R Wild Basil R	*Ambigolimax valentianus* Iberian Threeband Slug *Tandonia budapestensis* Budapest Keeled Slug *Forficula auricularia* Common Earwig *Palomena prasina* Common Green Shieldbug *Heterogaster* urticae Nettle Ground Bug *Tachyporus dispar* A rove beetle *Nehemitropia lividipennis* A rove beetle *Lithocharis nigriceps* A rove beetle *Rugilus orbiculatus* A rove beetle *Gyrohypnus fracticornis* A rove beetle *Bisnius fimetarius* A rove beetle *Rhagonycha fulva* A soldier beetle *Psyllobora vigintiduopunctata* 22-spot Ladybird *Coccinella septempunctata* 7-spot Ladybird *Lagria hirta* A darkling beetle *Sphaeroderma rubidium* A flea beetle *Longitarsus luridus* A flea beetle *Anthonomus rubi* A weevil *Mecinus pascuorum* A weevil *Maniola jurtina* Meadow Brown butterfly - 1 *Celastrina argiolus* Holly Blue butterfly - 1 *Pleuroptya ruralis* Mother of pearl moth *Macroglossum stellatarum* Hummingbird hawk-moth *Chiasmia clathrata* Latticed Heath moth *Tyria jacobaeae* Cinnabar Moth *Autographa gamma* Silver Y moth *Episyrphus balteatus* Marmalade Hoverfly *Sphaerophoria interrupta* Interrupted Globetail hoverfly *Syrphus ribesii* A hoverfly *Apis mellifera* Honeybee *Bombus lucorum/terrestris* Buff-tailed/White-tailed Bumblebee workers - 1 *Bombus pratorum* Early Bumblebee - 1 *Bombus pascuorum* Common Carder Bumblebee - 1 *Lasius niger* Black Garden Ant *Myrmica rubra* A red ant *Oniscus asellus* Common Shiny Woodlouse *Porcellio scaber* Common Rough Woodlouse	521 - 'unmanaged' 16 - 'Tall forbs' 61 - 'Re-created habitat'	206.11 m^2
SGS2	g4 – modified grassland	*Jacobaea vulgaris R* *Hedera helix FLA* *Leucanthemum vulgare R* *Bellis perennis F* *Lolium perenne A* *Potentilla reptans A* *Plantago major O* *Glechoma hederacea F* *Lonicera ligustrina FLA* *Hordeum murinum OLF* *Tanacetum vulgare R* *Helminthotheca echioides R* *Sherardia arvensis R* *Cirsium arvense R* *Cirsium vulgare R* *Lileaceae R*	Common Ragwort R Common Ivy FLA Oxe-eye Daisy R Common Daisy F Perennial Rye Grass A Creeping Cinquefoil A Greater Plantain O Ground Ivy F Wilson's Honeysuckle FLA Wall Barley OLF Tansy R Bristly Oxtongue R Field Madder Creeping Thistle R Spear Thistle R Lily species R	*Macroglossum stellatarum* Hummingbird hawk-moth *Apis mellifera* Honeybee *Bombus lucorum/terrestris* Buff-tailed/White-tailed Bumblebee workers - 1 *Bombus pascuorum* Common Carder Bumblebee - 1 *Monacha cantiana* Kentish Snail *Leptophyes punctatissima* Speckled Bush-cricket *Eysarcoris venustissimus* Woundwort Shieldbug *Harmonia axyridis* Harlequin Ladybird *Propylea quattuordecimpunctata* 14-spot Ladybird *Sphaeroderma testaceum* A flea beetle *Apion frumentarium* An Apionid weevil *Oxystoma pomonae* An Apionid weevil *Protapion fulvipes* An Apionid weevil *Pieris rapae* Small White butterfly - 1 *Pararge aegeria* Speckled Wood butterfly - 2	32 - 'Scattered trees' (Black Pine, Wild Cherry, Buddleia, Laurel, Silver Birch) 523 - 'Non-native'	686.54 m^2

		Knautia arvensis R *Medicago lupulina R* *Euphorbia helioscopia R* *Geranium molle R* *Hypochaeris radicata R* *Trifolium repens O* *Leontodon hispidus R* *Prunella vulgaris R*	Field Scabious R Black Medick R Sun Spurge R Dove's-foot Crane's-bill R Common Cat's-ear R White Clover O Rough Hawkbit R Common Selfheal R	*Pyronia tithonus* Gatekeeper butterfly - 1 *Eristalis tenax* Common Dronefly *Pipizella viduata* A root aphid hoverfly *Sphaerophoria scripta* Common Globetail hoverfly *Volucella pellucens* A hoverfly *Colletes daviesanus* Davies' Colletes *Lasioglossum calceatum* Common Furrow Bee		
SGS3	g4 – modified grassland	*Lotus corniculatus R* *Trifolium repens R* *Bellis perennis F* *Potentilla reptans O* *Lolium perenne A* *Rumex crispus R* *Ranunculus repens OLF* *Dactylis glomerata O* *Cirsium vulgare R* *Prunella vulgaris R* *Plantago major F* *Veronica persica R* *Plantago lanceolata O* *Hypochaeris radicata R* *Crepis capillaris R* *Hordeum murinum O* *Bromus hordeaceus R* *Taraxacum agg R*	Common Bird's-foot Trefoil R White Clover R Common Daisy F Creeping Cinquefoil O Perennial Rye Grass A Curled Dock R Creeping Buttercup OLF Cock's-foot O Spear Thistle R Common Selfheal R Greater Plantain F Common Field-speedwell R Ribwort Plantain O Common Cat's-ear R Smooth Hawksbeard R Wall Barley O Soft Brome R Dandelion R	*Cartodere nodifer* A mould beetle *Scaeva pyrastri* A hoverfly *Apis mellifera* Honeybee *Bombus pascuorum* Common Carder Bumblebee - 1		290.88 m^2
SGS4	c1f7* - polyculture	*Cucurbita sp.*	Squash species	N/A	616 - 'Allotments'	33.20 m^2
SGS5	u1b5 - buildings	None	None	N/A	827 - 'Garden'	55.66 m^2
SGS6	r1 –standing waters	None	None	None	41 - 'Pond (non-priority)'	9.36 m^2
SGS7	r1 - standing waters	*Lemna minor D*	Common Duckweed D	None	41 - 'Pond (non-priority)'	4.68 m^2
SGS8	h2b – other hedgerow	*Elaeagnus pungens D*	Spiny Oleaster D	None	523 - 'Non-native'	104.63 m
SGS9	w1g6 – line of trees	*Pyrus communis D* *Acer pseudoplatanus R*	Common Pear D Sycamore R	None	33 - 'Line of trees'	104.58 m
SGS10	w1g6 – line of trees	*Crataegus persimilis D* *Prunus avium R*	Broad-leaved Cockspur Thorn D Wild Cherry R	None	33 - 'Line of trees' 523 - 'Non-native'	92.76 m
* Relative abundance of species is provided for all habitats excluding those artificial, such as c1f7 – Polyculture.						

4. Brimsham Green School

4.1. Background

4.1.1. Brimsham Green School are transforming a disused sports field into an eco project that will focus on improving local biodiversity and natural systems, enabling students to learn to be involved in nature and grow food for people and wildlife.

4.2. Habitats

4.2.1. The site is situated in on the edge of an urban area, it backs on to semi-natural and agricultural land to the north and west with school playing fields to the east and immediately south. Immediately north of the site is an area of woodland, between the woodland and the site is a transitional woodland edge. This was not recorded during this assessment as it is considered unlikely to be the subject of ecological enhancement.

4.2.2. The habitats identified within the site included: other neutral grassland; priority hedgerow; polyculture (Figure 3, Table 4).

4.2.3. Other neutral grassland within the site was the dominant habitat type and was relatively species-rich, with some positive indicator species, such as Red Bartsia *Odontites vernus* (P11). The grassland appeared to match the physiognomy of the *Lolio-Cynosuretum* type, with a short, tight, grass-dominated sward. The management of the grassland appeared favourable, although may benefit from a later season cut as it had recently been cut at the time of survey.

4.2.4. The priority hedgerow borders the site on its western, southern and eastern boundaries (P12). The hedgerow is dominated by broadleaved deciduous species, like Hazel *Corylus avellana,* and has mature – veteran Pedunculate Oak *Quercus robur* trees at regular intervals throughout. There is a marginal habitat between the hedgerow and the grassland, which is also host to some notable species, such as Bitter-vetch *Lathyrus linifolius,* which was present on the eastern side of the site.

4.2.5. Two areas of polyculture are present within the site (P13, P14). These contained mixtures of ornamental species and some ornamental varieties of native species. It is considered that given the suitability of the grassland and hedgerow for native pollinators that efforts would be better focused in the more appropriate management of these habitats, as opposed to the creation of ornamental beds of nectar-rich flowers.

4.3. Invertebrates

4.3.1. The invertebrate fauna is overall considered moderately diverse with some local species being recorded in association with the line of old oak trees that mark the eastern boundary of the survey area.

4.4. Recommendations

4.4.1. Some outline recommendations in relation to Brimsham Green School have been provided below.

- Sensitive cutting regime applied to all areas of grassland, as the grassland has potential to develop into a diverse community. This should entail no cutting between March and August with regular cutting throughout Autumn and Winter.
- The creation of a pond would provide additional resources and habitat for invertebrates. If this is undertaken, allowing the pond to naturally develop a botanical assemblage should be attempted prior to the consideration of using species-mixes.
- The mature trees forming a part of the hedgerows around the site are considered to be important. It is recommended that these features are afforded protection in any future management within the site, if they require management (for example on health and safety grounds), this should be undertaken sensitively to ensure their long-term health (for example through pollarding). Any deadwood arising from management should be retained within the site as stacked piles, providing additional invertebrate habitat.
- The bordering hedgerows on the site should be managed sensitively, to enhance their use by invertebrates. This could include rotational trimming of different lengths of the hedgerow, on infrequent cycles, such as 3 – 5 yearly cycles. The less frequent the better.

Figure 3. Brimsham Green School Habitat Plan

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Table 4. Brimsham Green School Habitat Details

Reference	Habitat	Plant Species (Scientific)	Plant Species (Common)	Invertebrate Species	Secondary Code(s)	Area / Length
BGS1	g3c – other neutral grassland	*Achillea millefolium O* *Jacobaea vulgaris O* *Hypochaeris radicata O* *Leontodon saxatile R* *Leontodon hispidus R* *Lotus corniculatus OLF* *Agrostis capillaris A* *Lolium perenne D* *Holcus lanatus A* *Trifolium repens FLA* *Ranunculus repens F* *Cerastium fontanum O* *Prunella vulgaris OLA* *Cirsium palustre R* *Taraxacum agg. O* *Bellis perennis F* *Veronica serpyllifolia O* *Agrimonia eupatoria R* *Centaurea nigra R* *Cirsium vulgare R* *Odontites vernus R*	Yarrow O Common Ragwort O Common Cat's-ear O Lesser Hawkbit R Rough Hawkbit R Common Bird's-foot Trefoil OLF Common Bent A Perennial Rye Grass D Yorkshire Fog A White Clover FLA Creeping Buttercup F Common Mouse-ear O Common Selfheal OLA Marsh Thistle R Dandelion O Common Daisy F Thyme-leaved Speedwell O Common Agrimony R Common Knapweed R Spear Thistle R Red Bartsia R	*Pholidoptera griseoaptera* Dark Bush-cricket *Tachyporus dispar* A rove beetle *Rhagonycha fulva* A soldier beetle *Tytthaspis sedecimpunctata* 16-spot Ladybird *Coccinella septempunctata* 7-spot Ladybird *Pararge aegeria* Speckled Wood butterfly - 1 *Pyronia tithonus* Gatekeeper butterfly - 2 *Vanessa atalanta* Red Admiral butterfly - 1 *Episyrphus balteatus* Marmalade Hoverfly *Syritta pipiens* A hoverfly *Eriothrix rufomaculata* A parasite fly *Apis mellifera* Honeybee *Bombus lucorum/terrestris* Buff-tailed/White-tailed Bumblebee workers - 3 *Bombus pratorum* Early Bumblebee - 1 *Bombus pascuorum* Common Carder Bumblebee - 1	None	8305.76 m^2
BGS2	c1f7* - polyculture	*Aster sp.* *Leucanthemum vulgare* *Achillea ptarmica* *Hylotelephium sp.* *Verbena sp.* *Cornus sanguineus* *Corylus avellana*	Aster species Oxe-eye Daisy Sneezewort Stonecrop species Vervain species Common Dogwood Hazel	None	None	251.38 m^2
BGS3	h2a – priority hedgerow	*Corylus avellana A* *Crataegus monogyna F* *Quercus robur F* *Rubus fruticosus agg. F* *Acer campestre O* *Epilobium hirsutum F* *Filipendula ulmaria F* *Rumex sanguineus O* *Urtica dioica F* *Arrhenatherum elatius O* *Jacobaea vulgaris R* *Holcus mollis R* *Scrophularia nodosa R* *Angelica sylvestris O* *Lathyrus linifolius RLA*	Hazel A Hawthorn F Pedunculate Oak F European Bramble Complex F Field Maple O Great Willowherb F Meadowsweet F Wood Dock O Common Nettle False-oat Grass O Common Ragwort R Creeping Soft Grass R Common Figwort R Angelica O Bitter-vetch RLA	*Chorthippus brunneus* Field Grasshopper *Tachyporus hypnorum* A rove beetle *Cypha longicornis* A rove beetle *Stenus ossium* A rove beetle *Lagria hirta* A darkling beetle *Ischnopterapion virens* An Apionid weevil *Lasius niger* Black Garden Ant *Temnothorax nylanderi* A Myrmicine ant *Trichoniscus pusillus* Common Pigmy Woodlouse *Philoscia muscorum* Common Striped Woodlouse *Porcellio scaber* Common Rough Woodlouse *Micaria pulicaria* A Gnaphosid spider	50 - 'Ditch'; 11 - 'Hedgerow with trees'	314.82 m
BGS4	c1f7* - polyculture	*Sonchus asper* *Persicaria maculosa* *Plantago major* *Papaver sp.* *Lobelia erinus* *Hylotelephium sp.* *Sonchus oleraceus* *Scrophularia nodosa*	Prickly Sow-thistle Redshank Greater Plantain Poppy species Trailing Lobelia Stonecrop species Common Sow-thistle Common Figwort	*Ashfordia granulata* Silky Snail *Monacha cantiana* Kentish Snail *Trochulus striolatus* Strawberry Snail *Coreus marginatus* Dock Bug *Palomena prasina* Common Green Shieldbug *Corizus hyoscyami* A Rhopalid bug *Coccinella septempunctata* 7-spot Ladybird *Parethelcus pollinarius* A weevil *Pyronia tithonus* Gatekeeper butterfly - 3 *Conops quadrifasciatus* A Conopid fly *Bombus lucorum/terrestris* Buff-tailed/White-tailed Bumblebee workers - 2 *Bombus pascuorum* Common Carder Bumblebee - 1	None	181.09 m^2

*** Relative abundance of species is provided for all habitats excluding those artificial, such as c1f7 – Polyculture.**

5. Sodbury Wildflower Meadow

5.1. Background

5.1.1. Sodbury Town Council are aiming to create a 4 hectare wildflower meadow on what is currently an allotment field on Chipping Sodbury Common. It is currently not under an active tenancy with a farmer and therefore there is an opportunity to introduce a species-rich wildflower meadow.

5.2. Habitats

5.2.1. The site is situated in a large area of agricultural land, predominantly grazed pasture. The field is separated from the open habitat surrounding it and is an enclosed field within this expanse of agricultural land.

5.2.2. The habitats identified within the site included: modified grassland, priority hedgerows and standing water (Figure 4, Table 5).

5.2.3. The majority of the field is comprised of modified grassland, which was identified in two separate conditions. In the southeast of the site, the modified grassland is subject to less frequent cutting, and has several planted Apple trees *Malus* sp. (P15). This section of the grassland was characterised by a coarse, tussocky sward. The wider area of modified grassland was recently cut at the time of the survey and appears to be subject to a more frequent cutting regime (P16). Both habitats were dominated by common grass species, such as Perennial Rye Grass *Lolium perenne* and Meadow Foxtail *Alopecurus pratensis* and had relatively few forbs present. There was a lack of positive indicator species for the majority, except occasional Meadow Vetchling *Lathyrus pratensis* in the tussocky area. Injurious weeds were frequent in both habitats, with Broad-leaved Dock *Rumex obtusifolius* and Curled Dock *Rumex crispus* recorded. The grassland was likely historically subjected to high levels of nutrient input, creating fertile conditions suitable for grass dominance.

5.2.4. The field was surrounded by a priority hedgerow habitat, which was dominated by Hawthorn *Crataegus monogyna* (P17). There was a marginal habitat at the grassland-hedgerow interface with many species indicative of nutrient enrichment present.

5.2.5. In the southeastern corner of the field was a small pond, which may formerly have been used as a slurry pit or similar agricultural asset. This pond had a lack of aquatic species aside from the opportunistic grass Creeping Bent *Agrostis stolonifera*.

5.3. Invertebrates

5.3.1. The site appears to have a typical grassland invertebrate fauna currently, comprising common species such as the Meadow Brown and Small Skipper butterflies.

5.3.2. The most interesting record was of a single Small Heath butterfly, which is a severely declining species in the English lowlands. It requires undisturbed, relatively short, dry grassland.

5.4. Recommendations

5.4.1. Some outline recommendations in relation to Sodbury Wildflower Meadow are provided below:

- Sensitive cutting regime applied to all grassland areas. This should entail a cut late in August followed by aftermath grazing. Cutting should then be restricted from March until the late August cut. If grazing is not possible within this site, then regular mowing throughout Autumn and Winter would be beneficial.
- It is recommended that some investigation is undertaken into the underlying soil conditions, as the historical agricultural improvement may have left high levels of nutrients. Following this, an appropriate wildflower seed mix could be selected, for example EM1 Basic General Purpose Meadow Mixture from Emorsgate Seeds. Management of this meadow should then follow instructions associated with the mixture.
- Enhancements to the site could also be achieved through enhancing the pond in the southwest corner of the site. The existing pond could be extended and opened up, trimming the overhanging vegetation from the adjacent hedgerow to reduce shading.
- The bordering hedgerows on the site should be managed sensitively, to enhance their use by invertebrates. This could include rotational trimming of different lengths of the hedgerow, on infrequent cycles, such as 3 – 5 yearly cycles. The less frequent the better.

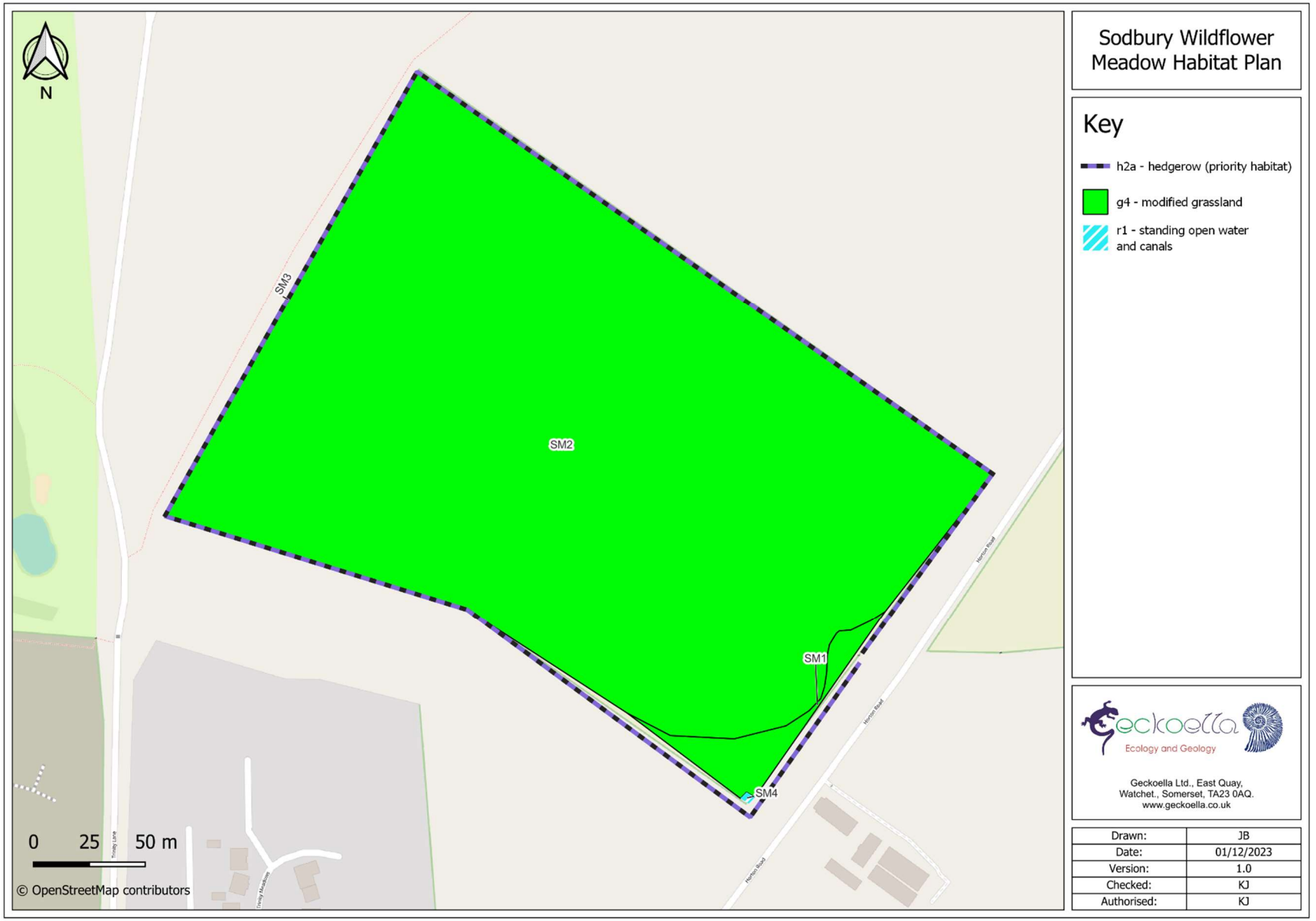

Figure 4. Sodbury Wildflower Meadow Habitat Plan

Table 5. Sodbury Wildflower Meadow Habitat Details

Reference	Habitat	Plant Species (Scientific)	Plant Species (Common)	Invertebrate Species	Secondary Code(s)	Area / Length
SM1	g4 – modified grassland	Lathyrus pratensis R Alopecurus pratensis A Rumex obtusifolius F Elymus repens F Lolium perenne O Holcus lanatus F Agrostis stolonifera A Malus sp. R	Meadow Vetchling R Meadow Foxtail A Broad-leaved Dock F Common Couch F Perennial Rye Grass O Yorkshire Fog F Creeping Bent A Apple species R	*Arion ater* Large Black Slug *Sympetrum striolatum* Common Darter Dragonfly *Pseudochorthippus parallelus* Meadow Grasshopper *Rhagonycha fulva* A soldier beetle *Thymelicus sylvestris* Small Skipper butterfly - 2 *Aphantopus hyperantus* Ringlet butterfly - 1 *Maniola jurtina* Meadow Brown butterfly - 12 *Pyronia Tithonus* Gatekeeper butterfly - 2 *Eriothrix rufomaculata* A parasite fly *Apis mellifera* Honeybee *Bombus lucorum/terrestris* Buff-tailed/White-tailed Bumblebee workers - 3 *Bombus lapidarius* Red-tailed Bumblebee - 1 *Bombus pascuorum* Common Carder Bumblebee - 1 *Lasius niger* Black Garden Ant *Pisaura mirabilis* - Nursery Web Spider	201 - 'Young trees - planted' 521 - 'Unmanaged'	1394.87 m^2
SM2	g4 – modified grassland	Lolium perenne D Phleum pratense F Dactylis glomerata F Agrostis stolonifera O Agrostis capillaris O Holcus lanatus F Potentilla reptans F Hypochaeris radicata R Cirsium vulgare R Ranunculus repens A Rumex crispus F Lamium album R Sonchus oleraceus R Alopecurus geniculatus R	Perennial Rye Grass D Timothy F Cock's-foot F Creeping Bent O Common Bent O Yorkshire Fog F Creeping Cinquefoil F Common Cat's-ear R Spear Thistle R Creeping Buttercup A Curled Dock F White Deadnettle R Common Sow-thistle R Marsh Foxtail R	*Arion ater* Large Black Slug *Rhagonycha fulva* A soldier beetle *Thymelicus sylvestris* Small Skipper butterfly - 1 *Coenonympha pamphilus* Small Heath butterfly - 1 *Aphantopus hyperantus* Ringlet butterfly - 1 *Maniola jurtina* Meadow Brown butterfly - 28 *Pyronia Tithonus* Gatekeeper butterfly - 5 *Polyommatus icarus* Common Blue butterfly - 1 *Tyria jacobaeae* Cinnabar Moth *Eriothrix rufomaculata* A parasite fly *Apis mellifera* Honeybee *Bombus lucorum/terrestris* Buff-tailed/White-tailed Bumblebee workers - 2 *Bombus pascuorum* Common Carder Bumblebee - 1 *Lasius niger* Black Garden Ant	109 - 'Hay' 108 - 'Frequently mown' 107 - 'Mown and collected'	57175.60 m^2
SM3	h2a – priority hedgerow	Crataegus monogyna D Rubus fruticosus agg. F Sambucus nigra R Rosa sp. R Ligustrum vulgare R Prunus spinosa R	Hawthorn D European Bramble Complex F Elder R Rose species R Wild Privet R Blackthorn R	*Pholidoptera griseoaptera* Dark Bush-cricket *Rhagonycha fulva* A soldier beetle *Pieris napi* Green-veined White butterfly - 1 *Pararge aegeria* Speckled Wood butterfly - 1 *Coenonympha pamphilus* Small Heath butterfly - 1 *Maniola jurtina* Meadow Brown butterfly - 5 *Pyronia Tithonus* Gatekeeper butterfly - 16 *Eriothrix rufomaculata* A parasite fly *Apis mellifera* Honeybee *Bombus lucorum* agg.White-tailed Bumblebee - 1 *Bombus lucorum/terrestris* Buff-tailed/White-tailed Bumblebee workers - 6 *Bombus lapidarius* Red-tailed Bumblebee - 1 *Bombus pascuorum* Common Carder Bumblebee - 5 *Lasius niger*	None	1024.15 m
SM4	r1 – standing waters	Agrostis stolonifera D	Creeping Bent D	None	42 - 'Pond'	16.97 m^2

6. Newbridge Open Space

6.1. Background

6.1.1. Newbridge Open Space is a park owned by Bath and North East Somerset Council, the council are looking to enhance areas of the park, particularly along its northern extent through the planting of meadow, management of woodland habitat and planting of pollinator flower beds.

6.2. Habitats

6.2.1. The site is situated in an urban environment, near to the River Avon and bordered by roads. The site is used as a public park and frequented by dogwalkers and families.

6.2.2. The habitats identified within the site included: modified grassland; other neutral grassland; other woodland, broadleaved; line of trees; priority hedgerow (Figure 5, Table 6).

6.2.3. Modified grassland is the most prominent habitat within the site, given the site's primary use as a public park (P18). The modified grassland communities are dominated by nutrient-loving species, such as Perennial Rye Grass and Annual Meadow Grass *Poa annua*. The grasslands are under intensive short-mowing regimes. One of these areas contains a play area, while another contains some shrubs and has a slightly taller sward (P19 and P20, respectively).

6.2.4. There are three main areas of other neutral grassland within the site. In the northwest of the site there is a large expanse of other neutral grassland, which is species-rich (P21). Within this northwestern habitat, there is a stand with abundant young trees (P22). In the northeast of the site, there is another, more isolated stand of other neutral grassland with scattered trees, this habitat is less species-rich than the other examples of this habitat (P22). In general, these grasslands are subject to a low intensity mowing regime, and are likely to be subject to less physical disturbance than the surrounding modified grassland habitats.

6.2.5. Other woodland, broadleaved, is present in two locations within the site. In the northwest of the site this forms a large strip of mature woodland, which connects to woodland outside of the site (P23). This example of the habitat is dominated by Ash with frequent Field Maple *Acer campestre* and other species indicative of limestone ash woodland habitat types, which are likely to arise due to the underlying ground conditions. However, there are some conifers within the canopy as well, which detract from the overall ecological value of this woodland.

6.2.6. In the east of the site, there is a recently planted stand of other woodland, broadleaved, with an understory of other neutral grassland (P24). This comprises a diverse array of young trees associated with limestone soils.

6.2.7. Along the southern border of the site there is a mature line of primarily Lombardy Poplar *Populus nigra 'Italica',* rarely with Black Poplar *Populus nigra* (P25). This line of trees runs parallel to another line, comprised predominantly of Ash, together they form an avenue of trees. This linear feature connects to woodland habitat at the western extent of the site.

6.2.8. Along the eastern border of the site there is a priority hedgerow, which contains scattered trees (P26). The hedgerow is comprised of a mixture of Ash, Elder *Sambucus nigra*, English Elm *Ulmus procera* and Hawthorn.

6.3. Invertebrates

6.3.1. This was an interesting site for invertebrates because of the range of habitat features present, despite its small size. The area of flower-rich grassland appeared to be well-managed and had a range of butterfly species present, including the local Brown Argus.

6.3.2. Wood-chip piles had an interesting beetle fauna that included the Nationally Scarce rove beetle *Medon apicalis*.

6.3.3. Old trees had some well-developed dead wood habitat features (e.g. The Dryad's Saddle bracket fungus *Polyporus squamosus* and the Chicken-of-the-woods bracket *Laetiporus sulphureus*). The local dead wood specialist beetle *Bitoma crenata* was recorded here.

6.4. Recommendations

6.4.1. Some outline recommendations in relation to Newbridge Open Space are provided below.

- It is recommended that the existing grassland management of the areas of other neutral grassland is continued as it is providing a rather diverse grassland in places. It would be desirable to extend this form of management into some of the modified grassland areas.
- The creation of a pond within the modified grassland, or between areas of other neutral grassland, would be beneficial to the overall biodiversity within the site.
- The site contains many mature trees that are considered important. It is recommended that these features are afforded protection in any future management within the site, if they require management (for example on health and safety grounds), this should be undertaken sensitively to ensure their long-term health (for example through pollarding). Any deadwood arising from management should be retained within the site as stacked piles, providing additional invertebrate habitat.

Figure 5. Newbridge Open Space Habitat Plan

Table 6. Newbridge Open Space Habitat Details

Reference	Habitat	Plant Species (Scientific)	Plant Species (Common)	Invertebrate Species	Secondary Code(s)	Area / Length
NOS1	g4 – modified grassland	Plantago major O Lolium perenne D Trifolium repens A Poa annua F Bellis perennis F Geranium molle O Achillea millefolium R	Greater Plantain O Perennial Rye Grass D White Clover A Annual Meadow Grass F Common Daisy F Dove's-foot Crane's-bill O Yarrow R	None	108 - 'Frequently mown'	7480.41 m^2
NOS2	w1g6 – line of trees	Fraxinus excelsior D Betula pendula O Populus nigra ssp italica F Populus nigra R Lolium perenne D Dactylis glomerata A Trifolium repens F Anthriscus sylvestris O Agrostis stolonifera F Ranunculus repens O Rumex sanguineus O Hordeum murinum O Geum urbanum O	Ash D Silver Birch O Lombardy Poplar F Black Poplar R Perennial Rye Grass D Cock's-foot A White Clover F Cow Parsley O Creeping Bent F Creeping Buttercup O Wood Dock O Wall Barley O Wood Avens O	*Cornu asperum* Garden Snail *Pentatoma rufipes* Forest Shieldbug *Medon apicalis* A rove beetle **NS.**	33 - Line of trees	149.48 m
NOS3	g4 – modified grassland	Crepis capillaris F Lolium perenne D Taraxacum agg. F Prunus padus O Bellis perennis O	Smooth Hawksbeard F Perennial Ryegrass D Dandelion F Bird Cherry O Common Daisy O	None	32 - 'Scattered trees' 201 - 'Young trees - planted' 823 - 'Children's Play Space'	1445.77 m^2
NOS4	w1g – other woodland, broadleaved*	Sorbus aria agg. Rosa canina agg. Acer campestre Cornus sanguinea Carpinus betulus Viburnum lantana Phleum pratense F Dactylis glomerata F Lolium perenne A Poa pratensis O Taraxacum agg. O Trifolium repens F Holcus lanatus O	Common Whitebeam Dog Rose Field Maple Common Dogwood Hornbeam Wayfaring Tree Timothy F Cock's-foot F Perennial Rye Grass A Smooth Meadow Grass O Dandelion O White Clover F Yorkshire Fog O	None	201 - 'Young trees - planted'	751.55 m^2
NOS5	g3c – other neutral grassland*	Tilia x europaea Crataegus monogyna Crataegus persimilis Dactylis glomerata A Arrhenatherum elatius O Lolium perenne D Hordeum murinum O Jacobaea vulgaris R Poa trivialis O Agrostis stolonifera A Taraxacum agg O Phleum pratense O Ranunculus repens O Potentilla reptans O Holcus lanatus R Plantago lanceolata R	Common Lime Hawthorn Broad-leaved Cockspur Thorn Cock's-foot A False-oat Grass O Perennial Rye Grass D Wall Barley O Common Ragwort R Rough Meadow Grass O Creeping Bent A Dandelion O Timothy O Creeping Buttercup O Creeping Cinquefoil O Yorkshire Fog R Ribwort Plantain R	*Chorthippus brunneus* Field Grasshopper *Pterostichus vernalis* A ground beetle *Lithocharis nigriceps* A rove beetle *Rugilus orbiculatus* A rove beetle *Xantholinus longiventris* A rove beetle *Tytthaspis sedecimpunctata* 16-spot Ladybird *Eriothrix rufomaculata* A parasite fly *Lasioglossum calceatum* Common Furrow Bee *Philoscia muscorum* Common Striped Woodlouse	32 - 'Scattered trees' 33 - 'Line of trees'	722.00 m^2

Reference	Habitat	Plant Species (Scientific)	Plant Species (Common)	Invertebrate Species	Secondary Code(s)	Area / Length
		Trifolium repens O Hypochaeris radicata O Agrostis capillaris O	White Clover O Common Cat's-ear O Common Bent O			
NOS6	g4 – modified grassland*	Juglans regia Prunus avium Malus sp. Hordeum murinum F Dactylis glomerata A Lolium perenne D Rumex obtusifolius R Agrostis stolonifera A Achillea millefolium F Phleum pratense O Taraxacum agg. O Geranium molle R Trifolium repens O Scorzoneroidea autumnalis F Rumex pulcher R Laetiporus sulphureus	Walnut Wild Cherry Apple Wall Barley F Cock's-foot A Perennial Rye Grass D Broad-leaved Dock R Creeping Bent A Yarrow F Timothy O Dandelion O Dove's-foot Crane's-bill R White Clover O Autumn Hawkbit F Fiddle Dock R Chicken of the Woods	*Arion ater* Large Black Slug *Forficula auricularia* Common Earwig *Bitoma crenata* A Zopherid beetle *Lasius niger* Black Garden Ant *Porcellio scaber* Common Rough Woodlouse	201 - Young trees - planted	309.69 m^2
NOS7	g3c – other neutral grassland	Lotus corniculatus F Centaurea nigra F Lolium perenne A Phleum pratense F Dactylis glomerata F Trifolium pratense F Taraxacum agg. O Medicago sativa R Achillea millefolium F Medicago lupulina O Geranium molle O Galium album O Hypochaeris radicata O Leucanthemum vulgare OLF Plantago lanceolata O Jacobaea vulgaris R Elymus repens O Poa trivialis F Rumex obtusifolius R Trifolium repens O Cirsium vulgare R	Common Bird's-foot Trefoil F Common Knapweed F Perennial Rye Grass A Timothy F Cock's-foot F Red Clover F Dandelion O Lucerne R Yarrow F Black Medick O Dove's-foot Crane's-bill O Hedge Bedstraw O Common Cat's-ear O Oxe-eye Daisy OLF Ribwort Plantain O Common Ragwort R Common Couch O Rough Meadow Grass F Broad-leaved Dock R White Clover O Spear Thistle R	*Aeshna mixta* Migrant Hawker dragonfly *Metrioptera roeselii* Roesel's Bush-cricket *Lasioglossum calceatum* Common Furrow Bee *Megachile willughbiella* Willughby's Leafcutter Bee	16 - 'Tall forbs' 18 - 'species-rich grassland' 61 - 'Re-created habitat'	1126.48 m^2
NOS8	w1g – other woodland, broadleaved	Acer platanoides F Fraxinus excelsior A Sorbus aria agg. R Sambucus nigra O Thuja plicata O Betula pendula R Prunus avium O Fagus sylvatica f. purpurea R Geum urbanum A Crataegus monogyna F Rumex sanguineus O Rubus fruticosus agg. A Hedera helix A	Norway Maple F Ash A Common Whitebeam R Elder O Western Red Cedar O Silver Birch R Wild Cherry O Copper Beech R Wood Avens A Hawthorn F Wood Dock O European Bramble Complex A Common Ivy A European Holly R	*Ambigolimax valentianus* Iberian Threeband Slug *Myathropa florea* A hoverfly	None	1206.17 m^2

Reference	Habitat	Plant Species (Scientific)	Plant Species (Common)	Invertebrate Species	Secondary Code(s)	Area / Length
		Ilex aquilifolium R Bryonia dioica O	White Bryony O			
NOS9	g3c – other neutral grassland	Prunus padus O Prunus avium O Acer campestre O Sorbus aucuparia O Crataegus monogyna O	Bird Cherry O Wild Cherry O Field Maple O Rowan O Hawthorn O	*Calopteryx splendens* Banded Demoiselle damselfly *Rhagonycha fulva* A soldier beetle *Pieris brassicae* Large White butterfly - 1 *Pieris rapae* Small White butterfly - 2 *Pararge aegeria* Speckled Wood butterfly - 2 *Maniola jurtina* Meadow Brown butterfly - 8 *Vanessa Atalanta* Red Admiral butterfly - 1 *Polygonia c-album* Comma butterfly - 1 *Aricia agestis* Brown Argus butterfly - 4 *Polyommatus icarus* Common Blue butterfly - 7 *Bombus lucorum/terrestris* Buff-tailed/White-tailed Bumblebee workers - 3 *Bombus lapidarius* Red-tailed Bumblebee - 4 *Bombus pascuorum* Common Carder Bumblebee - 3	201 - Young trees - planted	268.74 m^2
NOS10	h2a – priority hedgerow	Bryonica dioica O Rubus fruticosus agg. A Sambucus nigra O Fraxinus excelsior F Ulmus procera O Hedera helix F Crataegus monogyna O Solanum dulcamara R Cirsium arvense R Urtica dioica F Humulus lupulus R	White Bryony O European Bramble Complex A Elder O Ash F English Elm O Common Ivy F Hawthorn O Bittersweet R Creeping Thistle R Common Nettle F Common Hop R	*Monacha cantiana* Kentish Snail *Rhyzobius litura* A ladybird *Psyllobora vigintiduopunctata* 22-spot Ladybird *Harmonia axyridis* Harlequin Ladybird *Cartodere bifasciata* A mould beetle *Lasius flavus* Yellow Meadow Ant	11 - Hedgerow with trees	80.84 m
*** Relative abundance was not recorded for newly planted trees.**						

7. Yate Common Orchard

7.1. Background

7.1.1. Yate Common Orchard is a site on Yate Common managed by the Forest of Avon Trust. The Forest of Avon Trust are undertaking active management with volunteers to restore orchards and provide education to the public on orchard management.

7.2. Habitats

7.2.1. The site is situated in an area of grassland at the western extent of Yate Common. The site is enclosed by woodland to its north, west and south, and an inactive road to its east, beyond which the Common continues.

7.2.2. The habitats identified within the site included: *Arrhenatherum* neutral grassland; *Lolium-Cynosurus* neutral grassland; other blackthorn scrub; standing open water (Figure 6, Table 7).

7.2.3. The primary habitat across most of the site was *Arrhenatherum* neutral grassland (P27). This habitat was coarse and tussocky, with moderate species richness. The habitat was divided for the purposes of this survey into three compartments, two separate compartments containing orchards, and one larger base compartment, which contained scattered scrub and trees.

7.2.4. The orchards (P28 and P29) comprised a mixture of fruit trees. The most frequently encountered species were Apple *Malus* species, including Crab Apple *Malus sylvestris*.

7.2.5. North of the primary grassland habitat and north of the orchards was an area of *Lolium-Cynosurus* neutral grassland, which was heavily grazed by sheep (P30). This had a lower species diversity than the *Arrhenatherum* neutral grassland, but this could have been impacted by the level of grazing reducing the visibility of some species.

7.2.6. Throughout the *Arrhenatherum* grassland was scattered Blackthorn *Prunus spinosa* scrub and scattered trees, typically Pedunculate Oak *Quercus robur*. The Blackthorn scrub covered a large enough expanse in one area to be separated out into a distinct habitat (P31). Around the edges of this Blackthorn scrub, heathland species were present, including Western Gorse *Ulex gallii*.

7.2.7. In one location in the centre – northwest of the site was a large pond (P32). This pond was quite species-rich but water levels were low at the time of survey. Some notable species included Greater Spearwort *Ranunculus lingua*, which was surprisingly abundant.

7.3. Invertebrates

7.3.1. This site had a moderately diverse grassland invertebrate fauna, with local species such as Brown Argus butterfly present. The orchards themselves were of less importance to pollinators, with the greater resources present in the grasslands and pond.

7.4. Recommendations

7.4.1. Some outline recommendations in relation to Yate Common Orchard are provided below.

- Sensitive cutting regime applied to all grassland areas. This should entail a cut late in August followed by aftermath grazing. Cutting should then be restricted from March until the late August cut. If grazing is not possible within this site, then regular mowing throughout Autumn and Winter would be beneficial.
- It is considered that the orchards themselves are of less importance to pollinators, and that enhancements should be sought in areas of the wider site, such as the grasslands and the pond.

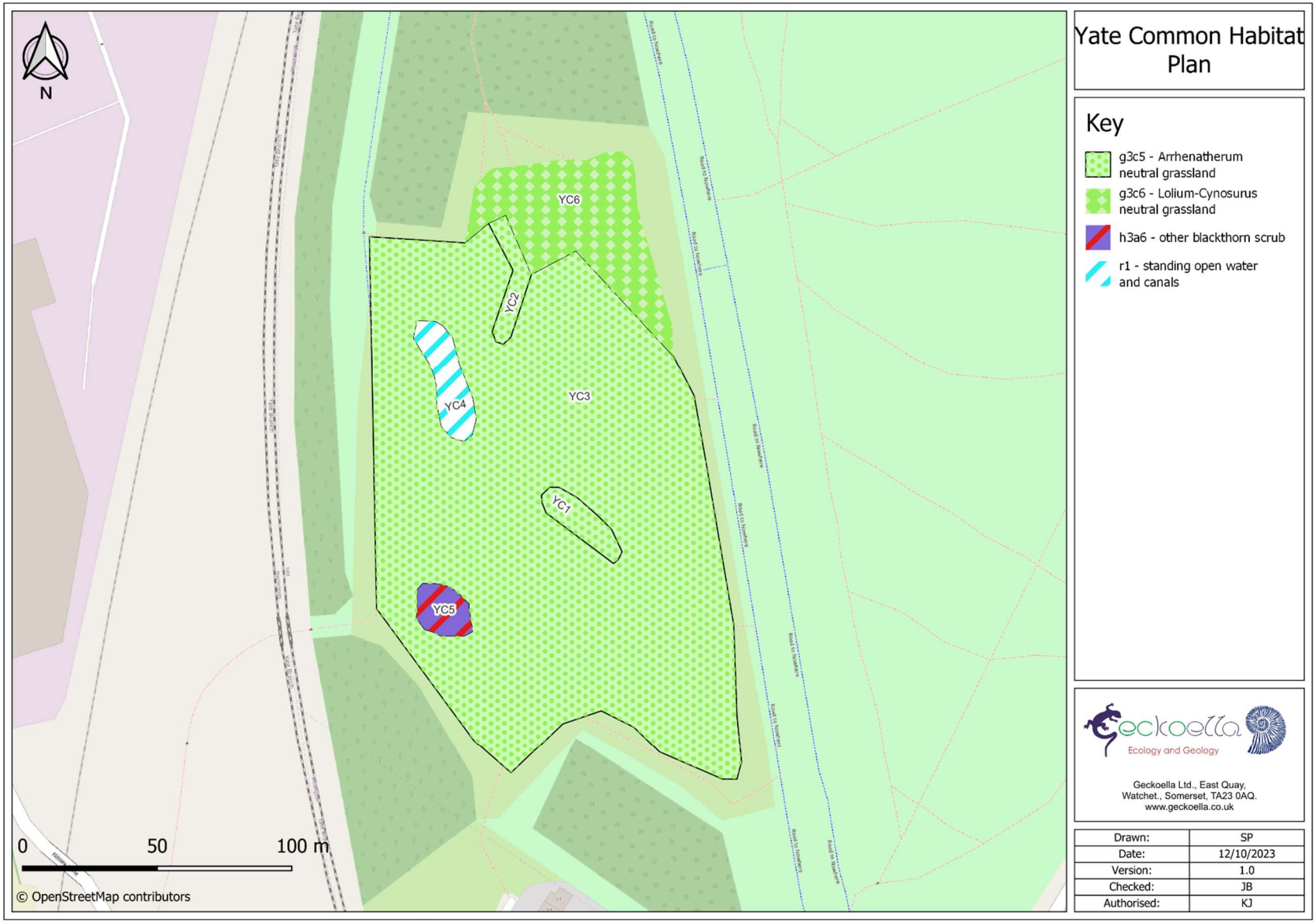

Figure 6. Yate Common Orchard Habitat Plan

Table 7. Yate Common Orchard Habitat Details

Reference	Habitat	Plant Species (Scientific)	Plant Species (Common)	Invertebrate Species	Secondary Code(s)	Area / Length
YC1	g3c5 – *Arrhenatherum* neutral grassland*	*Prunus cerasifera* *Malus domestica* *Prunus avium* *Pyrus communis* *Quercus robur (s) O* *Festuca rubra F* *Arrhenatherum elatius D* *Dactylis glomerata F* *Jacobaea vulgaris O* *Holcus lanatus F* *Agrostis capillaris F* *Rumex acetosa F* *Heracleum sphondylium R* *Rumex crispus R* *Rumex obtusifolius R* *Persicaria amphibia R* *Lathyrus pratensis O* *Trifolium repens O*	Cherry Plum Domestic Apple Wild Cherry European Pear Pedunculate Oak seedling O Red Fescue F False Oat-grass D Cock's-foot F Common Ragwort O Yorkshire Fog F Common Bent F Common Sorrel F Common Hogweed R Curled Dock R Broad-leaved Dock R Amphibious Bistort R Meadow Vetchling O White Clover O	*Eurygaster testudinaria* Tortoise Shieldbug *Paradromius linearis* A ground beetle *Tytthaspis sedecimpunctata* 16-spot Ladybird *Propylea quattuordecimpunctata* 14-spot Ladybird *Subcoccinella vigintiquattuorpunctata* 24-spot Ladybird *Sitona suturalis* A weevil *Eriothrix rufomaculata* A parasite fly *Ectophasia crassipennis* A parasite fly *Hylaeus communis* Common Yellow-face Bee	27 - 'Traditional orchards'	350.98 m^2
YC2	g3c5 – *Arrhenatherum* neutral grassland*	*Malus domestica* *Prunus avium* *Crataegus germanica* *Malus sylvestris* *Agrostis capillaris A* *Dactylis glomerata F* *Holcus lanatus F* *Anthoxanthum odoratum O* *Arrhenatherum elatius O* *Rubus fruticosus agg. F* *Jacobaea vulgaris O* *Cirsium arvense F* *Vicia sepium R* *Rumex acetosa F* *Lotus corniculatus R* *Cerastium fontanum R* *Stellaria graminea R* *Quercus robur (s) R* *Persicaria amphibia R* *Plantago lanceolata R* *Ranunculus repens R*	Domestic Apple Wild Cherry Common Medlar European Crab Apple Common Bent A Cock's-foot F Yorkshire Fog F Sweet Vernal Grass O False Oat-grass O European Bramble Complex F Common Ragwort O Creeping Thistle F Bush Vetch R Common Sorrel F Common Bird's-foot Trefoil R Common Mouse-ear R Lesser Stitchwort R Pedunculate Oak seedling R Amphibious Bistort R Ribwort Plantain R Creeping Buttercup R	See YC3	27 - 'Traditional orchards' 100 - 'Grazed'	326.89 m^2
YC3	g3c5 – *Arrhenatherum* neutral grassland	*Allium vineale O* *Arrhenatherum elatius D* *Dactylis glomerata F* *Heracleum sphondylium O* *Crepis capillaris O* *Holcus lanatus A* *Lotus pedunculatus OLA* *Agrostis stolonifera O* *Agrostis capillaris A* *Anthoxanthum odoratum FLA* *Rumex acetosa F* *Festuca rubra OLD* *Ranunculus repens O* *Persicaria amphibia OLA* *Vicia hirsuta R* *Cerastium fontanum O*	Wild Garlic O False Oat-grass D Cock's-foot F Common Hogweed O Smooth Hawksbeard O Yorkshire Fog A Greater Bird's-foot Trefoil OLA Creeping Bent O Common Bent A Sweet Vernal Grass FLA Common Sorrel F Red Fescue OLD Creeping Buttercup O Amphibious Bistort OLA Hairy Tare R Common Mouse-ear O	*Pholidoptera griseoaptera* Dark Bush-cricket *Metrioptera roeselii* Roesel's Bush-cricket *Pseudochorthippus parallelus* Meadow Grasshopper *Thymelicus sylvestris* Small Skipper butterfly *Pieris brassicae* Large White butterfly *Maniola jurtina* Meadow Brown butterfly - 4 *Pyronia tithonus* Gatekeeper butterfly *Vanessa atalanta* Red Admiral butterfly *Aglais io* Peacock butterfly *Celastrina argiolus* Holly Blue butterfly *Aricia agestis* Brown Argus butterfly *Polyommatus icarus* Common Blue butterfly *Tyria jacobaeae* Cinnabar Moth *Autographa gamma* Silver Y moth *Bombus lucorum/terrestris* Buff-tailed/White-tailed Bumblebee workers *Bombus lapidarius* Red-tailed Bumblebee	10 - 'Scattered scrub' 32 - 'Scattered trees'	19919.07 m^2

		Ranunculus acris O *Trifolium repens F* *Cirsium vulgare R* *Cirsium arvense R* *Phleum pratense OLA* *Odontites vulgaris R* *Jacobaea erucifolia R* *Alopecurus pratensis OLA* *Vicia cracca R*	Meadow Buttercup O White Clover F Spear Thistle R Creeping Thistle R Timothy OLA Red Bartsia R Hoary Ragwort R Meadow Foxtail OLA Tufted Vetch R	*Bombus pascuorum* Common Carder Bumblebee *Lasioglossum calceatum* Common Furrow Bee *Coreus marginatus* Dock Bug *Agapanthia villosoviridescens* A longhorn beetle *Phaedon tumidulus* A leaf beetle *Ischnopterapion modestum* An Apionid weevil *Protapion fulvipes* An Apionid weevil *Philoscia muscorum* Common Striped Woodlouse *Porcellio scaber* Common Rough Woodlouse *Pisaura mirabilis* Nursery Web Spider *Misumena vatia* A crab spider		
YC4	r1 – standing waters	*Juncus bulbosus F* *Ranunculus flammula A* *Iris pseudocorus F* *Mentha aquatica O* *Eleocharis palustris O* *Juncus articulatus F* *Juncus effusus R* *Glyceria fluitans O* *Cirsium palustre R* *Ranunculus lingua F* *Carex ovalis R*	Bulbous Rush F Lesser Spearwort A Yellow Flag Iris F Water Mint O Common Spike-rush O Jointed Rush F Soft Rush R Floating Sweet-grass O Marsh Thistle R Greater Spearwort F Oval Sedge R	*Bembidion lunulatum* A ground beetle *Stenolophus mixtus* A ground beetle *Oxypselaphus obscurus* A ground beetle *Coccinella septempunctata* 7-spot Ladybird Iris Flea Beetle *Aphthona nonstriata*	42 - 'Pond (non-priority)'	521.23 m^2
YC5	h3a6 – other blackthorn scrub	*Prunus spinosa D* *Quercus robur O* *Rubus fruticosus agg. A* *Ulex gallii R* *Salix caprea O*	Blackthorn D Pedunculate Oak O European Bramble Complex A Western Gorse R Goat Willow O	None	None	320.26 m^2
YC6	g3c6 – *Lolium* – *Cynosurus* neutral grassland	*Agrostis capillaris A* *Holcus lanatus F* *Anthoxanthum odoratum F* *Jacobaea vulgaris F* *Cirsium arvense F* *Cirsium palustre O* *Dactylis glomerata F* *Rumex acetosa F* *Stellaria graminea O* *Ranunculus repens F*	Common Bent A Yorkshire Fog F Sweet Vernal Grass F Common Ragwort F Creeping Thistle F Marsh Thistle O Cock's-foot F Common Sorrel F Lesser Stitchwort O Creeping Buttercup F	*Pholidoptera griseoaptera* Dark Bush-cricket *Metrioptera roeselii* Roesel's Bush-cricket *Pseudochorthippus parallelus* Meadow Grasshopper *Maniola jurtina* Meadow Brown butterfly - 1 *Lycaena phlaeas* Small Copper butterfly - 2 *Polyommatus icarus* Common Blue butterfly - 1 *Tyria jacobaeae* Cinnabar Moth *Bombus lapidarius* Red-tailed Bumblebee - 3	100 - 'Grazed'	2559.53 m^2
*** Relative abundance was not recorded for trees within orchards.**						

8. References

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APPENDICES

APPENDIX 1: Habitat photographs

P1 – Other neutral grassland at SGS College

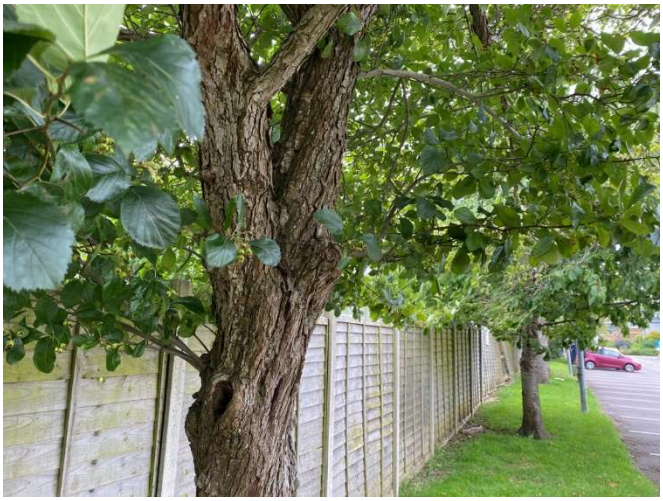
P2 – Modified grassland in the west of the SGS College site

P3 – Modified grassland in the east of the SGS College site

P4 – Scattered trees throughout the western modified grassland at SGS College

P5 – Hedgerow on the western border of SGS College

P6 – Line of trees on the western side of SGS College



P7 – Line of trees on the eastern side of SGS College

P8 – Ponds within the modified grassland at SGS College

P9 – Polytunnel in modified grassland at SGS College

P10 – Polyculture at SGS College

P11 – Other neutral grassland at Brimsham Green School

P12 – priority hedgerow with trees at Brimsham Green School

P13 – Polyculture in southeast of Brimsham Green School site

P14 – Polyculture in southwest of Brimsham Green School site

P15 – Rank modified grassland in the southeastern section of Sodbury Wildflower Meadow

P16 – Modified grassland base habitat for the majority of the Sodbury Wildflower Meadow

P17 – Priority Hawthorn hedgerow surrounding Sodbury Wildflower Meadow

P18 – Short mown modified grassland at Newbridge Open Space

P19 – Modified grassland with playground at Newbridge Open Space

P20 – Modified grassland with shrubs and a taller, less frequently mown sward at Newbridge Open Space

P21 – Species-rich other neutral grassland in the northwest of Newbridge Open Space

P22 – Species-rich other neutral grassland with planted trees in the northwest of Newbridge Open Space

P23 – Other neutral grassland with scattered trees in the northeast of Newbridge Open Space

P24 – strip of broadleaved woodland in northwest of Newbridge Open Space

P25 – Plantation of broadleaved woodland within other neutral grassland on the eastern side of Newbridge Open Space

P26 – Avenue of trees along the southern border of Newbridge Open Space

P27 – Priority hedgerow along the eastern border of Newbridge Open Space

P28 – *Arrhenatherum* neutral grassland with scattered trees and scrub at Yate Common Orchard

P29 – Orchard within *Arrhenatherum* neutral grassland at Yate Common Orchard

P30 – Orchard within *Arrhenatherum* neutral grassland at Yate Common Orchard

P31 – Other Blackthorn Scrub at Yate Common Orchard

P32 – Standing water (pond) at Yate Common Orchard