HIGHBURY PARK

Terrestrial Invertebrate Survey

2016-2020

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Contents

Summary 3

Background 4

Survey Aims 4

The Site 5

Site Description 5

Recording Compartments 6

Nature Conservation Designations 7

Methodology 8

Desk Study 8

Habitat Assessment 8

Terrestrial Invertebrate Survey 8

Sample Sub-sites 8

Early Spring Transect (March – April) 9

Late Spring to Autumn Transect (May – September) 10

Sample Locations 11

Target Species 21

Site Visits and Weather Conditions 22

Analysis 22

Results 23

Species Recorded in 2020 23

Species Recorded between 2016-2019 23

Combined Records (2016-2020) 23

Target Species - Hoverflies 26

Other Species 27

Species with a Conservation Status 30

Section 41 Priority Species - research only 30

GB Red List and National Rarity Status 30

Locally Rare Species 33

Pantheon Analysis 37

Specific Assemblage Types (SATS) 37

SATs Identified by the Survey Results 38

Other SATS Likely to be Present 45

Broad Habitats 46

Discussion 49
Method Limitations 49
Species Recorded 49
Pollinators 49
Connectivity to Other Sites 50
Appendix 51
Summary Results Table 51
Bibliography 60

Summary

- Highbury Park is a 30ha public park and located in the Moseley area of Birmingham.

- In 2020 Ellen Pisolkar has carried out a habitat survey and Local Site Assessment for the site. This invertebrate transect survey is designed to complement the Local Site Assessment.

- Two transect routes were designed with the aim of sampling the different types of habitat found in the park including meadows, woodland, scrub edge, stream margins, ponds and areas of formal parkland.

- The survey primarily focussed on hoverflies (Syrphidae), but secondary taxon groups were also noted where identification is often possible from photographs. The survey mainly focussed on flower-visiting species that were active at the time of the survey.

- A total of 590 records were made over the four survey visits in 2020 while a further 139 records were made during ad-hoc visits between 2016 and 2019.

- 192 different species were recorded and a further 38 organisms were identified to genus or family level. Overall 81 different families of invertebrate were recorded.

- Four species have a national conservation status. A further six species were either uncommon or under-recorded in Birmingham and the Black Country.

- An assessment of the total list of species recorded was undertaken using the Pantheon online tool.

- The analysis showed that Highbury Park is 'favourable' for the invertebrate assemblage type 'F002 Rich flower resource' - meaning that the sites' habitats are likely to support a high number of pollinator species.

- The park includes both formally-managed parkland and semi-natural 'wild' areas, some of which are quite flower-rich. This varied mix of habitats provides food for pollinators throughout the year. Areas of the site particularly important for pollinators included the meadow areas, the margins of Shuttock Stream, Moor Green Lane Bank and the Community Garden area

- Five other invertebrate assemblage types were shown as being present, though further survey work is needed to confirm to what extent. These include scrub-edge species and species that live in or feed on dead wood.

- The results reflected the variety of invertebrate habitats present on the site.

Background

Survey Aims

Highbury Park is an historic park with a variety of wildlife habitats present.

A Local Site Assessment was last carried out for the site in 1990. Since then there have been some positive changes in management and a number of habitat improvements have been carried out to improve the value of the site for wildlife.

In 2020 Ellen Pisolkar decided to carry out an updated assessment for the site to identify the parts of the site which are of nature conservation importance. The assessment involved looking mostly at the flora species and habitats present.

This invertebrate transect survey is designed to complement the main survey and increase our knowledge about the invertebrates of Highbury Park.

The Site

Site Description

Highbury Park is a 30ha public park located in the Moseley/King's Heath area of Birmingham (OSGR SP068823). The park was formed from two historic estates - the Henburys estate, which dates back to the 17th century and Highbury (the Chamberlain Estate) which was created by Joseph Chamberlain in the 19th century[i]. The park includes several ponds, a stream, swamp, woodlands (mostly originating from landscape planting or expansions of old hedges), created meadows, formal planting areas and scattered mature trees.

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Figure 1 Map showing the main habitats of Highbury Park - based on: E.M. Pisolkar (2020) Highbury Park Phase 1 Habitat Survey

Recording Compartments

For recording purposes Highbury Park is divided up into the following management plan compartments:

Compartment 1: Henbury's (Eastern Section) - The eastern section of the Henbury's Estate including the entrance from Alcester Road, Monument Bank, Henbury's House Wood and Henbury's Pond.

Compartment 2: Henbury's (Western Section) - The western section of the Henbury's Estate, south of the main path and carpark, including the bowling green, Pleck Wood, Hopyard Meadow and Dad's Close.

Compartment 3: Western Meadow - Two created wildflower meadows - Lower Shutlock Meadow and Middle Shutlock Meadow.

Compartment 4: Eastern Meadow and Wood - Includes Big Meadow - a large area of grassland with scattered mature trees, and Middle Piece Wood.

Compartment 5: Long Pool and surrounds

Compartment 6: Western Boundary and Specialist Gardens – includes Moor Green Lane Bank, Oak Tree Pond, Italian Gardens and areas of planted ornamental trees and shrubs.

Compartment 7: Meadow, Beech Copse and Planting – area to the north of the Long Pool including the Pinetum, Beech Copse, Highbury Park Plantation, Poor Barley Field and Six Day Field.

Compartment 8: Lodge Entrance, Drive to Mansion and Pleasure Grounds – Highbury Hall Pleasure grounds including Highbury Swamp and Swamp Pond, plus Viewing Platform Pond and Apiary.

Compartment 9: Orchard, Model Farm and Entranceway

Figure 2 Highbury Park Recording Compartments

Nature Conservation Designations

Some areas of the site are currently designated as a Site of Local Importance for Nature Conservation (SLINC). These areas comprise: 1) Long Pool and surrounding woodland; 2) Highbury Swamp to the north east of the Long Pool; 3) Oak Tree Pond 4) Henbury's Pond 4) an area of woodland outside of the park boundary in the Uffculme Estate.

The 2020 Local Site Assessment is still being prepared but it is likely to recommend that the majority of the park should be designated as a Local Wildlife Site (SINC or SLINC)[i].

Methodology

Desk Study

Desk study information from EcoRecord (Local Environmental Record Centre for Birmingham and the Black Country) was received and consulted to help inform this survey.

Habitat Assessment

The main habitats on site were identified. These are described in detail in the 2020 Local Site Assessment (E.M. Pisolkar)[i].

Habitats include:

Woodland – semi-natural, broad-leaved
Woodland – plantation (broad-leaved, coniferous, mixed)
Scrub and Tall Herb
Scattered Mature Trees
Lowland Meadow
Marshy Grassland
Other Semi-natural Grassland
Ponds
Stream
Swamp
Hedges with trees

Terrestrial Invertebrate Survey

The survey was carried out using hand searching and visual observation, aided by photography to identify the species present.

Sample Sub-sites

The survey was carried out by walking a transect, designed to include a variety of habitats thought to be important for invertebrates, with a focus on flower-visiting insects. The transect was changed through the year depending on where the best flower resource was, but followed two main routes.

The survey was not timed, instead each transect was walked until no new species (of any of the target groups) were being spotted.

Early Spring Transect (March – April)

This transect was designed to sample areas with plants and trees flowering in early spring:

Figure 3 Early Spring Transect Route. Dot size indicates number of visits to a particular point.

Late Spring to Autumn Transect (May – September)

This transect was designed to sample areas with plants and trees flowering in late spring, summer and early autumn:

Figure 4 Late Spring - Autumn Transect Route. Dot size indicates number of visits to a particular point.

Sample Locations

(🌱 = Early Spring; ☀ = Late Spring-Autumn)

Compartment 1:

Henbury's House Wood SP07048228 🌱☀

The wood has a field later including Ivy, Lesser Celandine, Cow Parsley, Wood Avens, Broad-leaved Willowherb, Daffodil., Bluebell (both native and Hybrid), Cyclamen, Snowdrop and Scilla. The south-western edge is likely to offer a sunny basking place for various insects. There are also areas of bare ground for nesting bees and good amounts of deadwood.

Figure 5 Probably mining-bee (Andrena sp.) nest hole, Henbury's House Wood

Henbury's Pond SP07028222 ☀

Old pond fringed with Yellow Flag and whose surface has an extensive area of White Waterlily. Likely to be a good pond for dragonflies and damselflies.

Compartment 2:

Hopyard Meadow SP06698201 ☀

Large grassland area, whose edges have been subject to habitat works to create wildflower meadow strips, which run along the NE, SE and SW sides of the field. Species present in these areas include Cowslip, Common Knapweed, Corn Marigold, Hogweed, Creeping Thistle, Yellow-rattle, Meadow Buttercup, Bird's-foot Trefoil and Red Clover.

Figure 6 edge of Hopyard Meadow

The interior of the field is less botanically interesting, but does include a significant amount of buttercup (mostly Creeping Buttercup).

Figure 7 Hopyard Meadow – edge of meadow, looking towards buttercup-dominated interior

Dad's Close Hedge SP06668206 🌱☀️

Old gappy hedgerow, with scrub running along a ridge separating Hopyard Meadow and Dad's Close. The hedgerow has a dense field-layer, dominated by Bramble and Ivy with Cow Parsley, Common Nettle, Wood Avens, Cleavers and Broad-leaved Dock. Because of the south-facing nature of the location, the bramble leaves are likely to offer a sunny basking place for a number of different types of insects.

Figure 8 Dad's Close Hedge

Dad's Close SP06628207 ☀️

A triangular area of grassland which has been left unmown with desire lines cut. The grassland contains flowers including Bulbous Buttercup, Creeping Buttercup, Pignut, Dandelion, Broad-leaved Dock, Lesser Stitchwort and Common Cat's-ear. The north east corner is quite wet.

Figure 9 Dad's Close grassland

Compartment 3:

Shutlock Middle Meadow SP06688220 ☀

Since 2008 this area has been managed as a meadow and the area has been spot-planted, seeded and haystrewn with a mix of meadow species.

Flowers present in the meadow include Meadow Buttercup, Yellow Rattle, Pignut, Meadow Vetchling, Black Knapweed, White Clover, Meadow Crane's-bill and Yarrow.

There is also some dead wood present, including a log, which appeared to be another good basking site for insects.

Figure 10 log in Shutlock Middle Meadow

Shutlock Lower Meadow SP06658232 ☀

In 2016/17 this area, which was previously regularly-mown grassland, was treated with herbicide and then strewn with species-rich green hay in order to introduce wildflower meadow species into the area.

The created meadow contains abundant Common Knapweed, Yellow-rattle, Meadow Buttercup, Red Clover, White Clover, Ox-eye Daisy, Bird's-foot Trefoil and Rough Hawkbit. A section of the meadow in the north western corner contains a large amount of Betony and Devil's-bit Scabious, as well as Orange Hawkweed.

Figure 11 Shutlock Lower Meadow

Figure 12 Shutlock Lower Meadow - NW corner

Compartment 4:

Middle Piece Wood SP06748235 🌱

The woodland's field-layer includes Lesser Celandine, Daffodil and Primrose, which are all early-flowering species. There are areas of bare ground and deadwood present.

There are also wet hollows, which are the remnants of a former pond.

Figure 13 Remnants of former pond

Compartment 5:

Shutlock (or Shuttock) Stream, Big Meadow SP06788242 ☀

Plants along the stream margins include Creeping Buttercup, Himalayan Balsam, Hogweed, Lesser Celandine, Cow Parsley, Broad-leaved Dock, Pendulous Sedge, Bramble, Willow and Elder.

The banks are bare in places and may provide suitable nesting habitat for ground-nesting bees.

Figure 14 Stream margins, Big Meadow

Compartment 6:

Moor Green Lane Bank SP06568251

Embankment running along the eastern part of Highbury Park, along Moor Green Lane. During early spring this is probably the most flower-rich section of the park – with lots of early-flowering species including Crocus, Dandelion, Pignut, Daffodil, Field Wood-rush, Ribwort Plantain, Meadow Buttercup and Bluebell. The bank has light soil and is partly south facing, making it a prime likely nesting site for mining bees.

Figure 15 Moor Green Lane Bank

Ornamental Tree and Shrub Area SP06598265

This area contains some south-facing Cherry-laurel bushes, whose leaves seem to be a particularly popular basking location for a number of invertebrate species. This part of the site also contained quite a few early-flowering species including Daffodil, Crocus, Lesser Celandine, Daisy and Meadow Buttercup.

Within the flower beds there are a number of areas of bare ground, which may be potential nesting sites for ground-nesting bees.

Figure 16 Ornamental Tree and Shrub Area

Italian Garden SP06598258 🌱☀️

During spring the flower beds are still quite bare offering quite a bit of potential nesting habitat for ground-nesting bees. Later in the year the flowers here include Giant Scabious, Comfrey and Bistort which provide nectar and pollen for flower-feeding insects.

Figure 17 Italian Gardens, early spring

Shuttock Stream, Lower Shutlock Meadow SP06638238 ☀️

The stream margins here are fringed by an area of tall herb with Cow Parsley, Broad-leaved Dock, Ivy, Common Nettle, Bramble, Cleavers, Creeping Thistle, Lesser Celandine and Common Hogweed.

Figure 18 Stream margins, Lower Shutlock Meadow

Compartment 7

East of Italian Garden SP06618259 🌱

This is another area containing south-facing Cherry-laurel bushes, whose leaves are likely to offer a good sunlit platform for insects to bask on.

Figure 19 East of Italian Gardens

Scrub North of Tree Avenue SP06658261 ☀️

South-facing woodland/scrub edge, along path with bramble offering potential basking area for various insects.

Figure 20 Scrub north of Tree Avenue

Compartment 8

Highbury Hall Pleasure Gardens SP06868259 ☀

Overgrown with quite a bit of scrub-edge habitat and flowers include Bramble, Rosebay Willowherb, Himalayan Balsam and Cleavers. There is quite a bit of dead wood and bare ground.

Figure 21 Highbury Hall Pleasure Gardens

Highbury Swamp Pool SP06938248 ☀

This is a small pond with Duckweed and Yellow Flag that's within a wider swamp area dominated by Reedmace.

Figure 22 Swamp Pool

Compartment 9

Highbury Community Orchard SP06978251 ☀

An area used for growing a variety of locally important fruit tree varieties as well as other fruits and vegetables. This is a very flower-rich area of the park, with a number of wild and garden-type species.

Figure 23 Highbury Community Orchard

Target Species

The survey primarily focussed on hoverflies (Syrphidae), but secondary taxon groups were also noted where identification is often possible from photographs. The survey mainly focussed on flower-visiting species that were active at the time of the survey.

These secondary groups included Bees and Wasps (Hymenoptera - Aculeata), Butterflies and Day-flying Moths (Lepidoptera), Thick-headed Flies (Conopidae), Soldier Flies (Stratiomyidae), Crane Flies (Tipulidae), Robberflies (Asilidae), Dragonflies (Odonata), Shieldbugs (Pentatomoidea), Ladybirds (Coccinellidae) and Grasshoppers and Crickets (Orthoptera).

Site Visits and Weather Conditions

Seventeen survey visits were made between March and September, which is the peak season for many hoverfly species.

The visits took place on the following dates. Most visits lasted for about 2 hours.

Date	Weather Conditions	Temperature (High)	No. of Species
MARCH			
21/03/2020	Sunny with light breeze	10ºC	11
25/03/2020	Sunny spells	14ºC	9
26/03/2020	Sunny spells	14ºC	8
APRIL			
05/04/2020	Sunny with light breeze	19ºC	18
09/04/2020	Sunny spells with light breeze	20ºC	28
19/04/2020	Sunny spells with light breeze	16ºC	23
27/04/2020	Overcast with sunny spells	15ºC	20
MAY			
08/05/2020	Sunny spells	22ºC	17
16/05/2020	Overcast with sunny spells and a light breeze	16ºC	32
27/05/2020	Sunny spells	23ºC	42
JUNE			
08/06/2020*	Overcast with sunny spells	16ºC	3
13/06/2020	Sunny spells with light breeze	23ºC	31
JULY			
05/07/2020	Sunny spells with light breeze	18ºC	30
06/07/2020*	Sunny spells with light breeze	18ºC	8
16/07/2020	Overcast with sunny spells and a light breeze	21ºC	53
AUGUST			
02/08/2020	Sunny spells	21ºC	27
17/08/2020	Sunny spells and light rain	20ºC	27
22/08/2020*	Sunny spells with light breeze	19ºC	1
23/08/2020	Sunny spells with light breeze	19ºC	50
SEPTEMBER			
05/09/2020	Overcast with sunny spells and a light breeze	17ºC	37

Table 1 Survey dates and weather conditions

*incidental records recorded during quick visit.

Analysis

The species were identified either in the field or later based on photographs taken. In some cases, experts helped with the identification of certain species. The survey results were entered into the Pantheon online tool in order to help analyse the data.

Results

Species Recorded in 2020

A total of 590 records were made over the 17 survey visits in 2020. 476 records were identified to species level while a further 113 records were identified to genus or family level. Overall 177 species in 75 different families were recorded.

A full record list is included in the appendix.

Species Recorded between 2016-2019

I have been recording terrestrial invertebrates of Highbury Park on an ad-hoc basis since 2016 so it was decided to also include these additional records in the analysis as:

1) the records were fairly recent

2) the records were collected using a similar method to the 2020 survey

3) the recording had a similar species group focus

4) there have been no major changes to the habitats of Highbury Park in this time.

Combined Records (2016-2020)

The records from 2016-2019 added 17 additional species to the list bring the total to 192 invertebrate species recorded at Highbury Park between 2016 to 2020.

A further 38 organisms were identified to genus or family level. This excludes any potential duplicates where a species had already been recorded in an identified genus.

Overall 81 different families of invertebrate were recorded.

Table 2 Species recorded per compartment 2016-2020

Compartment	2016-2020 Species Count
C1	14
C2	111
C3	68
C4	14
C5	32
C6	57
C7	19
C8	23
C9	57

Note: each compartment was surveyed with varying degrees of effort, so the species counts do not reflect the comparative value of each compartment for invertebrates.

Order/Family	Species
COLLEOPTERA - Beetles	25
Byturidae - Fruitworm Beetles	1
Cantharidae - Soldier Beetles	6
Cerambycidae - Longhorn Beetles	3
Chrysomelidae - Leaf Beetles	3
Coccinellidae - Ladybirds	6
Dermestidae - Carpet Beetles	1
Elateridae - Click Beetles	1
Malachiidae - Soft-wing Flower-Beetles	1
Oedemeridae - False Blister Beetles	2
Pyrochroidae - Cardinal Beetles	1
DIPTERA - True Flies	96
Agromyzidae - Leaf-miner Flies	1
Anthomyiidae - Root-maggot Flies	2
Asilidae - Robberflies	1
Bibionidae - March Flies	2
Bombyliidae - Bee Flies	1
Calliphoridae - Blow Flies	3
Chloropidae - Grass Flies	2
Conopidae - Thick-headed Flies	3
Dolichopodidae - Long-legged Flies	3
Empididae - Dagger Flies	3
Heleomyzidae - Heleomyzid Flies	1
Lauxaniidae - Lauxaniid Flies	1
Muscidae - House Flies	4
Polleniidae - Blow Flies	1
Ptychopteridae - Phantom Craneflies	1
Psychodidae - Moth Flies	1
Rhagionidae - Snipeflies	1
Sarcophagidae - Flesh Flies	1

	Species
HYMENOPTERA - Bees, Wasps, Ants & Sawflies	44
Andrenidae - Mining Bees	10
Apidae - True Bees	12
Colletidae - Plasterer Bees	1
Crabronidae - Sand Wasps	2
Cynipidae - Gall Wasps	4
Formicidae - Ants	1
Halictidae - Sweat Bees	4
Ichneumonidae - Ichneumonid Wasps	4
Ormyridae - Chalcid Wasps	1
Tenthredinidae - Sawflies	2
Vespidae - Social Wasps	2
LEPIDOPTERA - Butterflies & Moths	29
Adelidae - Fairy Longhorn Moths	1
Choreutidae - Choreuitid Moths	1
Crambidae - Crambid Snout Moths	1
Erebidae - Erebid Moths	3
Glyphipterigidae - Sedge Moths	1
Hesperiidae - Skipper Butterflies	3
Lycaenidae - Blue, Copper & Hairstreak Butterflies	2
Momphidae - Mompha Moths	1
Nepticulidae - Midget Moths	1
Noctuidae - Owlet Moths	1
Nymphalidae - Brush-footed Butterflies	9
Pieridae - White Butterflies	3
Tortricidae - Tortricid Moths	2
ODONATA - Dragonflies & Damselflies	2
Calopterygidae - Demoiselles	1
Coenagrionidae - Narrow-winged Damselflies	1
ORTHOPTERA - Grasshoppers & Crickets	2

Sciomyzidae - Snail-killing Flies	1	Acrididae - Short-horned Grasshoppers	2
Sepsidae - Ensign Flies	2	**ARANEAE** - Spiders	5
Stratiomyidae - Soldierflies	4	Araneidae - Orb-weaver Spiders	1
Syrphidae - Hoverflies	48	Linyphiidae - Money Spiders	2
Tachinidae - Punk Flies	5	Lycosidae - Wolf Spiders	1
Tephritidae - Fruit Flies	2	Philodromidae - Running Crab Spiders	1
Tipulidae - Crane Flies	2	**ACARI** - Mites	1
HEMIPTERA - True Bugs	20	Eriophyidae - Gall Mites	1
Anthocoridae - Flower Bugs	1	**COLLEMBOLA** - Springtails	1
Acanthosomatidae - Shieldbugs	2	Tomoceridae - Elongate-bodied Springtails	1
Cicadellidae - Leafhoppers	1	**ISOPODA** - Woodlice & allies	1
Coreidae - Leaf-footed Bugs	1	Oniscidae - Woodlice	1
Miridae - Mirid Bugs	9	**JULIDA** - Millipedes	1
Pentatomidae - True Shieldbugs	5	Julidae - Snake Millipedes	1
Rhopalidae - Rhopalid Bugs	1	**MOLLUSCA** - Slugs & Snails	1
		Helicidae - Helcid Snails	1

Table 3 Number of species per Order / Family

Diptera (True Flies) were the largest order recorded by number of species (41%) followed by Hymenoptera (Bees, Wasps, Ants, Sawflies) and Lepidoptera (Butterflies and Moths).

Figure 24
Merodon equestris
Large Narcissus Fly

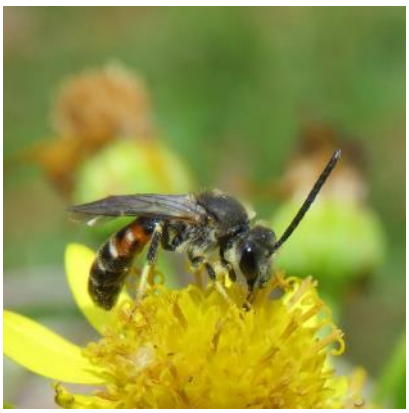

Figure 25
***Lasioglossum* sp.**
a furrow bee

Figure 26
Callistege mi
Mother Shipton

Target Species - Hoverflies

Of the primary target group Syrphidae (Hoverflies) 46 species were recorded and a further two organisms were identified to genus level (*Melanogaster, Neoascia)*. Some species in these genera are difficult to identify to species without examining under a microscope.

Figure 27
Chrysotoxum festivum
Hook-banded Wasp-hoverfly

Hoverfly Larval Guilds[ii]

22 of the recorded hoverfly species are identified as Aphidiphages (larvae feed on aphids), 7 species are identified as Wetland species (larvae live in water) and 3 species (*Chalcosyrphus nemorum, Xylota segnis, Xylota sylvarum*) are Saproxylic (larvae live in dead wood).

Figure 28
Xylota sylvarum
Golden-tailed Hoverfly.
The saproxylic larvae live in moist, fungus-infested, decaying wood, under the bark of tree trunks and stumps.

Figure 29
Didea fasciata
Pale-knobbed Didea
The larva feed on aphids. This is a woodland species. The males are quite territorial and can often be seen defending prime spots on sunlit leaves.

Figure 30
Helophilus pendulus
Tiger Hoverfly
The larva are aquatic and are associated with a wide variety of waterbodies, from large lakes and rivers to ditches, small ponds and muddy puddles.

Other Species

DIPTERA - True Flies

A range of other types of fly were recorded including Thick-headed Flies (Conopidae), Soldierflies (Stratiomyidae), Punkflies (Tachinidae), Bee-flies (Bombylidae) and Craneflies (Tipuludae) representing the wide range of habitats found in the park.

Figure 31
Oxycera rara
Four-barred Major

Figure 32
Sicus ferrugineus
Feruginous Bee-grabber

Figure 33
Bombylius major
Dark-edged Bee-fly

HYMENOPTERA – Bees, Wasps, Ants and Sawflies

The second most recorded Order was Hymenoptera (Bees, Wasps, Ants and Sawflies) with True Bees (Apidae) (12 species) and Mining Bees (Andrenidae) (10 species) being particularly well-represented.

Figure 34
Andrena haemorrhoa
Orange-tailed Mining-bee

Figure 35
Ormyrus cf. nitidulus
a parasitic wasp

Figure 36
Andrena cineraria
Ashy Mining-bee

HEMIPTERA – True Bugs

True Bugs (Hemiptera) were also quite well represented with quite a few Shieldbugs (Superfamily: Pentatomoidea) (7 species) and Mirid Bugs (Miridae) (9 species) found.

Figure 37
Dolycoris baccarum
Hairy Shieldbug

Figure 38
Coreus marginatus
Dock Bug

Figure 39
Troilus luridus
Bronze Shieldbug (nymph)

COLEOPTERA – Beetles

The beetle families represented at Highbury Park include Soldier Beetles (Cantharidae) (6 species), Ladybirds (Coccinellidae) (6 species), Long-horn Beetles (Cerambycidae) (3 species) and Leaf-beetles (Chrysomelidae) (3 species).

Figure 40
Rutpela maculata
Spotted Longhorn

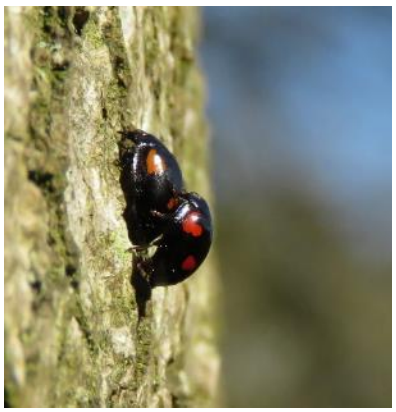

Figure 41
Exochomus quadripustulatus
Pine Ladybird

Figure 42
Pyrochroa serraticornis
Cardinal Beetle

LEPIDOPTERA – Butterflies and Moths

Overall 17 species of butterfly were recorded and 12 species of moths. As the surveys took place during the day they were biased towards day-flying moth species.

Figure 43
Vanessa atalanta
Red Admiral

Figure 44
Euclidia glyphica
Burnet Companion

Figure 45
Thymelicus lineola
Essex Skipper

Species with a Conservation Status

Section 41 Priority Species - research only

One species is listed in this category[iii]:

***Tyria jacobaeae* - Cinnabar**

The larvae of this moth feed gregariously on Common Ragwort (*Senecio jacobaea*) and other related plants[iv].

Figure 46
Tyria jacobaeae
Cinnabar - caterpillar on Ragwort.

GB Red List and National Rarity Status

The following species, recorded during the survey have Red List or National Rarity Statuses:

Family	Species	Common Name	Status
Apidae	*Nomada lathburiana*	Lathbury's Nomad Bee	[RDB 3]
Cerambycidae	*Poecilium alni*	A longhorn beetle	Nb
Vespidae	*Dolichovespula saxonica*	Saxon Wasp	[RDB K]

The conservation status of species is complicated by the fact that there are two different systems in place – an 'old' system, that combines both threat and rarity, and a 'new' system that separates these. New reviews replace the old conservation status.

Please note - some statuses are reported in square brackets. This is to indicate that these are considered out of date and should be used with caution.

Status Definitions:

RDB 3 – Rare: Species with small populations that are not at present Endangered or Vulnerable, but are at risk. (In GB, this was interpreted as species which exist in fifteen or fewer 10km squares).

Nb – Nationally Notable B: Species which do not fall within RDB categories but which are none-the-less uncommon in Great Britain and thought to occur in between 31 and 100 10km squares of the National Grid or, for less-well recorded groups between eight and twenty vice-counties

RDB K - Insufficiently Known: Species that are suspected but not definitely known to belong to any of the above categories (i.e. Endangered, Vulnerable, Rare), because of the lack of information.

***Nomada lathburiana* - Lathbury's Nomad Bee**

Figure 47
Nomada lathburiana
Lathbury's Nomad Bee

A nomad bee, which is often found near to the nest hole of its host *Andrena cinerea* – Ashy Mining-bee. It's a cleptoparasite where the female lays an egg in the wall of an incomplete Andrena cinerea larval cell which has been provisioned with food. When hatched, the nomad bee larva has large mandibles which it uses to kill the larva of its host, before feeding on the provisions.
The adult feeds on early flowering species such as Cherries, Willows and Dandelions.

Though currently listed as RDB 3 recent records indicate that the status of this species could be downgraded as it is now thought to be relatively frequent. [v]

The species is thought to be frequent in Birmingham and the Black Country with 23 records on the EcoRecord database.

***Dolichovespula saxonica* - Saxon Wasp**

Figure 48
Dolichovespula saxonica
Saxon Wasp

Saxon Wasp has a longer face than our more common social wasp species (Vespula vulgaris – Common Wasp) and tends to mostly nest aerially in trees and shrubs.
This species was first recorded in the UK in Surrey in 1989. Since then this species has extended its range northwards. In view of the recent expansion of its range, this status should be revised[vi].

This is only our 5th Birmingham and Black Country record for this species. It was first recorded in our area in 2008, and other sites with records are Dartmouth Park and Bluebell Wood, Sandwell Valley; Edgbaston Pool SSSI and in a garden in Brandwood End.

***Poecilium alni* – a longhorn beetle**

Figure 49
Poecilium alni
a longhorn beetle

This is a locally common longhorn beetle that's found in open deciduous woodland and woodland margins. Adults can be seen between April and July.

This species was found in May 2018 in the woodland to the west of Highbury Hall.

This is the first time this species has been recorded in Birmingham and the Black Country.

Locally Rare Species

The following species, recorded during the survey are either uncommon or under-recorded in Birmingham and the Black Country (B&BC)[vii].

Family	Species	Common Name	Rarity
Cantharidae	*Cantharis rufa*	a soldier beetle	4th B&BC Record
Cerambycidae	*Pogonocherus hispidus*	Lesser Thorn-tipped Longhorn Beetle	2nd B&BC Record
Chrysomelidae	*Cassida vibex*	Tortoise Beetle	3rd B&BC Record
Calliphoridae	*Stomorhina lunata*	Locust Blowfly	2nd B&BC Record
Miridae	*Closterotomus trivialis*	a mirid bug	3rd B&BC Record
Miridae	*Macrolophus rubi*	a mirid bug	3rd B&BC Record

Figure 50 Table of Locally uncommon or under-recorded species

Cantharis rufa – a soldier Beetle

Figure 51
Cantharis rufa
a soldier beetle

This soldier beetle is largely all orange but sometimes there is a black mark on the pronotum. It can be found in meadows, where the adult hunts flower-visiting insects.

This is only the 4th record of this species in B&BC but it is thought to be probably frequent, but under-recorded. This species has been recorded at other sites including Minworth Sewage Works, Sandwell Valley and Park Lime Pits. The most recent B&BC record is from 2002.

***Pogonocherus hispidus* - Lesser Thorn-tipped Longhorn Beetle**

Figure 52
Pogonocherus hispidus
Lesser Thorn-tipped Longhorn Beetle

A small longhorn beetle said to be camouflaged to resemble a bird dropping. It can be found in wooded or shrubby areas, though it is mostly nocturnal. This is only the 2nd time this species has been recorded in B&BC, with the only other record being from Stourbridge in 2018.

***Cassida vibex* – Tortoise Beetle**

Figure 53
Cassida vibex
Tortoise Beetle

A flat, round-bodied leaf-beetle species which can often found on Thistles and Yarrow in summer.

This is the 3rd B&BC record for this species. Other places it has been recorded include Mill Lane LNR (2012), Walsall and in a garden in Tettenhall (2014).

***Stomorhina lunata* - Locust Blowfly**

Figure 54
Stomorhina lunata
Locust Blowfly

This stripy eye fly might at first resemble at hoverfly, but it's actually a member of the Blow-fly (Calliphoridae) family. In the UK its larva is thought to be a predator of the egg pods of grasshoppers and crickets.

Once considered rare, this species is now becoming more frequent. This fly was recorded in the park in 2017 making it the 2nd B&BC record following the 1st recording of this species at Birmingham Botanical Gardens in 2016.

***Closterotomus trivialis* – a mirid bug**

Figure 55
Closterotomus trivialis
a mirid bug

In mainland Europe this species is a common pest of olive trees, but it has only recently been recorded in the UK (2008), where it may be associated with the ornamental Hypericum 'Hidcote' shrub.

This species was first recorded in B&BC in 2020 though the first two records, from the meadow area in Cannon Hill Park were seen just slightly before the record from Highbury Park, making the Highbury record the 3rd B&BC record.

Macrolophus rubi – a mirid bug

Figure 56
Macrolophus rubi
a mirid bug

This plantbug is found on bramble, although never commonly. This species has a dark bar behind the rather small eyes.

This is the 3rd record of this species in B&BC with other records including Sutton Park (1996) and Gorse Farm Wood (2003).

Pantheon Analysis

The species list was analysed using the Pantheon online tool[viii]. The Pantheon report was generated from database version 3.7.6 on 14/02/2021.

Pantheon is a tool which can be used for recognising invertebrate assemblage types in species lists collected at scales ranging from management compartment to landscape character area.

The assemblage types are labelled in terms that relate to their favoured habitats in order to make them accessible to non-specialists.

Two levels were recognised in the classification:

1) **Specific Assemblage Types (SATs)** - characterised by ecologically restricted species and generally only expressed in lists from sites with high conservation value. These assemblage types were developed with SSSI designations in mind but may also be present on Local Sites. These are characterised by restricted species and are considered to have an intrinsic conservation value, as such they are generally only found in sites with conservation value.

2) **Habitats** - a comprehensive series of assemblage types that are characterised by more widespread species.

Specific Assemblage Types (SATS)

Within the Pantheon tool the following 25 Specific Assemblage Types (SATs) are identified:

ARBOREAL ASSEMBLAGES (4)	
A211	Heartwood decay
A212	Bark & sapwood decay
A213	Fungal fruiting bodies
A215	Epiphyte fauna
FIELD LAYER ASSEMBLAGES (7)	
F001	Scrub edge
F002	Rich flower resource
F003	Scrub heath & moorland
F111	Bare sand & chalk
F112	Open short sward
F113	Exposed sea cliff
F221	Montane and upland
WETLANDS (12)	
Running Water	
W111	Shingle banks
W113	Fast-flowing streams & waterfalls
W114	Stream & river margins
W122	Riparian sands
W125	Slow-flowing rivers
W126	Seepage
Marshland	

W211	Open water on disturbed mineral sediments
W212	Northern lakes and lochs
W221	Undisturbed fluctuating marsh
Peatland	
W311	Open water in acid mire
W312	Moss and tussock fen
W314	Reed and fen pools
COASTAL (2)	
M311	Saltmarsh & transitional brackish marsh
M211	Sandy beaches

Table 4 Specific Assemblage Types (SATS)

The Pantheon tables for SATs show whether or not any of the SATs represented in a sample are sufficiently species-rich to reach 'Favourable' condition status.

Because the survey methods used were a) too unstructured to be considered 'Pantheon compliant', and b) were not designed to properly sample non flower-visiting species, the condition reporting in the SAT table is not really applicable.

The SATS identified in the results could be targeted for further structured survey to assess their true condition.

SATs Identified by the Survey Results

The following Specific Assemblage Types were recorded:

Broad Biotype	Habitat	SAT	No. of species	Code	Reported condition
open habitats		rich flower resource	26	F002	Favourable
tree-associated	decaying wood	bark & sapwood decay	7	A212	Unfavourable
open habitats		scrub edge	6	F001	Unfavourable
tree-associated	decaying wood	heartwood decay	1	A211	Unfavourable
open habitats	short sward & bare ground	bare sand & chalk	1	F111	Unfavourable
open habitats	short sward & bare ground	open short sward	1	F112	Unfavourable

Table 5 SATs Identified by the Survey Results

F002 Rich Flower Resource

This is a resource-based assemblage type that is expressed across a large range of habitats. It can be broadly taken to mean 'good pollinator habitat'.

The target number of species for the habitat to be classed as favourable is 15. The only species group coded to this SAT are aculeate Hymenoptera.

26 bee species coded to this SAT were recorded during this survey.

There are many species, apart from bees that are pollinators, and it is thought that some of these species, particularly hoverflies, aren't included in this SAT by Pantheon because they have complex life histories that also utilise other habitat types.

Overall 112 species that have nectivorus life-stages were recorded including hoverflies (Syrphidae), thick-headed flies (Conopidae), soldier beetles (Cantharidae), false-blister beetles (Oedemeridae) and butterflies and moths (Lepidoptera).

In most cases where a pollinator was observed feeding at a flower, a note was made of the plant species visited. Species were recorded visiting a variety of flowers but over half of the records were of pollinators visiting three types of flower: Buttercup sp., Common Knapweed and Hogweed.

There will some be bias in the flowers that insects were recorded visiting due to the survey method used, which focussed on habitats which were relatively easy to survey. Pollinators are also likely to be dependent on the flowers of trees and shrubs for food- particularly cherry and willow. As these flowers are often high up, it makes it harder to record pollinator visits.

Another flower which is under-represented in the results below is Ivy, which is an important flower for pollinators in autumn. Due to the timing of the surveys, the peak ivy flowering period of mid to late September was missed.

Buttercups were present in several areas of the site and have a long flowering season so it is no surprise that there were so many records of visits. Areas with large amounts of buttercup included the grasslands of Hopyard Meadow and Dad's Close, while there were also good numbers present on Moor Green Lane Bank, and in the Middle and Lower Shutlock Meadows.

The second most visited flower was Common Knapweed, which was abundant in Lower Shutlock Meadow and around the edges of Hopyard Meadow.

Hogweed is known to be an important plant for a number of pollinators and there were large stands of it found along Shuttock stream as well as some areas in Hopyard Meadow.

Other flowers with recorded visits included Corn Marigold, Creeping Thistle, Devil's Bit Scabious and Dandelion.

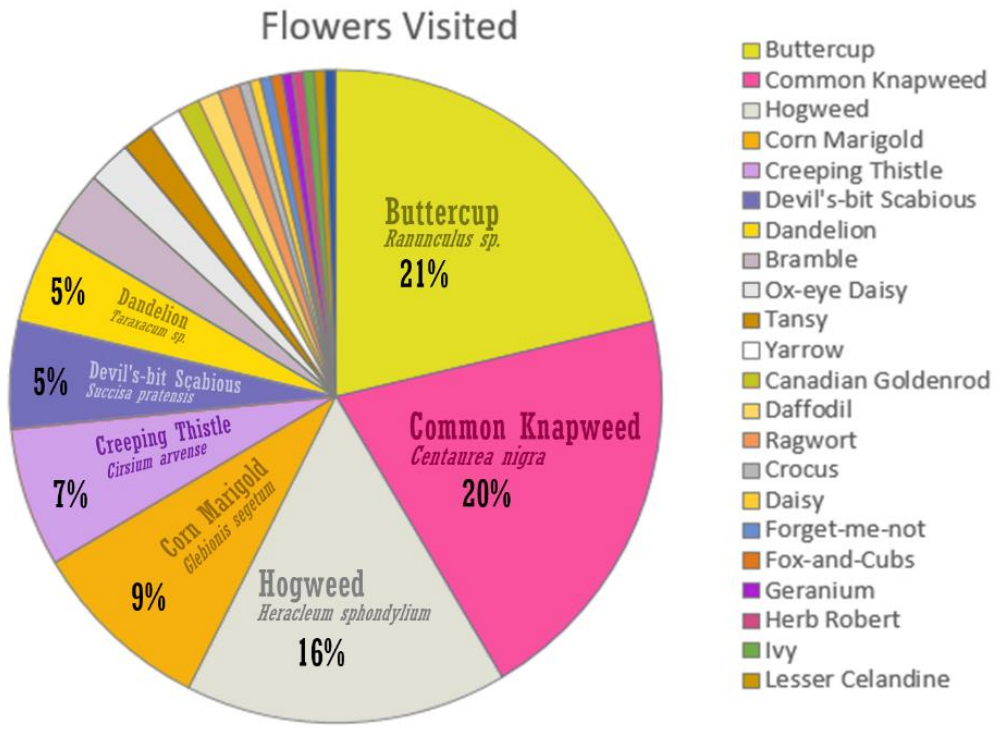

Figure 57 Flowers observed to be visited by pollinators during the survey

This SAT is thought to be best represented on site by the meadow areas and stream-sides as well as more formal areas including the Italian Gardens and the Community Orchard.

A212 Bark and Sapwood Decay

The assemblage type is found in and around trees and shrubs generally, but especially in older specimens. The assemblage is primarily associated with death and decay of the outer woody tissues of the trees or shrubs - the sapwood and bark.

The target number of species for the habitat to be classed as favourable is 20. The main species groups coded to this SAT are Coleoptera and Diptera.

Seven species coded to this SAT was recorded – including Golden-tailed Hoverfly (*Xylota Sylvarum*) whose larva develop in rotting tree roots, stumps, fallen trunks and also rot holes well above ground level.

Other species associated with this SAT include the three long-horn beetle species, Common Malachite Beetle (*Malachius bipustulatus*), Cardinal Beetle (*Pyrochroa serraticornis*) and Small Forest Hoverfly (*Chalcosyrphus nemorum*).

This habitat seems well-represented, with numerous examples of mature trees and standing deadwood throughout the site.

The survey method used is not ideal for surveying this assemblage type. A survey following a more-focussed methodology would likely show the site to be in favourable condition for this habitat.

A combination of active visits and passive trapping (vane/interception traps) seems to give the best account of the fauna of this habitat.

Typically, 3 visits should be made to coincide with the hawthorn flowering period (April-May), the bramble period (July-August), and the fungal period (September-October).

Figure 58 examples of standing dead wood and mature trees in Big Meadow

F001 Scrub Edge

The assemblage type is found where scrub or woodland grades into or is interspersed with open areas of grassland, heathland or early successional vegetation types. The juxtaposition of open vegetation with woody development is important to insects with complex life cycles that require different microhabitats at different stages of development.

The target number of species for the habitat to be classed as favourable is 15. There are a range of different target groups coded to this SAT including aculeate Hymenoptera, Coleoptera, larger Diptera, day-flying Lepidoptera, Heteroptera and Orthoptera.

Six species coded to this SAT were recorded, including

Common Awl Robberfly (*Neoitamus cyanurus*) which is particularly associated with rides in Ancient Woodland.

Figure 59
Neoitamus cyanurus
Common Awl Robberfly

Other species associated with this SAT include two butterflies: Speckled Wood and Gatekeeper, two bees: Hawthorn Mining-bee (*Andrena chrysosceles*) and Clarke's Mining-bee (*Andrena clarkella*) as well as Woundwort Shieldbug (*Eysarcoris venustissimus*).

The SAT is classed as unfavourable, though ideally a more targeted survey effort, with spot sweeping and beating, is needed to properly assess this habitat type.

There are many moth species associated with this habitat type, so moth trapping might help to reveal more about this habitat type onsite.

This SAT is likely to be represented on site by a number of areas including Dad's Close Hedge, the south-facing edges of Middle Piece Wood and Pleck Wood, the northern edge of Poor Barley Field and the southern edge of Henbury's House Wood.

A211 Heartwood Decay

The assemblage type is found in and around mature and ancient trees and shrubs. Many of the two-winged flies are associated with smaller pockets of wet heartwood decay within, for example, cavities resulting from ripped out branches, and a proportion have aquatic or semi-aquatic larvae within waterlogged decayed woody tissues (rot-hole species). In contrast, the rarer and more threatened beetles tend to develop in the main column of decaying heartwood within the trunk, where drainage is free but the atmosphere humid.

Open-grown conditions are important for a variety of reasons. Space is needed to enable sunlight to reach the trunk and main boughs, to help raise the temperatures for larval development within and adult flight activity. Trees past full canopy development are vulnerable to canopy competition from younger growth and cannot survive under close-grown conditions. The juxtaposition of mature and aging trees with open areas containing flowering shrubs is a key factor since the adult stages of many of the insect species have a requirement for pollen and nectar.

The target number of species for the habitat to be classed as favourable is 7. The two species groups coded to this SAT are Coleoptera and Diptera.

One species coded to this SAT was recorded – Batman Hoverfly (*Myathropa florea*) whose larvae typically develop in tree rot holes and other crevices in trees that become filled with water and wet detritus.

Figure 60 rot hole in Railway Wood

This habitat is likely to be present on site, especially given the historic parkland nature of the site, though it was not targeted for survey on this occasion.

A combination of active visits and passive trapping (vane/interception traps) seems to give the best account of the fauna of this habitat.

This SAT is probably represented on site by the mature scattered parkland trees in the Big Meadow and Poor Barley Field.

F111 Bare Sand & Chalk

This assemblage contains species that are associated with hot, dry soil conditions normally found in bare ground in early successional habitats.

The assemblage type is dominant in lowland habitats where disturbance removes vegetation to create areas of bare or sparsely vegetated ground. Suitable sources of disturbance include landslips, wind and salt blast on sea cliffs, sand accretion on sand dunes and small-scale poaching by grazing animals.

The target number of species for the habitat to be classed as favourable is 19. The species groups coded to SAT are Bees, Aculeate Wasps, Ants, Coleoptera, larger Diptera, day-flying Lepidoptera, Heteroptera.

Only one species coded to this SAT was recorded – Cinnamon Bug (*Corizus hyoscyami*) which was historically confined to the coasts of southern Britain, this species is now found inland and is associated with a range of plants.

This SAT may potentially be present on site due to the sandy nature of the soil.

If the SAT IS present, then it's likely to be restricted in extent as there is no large part of the site subject to the regular disturbance that this habitat requires.

Examples of this habitat can sometimes be found on arable land on nutrient-poor and freely-draining soils, so the flower bed areas, particularly in the Italian Gardens may support the SAT to some degree.

F112 Open Short Sward

This assemblage occurs in poached short sward grassland, especially calcareous grassland, but not in uniform, dense sward grassland where moist conditions prevail at ground level. It often occurs alongside SAT F111 Bare Sand & Chalk (see above).

F112 is found most frequently in lowland habitats where grazing or cutting of vegetation over calcareous soils limits the development of taller vegetation. Soils are also generally nutrient poor, which limits the dominance of grasses and thereby encourages widespread development of broad-leaved herbs.

The target number of species for the habitat to be classed as favourable is 13. The species groups coded to SAT are Bees, Aculeate Wasps, Ants, Coleoptera, larger Diptera, day-flying Lepidoptera, Heteroptera, Grasshoppers and Crickets.

Only one species coded to this SAT was recorded – Tortoise Beetle (*Cassida vibex*) which was recorded in the margins of The Hopyard Meadow.

It's unlikely that this habitat is present in large amounts at Highbury as the meadow areas are relatively dense and damp.

Other SATS Likely to be Present

The two SATS below are associated with older trees and so are likely to be present onsite. A survey targeting the Heartwood Decay and Bark and Sapwood Decay assemblages should also in theory pick up target species from these two SATS.

A213 Fungal fruiting bodies

The assemblage type is found in and around trees and shrubs generally, but especially in older specimens. A large variety of wood-decay fungi are active in all types of woody tissues from heartwood through to twigs and roots. All produce fruiting bodies on the outside of the decaying wood and above ground, which are exploited by this assemblage type.

A215 Epiphyte fauna

This assemblage type is found on the surface of trunks and branches of trees and shrubs. It includes grazers of epiphytes such as algae, lichens and mosses, as well as their predators and parasites. Some epiphyte feeders are also found on epiphytes growing on rocks and boulders.

There are some moth species (particularly Erebidae) associated with this habitat type, so moth trapping might help to reveal more about this habitat type onsite.

W126 Seepage

The assemblage type is found widely in Britain in association with groundwater sources. Assemblages in shaded seepages are dominated by crane flies and are especially species-rich in wet woodlands, especially in seepages under alder or willow (sallow) woodland in valley bottoms, and under birch or sometimes alder-ash woodland on hillsides. The soil is constantly saturated and usually contains a large proportion of organic matter giving rise to deep ooze. Vegetation diversity is often limited, although Carex paniculata may be well developed in some places. Dead wood is an important component of these seepages, as this is the medium for some crane fly larvae.

Broad Habitats

Below is a list of habitats characterised by some of the more widespread species recorded as part of the survey:

Open Habitats

Most of the species recorded in the survey were found to be associated with open habitats.

Tall Sward and Scrub

Of the 178 species analysed using the tool, 84 are associated with tall sward and scrub and 57 of these, including many of the pollinators, are associated with the sward or field layer of this habitat. Other species, such as the Soldier Beetles (Cantharidae) are more associated with litter or the ground layer.

Short Sward and Bare Ground

29 species were found to be associated with short sward or bare ground, with the majority (25) being associated with the sward or field layer.

17 species were found to be associated with bare sand including 9 species of mining bee (*Andrena* ssp) as well as other ground nesting species.

Tree Associated

43 of the species recorded are associated with trees:

Shaded Woodland Floor

20 species including six hoverflies are associated with the shaded woodland floor. Many characteristic species occur in or under leaf litter and are either saprophagous or predaceous. A smaller number of species are phytophagous and develop on shade-loving plants.

Arboreal

14 species, including six hoverflies, were found to be associated directly with trees, including the canopy, trunks and branches.

Decaying Wood

Ten species are associated with decaying wood including the three species of long-horn beetle.

Wet Woodland

Four species were found to be associated with wet woodland including the two crane fly species recorded.

Wetland

19 species were found to be associated with wetland. As the survey was focussed more on the terrestrial habitats of the site it's unsurprising that this figure is quite low, and probably unrepresentative of the site's habitats.

Peatland

12 of the species are associated with peatland including nine of the hoverfly species.

Running Water

Six species are associated with running water including the soldierfly Four-barred Major (*Oxycera rara*)

Marshland

Five species are asociated with this habitat including Common Blue Damselfly (*Enallagma cyathigerum*)

Other features

Nests

Five hoverfly species were found to be associated with the nests of other species, including four Volucella hoverflies (Volucella zonaria, V. pellucens, V. inanis and V. bombylans) which are associated with social wasp or bumblebee nests and one wasp-mimicking hoverfly species *Chrysotoxum festivum* which is associated with ant nests.

Three species of conopid fly *Sicus ferrugineus, Conops quadrifasciatus* and *Conops flavipes* are associated with Bumblebee nests (Bombus sp.).

Figure 61
Conops quadrifasciata
Four-banded Bee-grabber

One species of Cuckoo-bee – Vestal Cuckoo Bee (*Bombus vestalis*) is known to parasitise the nests of Buff-tail Bumblebee (*Bombus terrestris*).

Soil Humidity

Of the species recorded 47 were associated with dry soil, 13 were associated with damp soil and 14 were associated with variable humidity

Discussion

Method Limitations

To run a reliable analysis using the Pantheon tool you would usually need to have a survey which records over 100 species in groups that have been coded against one of the assemblage types. The analysis was carried out based on 178 species, though most of which are relatively generalist species and not within the species groups needed to assess some of the Specific Assemblage Types, so the results need to be interpreted with some degree of caution.

During this survey species were identified either in the field or from photographs. As only a proportion of species can be identified in this manner, the results will be skewed towards those more easily-identifiable species.

Species Recorded

Given the limitations of the methodology a reasonably long list of species was recorded, representing the variety of habitats present on site.

None of the species recorded were particularly rare, but this does not mean that rarer species aren't present onsite. Specialist surveys of the woodland areas focussing on features such as trees with heartwood decay; bark decay or sap runs might reveal some interesting results.

Pollinators

Quite a few pollinator species were recorded during the survey suggesting that several different parts of the site provide good food resource for pollinators throughout the year.

At least 48 species of hoverfly are present onsite including species with a variety of habitat requirements.

29 species of bee were also recorded, including many ground-nesting solitary bees.

The recent creation and enhancement of the meadows, as well as the woodland wildflower introductions have clearly increased the site's value for pollinator species and other invertebrate groups too including predatory beetles and grasshoppers.

The site has other important habitats for invertebrates including the ponds, stream and wetlands, which are particularly important for hoverfly species, whose larva live in damp or wet habitats.

Important features for invertebrates are present throughout the site including south facing scrub edges, standing dead wood and bare ground, which offer areas for basking and nesting for a number of species, particularly solitary bees.

During the survey a large aggregate of Ashy Mining-bees (*Andrena cineraria*) was found nesting in the short grassland and bare flower beds on a south-facing section of Moor Green Bank.

Figure 62 Ashy Mining-bee nesting area

There appear to be quite a few other prime nesting areas for bees onsite, including a suspected nesting area in the flowerbeds of the Italian Garden, and also in the parches of bare ground in Henbury's House Wood. The grassland north of the Long Pool also looked promising, for both solitary ground nesting bees and Bumblebees with some tussocky areas present, and quite a few Queen bumblebees seen in this area during early spring.

Connectivity to Other Sites

Highbury Park is well connected to other sites which are likely to be important for invertebrates including the more formal Kings Heath Park and the woodlands of the River Rea Valley as well as the banks of the adjacent railway line.

Appendix

Summary Results Table

Family	Scientific Name	Common Name	NC status	C1	C2	C3	C4	C5	C6	C7	C8	C9
COLEOPTERA - BEETLES												
Byturidae	*Byturus sp.*	a fruitworm beetle					Y					
Cantharidae	*Cantharis flavilabris*	a soldier beetle			Y							
	Cantharis livida	a soldier beetle			Y							
	Cantharis nigricans	a soldier beetle										Y
	Cantharis pallida	a soldier beetle						Y				
	Cantharis rufa	a soldier beetle			Y							
	Rhagonycha fulva	Common Red Soldier Beetle			Y	Y	P	Y	Y			
Cerambycidae	*Poecilium alni*	a longhorn beetle	Nb								P	
	Pogonocherus hispidus	Lesser Thorn-tipped Longhorn Beetle								Y		
	Rutpela maculata	Black and Yellow Longhorn Beetle			Y			Y				
Chrysomelidae	*Cassida vibex*	Tortoise Beetle			Y							
	Lilioceris lilii	Scarlet Lily Beetle										Y
	Neocrepidodera sp.	a leaf beetle						Y				
Coccinellidae	*Coccinella septempunctata*	7-spot Ladybird			Y	Y		Y	Y			
	Exochomus quadripustulatus	Pine Ladybird							Y	Y		
	Harmonia axyridis	Harlequin Ladybird			Y				Y			Y
	Propylea quattuordecimpunctata	14-spot Ladybird			Y							
	Psyllobora vigintiduopunctata	22-spot Ladybird			Y							
	Tytthaspis sedecimpunctata	16-spot Ladybird			Y							
Dermestidae	*Anthrenus verbasci*	Varied Carpet Beetle			Y							
Elateridae	Elateridae	a click beetle				Y					Y	
Malachiidae	*Malachius bipustulatus*	Common Malachite Beetle			Y							
Nitidulidae	Nitidulidae	a sap beetle							Y			
Oedemeridae	*Oedemera lurida*	a false-blister beetle				Y						

	Oedemera nobilis	Thick-legged Flower Beetle		Y	Y	P						
Pyrochroidae	*Pyrochroa serraticornis*	Cardinal Beetle										Y
DIPTERA - TRUE FLIES												
Agromyzidae	*Phytomyza ilicis agg.*	Holly Leaf Miner					Y					
Anthomyiidae	*Anthomyia sp.*	a root-maggot fly		Y							Y	
	Hydrophoria sp.	a root-maggot fly				Y						
Asilidae	*Neoitamus cyanurus*	Common Awl Robberfly									Y	
Bibionidae	*Bibio johannis*	Johann's Bibio						Y				
	Bibio lanigerus	Lesser Variable Bibio						Y				
Bombyliidae	*Bombylius major*	Dark-edged Bee-fly					Y	Y				
Calliphoridae	*Calliphora sp.*	a blow fly		Y								
	Lucilia sp.	a blow fly		Y	Y							
	Stomorhina lunata	Locust Blowfly			P							
Chloropidae	*Cetema sp.*	a grass fly		Y								
	Meromyza sp.	a grass fly		Y								
Conopidae	*Conops flavipes*	Yellow-legged Bee-grabber					Y					
	Conops quadrifasciatus	Four-banded Bee-grabber					Y					
	Sicus ferrugineus	Feruginous Bee-grabber		Y			Y					
Dolichopodidae	*Chrysotus sp.*	a long-legged fly		Y								
	Dolichopus sp.	a long-legged fly		Y								
	Poecilobothrus nobilitatus	Semaphore Fly		P			Y					
Empididae	*Empis livida*	a dance-fly		Y								
	Empis tessellata	a dance-fly						Y			Y	
	Rhamphomyia crassirostris	a dance-fly		Y								Y
Heleomyzidae	*Suillia variegata*	a heleomyzid fly										
Lauxaniidae	*Lauxaniidae*	a lauxanid fly						Y				
Lonchaeidae	*Lonchaeidae*	a lance fly					Y					
Muscidae	*Coenosia tigrina*	a house fly		Y								
	Graphomya maculata	a house fly				P	Y					
	Hydrotaea sp.	a house fly									Y	Y

	Phaonia sp.	a house fly						Y	Y	Y	
Polleniidae	*Pollenia sp.*	a blow fly		Y	Y			Y			
Ptychopteridae	*Ptychoptera contaminata*	a phantom cranefly	P								
Psychodidae	*Psychodidae*	a moth fly				Y					Y
Rhagionidae	*Rhagio scolopaceus*	Downlooker Snipefly			P						Y
Sarcophagidae	*Sarcophaga sp.*	a flesh fly		Y	Y						
Sciomyzidae	*Tetanocera sp.*	a marsh fly		Y							
Sepsidae	*Nemopoda nitidula*	an ensign fly		Y							
	Sepsis sp.	an ensign fly		Y							
Stratiomyidae	*Beris chalybata*	Murky-legged Black Legionnaire		Y		Y					
	Chloromyia formosa	Broad Centurion			P	P					
	Oxycera rara	Four-barred Major		Y							
	Sargus bipunctatus	Twin-spot Centurion					Y				Y
Syrphidae	*Baccha elongata*	Gossamer Hoverfly		P				Y		Y	
	Chalcosyrphus nemorum	Small Forest Hoverfly		Y							
	Cheilosia albitarsis agg.	Late Buttercup Cheilosia		Y							
	Cheilosia pagana	Parsley Cheilosia								Y	
	Chrysogaster cemiteriorum	Grey-sided Chrysogaster		Y							
	Chrysogaster solstitialis	Dark-winged Chrysogaster		Y			Y	Y			
	Chrysotoxum bicinctum	Two-banded Wasp-hoverfly			Y						
	Chrysotoxum festivum	Hook-banded Wasp-hoverfly		Y							
	Dasysyrphus albostriatus	Stripe-backed Dasysyrphus		P	Y						
	Didea fasciata	Pale-knobbed Didea							Y		
	Epistrophe eligans	Spring Epistrophe				Y		Y			
	Epistrophe grossulariae	Broad-banded Epistrophe		Y	Y						Y
	Episyrphus balteatus	Marmalade Hoverfly		Y	Y		Y	Y		Y	
	Eristalis arbustorum	Plain-faced Dronefly		Y	P			Y			
	Eristalis intricaria	Furry Dronefly		Y	Y						
	Eristalis nemorum	Stripe-faced Dronefly			Y						Y
	Eristalis pertinax	Tapered Dronefly	P	Y	Y		Y	Y	Y		

Eristalis tenax	Common Dronefly		P	P		P				
Eupeodes corollae	Migrant Field Syrph		Y	Y						
Eupeodes latifasciatus	Meadow Field Syrph		Y	Y						Y
Eupeodes luniger	Common-spotted Field Syrph									Y
Helophilus pendulus	Tiger Hoverfly	Y	Y	Y			Y			
Helophilus trivittatus	Large Tiger Hoverfly			Y						
Leucozona lucorum	Blotch-winged Hoverfly		P							
Melangyna cincta	Beech Melangyna						Y		Y	Y
Melanogaster	a melanogaster hoverfly									
Melanostoma mellinum	Short Melanostoma							Y		Y
Melanostoma scalare	Slender Melanostoma	Y	Y				Y		Y	
Meliscaeva auricollis	Spotted Meliscaeva						Y			Y
Merodon equestris	Large Narcissus Fly		Y	P						Y
Myathropa florea	Batman Hoverfly		Y	Y		Y	Y	P	Y	
Neoascia	a neoascia hoverfly						Y			
Parasyrphus punctulatus	Six-spotted Parasyrphus						Y			Y
Platycheirus albimanus	Common Grey-spotted Platycheirus	Y	Y	Y			Y			Y
Platycheirus scutatus	a big-handed hoverfly									
Riponnensia splendens	Bronzy Marsh Hoverfly						Y			
Scaeva pyrastri	White-clubbed Hoverfly		Y	P						
Sphaerophoria scripta	Long Hoverfly		P	Y			Y			Y
Syritta pipiens	Thick-legged Hoverfly		Y	P						
Syrphus ribesii	Humming Syrphus		Y	Y					Y	Y
Syrphus torvus	Hairy-eyed Syrphus		P							
Volucella bombylans	Bumblebee Hoverfly			P						
Volucella inanis	Lesser Hornet Hoverfly					P				Y
Volucella pellucens	Large Pied-hoverfly					Y	Y			
Volucella zonaria	Hornet Hoverfly		Y							Y
Xanthogramma pedissequum	Superb Ant-hill Hoverfly		P							
Xylota segnis	Orange-belted Hoverfly								Y	

	Xylota sylvarum	Goldern-tailed Hoverfly	Y				Y				
Tachinidae	*Dexiosoma caninum*	a punk fly							Y		
	Eriothrix rufomaculata	a punk fly		Y	P						
	Exorista sp.	a punk fly		Y							
	Phasia pusilla	a punk fly			P						
	Tachina fera	a punk fly		Y							
Tephritidae	*Urophora jaceana agg.*	a fruit fly			Y						
Tipulidae	*Tipula fulvipennis*	a cranefly								Y	Y
	Tipula paludosa	a cranefly									Y
HEMIPTERA - TRUE BUGS											
Shieldbugs and allies											
Acanthosomatidae	*Acanthosoma haemorrhoidale*	*Hawthorn Shieldbug*					Y				Y
	Elasmucha grisea	Parent Bug									Y
Coreidae	*Coreus marginatus*	Dock Bug		Y		Y		Y	Y		
Pentatomidae	*Dolycoris baccarum*	Hairy Shieldbug									Y
	Eurydema oleracea	Cabbage Shieldbug									Y
	Eysarcoris venustissimus	Woundwort Shieldbug									Y
	Palomena prasina	Green Shieldbug		Y	P	Y	Y	Y	Y		Y
	Troilus luridus	Bronze Shieldbug									Y
Rhopalidae	*Corizus hyoscyami*	Cinnamon Bug						P			
Plantbugs and allies											
Anthocoridae	*Anthocoris nemorum*	Common Flower Bug	Y							Y	Y
Miridae	*Closterotomus trivialis*	a mirid bug						Y			
	Harpocera thoracica	a mirid bug		Y							
	Heterotoma planicornis	a mirid bug		Y							
	Leptopterna dolabrata	a mirid bug		Y							
	Liocoris tripustulatus	a mirid bug								Y	
	Lygocoris pabulinus	a mirid bug		Y							
	Macrolophus rubi	a mirid bug		Y							
	Plagiognathus arbustorum	a mirid bug		Y			Y				

	Plagiognathus chrysanthemi	a mirid bug				Y						Y
Leafhoppers and Froghoppers												
Cicadellidae	*Cicadella viridis*	Green Leaf-hopper			P							
HYMENOPTERA - BEES, WASPS, ANTS & SAWFLIES												
Bees												
Andrenidae	*Andrena chrysosceles*	Hawthorn Mining Bee								Y		
	Andrena cineraria	Ashy Mining Bee			Y	P			Y			
	Andrena clarkella	Clarke's Mining Bee							Y			Y
	Andrena denticulata	Grey-banded Mining Bee										
	Andrena dorsata	Short-fringed Mining Bee						Y				
	Andrena fulva	Tawny Mining Bee			P				Y	Y	Y	
	Andrena haemorrhoa	Orange-tailed Mining Bee							Y			
	Andrena nigroaenea	Buffish Mining Bee			Y					Y		
	Andrena nitida	Grey-patched Mining Bee							Y			
	Andrena scotica	Chocolate Mining Bee			Y							
Apidae	*Anthophora plumipes*	Hairy-footed Flower Bee		Y								
	Apis mellifera	Honey Bee			Y				Y			
	Bombus hortorum	Small Garden Bumble Bee									Y	
	Bombus hypnorum	Tree Bumblebee			Y				Y			
	Bombus lapidarius	Large Red Tailed Bumble Bee			Y	Y			Y			Y
	Bombus lucorum	White-Tailed Bumble Bee				P						
	Bombus pascuorum	Common Carder Bee			Y	Y			Y	Y	Y	Y
	Bombus pratorum	Early Bumblebee			P	Y			Y			
	Bombus terrestris	Buff-tailed Bumblebee		Y	Y	Y			Y			
	Bombus vestalis	Vestal Cuckoo Bee		Y	Y							
	Nomada fabriciana	Fabricius' Nomad Bee							Y			
	Nomada lathburiana	Lathbury's Nomad Bee	[RDB 3]						Y			
Colletidae	*Hylaeus communis*	Common Yellow-face Bee			Y							
Halictidae	*Halictus rubicundus*	Yellow-legged Furrow Bee				P			Y			
	Lasioglossum albipes/calceatum	a furrow bee					Y					

	Lasioglossum morio agg.	Green Furrow Bee (agg.)				Y			Y			
	Sphecodes sp.	a blood bee							Y			
Megachilidae	*Megachile sp.*	a leaf-cutter bee			Y	Y						
	Osmia bicornis	Red Mason Bee			Y				Y			Y
Aculeate Wasps												
Crabronidae	*Ectemnius sp.*	a sand wasp				Y						
	Lindenius albilabris	a sand wasp				Y						
Vespidae	*Dolichovespula saxonica*	Saxon Wasp	[RDB K]	Y								
	Vespula vulgaris	Common Wasp			Y					Y		Y
Ants												
Formicidae	*Myrmica sp.*	an ant										
Parasitic Wasps												
Ichneumonidae	*Alomya sp.*	an ichneumon wasp			Y							
	Amblyteles armatorius	an ichneumon wasp				P			Y			Y
	Ichneumon sp.	an ichneumon wasp			Y							
	Tryphon sp.	an ichneumon wasp			Y							
Ormyridae	*Ormyrus sp.*	a chalcid wasp										Y
Gall Wasps												
Cynipidae	*Andricus foecundatrix*	Artichoke Gall Wasp								Y		
	Andricus quercuscalicis	Knopper Oak Gall Wasp						Y		Y		
	Neuroterus numismalis	Silk Button Gall Wasp			Y		Y	Y	Y	Y		
	Neuroterus quercusbaccarum	Spangle Gall Wasp							Y			Y
Sawflies												
Tenthredinidae	*Blennocampinae*	a sawfly			Y							
	Tenthredo mesomela	a sawfly			Y							
LEPIDOPTERA - BUTTERFLIES & MOTHS												
Butterflies												
Hesperiidae	*Ochlodes sylvanus*	Large Skipper				Y						
	Thymelicus lineola	Essex Skipper				Y						
	Thymelicus sylvestris	Small Skipper			Y							

Lycaenidae	*Celastrina argiolus*	Holly Blue			Y							
	Polyommatus icarus	Common Blue				Y						
Nymphalidae	*Aglais io*	Peacock			Y	Y						
	Aglais urticae	Small Tortoiseshell			Y	Y						
	Aphantopus hyperantus	Ringlet			P							
	Maniola jurtina	Meadow Brown			Y	P	P					
	Pararge aegeria	Speckled Wood			Y	Y			Y		Y	Y
	Polygonia c-album	Comma			Y			Y				
	Pyronia tithonus	Gatekeeper						Y				Y
	Vanessa atalanta	Red Admiral										Y
	Vanessa cardui	Painted Lady				Y						
Pieridae	*Anthocharis cardamines*	Orange-tip			Y							
	Pieris napi	Green-veined White			P	P						
	Pieris rapae	Small White			Y	Y						Y
Moths												
Adelidae	*Cauchas rufimitrella*	Meadow Long-horn				P						
Choreutidae	*Anthophila fabriciana*	Common Nettle-tap			Y			Y				Y
Crambidae	*Pyrausta aurata*	Mint Moth										
Erebidae	*Euclidia glyphica*	Burnet Companion				Y						
	Euclidia mi	Mother Shipton				Y						
	Tyria jacobaeae	Cinnabar	NERC S.41		P	P						
Glyphipterigidae	*Glyphipterix simpliciella*	Cocksfoot Moth			P				Y			
Momphidae	*Mompha langiella*	Clouded Cosmet		P								
Nepticulidae	*Stigmella aurella*	Bramble Leaf-mining Moth								Y		
Noctuidae	*Autographa gamma*	Silver Y			Y	Y						
Tortricidae	*Celypha lacunana*	Common Marble										Y
	Epiphyas postvittana	Light Brown Apple Moth			P							
ODONATA - DRAGONFLIES & DAMSELFLIES												
Damselflies												
Calopterygidae	*Calopteryx virgo*	Beautiful Demoiselle		Y								

Coenagrionidae	*Enallagma cyathigerum*	Common Blue Damselfly			P						
	Pyrrhosoma nymphula	Large Red Damselfly	Y							Y	
ORTHOPTERA - CRICKETS & GRASSHOPPERS											
Acrididae	*Chorthippus brunneus*	Common Field Grasshopper			Y						
	Omocestus viridulus	Common Green Grasshopper			Y						
ARACHNIDA - SPIDERS, HARVESTMEN, MITES, TICKS											
Mites											
Eriophyidae	*Eriophyes tiliae*	Lime Nail Gall						Y			Y
Spiders											
Araneidae	*Araneus diadematus*	European Garden Spider									Y
Linyphiidae	*Megalepthyphantes sp.*	a dwarf spider									Y
	Tenuiphantes sp.	a sheet-waever									Y
Lycosidae	*Pardosa sp.*	a wolf spider		Y			Y				
Philodromidae	*Philodromus sp.*	a crab spider						Y			Y
COLLEMBOLA - SPRINGTAILS											
Tomoceridae	*Tomocerus sp.*	a springtail									Y
ISOPODA - WOODLICE & ALLIES											
Oniscidae	*Oniscus asellus*	Common Shiny Woodlouse									Y
JULIDA - MILLIPEDES											
Julidae	*Cylindroiulus punctatus*	Blunt-tailed Snake Millipede			Y						Y
MOLLUSCA - SLUGS & SNAILS											
Helicidae	*Cepaea hortensis*	White-lipped Snail									Y
			14	112	68	14	32	57	19	23	57

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