M25 junction 10/A3 Wisley interchange TR010030
6.5 Environmental Statement: Appendix 7.18 Terrestrial invertebrates

Regulation 5(2)a
Planning Act 2008
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (as amended)

M25 junction 10/A3 Wisley interchange

The M25 junction 10/A3 Wisley interchange Development Consent Order 202[x]

6.5 ENVIRONMENTAL STATEMENT:

APPENDIX 7.18 TERRESTRIAL INVERTEBRATES

Regulation Number:	Regulation 5(2)(a)
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Author:	M25 junction 10/A3 Wisley interchange project team, Highways England

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Rev 0	June 2019	Development Consent Order application

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7.1 Invertebrate assessment

7.1.1 Introduction

7.1.1.1 Conops Entomology Ltd were commissioned by Atkins, on behalf of Highways England to undertake invertebrate surveys for the M25 junction 10/A3 Wisley interchange Improvement Scheme.

7.1.1.2 Junction 10 of the M25 is surrounded by four quadrants, which make up the Ockham and Wisley Commons Site of Special Scientific Interest (SSSI). The citation for Ockham and Wisley Commons SSSI, includes a number of invertebrates (silver-studded blue butterfly (*Plebejus argus*), wood tiger beetle (*Cicindela sylvatica*), bog bush-cricket (*Metrioptera brachyptera*), and the hornet robber fly (*Asilus crabroniformis*). Due to the presence of invertebrates forming part of the SSSI citation, it was decided by the Atkins ecology team that invertebrate surveys would be appropriate.

7.1.2 Objectives

7.1.2.1 The aim of the assessment was to appraise the key habitats and/or features of the four quadrants through the recording of invertebrates.

7.1.3 Methodology

Survey area selection

7.1.3.1 An initial walkover of the four quadrants surrounding M25 junction 10, and the Scheme footprint at Wisley Airfield was carried out on June 5 2017.

7.1.3.2 The walkover survey assessed the habitats within the five locations for their potential to support a range of invertebrates. Survey areas are shown on Figure 7.30.

7.1.3.3 Based on the findings of the initial walkover of the five locations, three survey areas were selected for further assessment, and two were ruled out of further survey requirements owing to the limited potential to support invertebrates or assemblages of note.

7.1.3.4 Areas included for further assessment:

- The south-west quadrant (central Ordnance Survey National Grid Reference (OSNGR) TQ 07860 59187) mainly comprises two broad habitats: lowland heathland and woodland. The lowland heath is dominated by heather (*Calluna vulgaris*) with lesser amounts of bell heather (*Erica cinerea*) and birch scrub (*Betula pendula*). There is an area of disturbed, friable, sandy ground adjacent to a sandy track that includes a range of flowers such as ragwort (*Senecio jacobaea*), bramble (*Rubus fruticosus agg*.) and yellow composites (*Asteraceae*). The woodland comprises oak-dominated (*Quercus* spp.) stands and also local areas of Scot's pine (*Pinus sylvestris*) dominance. The understorey to the woodland also varies from bracken-dominated (*Pteridium aquilinum*) to limited understorey and deep leaf litter. Deadwood is mainly aggregated around the ancient monument on the eastern side of the south-west quadrant and includes the occasional standing deadwood birch tree or oak branch. The wider context of the south-west quadrant is that of pine

plantation, oak woodland, lowland heathland of varying qualities, wet heath with scrub, and an acidic pond.

- The north-west quadrant (central OSNGR TQ 07987 59405) is dominated by birch woodland with small areas of oak. The ground flora is dominated by bracken and bramble. There are a number of standing deadwood and fallen birch trees in this area. On the western edge of the sample area is a small mosaic of higher-value features. This mosaic includes Canadian fleabane (*Conyza canadensis*), ragwort, bramble, and oak trees in a sunlit situation adjacent to dry, sandy friable soils along a path. There are moderate quantities of deadwood in the north-west quadrant including standing deadwood, deadwood on branches, and fallen trees. The wider context of the north-west quadrant is a mosaic of lowland heath and mature oak woodland including some of considerable age.
- The north-east quadrant (central OSNGR TQ 08220 59311) is locally dominated by oak woodland that also includes some mature specimens of beech (*Fagus sylvatica*), Scot's pine and hornbeam (*Carpinus betulus*). There is sycamore (*Acer pseudoplatanus*) also present in this woodland. The understorey is limited mainly with young beech trees. The ground flora is also limited, being dominated by ferns (possibly *Dryopteris* spp.), bracken, and bramble or leaf litter of various depths. There is a good resource of deadwood in this north-east quadrant. The wider context of the north-east quadrant is that of contiguous woodland with a similar profile of flora and tree ages.

7.1.3.5 Areas scoped out from further assessment:

- The south-east quadrant (central OSNGR TQ 08101 59169). This south-east quadrant was scoped out of further survey, as the footprint of the Scheme in this quadrant consists of a narrow area of coniferous plantation with a bracken understorey. Based on the habitats present, it is considered that few opportunities for a rich assemblage of invertebrates to have developed or for key species to be present.
- Wisley Airfield (central OSNGR TQ 06956 57813). This is an area of hardstanding adjacent to oak woodland with willows (*Salix* spp.). There is also an area of disturbed ground to the south of this area that includes narrow sandy paths and dense, tall ruderal vegetation. It was scoped out of further survey owing to the limited habitat offering suitability to invertebrates that may be affected as a result of the proposed Scheme. Since similar types but better-quality habitats are represented in other survey areas, particularly the south-west quadrant, it was thought unlikely that there would be any species unique or special to this survey area that would not be recorded elsewhere and therefore mitigation can be accommodated through any recommendations for habitat or bespoke species mitigation in other areas.

Survey methods

7.1.3.6 Methods utilized for the assessment include bespoke methods and those recommended in the Natural England guidance document, Surveying Terrestrial and Freshwater Invertebrates for Conservation Evaluation[1]. In some instances, the method has been made bespoke for the Site assessment but still retains the overall approach to assessing features and habitats for conservation assessment.

Sweep netting

7.1.3.7 This method provides the main proportion of the survey element and is the most efficient method of cataloguing a site's invertebrate resource. It is used across all areas of the Site subject to further survey as shown in Figure 7.30.

Spot sampling

7.1.3.8 Spot sampling is employed to enable closer examination of bumblebees and the collection of any other ambiguous specimens that cannot be identified in the field.

Grubbing

7.1.3.9 Deadwood and piles of rotting timber were searched for deadwood beetles.

Beating

7.1.3.10 Tree limbs and deadwood on branches were tapped to dislodge any hiding beetles. These were collected from a white sheet held under the branch.

Pitfall traps

7.1.3.11 Pitfall traps were used in each survey area:

- South-west quadrant – two grids, eleven traps on the open heath (OSNGR TQ 0772 5913, pitfall trap (PT) 1) and ten traps within the woodland (OSNGR TQ 0780 5895, PT2);
- North-west quadrant – two grids of five traps in each grid were positioned in representative woodland habitat, one of which was adjacent to fallen deadwood (OSNGR TQ 0791 5941, PT3) and the other under oak canopy (OSNGR TQ 0811 5952, PT 4); and,
- North-east quadrant – a single grid of seven traps was positioned in representative habitat adjacent to fallen deadwood (OSNGR TQ 0824 5933, PT5).

7.1.3.12 Pitfall trap locations are shown on Figure 7.30 with grid accompanies illustrated in Annex A.

[1] Drake, C.M., Lott, D.A., Alexander, K.N.A & Webb, J. (2007). NERR005. Surveying Terrestrial and Freshwater Invertebrates for Conservation Evaluation. Natural England, Peterborough.

Survey timing

7.1.3.13 The three survey areas taken forward for further survey were visited during each of the five sample periods[2] as detailed in Table 7.1.1.

Table 7.1.1: Sample period details

Sample period (SP)	Date / weather / duration on Site		
	Visit 1	Visit 2	Visit 3
SP_1	05/06/2017 Sunny, 18 – 22°C 10:00 – 16:00	06/06/2017 - aborted Rain and cloud, 15 – 18°C 10:00 - 11:30 07/06/2017 - re-survey Sunny, 18 – 22°C 09:00-15:30	N/A
SP_2	19/06/2017 Sunny, 24 – 30°C 14:00 – 17:00	20/06/2017 Sunny, 22 – 31°C 09:00 – 16:30	21/06/2017* Sunny, 22 – 31°C+ 08:30 – 15:00
SP_3	13/07/2017 Cloudy, 18 – 21°C 10:00 – 16:30	14/07/2017 Cloud then sun, 19 – 22°C 08:45 – 15:30	N/A
SP_4	01/08/2017 Sunny, 22°C 12:00 - 16:00	02/08/2017 Cloudy, 17 – 19°C 09:00 - 16:30	03/08/2017* Sunny, 18 – 20°C 09:00 - 15:30
SP_5	24/08/2017 Sunny, 19 – 21°C 09:00 - 16:30	25/08/2017 Sunny, 18 – 21°C 09:00 - 16:00	N/A

* Although only two visits were required under the methodology, the specialist surveyor was able to undertake an additional supplementary visit, which covered SP_2 and SP_4. While this adds data to inform habitat restoration, creation and enhancement measures, the additional visits do not detract from the robustness of baseline for the set of surveys as a whole.

[2] Following Natural England guidance, five sampling periods were undertaken between May to September.
a

Analysis

7.1.3.14 The most up-to-date information and species reviews are used in the assessment. Where there is no up-to-date review, the Pantheon software package[3] is used.

7.1.3.15 Species ecology and habitat preferences are taken from Recorder[4] and surveyor's personal knowledge of some of the species.

7.1.3.16 Species lists have been analysed using Pantheon, an analytical tool developed by Natural England and the Centre for Ecology & Hydrology (CEH) to assist invertebrate nature conservation in England. Site data in the form of species lists can be imported into Pantheon, which then analyses the species within the lists, assigning them to habitats and resources. Pantheon also consigns the most up-to-date national status to the species where it is available.

7.1.3.17 The information obtained from Pantheon can then be used to assign quality to sites and their features, assist in management decisions, and also facilitate requirements for further surveys, where required and appropriate.

7.1.4 Survey limitations

7.1.4.1 Ecological surveys are limited by factors which affect the presence of invertebrates such as the time of year, migration patterns and behaviour. Therefore, the absence of evidence of any invertebrate species following the surveys at this Site should not be taken as conclusive proof that the species is not present or that it will not be present in the future.

7.1.4.2 All surveys were undertaken in suitable weather conditions, during the appropriate time period with good coverage and therefore there are considered to be no limitations to the surveys.

7.1.5 Results

7.1.5.1 Across the three quadrants surveyed (south-west, north-west and north-east), a total of 402 invertebrate species were recorded. Of these, 37 species are species of importance and have a national designation as either Endangered[5], Nationally Threatened, Nationally Scarce, Red Data Book or Section 41 status. A total of 27 of the 37 species of importance were recorded within the south-west quadrant, with nine species recorded in the north-west quadrant and eight species recorded in the north-east quadrant. The full list of species recorded for each survey area is provided in Annex D, and Table 7.1.2 lists the species of importance. Table 7.1.3, Table 7.1.4 and Table 7.1.5 have been generated using the Pantheon software package. Not all species are expressed in the following tables, as some species do not form part of the Pantheon analysis and/or their specific requirements are not yet fully understood. They are listed in the full species list at the end of the report in Table 7.1.8, Table 7.1.9 and Table 7.1.10 in Annex D.

[3] Webb, J., Heaver, D., Lott, D., Dean, H.J., van Breda, J., Curson, J., Harvey, M., Gurney, M., Roy, D.B., van Breda, A., Drake, M., Alexander, K.N.A. and Foster, G. (2017). *Pantheon – Database Version 3.7.4. [*online] Available at: http://www.brc.ac.uk/pantheon/ [Accessed on 28 May 2017].
[4] Recorder 6 (2010) *Version 6.15.4.238.* Joint Nature Conservation Committee. Dorset Software Services.
[5] See Annex B and C for explanation of the different statuses

7.1.5.2 Within the south-west quadrant the following were recorded:

- 270 species recorded;
- 27 species of importance (includes those that may not now warrant national significant status), see Table 7.1.3

7.1.5.3 Within the north-west quadrant the following were recorded:

- 173 species recorded;
- 11 species of importance (includes those that may not now warrant national significant status), see Table 7.1.4

7.1.5.4 Within the north-east quadrant the following were recorded:

- 134 species recorded;
- 8 species of importance (includes those that may not now warrant national significant status), see Table 7.1.5

Table 7.1.2: Species of importance recorded within the three quadrants

Scientific name	Vernacular name	Status [6] / [7]	Habitat preferences and species notes (see list of references below)	Site notes
Ampedus elongatulus	a click beetle	Nationally Scarce A; Nationally Threatened (European status)	Ancient, broadleaved woodland and other locations with a plentiful supply of red rot in tree stumps and fallen deadwood, associated with oaks, beech (*Fagus* spp.), and pine (*Pinus* spp.)	Recorded in the south-west quadrant, in decaying red rot timbers on ancient monument
Ampedus pomorum	a click beetle	Notable b	Found in red rot on birch (*Betula* spp.) in woodland and parkland	Recorded in the north-east quadrant, extracted from an area of red rot in a fallen birch tree
Andrena minutoides	a mining bee	Notable a* Surrey status: Local	Widespread in the south on heaths and calcareous grasslands	Recorded in the south-west quadrant, within the heath
Caenopsis fissirostris	a weevil	Notable b	Inhabits heaths, sandpits, and woodlands; lives in leaf litter	Recorded in all three quadrants
Ceratina cyanea	blue carpenter bee	Red Data Book 3* Surrey status: Locally common	Stem-nesting bee species that appears to prefer very hot sites that have a complex mosaic of dead sticks and dried pithy stem plants for nesting and bramble flowers for foraging	Recorded in the north-west quadrant, located along sunlit, sandy path at western end of sample area

[6] Resources for determining national status:
Alexander, K.N.A. (2014) A Review of the Beetles of Great Britain: The Soldier Beetles and Their Allies. Species Status No. 16. Natural England Commissioning Reports, Number 134.
Alexander, K.N.A. and Denton, J.S. (2014) *A Review of the Beetles of Great Britain: The Darkling Beetles and Their Allies. Species Status No. 18.* Natural England Commissioning Reports, Number 148.
Bantock, T. (2016) *A Review of the Hemiptera of Great Britain: The Shield Bugs and Their Allies. Species Status No. 26.* Natural England Commissioning Reports, Number 190.
Duff, A. (2007) *Identification – Longhorn Beetles: Part 2. British* Wildlife 19: 35–43.
Falk, S.J., Ismay, J.W. and Chandler, P.J. (2016) *A Provisional Assessment of the Status of Acalyptratae Flies in the UK*. Natural England Commissioned Reports, Number 217.
Hubble, D.S. (2014) *A Review of the Scarce and Threatened Beetles of Great Britain: the Leaf Beetles and Their Allies. Species Status No. 19.* Natural England Commissioning Reports, Number 161.
Shirt, D.B. (1987) *British Red Data Books: 2. Insects.* Nature Conservancy Council, Peterborough.
Sutton, P. (2015) *A Review of the Orthoptera (Grasshoppers and Crickets) of Great Britain: Species Status No. 21.* Natural England Commissioning Reports, Number 187.
Telfer, M.G. (2016) *A Review of the Beetles of Great Britain: Ground Beetles (Carabidae): Species Status No. 25.* Natural England Commissioning Reports, Number 189.
[7] Surrey statuses, where available, derived from:
Baldock, D.W. (2008) *Bees of Surrey.* Surrey Wildlife Trust, Woking.
Baldock, D.W. (2010) *Wasps of Surrey.* Surrey Wildlife Trust, Woking.
Pontin, J. (2005) *Ants of Surrey.* Surrey Wildlife Trust, Woking.

Scientific name	Vernacular name	Status [6 / 7]	Habitat preferences and species notes (see list of references below)	Site notes
Colletes fodiens	a mining bee	EN (European) Surrey status: Local	A species of sandy places such as heathlands and sand quarries; adults on flowers such as ragwort	Recorded in the south-west quadrant, foraging on ragwort
Crabro scutellatus	a solitary wasp	Notable a* Surrey status: Local	Open heathland, sandy places with bare sand and in close proximity to wet places such as pools, bogs and mires	Recorded in the south-west quadrant on sandy paths
Diaperis boleti	a fungus beetle	Nationally Scarce	A beetle that is found in the bracket fungus (*Pipoporus betulinus*) on birch (*Betula* spp.) and possibly other tree species	Recorded in the south-west and north-east quadrants, in the woodlands; knocked from bracket fungus; good numbers recorded
Dolichovespula media	median wasp	Notable a*	A woodland social wasp, formerly quite scarce but expanded distribution and frequency in recent decades	Recorded from north-west quadrant in woodland
Eutolmus rufibarbis	a robberfly	Nationally Scarce	South and eastern species of dry soils; wood edge and open heathlands	Recorded in the south-west and north-west quadrants, this species appears to be widely-distributed throughout the local area
Formica rufa	red (southern) wood ant	Nationally Threatened (global status) Surrey status: Frequent in open woodland	A nest mound forming ant species of mature woodlands and plantations, locally frequent but susceptible to decline and loss	Recorded in the south-west and north-east quadrants, this species is widespread in both areas
Formica sanguinea	slavemaking ant	Notable b Surrey status: Frequent on heathland	On open and woodland sites where they raid other ant species nests such as *Formica fusca*	Recorded in the south-west quadrant, this species was frequently observed on the heathland, including winged queens
Hippodamia variegata	Adonis's ladybird	Notable b*	Open sites such as brownfield and heathland	Recorded in the south-west quadrant, on heath

Scientific name	Vernacular name	Status [6 / 7]	Habitat preferences and species notes (see list of references below)	Site notes
Lasioglossum pauxillum		Notable a*	Open habitats such as heaths and calcareous grasslands with patchy, bare ground	Recorded in the south-west quadrant, on the heath and sandy paths
Lasioglossum semilucens	a solitary bee	Red Data Book 3* Surrey status: Very rare	A species of open sites and also woodland clearings on dry, friable sands	Recorded in the north-west quadrant, located along sunlit sandy path on woodland at western end of sample area
Lasius brunneus	brown ant	Notable a Surrey status: Local in woodland parkland	Broadleaved woodland and parkland with mature oak trees or at least those with some rot or cavities on them	Recorded in the north-east quadrant, this species appears to be reasonably well distributed in the woodland on oak trees; not noted from other survey areas, though is likely to be present, especially in the south-west quadrant
Macropis europaea	a solitary bee	Notable a*; Notable a Surrey status: Local	A wetland species that collects pollen solely from yellow loosestrife (*Lysimachia vulgaris*); can be far-ranging, however, for nectar	Recorded in the south-west quadrant, within the heathland; a single male was recorded on ragwort flowers
Magdalis carbonaria	a weevil	Notable b	Associated with birch (*Betula* spp.) in scrub or broadleaved woodland	Recorded in the north-west quadrant, found in woodland
Metrioptera brachyptera	bog bush cricket	Nationally Scarce*	Prefers a habitat mosaic of wet and dry heath; it breeds in wet heath but often moves out to drier parts during the nymphal and adult life	Recorded in the south-west quadrant, a single was male recorded within the dry heath; not suitable breeding habitat but part of a mosaic important to the species.
Microrhagus pygmaeus	a click beetle	Red Data Book 3	A deadwood species in oak	Recorded in the south-west quadrant, within woodland, tapped from deadwood branches
Mordellistena neuwaldeggiana	a tumbling flower beetle	Nationally Scarce	Larvae are thought to develop in plant stems and possibly deadwood; adults on umbellifer flowers at woodland edges and along rides	Recorded in the south-west quadrant, within woodland

Scientific name	Vernacular name	Status [6 / 7]	Habitat preferences and species notes (see list of references below)	Site notes
Myopa fasciata	a thick-headed fly	Red Data Book 3	A strongly southern heathland parasitic fly species on the proposed host *Andrena fuscipes*, a solitary bee; locally recorded from heaths in Surrey	Recorded in the south-west quadrant, two individuals were recorded within the heathland, searching for hosts
Nemobius sylvestris	wood cricket	Nationally Scarce	Relies on deep leaf litter to survive so associated with well-established broadleaved and mixed woodlands	Recorded in the south-west and north-west quadrants, in the woodlands and also recorded from the centre of the heath in the south-west quadrant, with extensive and robust populations wherever conditions suit
Nomada fucata	a cuckoo bee	Notable a* Surrey status: Common	Parasite on *Andrena flavipes*, a local species recorded frequently on the heathlands of the south-west quadrant	Recorded in the south-west quadrant, on the heathland
Nomada lathburiana	a cuckoo bee	Red Data Book 3* Surrey status: Local	A cuckoo on the spring flying solitary bee *Andrena cineraria*	Recorded in the north-west quadrant, located along sunlit, sandy path at western end of sample area
Nysson dimidiatus	a cuckoo wasp	Notable b* Surrey status: Local	A cuckoo wasp on the host *Lindenius albilabris* (a solitary wasp); sandy, dry places such as heaths, sandy quarries, and brownfields; host present on the Site	Recorded in the south-west quadrant, within the heathland
Nysson trimaculatus	a cuckoo wasp	Notable b* Surrey status: Very local	Lays its eggs in other solitary wasp nests; *Gorytes* species are principal hosts	Recorded in the south-west quadrant, on ragwort flowers and over heathland
Oedostethus quadripustulatus	a click beetle	Notable a; Notable a	Normally recorded from water margins of river banks	Recorded in the north-east quadrant, within a wet ditch set within woodland
Oxybelus mandibularis	a solitary wasp	Notable a* Surrey status: Local	Heathlands and coastal sites with bare and sparsely-vegetated ground	Recorded in the south-west quadrant, within heathland
Philanthus triangulum	a solitary wasp	Red Data Book 2* Surrey status: Ubiquitous	Nests in open and sparsely-vegetated, friable, sandy ground; preys on honeybees (*Apis mellifera*)	Recorded in the south-west quadrant, within heathland

Scientific name	Vernacular name	Status [6 / 7]	Habitat preferences and species notes (see list of references below)	Site notes
Platyrhinus resinosus	a fungus weevil	Notable B*	Larvae develop in fungus such as *Daldinia concentrica*; found in a range of wood habitats including ancient woodlands, parklands, and also piles of timber adjacent to woods	Recorded in the south-west quadrant, on deadwood timbers surrounding the ancient monument
Polydrusus formosus	a weevil	Notable a*	A scrub edge and woodland weevil	Recorded in all three quadrants, in the woodlands and along the edges of the woods
Rhagonycha lutea	a soldier beetle	Nationally Scarce	A species of woodlands and parklands	Recorded in the north-west quadrant, within woodland
Rhaphium micans	a dolyfly	Nationally Scarce	Associated with running water, including seepages	Recorded from the north-east quadrant from the wet ditches along Pointers lane
Rhopalus parumpunctatus	a ground bug	Nationally Scarce	Ground bug on sparsely-vegetated, dry habitats such as heaths and the East Anglian Breckland	Recorded throughout the south-west quadrant on open heath
Rhyparochromus pini	a ground bug	Notable b	Associated with dry heathlands and coastal habitats; a strong southern distribution	Recorded throughout the south-west and north-west quadrants on open heath
Stictoleptura scutellata	a longhorn beetle	Notable a; Notable a	A deadwood species associated with beech and probably others such as oak	Recorded in the north-east quadrant, a single individual was recorded investigating an oak tree at the western end of Pointers Lane
Tyria jacobaeae	cinnabar moth	Section 41 Priority Species – research only	Larvae on ragwort	Recorded in the south- and north-west quadrant, on ragwort

* Accepted as being more common than this status suggests; likely to be downgraded in any upcoming review.

Table 7.1.3: South-west quadrant resource usage[8]

Broad biotope	Habitat	No. of species	No. of species with conservation status	Percentage of scarce species of habitat fauna	Conservation status
Open habitats	Tall sward and scrub	82	6	7.3	*Caenopsis fissirostris:* Nb *Eutolmus rufibarbis:* NS *Formica rufa:* NT (Global) *Hippodamia variegata:* Nb *Rhyparochromus pini:* Nb *Tyria jacobaeae:* Section 41 Priority Species – research only
Open habitats	Short sward and bare ground	73	12	16.4	*Andrena minutuloides:* Na *Colletes fodiens:* EN (European) *Crabro scutellatus*: Na *Eutolmus rufibarbis:* NS *Formica sanguinea:* Nb *Lasioglossum pauxillum:* Na *Myopa fasciata:* RDB 3 *Nomada fucata:* Na *Nysson dimidiatus:* Nb *Oxybelus mandibularis:* Na *Philanthus triangulum:* RDB 2 *Rhopalus parumpunctatus:* NS
Tree-associated	Decaying wood	32	5	15.6	*Ampedus elongantulus:* NS A, NT (European) *Diaperis boleti:* NS *Microrhagus pygmaeus*: RDB 3 *Mordellistena neuwaldeggiana:* NS *Platyrhinus resinosus:* Nb
Tree-associated	Arboreal	29	1	3.4	*Polydrusus formosus:* Na

[8] Webb, J., Heaver, D., Lott, D., Dean, H.J., van Breda, J., Curson, J., Harvey, M., Gurney, M., Roy, D.B., van Breda, A., Drake, M., Alexander, K.N.A. and Foster, G. (2017). *Pantheon – Database Version 3.7.4. [*online] Available at: http://www.brc.ac.uk/pantheon/ [Accessed on 28 May 2017].

Broad biotope	Habitat	No. of species	No. of species with conservation status	Percentage of scarce species of habitat fauna	Conservation status
Tree-associated	Shaded woodland floor	21	2	9.5	*Nemobius sylvestris:* NS *Nysson trimaculatus:* Nb
Wetland	-	1	1	100	*Metrioptera brachyptera:* NS
Wetland	Marshland	13	–	–	–
Wetland	Peatland	8	1	12.5	*Macropis europaea:* Na
Wetland	Running water	2	–	–	–
Wetland	Wet woodland	1	–	–	–
Tree-associated	Wet woodland	1	–	–	–
Open habitats	Upland	1	–	–	–

Table 7.1.4: North-west quadrant resource usage

Broad biotope	Habitat	No. of species	No. of species with conservation status	Percentage of scarce species of habitat fauna	Conservation status
Open habitats	Tall sward and scrub	62	5	8.0	*Caenopsis fissirostris:* Nb *Ceratina cyanea:* RDB 3 *Eutolmus rufibarbis:* NS *Rhyparochromus pini:* Nb *Tyria jacobaeae:* Section 41 Priority Species – research only
Tree-associated	Arboreal	30	2	6.7	*Polydrusus formosus:* Na *Rhagonycha lutea:* NS
Tree-associated	Shaded woodland floor	24	1	4.2	*Nemobius sylvestris:* NS
Open habitats	Short sward and bare ground	19	3	15.8	*Eutolmus rufibarbis:* NS *Lasioglossum semilucens:* RDB 3 *Nomada lathburiana:* RDB 3
Tree-associated	Decaying wood	18	1	5.5	*Magdalis carbonaria:* Nb
Wetland	Marshland	7	–	–	–
Wetland	Peatland	2	–	–	–
Wetland	Running water	1	–	–	–
Tree-associated	Wet woodland	1	–	–	–

Table 7.1.5: North-east quadrant resource usage[9]

Broad biotope	Habitat	No. of species	No. of species with conservation status	Percentage of scarce species of habitat fauna	Conservation status
Open habitats	Tall sward and scrub	50	2	4	*Caenopsis fissirostris:* Nb *Oedostethus quadripustulatus:* NS B *Formica rufa:* NT (Global)
Tree-associated	Shaded woodland floor	29	–	–	–
Tree-associated	Decaying wood	21	4	19	*Ampedus pomorum:* Nb *Diaperis boleti:* NS *Lasius brunneus:* Na *Stictoleptura scutellata:* Na
Tree-associated	Arboreal	17	1	5.9	*Polydrusus formosus:* Na
Wetland	Running water	7	1	14.2	*Rhaphium micans:* NS
Tree-associated	Wet woodland	6	–	–	–
Wetland	Wet woodland	5	–	–	–
Open habitats	Short sward and bare ground	4	–	–	–
Wetland	Marshland	3	–	–	–
Wetland	Peatland	3	–	–	–

[9] Webb, J., Heaver, D., Lott, D., Dean, H.J., van Breda, J., Curson, J., Harvey, M., Gurney, M., Roy, D.B., van Breda, A., Drake, M., Alexander, K.N.A. and Foster, G. (2017). *Pantheon – Database Version 3.7.4. [*online] Available at: http://www.brc.ac.uk/pantheon/ [Accessed on 28 May 2017].

7.1.6 Discussion

South-west quadrant

Habitats

7.1.6.1 The south-west quadrant is dominated by two biotopes; open habitats and tree-associated habitats, see Table 7.1.3.

7.1.6.2 The open habitats biotope is dominated by two features: the tall sward and scrub and the short sward and bare ground habitats. The tall sward and scrub is often represented on a site by a scrub–grass interface, and this is the situation at this quadrant. The assemblage of species with a fidelity to this interface is 82 with six of national significance. The tall sward and scrub habitat is widespread around the peripheries of the woodland along paths and also on the heathland where there is a strong birch (*Betula spp*.) interface with the open heathland.

7.1.6.3 In the short sward and bare ground habitat, 73 species were recorded with 12 of national significance. This habitat supports species indicative of heathland or, more specifically, the bare sandy or patchy bare ground that forms part of the heathland mosaic. This niche feature is also present along the sunlit, sandy paths, either compacted or loose and friable. The bare ground and patchy swards that produce this habitat type are present over much of the heathland but are of greatest quality at the heath-birch interface by the sandy track.

7.1.6.4 Tree-associated habitats include a range of particular features, supporting decaying wood (32 species), arboreal (29 species), and shaded woodland floor (21 species). Combined, the woodland fauna is represented by 82 species of fidelity including a suite of eight species of national significance.

7.1.6.5 The decaying wood assemblage is of particular note, as it produced 32 species with five being of national significance. The resource is present across all areas of the woodland, both in and outside the Scheme. However, the area of greatest potential is the ancient Tumulus monument around which a number of tree trunks and timbers have been positioned. This feature is sheltered and sunlit, and has a large volume of decaying timber that exhibits cubic red rot, a noted important rot type for many scarce and threatened invertebrates, mainly beetles. This Tumulus monument falls outside of the Scheme.

7.1.6.6 Deadwood on oak branches and silver birch standing deadwood provides another niche for saproxylics and expands the resource, since it offers further situations for other high-fidelity, rot-dependent species.

7.1.6.7 The shaded woodland floor exhibits 21 species including two of national significance. The habitat, being locally dominated by bracken, is limited to areas where there is no shading or little shading from the bracken and leaf litter, and other flora is exposed.

7.1.6.8 There are two species of significance that highlight the wetland biotope in the analysis. However, these are not directly related to the mosaic present in the Scheme but utilize the features present in the area either to supplement their foraging (*Macropis europaea*) or as an exploration area for a mate, in this instance male bog bush-crickets.

Species

7.1.6.9 This quadrant and its habitats include a range of common and ubiquitous species and also a suite of scarce invertebrates across all parts of the quadrant. The habitat with the greatest scarce species representation is the short sward and bare ground, with 12 scarce species of national significance equating to 16.4% of the total species recorded from the habitat. This is a high concentration of scarce species but is typical of these specialized features that attract habitat specialists; many are subsequently localized in the distribution. The fauna includes many southern England specialists including Myopa fasciata (Red Data Book 3), a big-headed fly that is a parasite on the common solitary bee Andrena fuscipes and recorded on the south-west quadrant heathland. The fly is also recorded locally from other Surrey heathlands including Pirbright Common, approximately 16 km to the southwest of the Scheme.

7.1.6.10 The scarce species associated with the heathland are all species recorded elsewhere in Surrey, and with reference to the bees, wasps, and ants (*aculeate Hymenoptera*), a local status has been provided for each species. None of the aculeate Hymenoptera recorded from the south-west quadrant heathland is described as scarce or threatened within Surrey, and many are described as local, which relates to their reliance on sandy ground and intricate mosaics of habitats (see Table 7.1.3 for their ecological preferences).

7.1.6.11 The woodland fauna includes a suite of species of conservation value. Most of these are associated with deadwood and senescent phases on trees. Most notably, there is a high-volume timber resource on the ancient monument that yielded a number of scarce species including the nationally scarce click beetle Ampedus elongatulus. This species, along with many others, is recorded only or largely from red rot that is present on certain species of tree such as oak, beech, and, to a lesser extent, birch (*Betula spp*.).

7.1.6.12 The south-west quadrant also includes a strong population of the nationally scarce wood cricket (*Nemobius sylvestris*), a species of probable intrinsic value to the area, since it is more noticeable than many invertebrates owing to its characteristic stridulation (singing). The species is widespread across the quadrant, in the woodlands where there is deep leaf litter both within and outside the Scheme, and also within the heathland habitats.

North-west quadrant

Habitats

7.1.6.13 The dominant biotope in terms of coverage is the tree-associated classification. This biotope includes 72 species across the various associated habitats from decaying wood (18 species) to the arboreal habitat (30 species), see Table 7.1.4.

7.1.6.14 The resource is not especially large and is due to the relative homogenous tree age of the birch. There is an elevation of interest in places owing to the presence of fallen deadwood and saproxylic features on the branches of oak trees.

7.1.6.15 The ground flora is also largely homogeneous with bracken and bramble being the co-dominant plant species of the north-west quadrant. Variation occurs at the western end of the quadrant, near the footbridge crossing the M25. The flora

here is more associated with disturbed ground and gives rise to a slightly different fauna.

7.1.6.16 The open habitats are largely centred around the path edges and disturbed ground of the western edge of the north-west quadrant. There are a range of niches all in close proximity to one another from deadwood and bare ground to flowery swards and structural interfaces. This is a key area of the north-west quadrant in terms of habitats and species, including a number of nationally significant species.

7.1.6.17 The wetland biotope is also highlighted, but only by a few species of a wide range of situations including damp ground or vagrants. Owing to a lack of water bodies, and to the wetland-associated species list not including any species of conservation value, the biotope is not thought to be relevant to the assessment of the north-west quadrant.

Species

7.1.6.18 The species recorded in the north-west quadrant are largely typical of woodlands, and there is some inhibition to the fauna owing to the lack of diversity of plant species, both trees and ground flora/understorey. This is reflected in the species that are within this quadrant. A total of 10 scarce species were recorded within this quadrant. Many of these are associated with sunlit locations or open habitats such as heathland and were recorded from one specific location within the Scheme on the western edge of the north-west quadrant at OSNGR TQ 07548 59491. This includes the Red Data Book 3 solitary bee Lasioglossum semilucens. This bee is regarded as very rare in Surrey[10]. Other species at this location include the nationally scarce robberfly Eutolmus rufibarbis and the Red Data Book 3 blue carpenter bee (*Ceratina cyanea*). As the north-west quadrant lacks deadwood of any substantial quantity, only 18 species associated with this important woodland feature were noted, including one species of national significance, the birch-associated (*Betula spp.)* weevil Magdalis carbonaria (Nationally Scarce B).

7.1.6.19 The wood cricket is also present in the north-west quadrant, though much more locally and only towards the western end of this quadrant. The strongest proportion of the population is found outside of the Scheme to the north where the species appears to be widespread in the woodlands.

North-east quadrant

Habitats

7.1.6.20 The north-east quadrant is dominated by woodland as demonstrated by the tree-associated habitats. The woodland supports 73 species of fidelity, including five species of significance, see Table 7.1.5.

7.1.6.21 The woodland is mainly oak woodland with some beech, pine, and sycamore. The understorey is not well developed, as with other survey areas, and the ground flora consists of ferns (possibly Dryopteris spp.), bracken, and bramble. There is a resource of deadwood in the woodland, but there is not a large volume, and it is sporadic in occurrence. The other biotope noted from the woodland is the open habitats and specifically the tall sward and scrub habitat.

[10] Baldock, D.W. (2008) Bees of Surrey. Surrey Wildlife Trust, Woking.

This is represented by 50 species and is generally centred around the open fringe areas of Pointers Lane and, where it exists, the scrub understorey of the woodland. Despite the moderately low volume of deadwood noted from the north-east quadrant, there is a resource of 21 species associated with this habitat including four of significance.

7.1.6.22 The wetland biotope is also represented in the north-east quadrant, despite there being no water bodies. This is highlighted by species that can be found in damp situations such as wet ditches, or vagrant species, such as the hoverfly Parhelophilus versicolor a reed-dependent (*Typha spp*.) species and migrant hawker dragonfly.

Species

7.1.6.23 The north-east quadrant has a list of invertebrate species including eight species of significance. This list includes species not recorded elsewhere such as the nationally scarce longhorn beetle Stictoleptura scutellata. This species was recorded from the oak tree at the western end of Pointers Lane (OSNGR TQ 08261 59354). This tree was also the location of the purple hairstreak (Favonius quercus) colony. It is considered that these two species could also potentially occur within the north-west and south-west quadrant where tall oak trees are present, and the species can be elusive to record.

7.1.6.24 The north-east quadrant also includes Lasius brunneus (the brown ant), a species associated with mature oak trees with some signs of rot or decay in which they construct their nests. It is described as local to Surrey and found in woodland and parkland (Pontin, 2005[11]).

Site assessment

7.1.6.25 The Site comprises a range of habitats from three principal broad biotopes. The two dominant biotopes are the tree-associated and open habitats. The third principle biotope, the wetland biotope, is not directly present within the survey areas of the quadrants, but was highlighted by a suite of vagrants, generalists of many damp situations and species that forage far from their breeding sites, such as dragonflies and damselflies.

7.1.6.26 The woodlands offer a similar range of species across all quadrants. However, a subtle variation in the niche features present in each of the areas surveyed and the differences in overall quality of the woodlands influences the corresponding suites of scarce species.

7.1.6.27 Based on the survey and subsequent analysis of the data, the woodland with the greatest number of species, including scarce species, is that in the south-west quadrant. This is due to the different age classes of trees, which produces a structural variation within the woodland and at its fringes that enables a wider range of species to establish. Importantly, it also includes a localized and high volume of deadwood in an optimal or near-optimal state. The fauna on the ancient monument includes a suite of scarce saproxylic species including Ampedus elongatulus (NS A). The surrounding woodland also supports species

[11] Pontin, J. (2005) *Ants of Surrey*. Surrey Wildlife Trust. Woking,

associated with other saproxylic features such as Platyrhinus resinosus (Nb) that is found at fungi on standing and fallen deadwood.

7.1.6.28 The woodland in the south-west quadrant has a more localized dominance of bracken than in other woodlands enabling localized areas of invertebrate richness on the woodland floor and understorey. The nationally scarce wood cricket in particular appears to have strong colonies in the woodland and, as it has suggested intrinsic value to the area, is a key species.

7.1.6.29 The other woodland quadrants also possess species of value, but the woodlands are broadly of lower value than the woodland in the south-west quadrant.

7.1.6.30 All of the woodlands are contiguous with similar-quality woodland outside the Scheme. In the case of the north-west quadrant, woodland outside the Scheme is of significantly greater quality than the woodland within the Scheme. This is due to the greater number of mature and over-mature oak trees varied structure in the canopy and understorey, and more typical woodland ground flora. It also includes open areas of lowland heathland and bare ground.

7.1.6.31 The open habitat biotope is present in all quadrants, in varying amounts of unit area, species composition, and value. The north-east quadrant has the lowest-value habitat of open spaces. This is due to the woodland not having any glade or heathland components to its mosaic. The north-west quadrant possesses a suite of species that are indicative of lowland heaths and short sward/bare ground mosaics. These are strictly localized at the western edge of the quadrant, within the Scheme at OSNGR TQ 07548 59491 and where there is a mosaic of sandy open ground with adjacent flower foraging, mature oaks, and deadwood are all present next to one another. This is the location of the Red Data Book 3 solitary bee Lasioglossum semilucens. This species is associated with woodland clearings and nests in sandy, friable ground, and this location fulfils the species' nesting requirements. This criterion may not be fulfilled at many other locations elsewhere across the Scheme, but there may be potential for it along the sandy woodland edge paths in the south-west quadrant. It is a small species and may be moderately under-recorded. However, it is a key species of the Site. The sandy path location in the north-west quadrant also includes the Red Data Book 3 blue carpenter bee. This species is likely to be recorded elsewhere within and outside the Scheme, but it is a small, fast, and elusive species, making detection sometimes difficult.

7.1.6.32 The location of greatest value to the open biotope is the heathland of the south-west quadrant. This habitat area is a mosaic of soft, friable sands, compacted soils, disturbed path edges, birch scrub, and lowland heath with stands of heather. The mosaic is the richest part of the Site, exhibiting over 100 species including 16 with a national status. The list includes many species of solitary bee and wasp, and their associated parasites. This heathland area falls outside the Scheme.

7.1.6.33 The wetland biotope is indirectly present on the Site, as various locations support either generalists of damp or wet situations or the foraging location of some water-breeding species. This is particularly so for the dragonflies and damselflies (*Odonata*) that breed in the acidic pool within the south-west quadrant. This pool supports a rich Odonata fauna including the black darter (*Symeptrum danae*) and also potentially the downy emerald (*Cordulia aenea*), both of which were noted, amongst others, as regularly foraging or basking on the heathland and along the woodland rides. This pool is located outside the Scheme.

Appendices

Appendix A Pitfall trap grid accompanies illustration

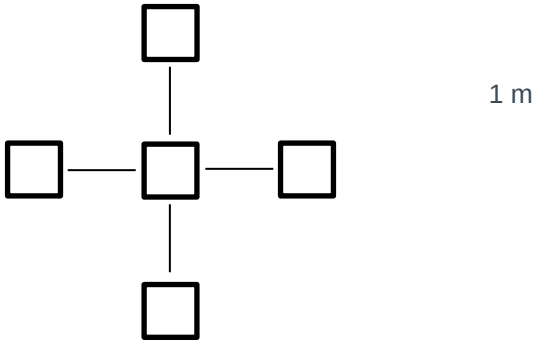

Figure A1 Pitfall trap grid of five traps

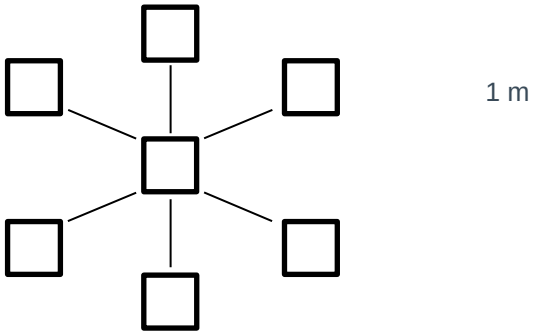

Figure A.2 Pitfall trap grid of seven traps

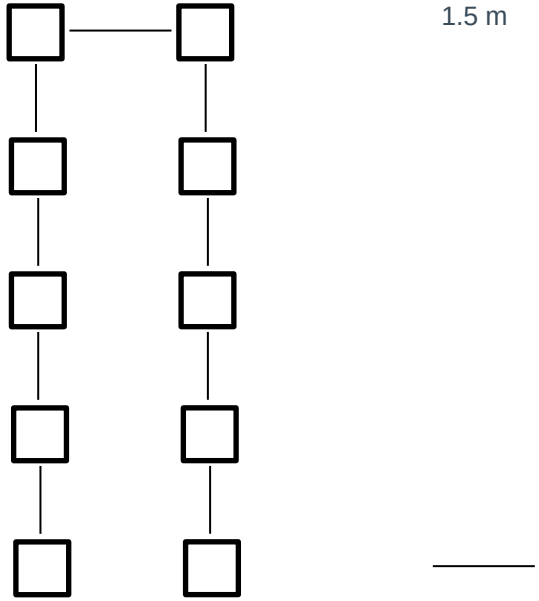

Figure A.3 Pitfall trap grid of ten traps

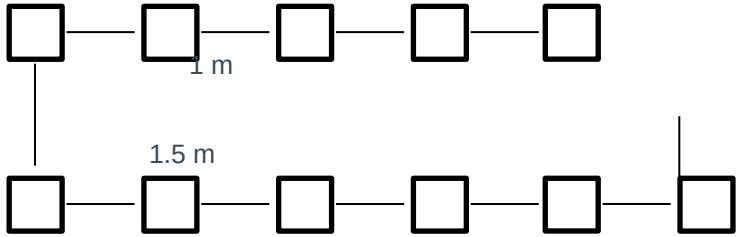

Figure A.4 Pitfall trap grid of eleven traps

Appendix B Red Data Book Definition

Table 7.1.6: Red Data Book definitions

Red Data Book National Status	Category	Definition
Red Data Book category 1 (RDB 1)	Endangered	Species that are known or believed to occur as only a single population within one 10 km square of the Ordnance Survey National Grid.
Red Data Book category 2 (RDB 2)	Vulnerable	Species declining throughout their range or in vulnerable habitats.
Red Data Book category 3 (RDB 3)	Rare	Species that are estimated to exist in only 15 or fewer post-1970 10 km squares. This criterion may be relaxed where populations are likely to exist in over fifteen 10 km squares but occupy small areas of especially vulnerable habitat.
Nationally Notable (Scarce) category A (NS A)	Notable A	Taxa that do not fall within the RDB category but that are nonetheless uncommon in Great Britain and thought to occur in 30 or fewer 10 km squares of the Ordnance Survey National Grid or, for less well-recorded groups, between eight and 20 vice counties.
Nationally Notable (Scarce) category B (NS B)	Notable B	Taxa that do not fall within the RDB category but that are nonetheless uncommon in Great Britain and thought to occur in 31–100 10 km squares of the Ordnance Survey National Grid or, for less well-recorded groups, between eight and 20 vice counties.
Nationally Notable (Scarce) (N)	Notable	Species that are estimated to occur within the range of 16–100 10 km squares. The subdividing of this category into Notable A and Notable B has not been attempted for many species in this part of the review.

Appendix C International Union for Conservation Nature definitions

Table 7.1.7: International Union for Conservation Nature (UCN) definitions

IUCN Category	Abbreviation	Definition
Regionally Extinct	RE	A taxon is Extinct when there is no reasonable doubt that the last individual has died. In this review, the last date for a record is set at 50 years before publication.
Critically Endangered	CR	A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered.
Endangered	EN	A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered.
Vulnerable	VU	A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable.
Near Threatened	NT	A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered, or Vulnerable now, but is close to qualifying for, or is likely to qualify for, a threatened category in the near future.
Least Concern	LC	A taxon is of Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable, or Near Threatened. Widespread and abundant taxa are included in this category.
Data Deficient	DD	A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate.
Not Evaluated	NE	A taxon is Not Evaluated when it has not yet been evaluated against the criteria.

Appendix D Survey results

D.1 Species list

D.1.1 Only species with a national status (as defined in Appendix B above) has been annotated. All others are common or local species

South-west quadrant

Table 7.1.8: South-west quadrant species list

Taxon	Vernacular name	Date first recorded	UK status
Abax parallelepipedus	a ground beetle	14-Jul-17	–
Aeshna cyanea	southern hawker	03-Aug-17	–
Aeshna mixta	migrant hawker	03-Aug-17	–
Amara aenea	a ground beetle	14-Jul-17	–
Amara tibialis	a ground beetle	07-Jun-17	–
Ammophila pubescens	heath sand wasp	20-Jun-17	–
Ampedus elongantulus	a click beetle	07-Jun-17	NS A (NT – European status)
Anarta myrtilli	beautiful yellow underwing	03-Aug-17	–
Anaspis maculata	a tumbling flower beetle	21-Jun-17	–
Anatis ocellata	eyed ladybird	03-Aug-17	–
Anax imperator	emperor dragonfly	07-Jun-17	–
Andrena barbilabris	a mining bee	20-Jun-17	–
Andrena dorsata	a mining bee	20-Jun-17	–
Andrena fuscipes	a mining bee	01-Aug-17	–
Andrena minutula	a mining bee	20-Jun-17	–
Andrena minutuloides	a mining bee	01-Aug-17	Na*
Andrena subopaca	a mining bee	20-Jun-17	–
Anobium fulvicorne	a beetle	21-Jun-17	–
Anomoia purmunda	a fruitfly	14-Jul-17	–
Anoplius infuscatus	a spider-hunting wasp	07-Jun-17	–
Anoplius viaticus	black banded spider wasp	21-Jun-17	–
Anoplus plantaris	a weevil	21-Jun-17	–
Anthophora bimaculata	a solitary bee	21-Jun-17	–
Aphantopus hyperantus	ringlet	20-Jun-17	–
Apion haematodes	a weevil	21-Jun-17	–
Arachnospila spissa	a spider-hunting wasp	20-Jun-17	–
Armadillidium vulgare	common pill woodlouse	20-Jun-17	–

Taxon	Vernacular name	Date first recorded	UK status
Astata boops	a digger wasp	21-Jun-17	–
Athous haemorrhoidalis	a click beetle	21-Jun-17	–
Atrecus affinis	a rove beetle	03-Aug-17	–
Austrolimnophila ochracea	a cranefly	14-Jul-17	–
Badister bullatus	a ground beetle	03-Aug-17	–
Betulapion simile	a weevil	25-Aug-17	–
Blepharidopterus angulatus	a plantbug	14-Jul-17	–
Bombus hortorum	small garden bumble bee	14-Jul-17	–
Bombus hypnorum	a bumblebee	07-Jun-17	–
Bombus jonellus	heath bumble bee	01-Aug-17	–
Bombus pascuorum	common carder bee	20-Jun-17	–
Bombus pratorum	early bumble bee	07-Jun-17	–
Bombus vestalis	a bumblebee	07-Jun-17	–
Brachytron pratense	hairy dragonfly	20-Jun-17	–
Byrrhus fasciatus	banded pill beetle	03-Aug-17	–
Byrrhus pilula	pill beetle	14-Jul-17	–
Caenopsis fissirostris	a weevil	03-Aug-17	Nb
Calathus erratus	a ground beetle	25-Aug-17	–
Calathus fuscipes	a ground beetle	03-Aug-17	–
Callicerus rigidicornis	a rove beetle	14-Jul-17	–
Calvia quattuordecimguttata	cream-spot ladybird	21-Jun-17	–
Capsus ater	a plantbug	07-Jun-17	–
Cerceris ruficornis	a digger wasp	01-Aug-17	NS
Cerceris rybyensis	ornate-tailed digger wasp	20-Jun-17	–
Chalcosyrphus nemorum	a hoverfly	07-Jun-17	–
Chloromyia formosa	a soldierfly	07-Jun-17	–
Choerades marginatus	a robberfly	03-Aug-17	–
Chorthippus brunneus	common field grasshopper	14-Jul-17	–
Chorthippus parallelus	meadow grasshopper	20-Jun-17	–
Chrysops relictus	a horsefly	01-Aug-17	–
Chrysotus neglectus	a dolyfly	07-Jun-17	–
Cicindela campestris	green tiger beetle	20-Jun-17	–
Coelioxys conoidea	a cuckoo bee	01-Aug-17	–

Taxon	Vernacular name	Date first recorded	UK status
Colletes fodiens	a mining bee	20-Jun-17	EN (European)
Colletes similis	a mining bee	20-Jun-17	–
Colletes succinctus	a mining bee	01-Aug-17	–
Conocephalus discolor	long-winged conehead	20-Jun-17	–
Conops quadrifasciatus	a thick-headed fly	13-Jul-17	–
Cordulia aenea	downy emerald	19-Jun-17	–
Crabro scutellatus	a digger wasp	07-Jun-17	Na*
Crossocerus annulipes	a digger wasp	01-Aug-17	–
Crossocerus megacephalus	a digger wasp	07-Jun-17	–
Cryptocephalus fulvus	a leaf beetle	01-Aug-17	–
Cryptocephalus labiatus	a leaf beetle	25-Aug-17	–
Cymus melanocephalus	a plantbug	21-Jun-17	–
Dasysyrphus tricinctus	a hoverfly	25-Aug-17	–
Deraeocoris flavilinea	a plantbug	21-Jun-17	–
Deraeocoris lutescens	a plantbug	14-Jul-17	–
Diaperis boleti	a beetle	21-Jun-17	NS
Dicranopalpus ramosus	a harvestman	25-Aug-17	–
Dioctria baumhaueri	a robberfly	07-Jun-17	–
Dioctria rufipes	a robberfly	20-Jun-17	–
Diodontus minutus	minute black wasp	01-Aug-17	–
Dolichopus campestris	a dolyfly	06-Jul-17	–
Dolichopus trivialis	a dolyfly	20-Jun-17	–
Dromius agilis	a ground beetle	25-Aug-17	–
Dromius quadrimaculatus	a ground beetle	03-Aug-17	–
Drusilla canaliculata	a rove beetle	07-Jun-17	–
Drymus ryei	a bug	21-Jun-17	–
Drymus sylvaticus	a bug	01-Aug-17	–
Ectemnius continuus	a digger wasp	25-Aug-17	–
Ectemnius lapidarius	a digger wasp	25-Aug-17	–
Elampus panzeri	a cuckoo wasp	20-Jun-17	–
Elasmostethus interstinctus	birch shieldbug	14-Jul-17	–
Elasmucha grisea	parent bug	07-Jun-17	–
Enallagma cyathigerum	common blue damselfly	14-Jul-17	–
Epeolus cruciger	a solitary bee	03-Aug-17	–

Taxon	Vernacular name	Date first recorded	UK status
Episyron rufipes	red-legged spider wasp	01-Aug-17	–
Eupeodes luniger	a hoverfly	25-Aug-17	–
Eutolmus rufibarbis	a robberfly	14-Jul-17	NS
Evagetes crassicornis	a spider-hunting wasp	21-Jun-17	–
Ferdinandea cuprea	a hoverfly	03-Aug-17	–
Formica fusca	an ant	19-Jun-17	–
Formica rufa	an ant	20-Jun-17	NT (global status)
Formica sanguinea	an ant	21-Jun-17	Nb
Glomeris marginata	pill millipede	20-Jun-17	–
Grammoptera ruficornis	a longhorn beetle	07-Jun-17	–
Grynobius planus	a wood boring beetle	14-Jul-17	–
Gymnopternus aerosus	a dolyfly	07-Jun-17	–
Halictus rubicundus	a mining bee	03-Aug-17	–
Halyzia sedecimguttata	orange ladybird	14-Jul-17	–
Harmonia axyridis	harlequin ladybird	21-Jun-17	–
Harpalus rufipes	a ground beetle	25-Aug-17	–
Hedychridium roseum	a cuckoo wasp	20-Jun-17	NS
Helophilus pendulus	a hoverfly	07-Jun-17	–
Himacerus apterus	a bug	07-Jun-17	–
Himacerus mirmicoides	a bug	21-Jun-17	–
Hippodamia variegata	Adonis's ladybird	25-Aug-17	Nb*
Hoplitis claviventris	a solitary bee	01-Aug-17	–
Hybos culiciformis	a hybotid fly	14-Jul-17	–
Hylaeus confusus	a solitary bee	20-Jun-17	–
Hylaeus hyalinatus	a solitary bee	20-Jun-17	–
Hypera zoilus	a weevil	25-Aug-17	–
Isomira murina	a beetle	07-Jun-17	–
Kleidocerys resedae	a plantbug	21-Jun-17	–
Lampyris noctiluca	glow-worm	25-Aug-17	–
Lasioglossum albipes	a mining bee	03-Aug-17	–
Lasioglossum calceatum	slender mining bee	25-Aug-17	–
Lasioglossum leucozonium	a mining bee	03-Aug-17	–
Lasioglossum minutissimum	least mining bee	01-Aug-17	–
Lasioglossum pauxillum	a mining bee	01-Aug-17	Na*

Taxon	Vernacular name	Date first recorded	UK status
Lasioglossum prasinum	a mining bee	07-Jun-17	–
Lasioglossum villosulum	shaggy mining bee	07-Jun-17	–
Lasioglossum zonulum	a mining bee	25-Aug-17	–
Lasius fuliginosus	an ant	07-Jun-17	–
Leptophyes punctatissima	speckled bush cricket	07-Jun-17	–
Leptothorax acervorum	an ant	07-Jun-17	–
Lestes sponsa	emerald damselfly	14-Jul-17	–
Libellula quadrimaculata	four-spotted chaser	07-Jun-17	–
Lochmaea suturalis	heather beetle	21-Jun-17	–
Luperus longicornis	a beetle	21-Jun-17	–
Lycaena phlaeas	small copper	14-Jul-17	–
Machimus atricapillus	a robberfly	01-Aug-17	–
Macropis europaea	a mining bee	13-Jul-17	Na*; Na
Maniola jurtina	meadow brown	20-Jun-17	–
Meconema meridionale	southern oak bush cricket	25-Aug-17	–
Megacoelum infusum	a bug	14-Jul-17	–
Melanimon tibialis	a beetle	25-Aug-17	–
Melanostoma scalare	a hoverfly	14-Jul-17	–
Meligethes aeneus	common pollen beetle	21-Jun-17	–
Mellinus arvensis	field digger wasp	03-Aug-17	–
Metrioptera brachyptera	bog bush cricket	25-Aug-17	NS*
Metrioptera roeselii	Roesel's bush cricket	07-Jun-17	–
Micrelus ericae	small heather weevil	14-Jul-17	–
Microchrysa flavicornis	a soldierfly	14-Jul-17	–
Microrhagus pygmaeus	a click beetle	14-Jul-17	RDB 3
Mimesa equestris	a digger wasp	01-Aug-17	–
Minettia fasciata (=rivosa)	a lauxanid fly	07-Jun-17	–
Minettia longipennis	a lauxanid fly	14-Jul-17	–
Mordellistena neuwaldeggiana	a tumbling flower beetle	21-Jun-17	NS
Myopa fasciata	a thick-headed fly	01-Aug-17	RDB 3
Myrmosa atra	black-headed velvet ant	13-Jul-17	–
Nabis ferus	a bug	21-Jun-17	–
Nabis limbatus	a bug	14-Jul-17	–
Nabis rugosus	a bug	14-Jul-17	–

Taxon	Vernacular name	Date first recorded	UK status
Nalassus laevioctostriatus	a beetle	07-Jun-17	–
Nebria brevicollis	a ground beetle	14-Jul-17	–
Nedyus quadrimaculatus	small nettle weevil	14-Jul-17	–
Neliocarus sus	heather weevil	21-Jun-17	–
Nemobius sylvestris	wood cricket	13-Jul-17	NS
Neoitamus cyanurus	a robberfly	07-Jun-17	–
Neolygus contaminatus	a plantbug	21-Jun-17	–
Nephrotoma flavipalpis	a cranefly	25-Aug-17	–
Nephrotoma scurra	a cranefly	25-Aug-17	–
Nicrophorus vespilloides	a carrion beetle	03-Aug-17	–
Nomada flava	a cuckoo bee	20-Jun-17	–
Nomada fucata	a cuckoo bee	13-Jul-17	Na*
Nomada rufipes	a cuckoo bee	01-Aug-17	–
Nomada sheppardana	a cuckoo bee	07-Jun-17	–
Notiophilus aquaticus	a ground beetle	14-Jul-17	–
Notiophilus biguttatus	a ground beetle	14-Jul-17	–
Notiophilus rufipes	a ground beetle	14-Jul-17	–
Nysson dimidiatus	small spurred digger wasp	13-Jul-17	Nb*
Nysson trimaculatus	a digger wasp	20-Jun-17	Nb*
Ochlodes sylvanus	large skipper	14-Jul-17	–
Ocydromia glabricula	a hybotid fly	07-Jun-17	–
Ocypus olens	devil's coach-horse	25-Aug-17	–
Oedemera lurida	a flower beetle	07-Jun-17	–
Oedemera nobilis	swollen-thighed beetle	20-Jun-17	–
Olibrus affinis	a beetle	21-Jun-17	–
Olibrus liquidus	a beetle	14-Jul-17	–
Omocestus viridulus	common green grasshopper	14-Jul-17	–
Ophonus rufibarbis	a ground beetle	03-Aug-17	–
Opomyza florum	a seedfly	14-Jul-17	–
Opomyza germinationis	a seedfly	07-Jun-17	–
Orchestes rusci	a weevil	21-Jun-17	–
Orthetrum cancellatum	black-tailed skimmer	07-Jun-17	–
Oxybelus mandibularis	pale-jawed spiny digger wasp	21-Jun-17	Na*

Taxon	Vernacular name	Date first recorded	UK status
Oxybelus uniglumis	common spiny digger wasp	01-Aug-17	–
Palloptera muliebris	a fly	14-Jul-17	–
Paragus haemorrhous	a hoverfly	03-Aug-17	–
Pararge aegeria	speckled wood	07-Jun-17	–
Pemphredon inornata	a digger wasp	14-Jul-17	–
Pentatoma rufipes	red-legged shieldbug	19-Jun-17	–
Philanthus triangulum	bee wolf	13-Jul-17	RDB 2*
Phyllopertha horticola	bracken chafer	19-Jun-17	–
Pilophorus clavatus	a groundbug	25-Aug-17	–
Platynus assimilis	a ground beetle	03-Aug-17	–
Platyrhinus resinosus	cramp-ball fungus weevil	25-Aug-17	Nb*
Poecilus versicolor	a ground beetle	14-Jul-17	–
Pogonocherus hispidus	a longhorn beetle	25-Aug-17	–
Polydesmus angustus	common flat-backed millipede	20-Jun-17	–
Polydrusus cervinus	a weevil	07-Jun-17	–
Polydrusus formosus	a weevil	01-Aug-17	Na*
Polygonia c-album	comma	25-Aug-17	–
Priocnemis fennica	a spider-hunting wasp	25-Aug-17	–
Psallus betuleti	a plantbug	07-Jun-17	–
Psyllobora vigintiduopunctata	22-spot ladybird	14-Jul-17	–
Pterostichus diligens	a ground beetle	01-Aug-17	–
Pterostichus madidus	a ground beetle	14-Jul-17	–
Pycnomerus fuliginosus	a beetle	03-Aug-17	–
Pyronia tithonus	gatekeeper	14-Jul-17	–
Quedius nigriceps	a rove beetle	14-Jul-17	–
Rhacognathus punctatus	heather shieldbug	21-Jun-17	–
Rhagio lineola	a snipefly	14-Jul-17	–
Rhagonycha fulva	a soldier beetle	07-Jun-17	–
Rhagonycha lignosa	a soldier beetle	07-Jun-17	–
Rhamphomyia variabilis	a dancefly	25-Aug-17	–
Rhopalum coarctatum	a digger wasp	14-Jul-17	–
Rhopalus parumpunctatus	a bug	01-Aug-17	NS
Rhopalus subrufus	a bug	03-Aug-17	–

Taxon	Vernacular name	Date first recorded	UK status
Rhyparochromus pini	a bug	14-Jul-17	Nb
Rivellia syngenesiae	a fruitfly	20-Jun-17	–
Rutpela maculata	a longhorn beetle	19-Jun-17	–
Scaeva pyrastri	a hoverfly	14-Jul-17	–
Scymnus frontalis	a ladybird	21-Jun-17	–
Sehirus luctuosus	forget-me-not shieldbug	21-Jun-17	–
Sitona lineatus	a weevil	14-Jul-17	–
Sphaerophoria batava	a hoverfly	03-Aug-17	–
Sphaerophoria scripta	a hoverfly	20-Jun-17	–
Sphecodes ephippius	a cuckoo bee	01-Aug-17	–
Sphecodes monilicornis	a cuckoo bee	25-Aug-17	–
Sphecodes pellucidus	a cuckoo bee	20-Jun-17	–
Stenodema calcarata	a grassbug	14-Jul-17	–
Stenurella melanura	a longhorn beetle	21-Jun-17	–
Stomis pumicatus	a ground beetle	25-Aug-17	–
Strophosoma melanogrammum	nut leaf weevil	21-Jun-17	–
Sympetrum danae	black darter	13-Jul-17	–
Sympetrum sanguineum	ruddy darter	13-Jul-17	–
Sympetrum striolatum	common darter	13-Jul-17	–
Syntomus foveatus	a ground beetle	21-Jun-17	–
Syritta pipiens	a hoverfly	14-Jul-17	–
Syrphus ribesii	a hoverfly	07-Jun-17	–
Syrphus torvus	a hoverfly	03-Aug-17	–
Tachyerges stigma	a weevil	07-Jun-17	–
Tasgius morsitans	a rove beetle	25-Aug-17	–
Temnocerus nanus	a weevil	21-Jun-17	–
Tephritis leontodontis	a fruitfly	14-Jul-17	–
Tephritis neesii	a fruitfly	03-Aug-17	–
Tetrix undulata	common ground hopper	07-Jun-17	–
Thereva bipunctata	a stilettofly	21-Jun-17	–
Thereva nobilitata	a stilettofly	07-Jun-17	–
Tiphia femorata	a solitary wasp	14-Jul-17	–
Tipula lunata	a cranefly	20-Jun-17	–
Trapezonotus dispar	a bug	14-Jul-17	–
Trypoxylon attenuatum	slender wood borer wasp	03-Aug-17	–

Taxon	Vernacular name	Date first recorded	UK status
Tyria jacobaeae	cinnabar	07-Jun-17	S41 (research only)
Vanessa atalanta	red admiral	25-Aug-17	–
Vespa crabro	the hornet	14-Jul-17	–
Vespula vulgaris	common wasp	20-Jun-17	–
Volucella inanis	a hoverfly	01-Aug-17	–
Volucella pellucens	a hoverfly	21-Jun-17	–
Xylota segnis	a hoverfly	07-Jun-17	–

North-west quadrant

Table 7.1.9: North-west quadrant species list

Taxon	Vernacular name	Date first recorded	UK status
Abax parallelepipedus	a ground beetle	20-Jun-17	–
Adalia decempunctata	10-spot ladybird	07-Jun-17	–
Aeshna cyanea	southern hawker	03-Aug-17	–
Aeshna grandis	brown hawker	13-Jul-17	–
Aeshna mixta	migrant hawker	03-Aug-17	–
Aglais io	peacock	13-Jul-17	–
Agrilus laticornis	a jewel beetle	13-Jul-17	–
Agriotes pallidulus	a click beetle	07-Jun-17	–
Ammophila sabulosa	red-banded sand wasp	07-Jun-17	–
Anaspis frontalis	a tumbling flower beetle	07-Jun-17	–
Anax imperator	emperor dragonfly	13-Jul-17	–
Ancistrocerus trifasciatus	a mason wasp	07-Jun-17	–
Andrena fucata	a mining bee	19-Jun-17	–
Andrena fuscipes	a mining bee	19-Jun-17	–
Anobium fulvicorne	a wood-boring beetle	20-Jun-17	–
Anoplus plantaris	a weevil	07-Jun-17	–
Aphantopus hyperantus	ringlet	19-Jun-17	–
Arachnospila spissa	a spider-hunting wasp	13-Jul-17	–
Argynnis paphia	silver-washed fritillary	19-Jun-17	–
Aricia agestis	brown argus	13-Jul-17	–
Atheta britanniae	a rove beetle	02-Aug-17	–
Athous haemorrhoidalis	a click beetle	20-Jun-17	–

Taxon	Vernacular name	Date first recorded	UK status
Austrolimnophila ochracea	a cranefly	03-Aug-17	–
Baccha elongata	a hoverfly	24-Aug-17	–
Barypeithes pellucidus	a weevil	20-Jun-17	–
Blepharidopterus angulatus	a bug	03-Aug-17	–
Bombus pascuorum	common carder bee	13-Jul-17	–
Bombus pratorum	early bumble bee	07-Jun-17	–
Byturus tomentosus	raspberry beetle	20-Jun-17	–
Caenopsis fissirostris	a weevil	24-Aug-17	Nb
Calvia quattuordecimguttata	cream-spot ladybird	07-Jun-17	–
Campyloneura virgula	a bug	20-Jun-17	–
Cantharis rustica	a soldier beetle	07-Jun-17	–
Capsus ater	a plantbug	07-Jun-17	–
Catops nigrita	a ground beetle	02-Aug-17	–
Ceratina cyanea	blue carpenter bee	24-Aug-17	RDB 3
Cerceris arenaria	sand-tailed digger wasp	03-Aug-17	–
Cerceris rybyensis	ornate-tailed digger wasp	24-Aug-17	–
Cheilosia pagana	a hoverfly	13-Jul-17	–
Chilocorus renipustulatus	kidney-spot ladybird	13-Jul-17	–
Chloromyia formosa	a soldierfly	07-Jun-17	–
Choerades marginatus	a robberfly	03-Aug-17	–
Chorthippus brunneus	common field grasshopper	13-Jul-17	–
Chorthippus parallelus	meadow grasshopper	13-Jul-17	–
Coccinella septempunctata	seven-spot ladybird	07-Jun-17	–
Corizus hyoscyami	a bug	24-Aug-17	–
Cryptocephalus labiatus	a leaf beetle	07-Jun-17	–
Dalopius marginatus	a click beetle	20-Jun-17	–
Deraeocoris flavilinea	a bug	07-Jun-17	–
Deraeocoris lutescens	a bug	13-Jul-17	–
Dicyphus pallidus	a bug	20-Jun-17	–
Didea fasciata	a hoverfly	07-Jun-17	–
Dioctria baumhaueri	a robberfly	07-Jun-17	–
Dioctria linearis	a robberfly	19-Jun-17	–
Dioctria rufipes	a robberfly	07-Jun-17	–

Taxon	Vernacular name	Date first recorded	UK status
Dolichopus ungulatus	a dolyfly	07-Jun-17	–
Dolichovespula media	a social wasp	02-Aug-17	–
Dromius quadrimaculatus	a ground beetle	13-Jul-17	–
Drusilla canaliculata	a rove beetle	02-Aug-17	–
Drymus brunneus	a bug	13-Jul-17	–
Elasmostethus interstinctus	birch shieldbug	13-Jul-17	–
Elasmucha grisea	parent bug	13-Jul-17	–
Empis concolor	a dancefly	19-Jun-17	–
Enallagma cyathigerum	common blue damselfly	07-Jun-17	–
Epeolus cruciger	a solitary bee	24-Aug-17	–
Episyrphus balteatus	a hoverfly	07-Jun-17	–
Eupeodes luniger	a hoverfly	13-Jul-17	–
Eutolmus rufibarbis	a robberfly	03-Aug-17	NS
Exochomus quadripustulatus	pine ladybird	20-Jun-17	–
Favonius quercus	purple hairstreak	13-Jul-17	–
Forficula auricularia	common earwig	13-Jul-17	–
Formica fusca	an ant	13-Jul-17	–
Galeruca tanaceti	a leaf beetle	20-Jun-17	–
Grammoptera ruficornis	a longhorn beetle	13-Jul-17	–
Gymnopternus aerosus	a dolyfly	07 Jun 0717	–
Halictus tumulorum	a mining bee	13-Jul-17	–
Halyzia sedecimguttata	orange ladybird	13-Jul-17	–
Harmonia axyridis	harlequin ladybird	07-Jun-17	–
Helophilus pendulus	a hoverfly	19-Jun-17	–
Hemicrepidius hirtus	a click beetle	20-Jun-17	–
Himacerus apterus	a bug	13-Jul-17	–
Himacerus mirmicoides	a bug	20-Jun-17	–
Hybos culiciformis	a hybotid fly	03-Aug-17	–
Hylaeus communis	common yellow-face bee	07-Jun-17	–
Hylaeus confusus	a solitary bee	07-Jun-17	–
Kleidocerys resedae	a bug	20-Jun-17	–
Lagria hirta	a beetle	13-Jul-17	–
Lampyris noctiluca	glow-worm	24-Aug-17	–
Lasioglossum semilucens	a mining bee	13-Jul-17	RDB 3

Taxon	Vernacular name	Date first recorded	UK status
Lasioglossum smeathmanellum	a mining bee	03-Aug-17	–
Ledra aurita	a planthopper	19-Jun-17	–
Leiopus nebulosus	a longhorn beetle	19-Jun-17	–
Leistus rufomarginatus	a ground beetle	20-Jun-17	–
Leptophyes punctatissima	speckled bush cricket	07-Jun-17	–
Limonia nubeculosa	a cranefly	07-Jun-17	–
Liocoris tripustulatus	a bug	13-Jul-17	–
Loricera pilicornis	a ground beetle	13-Jul-17	–
Loxocera fulviventris	a fly	13-Jul-17	–
Luperus longicornis	a leaf beetle	07-Jun-17	–
Lygocoris pabulinus	a bug	07-Jun-17	–
Machimus atricapillus	a robberfly	13-Jul-17	–
Magdalis carbonaria	a weevil	07-Jun-17	NS B
Malthinus seriepunctatus	a soldier beetle	20-Jun-17	–
Maniola jurtina	meadow brown	19-Jun-17	–
Meconema meridionale	southern oak bush cricket	24-Aug-17	–
Meconema thalassinum	oak bush cricket	07-Jun-17	–
Meiosimyza rorida	a lauxanid fly	13-Jul-17	–
Meligethes aeneus	common pollen beetle	20-Jun-17	–
Meligethes obscurus	a pollen beetle	07-Jun-17	–
Minettia longipennis	a lauxanid fly	13-Jul-17	–
Monalocoris filicis	a bug	13-Jul-17	–
Myrmica rubra	an ant	03-Aug-17	–
Myrmica ruginodis	an ant	07-Jun-17	–
Nabis rugosus	a bug	03-Aug-17	–
Nebria brevicollis	a ground beetle	13-Jul-17	–
Nemobius sylvestris	wood cricket	13-Jul-17	NS
Neocoenorrhinus germanicus	strawberry rhynchites	07-Jun-17	–
Neolygus contaminatus	a bug	07-Jun-17	–
Neurigona quadrifasciata	a dolyfly	13-Jul-17	–
Nicrophorus vespilloides	a carrion beetle	13-Jul-17	–
Nomada fabriciana	a cuckoo bee	13-Jul-17	–
Nomada lathburiana	a cuckoo bee	07-Jun-17	RDB 3

Taxon	Vernacular name	Date first recorded	UK status
Notiophilus rufipes	a ground beetle	13-Jul-17	–
Ochlodes sylvanus	large skipper	19-Jun-17	–
Oedemera lurida	a flower beetle	07-Jun-17	–
Oedemera nobilis	swollen-thighed beetle	07-Jun-17	–
Opomyza florum	a seedfly	13-Jul-17	–
Opomyza germinationis	a seedfly	13-Jul-17	–
Othius punctulatus	a rove beetle	13-Jul-17	–
Otiorhynchus singularis	raspberry weevil	13-Jul-17	–
Oxystoma pomonae	a weevil	24-Aug-17	–
Pararge aegeria	speckled wood	13-Jul-17	–
Pentatoma rufipes	red-legged shieldbug	19-Jun-17	–
Philonthus decorus	a rove beetle	20-Jun-17	–
Phyllobius argentatus	silver-green leaf weevil	20-Jun-17	–
Phytocoris longipennis	a bug	13-Jul-17	–
Pieris brassicae	large white	19-Jun-17	–
Pilophorus perplexus	a bug	13-Jul-17	–
Platycheirus clypeatus	a hoverfly	19-Jun-17	–
Polydrusus cervinus	a weevil	07-Jun-17	–
Polydrusus formosus	a weevil	07-Jun-17	NS A
Polygonia c-album	comma	03-Aug-17	–
Propylea quattuordecimpunctata	14-spot ladybird	03-Aug-17	–
Pseudomalus auratus	a cuckoo wasp	03-Aug-17	–
Pterostichus madidus	a ground beetle	20-Jun-17	–
Pyronia tithonus	gatekeeper	13-Jul-17	–
Rhagio lineola	a snipefly	19-Jun-17	–
Rhagium bifasciatum	a longhorn beetle	19-Jun-17	–
Rhagonycha fulva	a soldier beetle	06-Jul-17	–
Rhagonycha lutea	a soldier beetle	07-Jun-17	NS
Rhopalus subrufus	a bug	20-Jun-17	-–
Rhyparochromus pini	a bug	02-Aug-17	NS B
Rutpela maculata	a longhorn beetle	07-Jun-17	–
Scaphidium quadrimaculatum	a rove beetle	20-Jun-17	–
Sciapus platypterus	a dolyfly	19-Jun-17	–
Scolopostethus affinis	a bug	02-Aug-17	–

Taxon	Vernacular name	Date first recorded	UK status
Scolopostethus grandis	a bug	13-Jul-17	–
Sicus ferrugineus	a thick-headed fly	13-Jul-17	–
Silpha atrata	a beetle	20-Jun-17	–
Stenodema calcarata	a grassbug	03-Aug-17	–
Stenodema laevigata	a grassbug	13-Jul-17	–
Strophosoma melanogrammum	nut leaf weevil	20-Jun-17	–
Syrphus ribesii	a hoverfly	07-Jun-17	–
Tasgius morsitans	a rove beetle	13-Jul-17	–
Thereva nobilitata	a stilettofly	03-Aug-17	–
Tipula luna	a cranefly	19-Jun-17	–
Trapezonotus dispar	a bug	24-Aug-17	–
Tricholauxania praeusta	a lauxanid fly	07-Jun-17	–
Tyria jacobaeae	cinnabar	03-Aug-17	–
Vespa crabro	the hornet	03-Aug-17	–
Volucella bombylans	a hoverfly	19-Jun-17	–
Volucella pellucens	a hoverfly	19-Jun-17	–
Xylota segnis	a hoverfly	07-Jun-17	–

North-east quadrant species list

Table 7.1.10: North-east quadrant species list

Taxon	Vernacular name	Date first recorded	UK status
Abax parallelepipedus	a ground beetle	13-Jul-17	–
Aeshna mixta	migrant hawker	19-Jun-17	–
Agrilus laticornis	a jewel beetle	20-Jun-17	–
Agriotes pallidulus	a click beetle	20-Jun-17	–
Ampedus balteatus	a click beetle	07-Jun-17	–
Ampedus pomorum	a click beetle	24-Aug-17	NS B
Anobium fulvicorne	a wood-boring beetle	20-Jun-17	–
Aphthona euphorbiae	a flea beetle	13-Jul-17	–
Argynnis paphia	silver-washed fritillary	19-Jun-17	–
Argyra leucocephala	a dolyfly	19-Jun-17	–
Armadillidium vulgare	common pill woodlouse	07-Jun-17	–
Atheta britanniae	a rove beetle	02-Aug-17	–
Athous haemorrhoidalis	a click beetle	20-Jun-17	–

Taxon	Vernacular name	Date first recorded	UK status
Austrolimnophila ochracea	a cranefly	02-Aug-17	–
Baccha elongata	a hoverfly	13-Jul-17	–
Bembidion lampros	a ground beetle	20-Jun-17	–
Beris morrisii	a soldierfly	13-Jul-17	–
Bombus hypnorum	a bumblebee	07-Jun-17	–
Bombus pratorum	early bumble bee	07-Jun-17	–
Brachypalpoides lentus	a hoverfly	07-Jun-17	–
Byturus tomentosus	raspberry beetle	20-Jun-17	–
Caenopsis fissirostris	a weevil	13-Jul-17	Nb
Calopteryx virgo	beautiful demoiselle	07-Jun-17	–
Capsus ater	a bug	07-Jun-17	–
Centrotus cornutus	a planthopper	07-Jun-17	–
Ceutorhynchus obstrictus	a weevil	07-Jun-17	–
Choerades marginatus	a robberfly	24-Aug-17	–
Chrysopilus cristatus	a snipefly	07-Jun-17	–
Cionus tuberculosus	a weevil	07-Jun-17	–
Crossocerus megacephalus	a digger wasp	13-Jul-17	–
Cryptocephalus labiatus	a leaf beetle	07-Jun-17	–
Deraeocoris flavilinea	a bug	07-Jun-17	–
Deraeocoris lutescens	a bug	13-Jul-17	–
Diaperis boleti	a beetle	24-Aug-17	NS
Dicyphus pallidus	a bug	20-Jun-17	–
Dioctria baumhaueri	a robberfly	07-Jun-17	–
Dioctria linearis	a robberfly	19-Jun-17	–
Dolichopus trivialis	a dolyfly	02-Aug-17	–
Dolichopus ungulatus	a dolyfly	13-Jul-17	–
Dorcus parallelipipedus	lesser stag beetle	13-Jul-17	–
Dromius quadrimaculatus	a ground beetle	02-Aug-17	–
Drymus brunneus	a bug	20-Jun-17	–
Drymus ryei	a bug	02-Aug-17	–
Drymus sylvaticus	a bug	13-Jul-17	–
Elasmostethus interstinctus	birch shieldbug	13-Jul-17	–
Epiphragma ocellare	a cranefly	19-Jun-17	–

Taxon	Vernacular name	Date first recorded	UK status
Episyrphus balteatus	a hoverfly	07-Jun-17	–
Eumerus strigatus	a hoverfly	13-Jul-17	–
Favonius quercus	purple hairstreak	13-Jul-17	–
Forficula auricularia	common earwig	13-Jul-17	–
Formica rufa	red wood ant	19-Jun-17	NT (global status)
Gastrophysa viridula	green dock beetle	20-Jun-17	–
Glomeris marginata	pill millipede	13-Jul-17	–
Gymnopternus aerosus	a dolyfly	07-Jun-17	–
Gymnopternus cupreus	a dolyfly	07-Jun-17	–
Gymnopternus metallicus	a dolyfly	07-Jun-17	–
Halyzia sedecimguttata	orange ladybird	20-Jun-17	–
Harmonia axyridis	harlequin ladybird	20-Jun-17	–
Himacerus apterus	a bug	20-Jun-17	–
Himacerus mirmicoides	a bug	13-Jul-17	–
Hybos culiciformis	a hybotid fly	24-Aug-17	–
Kleidocerys resedae	a bug	11-Jun-17	–
Lagria hirta	a beetle	13-Jul-17	–
Lasioglossum smeathmanellum	a mining bee	24-Aug-17	–
Lasius brunneus	an ant	13-Jul-17	NS A
Lasius niger sens. str.	an ant	07-Jun-17	–
Ledra aurita	a planthopper	19-Jun-17	–
Leiopus nebulosus	a longhorn beetle	07-Jun-17	–
Leistus rufomarginatus	a ground beetle	20-Jun-17	–
Leptophyes punctatissima	speckled bush cricket	07-Jun-17	–
Limonia nubeculosa	a cranefly	24-Aug-17	–
Liocoris tripustulatus	a bug	13-Jul-17	–
Lonchoptera bifurcata	a pointed winged fly	02-Aug-17	–
Lonchoptera lutea	a pointed winged fly	13-Jul-17	–
Loricera pilicornis	a ground beetle	24-Aug-17	–
Lygocoris pabulinus	a bug	13-Jul-17	–
Machimus atricapillus	a robberfly	24-Aug-17	–
Malachius bipustulatus	malachite beetle	19-Jun-17	–
Maniola jurtina	meadow brown	19-Jun-17	–
Meconema meridionale	southern oak bush cricket	24-Aug-17	–

Taxon	Vernacular name	Date first recorded	UK status
Meconema thalassinum	oak bush cricket	07-Jun-17	–
Meiosimyza rorida	a lauxanid fly	24-Aug-17	–
Melanostoma mellinum	a hoverfly	13-Jul-17	–
Melanostoma scalare	a hoverfly	13-Jul-17	–
Metatropis rufescens	a bug	07-Jun-17	–
Minettia longipennis	a lauxanid fly	07-Jun-17	–
Myathropa florea	a hoverfly	24-Aug-17	–
Myrmica rubra	an ant	02-Aug-17	–
Myrmica ruginodis	an ant	07-Jun-17	–
Nabis rugosus	a bug	24-Aug-17	–
Nebria brevicollis	a ground beetle	20-Jun-17	–
Neliocarus nebulosus	a weevil	13-Jul-17	–
Neolygus contaminatus	a bug	20-Jun-17	–
Notiophilus biguttatus	a ground beetle	20-Jun-17	–
Notiophilus rufipes	a ground beetle	20-Jun-17	–
Oedostethus quadripustulatus	a click beetle	13-Jul-17	NS B
Opomyza florum	a seedfly	13-Jul-17	–
Orgyia antiqua	vapourer	13-Jul-17	–
Oxystoma pomonae	a weevil	24-Aug-17	–
Panorpa germanica	a scorpionfly	07-Jun-17	–
Pararge aegeria	speckled wood	07-Jun-17	–
Parhelophilus versicolor	a hoverfly	13-Jul-17	–
Parydra coarctata	a shorefly	02-Aug-17	–
Pentatoma rufipes	red-legged shieldbug	19-Jun-17	–
Peplomyza litura	a lauxanid fly	07-Jun-17	–
Peritrechus nubilus	a bug	24-Aug-17	–
Philonthus decorus	a rove beetle	13-Jul-17	–
Philonthus laminatus	a rove beetle	13-Jul-17	–
Philonthus tenuicornis	a rove beetle	02-Aug-17	–
Pipizella viduata	a hoverfly	13-Jul-17	–
Plagiognathus arbustorum	a bug	13-Jul-17	–
Polydrusus cervinus	a weevil	07-Jun-17	–
Polydrusus formosus	a weevil	07-Jun-17	–
Psallus perrisi	a bug	20-Jun-17	–

Taxon	Vernacular name	Date first recorded	UK status
Pterostichus madidus	a ground beetle	20-Jun-17	–
Ptilinus pectinicornis	fan-bearing wood borer	13-Jul-17	–
Pycnomerus fuliginosus	a beetle	13-Jul-17	–
Rhagonycha fulva	a soldier beetle	13-Jul-17	–
Rhaphium caliginosum	a dolyfly	24-Aug-17	–
Rhaphium micans	a dolyfly	07-Jun-17	NS
Rhopalus subrufus	a bug	13-Jul-17	–
Sciapus platypterus	a dolyfly	07-Jun-17	–
Silpha atrata	a beetle	02-Aug-17	–
Stenus impressus	a rove beetle	24-Aug-17	–
Stictoleptura scutellata	a longhorn beetle	19-Jun-17	Na; NA
Strophosoma melanogrammum	nut leaf weevil	20-Jun-17	–
Sybistroma obscurellum	a dolyfly	02-Aug-17	–
Syrphus ribesii	a hoverfly	24-Aug-17	–
Tetrix undulata	common ground hopper	07-Jun-17	–
Tomicus piniperda	large pine shoot beetle	02-Aug-17	–
Tricholauxania praeusta	a lauxanid fly	02-Aug-17	–
Vespula vulgaris	common wasp	13-Jul-17	–
Volucella pellucens	a hoverfly	13-Jul-17	–
Xylota segnis	a hoverfly	13-Jul-17	–

Appendix E Criteria for defining invertebrate sites of significance

Table 7.1.11: Criteria for defining invertebrate sites of significance, taken from Plant (2009)

Importance	Description	Minimum qualifying criteria
International (high) importance	European important site (i.e. SAC)	Internationally important invertebrate populations present or containing RDB 1 (Endangered) species or containing any species protected under European legislation or containing habitats that are threatened or rare at the European level (including, but not exclusively so, habitats listed on the EU Habitats Directive)
National (high) importance	UK important site (SSSI)	Achieving SSSI invertebrate criteria (Ratcliffe, 1989[12]) or containing RDB 2 (Vulnerable) or containing viable populations of RDB 3 (Rare) species or containing viable populations of any species protected under UK legislation or containing habitats that are threatened or rare nationally (Great Britain)
Regional (medium) importance (for border sites, both regions must be taken into account)	Site with populations of invertebrates or invertebrate habitats considered scarce or rare or threatened in south-east England	Habitat that is scarce or threatened in the region or that has, or is reasonably expected to have, the presence of an assemblage of invertebrates including at least 10 Nationally Notable species or at least 10 species listed as Regionally Notable for the English Nature region in question in the Recorder database or elsewhere or a combination of these categories amounting to 10 species in total
County (medium) importance (for border sites, both counties must be taken into account)	Site with populations of invertebrates or invertebrate habitats considered scarce or rare or threatened in the county in question	Habitat that is scarce or threatened in the county and/or that contains, or is reasonably expected to contain, an assemblage of invertebrates that includes viable populations of at least five Nationally Notable species or viable populations of at least five species regarded as Regionally Scarce by the county records centres and/or field club
District (low) importance	Site with populations of invertebrates or invertebrate habitats considered scarce or rare or threatened in the administrative district	A rather vague definition of habitats falling below county significance level, but which may be of greater significance than merely Local; they include sites for which Nationally Notable species in the range from one to four examples are reasonably expected but not yet necessarily recorded and where this omission is considered likely to be partly due to under-recording

[12] Ratcliffe, D.A., ed. (1989) Guidelines for Selection of Biological SSSIs. Nature Conservancy Council, Peterborough.

Importance	Description	Minimum qualifying criteria
Local (low) importance	Site with populations of invertebrates or invertebrate habitats considered scarce or rare or threatened in the affected and neighbouring parishes (except Scotland, where the local area may best be defined as being within a radius of 5 km)	Habitats or species unique or of some other significance within the local area
Importance within the context of the site only (low importance)	N/A	Although almost no area is completely without significance, these are the areas with nothing more than expected 'background' populations of common species and the occasional Nationally Local species

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