THE ENVIRONMENT PARTNERSHIP

Brislington Meadows, Bristol

ECOLOGICAL TECHNICAL APPENDIX H

Invertebrate Survey

7507.20.062

March 2022

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1.0 Introduction

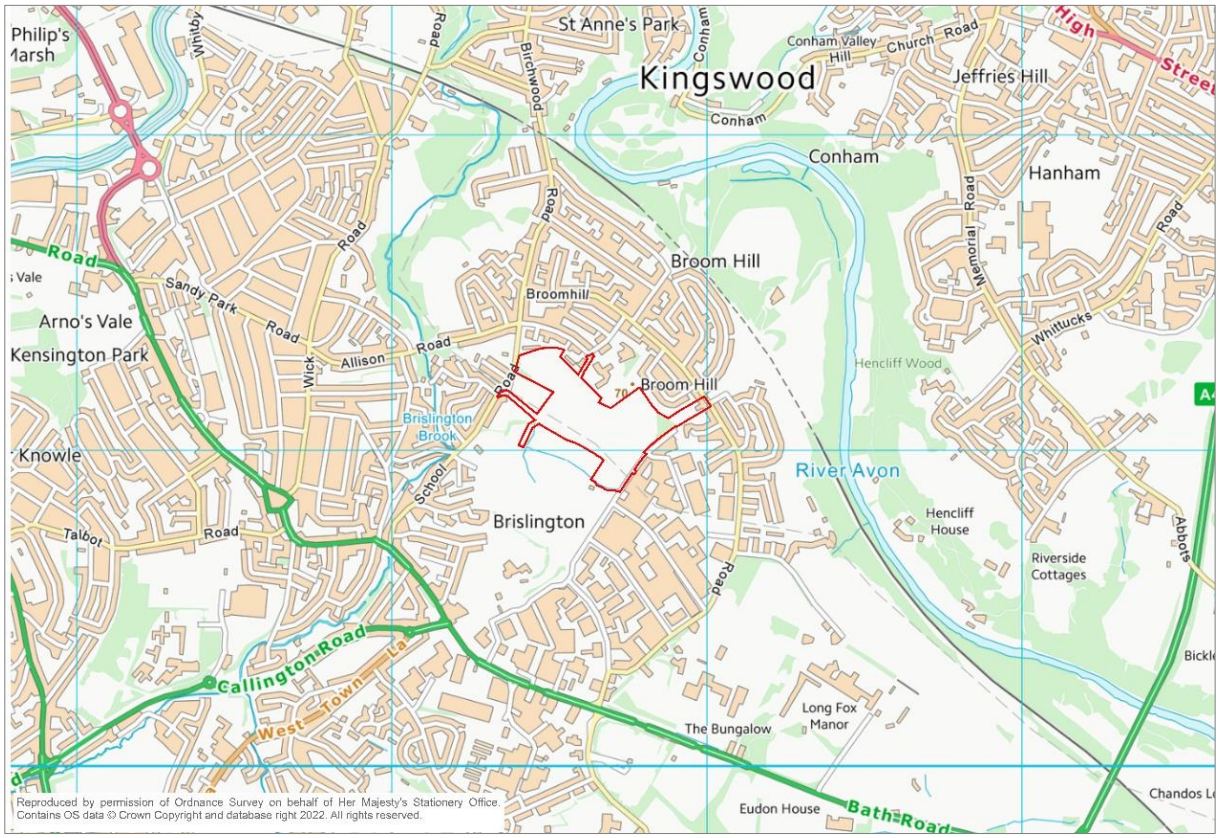
Background

1.1 The Environment Partnership (TEP) was commissioned in July 2020, by Campbell Reith on behalf of Homes England, to complete an Ecological Impact Assessment (EcIA) for the site known as Brislington Meadows (hereafter referred to as 'the site').

1.2 Prior to TEP's appointment, WSP completed a Preliminary Ecological Appraisal (PEA) in September 2019 for the site on behalf of Homes England to inform a pre-planning application (ref 9/05220/PREAPP). Although the PEA scoped out the requirement for detailed invertebrate survey, following further habitat survey and habitat condition assessment by TEP in 2020, an invertebrate survey was commissioned in 2021.

1.3 The site is located within Brislington in the southeast of Bristol. The central grid reference for the site is ST 626 711 and the location of the site is shown in Figure 1.

Figure 1: Site Location



1.4 The site is situated within an area surrounded by residential, industrial buildings and parkland within Brislington, a suburb located southeast of the City of Bristol. The River Avon circumnavigates the northern and eastern outskirts of the site. The site comprises mainly grassland fields with relic hedgerows outgrown with scrub forming field boundaries.

2.0 Methods

2.1 Daytime survey visits were made to the site in May, July and August 2021, during which time a variety of invertebrate capture techniques were employed, targeting key habitats.

2.2 Details of survey dates and weather conditions appear in Table 1; survey visits took place on days suitable for insect activity, avoiding wet, cold and windy days.

Table 1: Daytime survey visit dates and associated weather conditions

Visit number	Date (2021)	Time (B.S.T.)	Weather conditions
V1	27th May	13.30–18.30	Dry, clear, Beaufort Force 2 south-westerly, 18°C.
V2	16th July	16.00–19.30	Dry, clear, calm, 24°C
	17th July	09.30–13.30	Dry, clear, Beaufort Force 2 north-westerly, 25°C.
V3	17th August	14.30–19.00	Dry, 8/8 cloud cover, occasional hazy sunshine, Beaufort Force 2 westerly, 16°C.
	18th August	09.10–13.10	Dry, 8/8 cloud cover, occasional hazy sunshine, Beaufort Force 2 westerly, 16°C.

2.3 Techniques employed during the daytime visits included casual observation/netting of flying insects, sweep-netting of ground vegetation, and beating of trees/bushes to capture dislodged insects; some specimens were taken away for subsequent identification.

2.4 In addition, a programme of static pitfall trapping and water trapping took place to capture day-flying insects (Table 2). Water-trapping is a simple but effective method of attracting flower-visiting insects, consisting of a shallow and brightly coloured bowl (yellow or pink) containing water and a small amount of detergent to aid rapid wetting and sinking of any attracted insect. The insects are attracted to the bowl, mistaking it for a flower, and are drowned. It is particularly effective for Hymenoptera and Diptera, which were target groups. Weather conditions during the sampling periods were generally favourable for insect activity with warm and sunny conditions prevailing (Table 2). Pitfall traps were also operated, which consisted of a Pyrex bowl sunk into the ground so that the rim was level with the ground surface, containing water and a small amount of detergent. Ground-dwelling insects moving about the site fall into the bowl and are drowned. Pitfall/water-trapping during the May visit was confined to a single day; July and August trapping effort was spread over two days.

Table 2: Pitfall and water-trapping effort, 2021 (refer to Drawing G7507.20.056)

Date (2021)	Weather conditions
27th May	10 water traps operated across five locations
16th & 17th July	12 water traps and six pitfall traps operated across six locations
17th & 18th August	14 water traps and seven pitfall traps operated in seven locations

2.5 Two nights of moth-trapping were also carried out (Table 3). This involved the use of a single 125W mercury vapour moth-trap, powered by an electrical generator, which was appropriately placed in a sheltered and secure location in the Paddocks area (F6) and operated from sunset until sunrise. Moths were captured alive and released unharmed the next day.

Table 3: Moth-trapping effort, 2021 (refer to Drawing G7507.20.056)

Date (2021)	Weather conditions
16th July	Dry, calm, 8/8 cloud cover, minimum temperature 14°C.
17th August	Dry, calm, 8/8 cloud cover, minimum temperature 15°C.

2.6 Specialist identification assistance was provided by Steven Lane (mainly Coleoptera, Hemiptera and Isopoda), Steven Falk (Hymenoptera and Diptera) and Peter Harvey (Arenea).

Limitations

2.7 Being based on a three-visit fieldwork programme this survey will have recorded only a proportion of the species inhabiting the site. Early spring species in particular will have been missed. However, the spread of visits did ensure that a reasonable proportion of the species occurring at the site will have been encountered. Targeted searches at other times of years would no doubt add to the species list, including species of conservation significance.

2.8 Health and safety concerns limited the placement of moth traps within the site. Previous arson events had occurred when equipment or machinery had been retained on site overnight, even with a security presence. Mercury vapour lamps, if damaged,

present a human health hazard. Consequently, operation of a single moth trap in the Paddocks which is a secure area of the site under private tenancy, was considered an appropriate compromise. Operation of a single moth trap is not considered a significant limitation for the purposes of informing this site evaluation.

3.0 Results

3.1 A total of 365 species were recorded, which is summarised in Table 4. The species list includes 26 species of Araneae (spiders), 58 species of Coleoptera (beetles), two species of Dermaptera (earwigs), 99 species of Diptera (flies), one species of Glomerida (pill millipedes), 32 species of Hemiptera (bugs), 27 species of Hymenoptera (bees, wasps, ants and sawflies), four species of Isopoda (woodlice), 104 species of Lepidoptera (butterflies and moth), one species of Lithobiomorpha (centipedes), one species of Mecoptera (scorpionflies), two species of Odonata (dragonflies and damselflies), one species of Opiliones (harvestmen), six species of Orthoptera (grasshoppers and crickets) and one species of Polydesmida (flat-backed millipedes).

Table 4: Species recorded during the survey programme, 2021

Taxon	Vernacular	Type of insect
ARENEAE		
Agalenatea redii	Gorse Orb-weaver	Orbweb spider
Agyneta saxatilis s.s.		Money spider
Alopecosa pulverulenta		Wolf spider
Ceratinella brevipes		Money spider
Cheiracanthium erraticum	Two-clawed Hunting Spider	Sac spider
Clubiona brevipes		Sac spider
Dictyna arundinacea		Meshweb spider
Diplostyla concolor		Money spider
Enoplognatha ovata s.s.	Common Candy-striped Spider	Comb-footed spider
Gongylidium rufipes		Money spider
Heliophanus cupreus	Copper Sun Jumper	Jumping spider
Lariniodes cornutus		Orbweb spider
Mangora acalypha		Orbweb spider
Metellina mengei		Long-jawed orbweb spider
Metellina segmentata		Long-jawed orbweb spider
Pachygnatha degeeri		Long-jawed orbweb spider
Pardosa pullata		Wolf spider
Philodromus cespitum		Running crab spider
Pisaura mirabilis	Nurseryweb Spider	Nurseryweb spider
Robertus lividus		Comb-footed spider
Savignya frontata		Money spider
Tenuiphantes tenuis		Money spider
Tibellus oblongus		Running crab spider
Trochosa terricola		Wolf spider
Xysticus acerbus		Crab spider
Xysticus cristatus		Crab spider

Taxon	Vernacular	Type of insect
COLEOPTERA		
Abax parallepipedus		Ground beetle
Agriotes lineatus		Click beetle
Agriotes obscurus		Click beetle
Agriotes sputator		Click beetle
Amara convexior		Ground beetle
Amara lunicollis		Ground beetle
Anthonomus rubi	Strawberry Blossom Weevil	Weevil
Archarius salicivorus		Weevil
Barypeithes pellucidus	Hairy Spider Weevil	Weevil
Bruchus rufimanus	Broad Bean Weevil	Leaf beetle
Calathus fuscipes		Ground beetle
Calathus rotundicollis		Ground beetle
Cantharis decipiens		Soldier beetle
Cantharis rustica		Soldier beetle
Carabus violaceus	Violet Ground Beetle	Ground beetle
Chaetocnema concinna		Leaf beetle
Chaetocnema hortensis		Leaf beetle
Coccinella septempunctata	Seven-spot Ladybird	Ladybird
Cortinicara gibbosa		Minute brown scavenger beetle
Curtonotus aulicus		Ground beetle
Drusilla canaliculata		Rove beetle
Harmonia axyridis	Harlequin Ladybird	Ladybird
Harpalus rufipes	Strawberry Seed Beetle	Ground beetle
Hylesinus varius	Ash Bark Beetle	Weevil
Lochmaea crataegi	Hawthorn leaf Beetle	Leaf beetle
Longitarsus luridus		Leaf beetle
Longitarsus succineus		Leaf beetle
Mecinus pascuorum		Weevil
Meligethes aeneus		Pollen beetle
Neliocarus nebulosus		Weevil
Neocrepidodera ferruginea	Wheat Flea Beetle	Leaf beetle
Oedemera lurida		False blister beetle
Oedemera nobilis	Swollen-thighed beetle	False blister beetle
Paederus littoralis		Rove beetle
Perapion curtirostre		Weevil
Perapion violaceum		Weevil
Philonthus decorus		Rove beetle
Phyllobius roboretanus	Small Green Nettle Weevil	Weevil
Phyllobius virideaeris		Weevil
Propylea quattuordecimpunctata	14-spot Ladybird	Ladybird
Protapion apricans	Clover Seed Weevil	Weevil

Taxon	Vernacular	Type of insect
Pterostichus madidus	Black Clock Beetle	Ground beetle
Pterostichus melanarius	Strawberry Ground Beetle	Ground beetle
Pterostichus strenuus		Ground beetle
Rhagonycha fulva	Common Red Soldier Beetle	Soldier beetle
Rhyzobius litura		Ladybird
Rugilus similis		Rove beetle
Rutpela maculata	Spotted Longhorn	Longhorn beetle
Silpha tristis		Rove beetle
Sitona lineatus	Pea-leaf Weevil	Weevil
Sitona obsoletus		Weevil
Sphaeroderma testaceum		Leaf beetle
Stenus clavicornis		Rove beetle
Strophosoma nebulosum		Weevil
Subcoccinella vigintiquattuorpunctata	24-spot Ladybird	Ladybird
Tachyporus dispar		Rove beetle
Tachyporus solutus		Rove beetle
Tytthaspis sedecimpunctata	16-spot Ladybird	Ladybird
DERMAPTERA		
Forficula auricularia	Common Earwig	Earwig
Forficula lesnei	Lesne's Earwig	Earwig
DIPTERA		
Anthomyia confusanea		Anthomyiid fly
Beris vallata	Orange Legionnaire	Soldier fly
Botanophila fugax		Anthomyiid fly
Brachicoma devia		Flesh fly
Calliphora vicina		Blowfly
Chlorops serenus		Grass fly
Chrysopilus asiliformis		Snipefly
Chrysotus blepharosceles		Long-legged fly
Clusiodes albimanus		Clusid fly
Coenosia mollicula		Housefly
Coenosia testacea		Housefly
Delia florilega		Anthomyiid fly
Delia platura	Bean Seed Fly	Anthomyiid fly
Dilophus febrilis		St. Mark's fly
Dilophus femoratus	Milky-winged Feverfly	St. Mark's fly
Dioctria rufipes	Common Red-legged Robberfly	Robberfly
Dolichopus arbustorum		Long-legged fly
Dolichopus festivus		Long-legged fly
Dolichopus griseipennis		Long-legged fly
Dolichopus trivialis		Long-legged fly

Taxon	Vernacular	Type of insect
Dolichopus ungulates		Long-legged fly
Empis caudatula		Dance fly
Episyrphus balteatus	Marmalade Hoverfly	Hoverfly
Eriothrix rufomaculata		Parasitic fly
Eristalis arbustorum	Plain-faced Dronefly	Hoverfly
Eristalis horticola	Stripe-winged Dronefly	Hoverfly
Eristalis nemorum	Dwarf Drone-fly	Hoverfly
Eristalis pertinax	Tapered Drone-fly	Hoverfly
Eristalis tenax	Common Drone-fly	Hoverfly
Eustalomyia festiva		Anthomyiid fly
Exorista rustica		Parasitic fly
Fannia armata		Lesser Housefly
Fannia serena		Lesser Housefly
Fannia similis		Lesser Housefly
Helina evecta		Housefly
Helina impuncta		Housefly
Helina reversio		Housefly
Helophilus pendulus	Tiger Hoverfly	Hoverfly
Hybos culiciformis		Dance fly
Hydrellia maura		Shore fly
Hydrophoria ruralis		Anthomyiid fly
Lasiomma seminitidum		Anthomyiid fly
Leucozona lucorum		Hoverfly
Limonia nubeculosa	Short-palped Cranefly	Short-palped cranefly
Lispe tentaculata		Housefly
Lonchoptera lutea		Lance fly
Lucilia ampullacea	Streakless Greenbottle	Blowfly
Lucilia sericata		Blowfly
Medetera saxatilis		Long-legged fly
Melanostoma mellinum	Short Melanostoma	Hoverfly
Melanostoma scalare	Slender Melanostoma	Hoverfly
Minettia rivosa		Lauxaniid fly
Morellia aenescens		Housefly
Mydaea electa		Housefly
Nemopoda nitidula		Ensign fly
Nyctia halterata	Dark-winged Flesh Fly	Flesh fly
Opomyza germinationis		Opomyziid fly
Opomyza petrei		Opomyziid fly
Orellia falcata		Fruit fly
Orthonevra nobilis	Long-horned Orthonevra	Hoverfly
Oscinella frit		Grass fly
Oscinella maura		Grass fly

Taxon	Vernacular	Type of insect
Parydra coarctata		Shore fly
Pegoplata infirma		Anthomyiid fly
Phaonia fuscata		Housefly
Phaonia pallida		Housefly
Phaonia tugurionum		Housefly
Phaonia valida		Housefly
Phyllodromia melanocephalus		Dance fly
Platycheirus clypeatus		Hoverfly
Platypalpus optiva		Dance fly
Poecilobothrus nobilitatus	Semaphore Fly	Long-legged fly
Polietes lardarius		Housefly
Pollenia angustigena	Narrow-cheeked Clusterfly	Blowfly
Pollenia rudis	Awkward Clusterfly	Blowfly
Ravinia pernix	Comb-legged Fleshfly	Fleshfly
Rhagio lineola		Snipefly
Rhamphomyia tarsata		Dance fly
Rhingia campestris		Hoverfly
Rhinophora lepida	Pouting Woodlouse-fly	Woodlouse fly
Sarcophaga carnaria		Flesh fly
Sarcophaga depressifrons		Flesh fly
Sarcophaga incisilobata		Flesh fly
Sarcophaga melanura		Flesh fly
Sarcophaga nigriventris		Flesh fly
Sarcophaga subvicina		Flesh fly
Sarcophaga variegata		Flesh fly
Scaeva pyrastri		Hoverfly
Scathophaga stercoraria		Flesh fly
Sciapus platypterus		Long-legged fly
Sepsis fulgens		Black scavenger fly
Sphaerophoria interrupta	Interrupted Twist-tail	Hoverfly
Sphaerophoria taeniata	Broad-banded Twist-tail	Hoverfly
Suilla variegata		Heleomyzid fly
Sympycnus desoutteri		Long-legged fly
Urophora quadrifasciata		Fruit fly
Volucella pelluscens		Hoverfly
Volucella zonaria		Hoverfly
Xanthogramma pedissequum		Hoverfly
GLOMERIDA		
Glomeris marginata		Pill millipede
HEMIPTERA		
Aelia acuminata	Bishops Mitre Shieldbug	Shieldbug
Aphrodes makarovi		Leafhopper

Taxon	Vernacular	Type of insect
Apolygus spinolae		Plant bug
Athysanus argentarius	Silver Leafhopper	Leafhopper
Capsus ater		Plant bug
Cercopis vulnerata	Red-and-black Froghopper	Froghopper
Closterotomus norwegicus	Potato Capsid	Plant bug
Coreus marginatus	Dock Bug	Leatherbug
Dolycoris baccarum	Hairy Shieldbug	Shieldbug
Drymus sylvaticus		Groundbug
Errastunus ocellaris		Leafhopper
Eupteryx aurata		Leafhopper
Eurygaster testudinaria	Tortoise Bug	Shieldbug
Euscelis incisus		Leafhopper
Leptopterna dolabrata		Plant bug
Liocoris tripustulatus	Common Nettle Bug	Plant bug
Lygus rugulipennis	Tarnished Plant Bug	Plant bug
Nabis rugosus	Common Damsel Bug	Damsel bug
Neophilaenus lineatus		Froghopper
Notostira elongata		Plant bug
Oncotylus viridiflavus		Plant bug
Palomena prasina	Green Shieldbug	Shieldbug
Pentatoma rufipes	Forest Bug	Shieldbug
Peritrechus geniculatus		Ground bug
Philaenus spumarius	Common Froghopper	Froghopper
Phytocoris varipes		Plant bug
Plagiognathus arbustorum		Plant bug
Plagiognathus chrysanthemi		Plant bug
Rhopalus parumpunctatus		Rhapalid bug
Stenodema calcarata		Plant bug
Stenodema laevigata		Plant bug
Stenotus binotatus	Two-spotted Grass Bug	Plant bug
HYMENOPTERA		
Andrena haemorrhoa	Orange-tailed Mining Bee	Mining bee
Andrena labiata	Red-girdled Mining Bee	Mining bee
Andrena scotica	Chocolate Mining Bee	Mining bee
Andrena wilkella	Wilke's Mining Bee	Mining bee
Anoplius nigerrimus		Spider wasp
Apis mellifera	Western Honey Bee	Honey bee
Bombus hypnorum	Tree Bumblebee	Bumblebee
Bombus lapidarius	Red-tailed Bumblebee	Bumblebee
Bombus lucorum	White-tailed Bumbleebee	Bumblebee
Bombus pascuorum	Common Carder Bee	Bumblebee
Bombus pratorum	Early Bumblebee	Bumblebee

Taxon	Vernacular	Type of insect
Bombus terrestris	Buff-tailed Bumblebee	Bumblebee
Cephus spinipes		Sawfly
Halictus tumulorum	Bronze Furrow Bee	Base-banded furrow bee
Lasioglossum calceatum	Common Furrow Bee	Base-banded Furrow bee
Lasioglossum leucozonium	White-zoned Furrow Bee	Base-banded Furrow bee
Lasioglossum pauxillum	Blunt-lobed Furrow Bee	Base-banded furrow bee
Lasius flavus	Yellow Meadow Ant	Ant
Lasius niger s.s.		Ant
Lindenius albilabris		Digger wasp
Megachile willughbiella	Willughby's Leafcutter Bee	Leafcutter bee
Myrmica rubra		Ant
Myrmica sabuleti		Ant
Myrmica scabrinodis		Ant
Selandria serva		Sawfly
Vespula germanica	German Wasp	Social wasp
Vespula vulgaris	Common Wasp	Social wasp
ISOPODA		
Armadillidium vulgare	Common Pill Woodlouse	Woodlouse
Oniscus asellus	Common Woodlouse	Woodlouse
Philoscia muscorum	Striped Woodlouse	Woodlouse
Porcellio scaber	Common Rough Woodlouse	Woodlouse
LEPIDOPTERA		
Abrostola tripartita	Spectacle	Moth
Acasis viretata	Yellow-barred Brindle	Moth
Acleris laterana		Moth
Acrobasis advenella		Moth
Acronicta aceris	Sycamore	Moth
Acronicta rumicis	Knot Grass	Moth
Aglais io	Peacock	Butterfly
Agriphila tristella		Moth
Agrotis exclamationis	Heart and Dart	Moth
Agrotis puta	Shuttle-shaped Dart	Moth
Anania coronata		Moth
Anania hortulata	Small Magpie	Moth
Apamea lithoxylaea	Light Arches	Moth
Apamea monoglypha	Dark Arches	Moth
Aphantopus hyperantus	Ringlet	Butterfly
Argynnis paphia	Silver-washed Fritillary	Butterfly
Autographa gamma	Silver Y	Moth
Axylia putris	Flame	Moth
Biston betularia	Peppered Moth	Moth
Blastobasis adustella		Moth

Taxon	Vernacular	Type of insect
Cabera pusaria	Common White Wave	Moth
Calliteara pudibunda	Pale Tussock	Moth
Camptogramma bilineata	Yellow Shell	Moth
Caradrina morpheus	Mottled Rustic	Moth
Carcina quercana		Moth
Celypha lacunana		Moth
Chrysoteuchia culmella	Garden Grass-veneer	Moth
Cnephasia stephensiana	Grey Tortrix	Moth
Cochylis molliculana		Moth
Cosmia trapezina	Dun-bar	Moth
Craniophora ligustri	Coronet	Moth
Crocallis elinguaria	Scalloped Oak	Moth
Cyclophora punctaria	Maiden's Blush	Moth
Cydalima perspectalis	Box-tree Moth	Moth
Cydia splendana		Moth
Deilephila elpenor	Elephant Hawk-moth	Moth
Eilema griseola	Dingy Footman	Moth
Eilema lurideola	Common Footman	Moth
Ennomos alniaria	Canary-shouldered Thorn	Moth
Ennomos quercinaria	August Thorn	Moth
Epirrhoe alternata	Common Carpet	Moth
Eucosma campoliliana		Moth
Eudonia truncicolella		Moth
Eupithecia inturbata	Maple Pug	Moth
Eupithecia vulgata	Common Pug	Moth
Euplagia quadripunctaria	Jersey Tiger	Moth
Gymnoscelis rufifasciata	Double-striped Pug	Moth
Gypsonoma dealbana		Moth
Habrosyne pyritoides	Buff Arches	Moth
Herminia tarsipennalis	Fan-foot	Moth
Hofmannophila pseudospretella	Brown House-moth	Moth
Hoplodrina ambigua	Vine's Rustic	Moth
Hoplodrina blanda	Rustic	Moth
Hoplodrina octogenaria	Uncertain	Moth
Hypena proboscidalis	Snout	Moth
Idaea aversata	Riband Wave	Moth
Idaea biselata	Small Fan-footed Wave	Moth
Lacanobia oleracea	Bright-line Brown-eye	Moth
Laothoe populi	Poplar Hawk-moth	Moth
Laspeyria flexula	Beautiful Hook-tip	Moth
Lomographa temerata	Clouded Silver	Moth
Lycaena phlaeas	Small Copper	Moth

Taxon	Vernacular	Type of insect
Maniola jurtina	Meadow Brown	Moth
Melanargia galathea	Marbled White	Moth
Mesapamea didyma	Lesser Common Rustic	Moth
Mesoligia furuncula	Cloaked Minor	Moth
Mythimna impura	Smoky Wainscot	Moth
Noctua comes	Lesser Yellow Underwing	Moth
Noctua janthe	Lesser Broad-bordered Yellow Underwing	Moth
Noctua pronuba	Large Yellow Underwing	Moth
Notocelia uddmanniana	Bramble Shoot Moth	Moth
Ochlodes sylvanus	Large Skipper	Butterfly
Ochropleura plecta	Flame Shoulder	Moth
Opisthograptis luteolata	Brimstone Moth	Moth
Ourapteryx sambucaria	Swallow-tailed Moth	Moth
Pammene aurita		Moth
Pammene fasciana		Moth
Pandemis corylana	Chequered Fruit-tree Tortrix	Moth
Panemeria tenebrata	Small Yellow Underwing	Moth
Pararge aegeria	Speckled Wood	Butterfly
Patania ruralis	Mother of Pearl	Moth
Peribatodes rhomboidaria	Willow Beauty	Moth
Pheosia tremula	Swallow Prominent	Moth
Philereme transversata	Dark Umber	Moth
Phragmatobia fuliginosa	Ruby Tiger	Moth
Pieris brassicae	Large White	Moth
Plutella xylostella	Diamond-back Moth	Moth
Polygonia c-album	Comma	Butterfly
Polyommatus icarus	Common Blue	Butterfly
Pyronia tithonus	Gatekeeper	Butterfly
Rhodophaea formosa		Moth
Rivula sericealis	Straw Dot	Moth
Scoliopteryx libatrix	Herald	Moth
Selenia dentaria	Early Thorn	Moth
Spilonota ocellana	Bud Moth	Moth
Spilosoma lutea	Buff Ermine	Moth
Thalpophila matura	Straw Underwing	Moth
Thymelicus sylvestris	Small Skipper	Butterfly
Triodia sylvina	Orange Swift	Moth
Vanessa atalanta	Red Admiral	Butterfly
Xestia c-nigrum	Setaceous Hebrew Character	Moth
Xestia triangulum	Double Square-spot	Moth
Xestia xanthographa	Square-spot Rustic	Moth

Taxon	Vernacular	Type of insect
LITHOBIOMORPHA		
Lithobius forficatus	Common Centipede	Centipede
MECOPTERA		
Panorpa communis	Common Scorpionfly	Scorpionfly
ODONATA		
Anax imperator	Emperor Dragonfly	Dragonfly
Sympetrum striolatum	Common Darter	Dragonfly
OPILIONES		
Leiobunum rotundum		Harvestman
ORTHOPTERA		
Chorthippus brunneus	Common Field Grasshopper	Grasshopper
Chorthippus parallelus	Meadow Grasshopper	Grasshopper
Leptophyes punctatissima	Speckled Bush-cricket	Cricket
Meconema thalassinum	Oak Bush-cricket	Cricket
Roeseliana roeselii	Roesel's Bush-cricket	Cricket
Tetrix undulata	Common Ground-hopper	Ground-hopper
POLYDESMIDAE		
Polydesmus inconstans		Millipede

Significant Species

3.2 The national significance of species recorded in this survey is assessed in this report with reference to the following criteria:

- **Wildlife and Countryside Act**: a relatively small number of species are given full statutory protection in the 1981 act and subsequent quinquennial reviews.
- Invertebrate species listed under Section 41 of the **Natural Environment and Rural Communities Act**. Sections 41 and 42 of the NERC Act require the Secretary of State to publish lists of habitats and **species of principal importance** (SPI) for the conservation of biodiversity in England and Wales. The lists are used to guide public authorities in implementing their duty under Section 40 of the NERC Act: to have regard to the conservation of biodiversity in England and Wales, when carrying out their normal functions. Note that moth species listed under Section 41 are excluded where they were listed under the originally published Biodiversity Action Plan list for 'research' only, as these are common species that have undergone decline and require further study but are still widely distributed.
- **Red Data Book species**: Shirt (1987) details the status of rare insects based upon IUCN guidelines at the time, according to the degree of threat. The following categories are used in descending order of importance:
  - **RDB1**. Endangered
  - **RDB2**. Vulnerable
  - **RDB3**. Rare
  - **RDBK**. Status unknown

- Species listed as **Critically Endangered** (CR), **Endangered** (EN), **Vulnerable** (VU) and Near Threatened (NT) using International Union for the Conservation of Nature (IUCN) criteria, where an appropriate review of the relevant taxonomic group has been carried out.
- **Nationally Rare** (Nr), **Nationally Scarce A** species (Na) and **Nationally Scarce B** (Nb) species: these relate respectively to species recorded from 1–15, 16–30 and 31–100 10km grid-squares in Great Britain; Nationally Scarce A and B may be combined as Nationally Scarce (occurring in 16–100 10km squares in Great Britain). Nationally Scarce B may also be referred to as Nationally Notable.

3.3 The county significance of species is assessed in this report with reference to the following designations:

- Invertebrates listed in the **Bristol Biodiversity Action Plan**.

3.4 Using the above methods of evaluation, nine species of conservation significance are recognised. These are listed at Table 5.

Table 5: Species of conservation significance recorded during the survey

Latin Name	Common Name	Designation
Andrena labiata	Red-girdled Mining Bee	Nationally Notable A
Argynnis paphia	Silver-washed Fritillary	Bristol BAP
Coenonympha pamphilus	Small Heath	Near Threatened; SPI; Bristol BAP
Dolichopus arbustorum		Nationally Scarce
Eupithecia inturbata	Maple Pug	Endangered
Forficula lesnei	Lesne's Earwig	Nationally Scarce
Orellia falcata		Nationally Notable
Lasioglossum pauxillum	Blunt-lobed Furrow Bee	Nationally Notable A
Rugilus similis		Nationally Notable

3.5 Further detail about the occurrence of the species listed in Table 5 is given below:

3.6 **Red-girdled Mining Bee** *Andrena labiata* A single example of this mining bee was netted by day in May. Graded Notable A in Falk (1991a), it is a bee of habitats such as grasslands, gardens and urban greenspace rich in speedwells, forget-me-nots, daisies and dandelions. Nesting occurs in short or sparse vegetation (Falk, 2015). It is now widely recorded in southern and central England, having increased and expanded its range substantially in recent years (S. Falk, pers. comm.).

3.7 **Silver-washed Fritillary** *Argynnis paphia*. A single example of this butterfly was seen in hedgerows on 17th August 2021 This species inhabits woodland, wooded lanes and hedgerows; the larval foodplant is various violet species. Nationally it occurs mainly in southern England, Wales and Ireland.

3.8 **Small Heath** *Coenonympha pamphilus*. Two examples of this butterfly were seen in July. The species is listed as Near Threatened by Fox *et a*l. (2010), as well as appearing under Section 41 of the Natural Environment and Rural Communities Act and the Bristol Biodiversity Action Plan. It occurs in a wide variety of grasslands, heathlands and brownfield sites that are well-drained with low-growing flowering plants and fine grasses (Eeles, 2019); the larval foodplants are various grass species, including fescues Festuca spp., meadow-grasses *Poa* spp. and bents *Agrostis* spp. It is a species of particular national concern currently due to its decline.

3.9 ***Dolichopus arbustorum***. An example of this long-legged fly was captured in water traps in August. Graded Nationally Scarce in Drake (2018), it is a widespread but localised species with poorly understood habitats requirements because it can be found in wetlands, dry woodland, coastal grazing marsh and even old dry quarries. It may require small temporary water bodies or wet mud (S. Falk, pers. comm.).

3.10 **Maple Pug** *Eupithecia inturbata*. A single example of this species was recorded in July. It is listed as Endangered by Randle et al. (2019) as a result of severe decline at monitored sites, although the national distribution has increased. It is a species of woodland, scrub and hedgerows and the caterpillar feeds on the flowers of Field Maple *Acer campestre* (Waring & Townsend, 2017).

3.11 **Lesne's Earwig** *Forficula lesnei*. A single example of this Nationally Scarce earwig was captured by day in May with two found in August. It occurs in scrub and lightly wooded habitats in England and Wales, particularly where Old Man's Beard *Clematis vitalba* occurs; it also inhabits dead umbellifer stems.

3.12 ***Orellia falcata***. An example of this picture-winged fly was captured by day in July. Graded Notable in Falk (1991b), it is a widespread but rather localised species of taller grassland with plentiful Goat's-beard *Tragopogon pratensis* over much of England and south Wales. The larvae develop in the rootstocks and stem bases of this plant (S. Falk, pers. comm.).

3.13 **Blunt-lobed Furrow Bee** *Lasioglossum pauxillum*. An example of this base-banded furrow bee was captured by day in July. Graded Notable A in Falk (1991a) it has increased in recent decades and is now locally common over much of southern England north to Lincolnshire (S. Falk, pers. comm.). It forages on a variety of flowers and can form large nesting aggregations in sparsely-vegetated clay–rich ground, especially along well-trodden footpaths.

3.14 ***Rugilus similis***. An example of this Nationally Notable rove beetle was captured in a pitfall trap in August. This species is locally distributed throughout southern England in dry or chalk grassland habitats. There are a very small number of records from vice-county six up to the year 2000, and one record from vice-county 34 in 2001 (R. Barnett, pers. comm.). It is predatory on small invertebrates and has been found in moss, amongst grass, in reed debris and under stones (Hyman, 1994).

3.15 The following species are also of interest:

3.16 ***Rhodophaea formosa***. A single example of this micro-moth was recorded in the moth-trap in July. It is a local species, both nationally and in the region (R. Barnett, pers. comm.), and the larvae feed upon the leaves of elm *Ulmus* spp.

3.17 ***Neocochylis molliculana***. A single example of this tortrix moth was captured in the moth-trap in August. It was first recorded in Britain in Dorset in 1993 and has since colonised parts of southern England. The larvae feed upon Bristly Ox-tongue *Picris echioides*. It is a thinly distributed species in the Bristol region in the region (R. Barnett, pers. comm.).

3.18 A study of desk study records drawn from a 2km radius, provided by the Bristol Regional Environmental Records Centre, did not produce any additional significant species within the survey area or in immediately adjacent land of similar habitat, other than records of two Mocha *Cyclophora annularia* in 2008. This species is graded Nationally Notable in Waring & Townsend (2017); it inhabits scrub woodland and hedges, where the larva feeds on field maple *Acer campestre*. There is a small number of field maple within the site. They are not widespread, but would provide localised suitable habitat for this species within the site.

4.0 Evaluation

4.1 Based on the known presence of nine species of conservation concern and the overall diversity of species encountered, the site is assessed as holding **vice-county value** for invertebrates.

4.2 Specific habitats identified as being of importance for invertebrates across the site include:

- Hedgerows. The presence of Hawthorn *Crataegus monogyna*, Blackthorn *Prunus spinosa* and willow *Salix* sp. over the site is a rich source of nectar for insects in the spring months when these species are in blossom. Hawthorn blossom was particularly abundant at the site during the May visit and this species forms a significant component of the hedgerows. The presence of dense banks of ivy in the hedgerows is also a significant source of nectar in the autumn.
- Presence of dense bramble and nettle patches at the field edges, bramble being another valuable nectar source later in late summer.
- Mature woodland areas on the site boundaries and in particular in the eastern part of the site close to Bonville Road. Here areas of shade and dappled sunshine provide habitats for additional species.
- The extensive meadows provide valuable habitat for invertebrates and an abundance of nectar sources, including large clumps of bird's-foot trefoil *Lotus* spp., red clover *Trifolium pratense* and buttercups. In the summer months an abundance of butterflies are present here, including a large population of Marbled White *Melanargia galathea* and smaller numbers of Small Heath, as well as more common grassland species such as Meadow Brown *Maniola jurtina* and Ringlet *Aphantopus hyperantus*.
- The network of mown paths through the meadows provides valuable diversity in sward structure and edge habitats with basking areas for insects. The most heavily used of these paths provide a source of bare ground in places. Bare ground habitats provide warm and sheltered conditions, exposed to the sun and with an associated warm micro-climate, which is attractive to aculeate Hymenoptera, Coleoptera and other invertebrates

4.3 A significant factor in the site's value for invertebrates is the diversity of habitats present and the high degree of habitat connectivity. Although located in the centre of Bristol it forms part of a green corridor associated with the nearby River Avon, which connects with more substantial areas of countryside to the south-east.

5.0 References

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Drawings

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