Bernwood Area Invertebrate Surveys 2017-2021

An assessment of the invertebrate interest of several woodlands in the Bernwood area of Oxfordshire and Buckinghamshire 2017-2021

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Citation

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Executive summary

Invertebrate survey work was carried out in 2017-2019 at seven Sites of Special Scientific Interest (SSSIs) in the Bernwood area of north east Oxfordshire and north Buckinghamshire. The sites included are Finemere Wood SSSI, Grendon and Doddershall Woods SSSI, Ham Home-cum-Hamgreen Woods SSSI, Rushbeds Wood and Railway Cutting SSSI, Shabbington Woods Complex SSSI, Waterperry Wood SSSI and Whitecross Green and Oriel Woods SSSI.

In 2021, the previous survey efforts in 2017 and 2019 were continued, this time focussed on woodlands in the northern part of the Bernwood complex. The woods surveyed are Sheephouse Wood, Romer, Greatsea and Balmore Woods, Home Wood, Decoypond Wood, Shrub's Wood, Runt's Wood and Hewin's Wood.

The primary objectives of the work were to confirm the presence of assemblages associated with scrub edge habitat and mature woodland habitat, to assess the relative conservation importance of the assemblages if confirmed to be present and to determine their current condition. This is to inform the possible designation of a new or revised Bernwood SSSI with invertebrate assemblages as specific features of special nature conservation interest. A significant number of rare and uncommon species were found including the threatened butterflies Black Hairstreak and Brown Hairstreak.

When viewed as individual sites, most of the invertebrate assemblages recorded failed to reach the threshold to be assessed as being in 'favourable condition'. In some cases this can be regarded as an accurate reflection of current habitat condition and suitability for the specific assemblages which are the focus of this work. In other cases failure to meet threshold scores is likely to be related to survey effort and the species groups targeted (in particular relatively low level of effort to survey saproxylic groups).

The surveys confirm that, considered as an extensive woodland complex, this is an important area of supporting habitat of special interest for two invertebrate assemblage types in particular, ie bark and sapwood decay A212 (a mature tree associated assemblage) and shrub edge F001 (mostly associated with rides and glades). The quality and current suitability of the various woodlands for these assemblage types is variable but, considered as a woodland complex, both assemblages can be considered to be in favourable condition with supporting habitat widely distributed.

Further work is recommended in order to improve the focus on specific invertebrate groups, particularly saproxylic hymenoptera, beetles and diptera, as the habitat structures present are likely to be particularly favourable for these groups.

Contents

1. Introduction

Bernwood Forest was once a royal hunting ground consisting of a broad landscape of woodlands, copses and pastures stretching from an area north east of Oxford across north Buckinghamshire to Whaddon Chase near Milton Keynes. The remnants of this landscape are still evident in the form of woods and ancient hedgerows, and it remains a largely rural landscape. Some of the remaining woodlands are designated as Site of Special Scientific Interest (SSSI) because of their intrinsic interest as good quality woodlands supporting a high biodiversity but also because of the rich invertebrate diversity present. The Bernwood area has long been recognised as being a national stronghold for the threatened Black Hairstreak butterfly but it is also important for a wide range of other invertebrates. In addition, survey work in connection with the construction of the High Speed Rail 2 (HS2) line has brought to light the importance of the woodland complex for one of Britain's rarest mammals, the Bechstein's bat. In response, Natural England is proposing to designate a new, revised SSSI which will include the core roosting and foraging habitats which are critical for the survival of the Bechstein's bat colonies. As part of this work Natural England commissioned the Natural England Field Unit to re-assess the invertebrate interest of the woodland complex, specifically to determine which invertebrate assemblage types of special conservation interest are present and their current condition.

2017- 2019 Survey

The scope of the survey

The seven woodlands included in the survey work carried out in 2017, 2018 and 2019 are all existing SSSIs. These are Finemere Wood SSSI, Grendon and Doddershall Woods SSSI, Ham Home cum Hamgreen Woods SSSI, Rushbeds Wood and Railway Cutting SSSI, Shabbington Woods Complex SSSI, Waterperry Wood SSSI, and Whitecross Green and Oriel Woods SSSI. The original intention was to also undertake surveys in other woodlands in the northern section of the complex but access permission could not be obtained in time. This was subsequently granted and surveys were carried out in these woods in 2021. Separate survey work was also carried out specifically searching for Black Hairstreak, written up as separate reports.

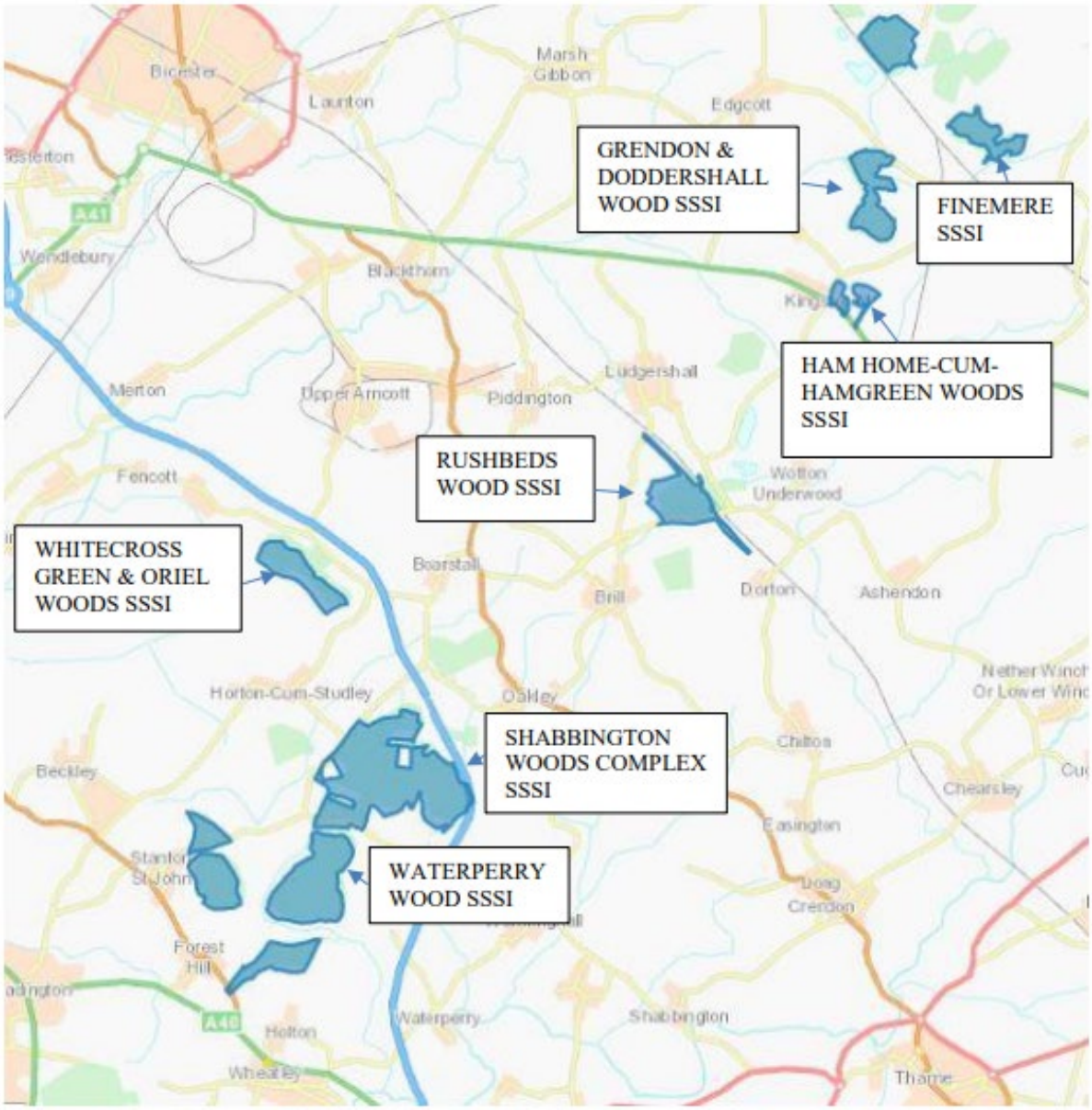

Figure 1. Map of the Bernwood area showing the seven woodlands surveyed in 2017- 2019: Grendon & Doddershall Wood, Finemere Wood, Hame Home-cum-HamGreen Woods, Rushbeds Wood, Whitecross Green & Oriel Woods, Shabbington Woods Complex and Waterperry Wood. Contains, or is derived from, information supplied by Ordnance Survey. © Crown copyright and database rights 2022. Ordnance Survey 100022021

Methods

Most of the survey work was carried out in 2017 and 2018, with only a single site visit carried out in 2019.

The surveys specifically targeted the following groups: Coleoptera (beetles), Diptera (true flies), Hemiptera (bugs) and Arachnids (spiders and harvestmen). These groups are the most appropriate taxonomic orders for judging the conservation status and condition assemblages in woodlands. Lepidoptera (butterflies and moths) mentioned in the SSSI citations for the SSSIs were also specifically searched for but to a much lesser degree.

Orthoptera (grasshoppers and crickets) and other orders were only recorded if casually encountered.

Visits to undertake the survey work were intentionally spread through the summer period to maximise the opportunity to detect a range of different species. The dates of survey and personnel involved are listed in Table 1.

Table 1: The surveyors and dates visited

Date	Surveyor(s) present
10/05/17	Pete Boardman, Vicky Gilson, Jo Hackman
11/05/17	Pete Boardman, Vicky Gilson, Jo Hackman
14/06/17	Pete Boardman, Adrian Gardiner, Des Sussex
28/06/17	Pete Boardman, Vicky Gilson, Jo Hackman
13/07/17	Pete Boardman, Vicky Gilson, Jo Hackman
04/09/17	Pete Boardman, Vicky Gilson, Adrian Gardiner
03/05/18	Pete Boardman, Tim Bernhard
31/05/18	Pete Boardman, Vicky Gilson, Julian Small
01/06/18	Pete Boardman, Vicky Gilson, Julian Small
14/06/18	Pete Boardman, Tim Bernhard
20/05/19	Vicky Gilson

Visits were only undertaken in suitable weather conditions, ie not in heavy rain or very windy or cold conditions.

The general procedure adopted during surveys was to focus on the ride system or habitat features with similar structural characteristics such as woodland/scrub transitions, scrubby areas or tracksides. The surveyors focussed attention on areas identified as good quality habitat likely to support the highest diversity of invertebrates associated with warm, sheltered, flower-rich habitat in woodland. This is based on the general assumption, based on the reasons for which these sites are designated as SSSI, that they support invertebrate assemblages of high diversity and high nature conservation interest which are particularly associated with ride-edge, scrub margin and woodland edge type features, as well as mature woodland.

The general approach was to collect invertebrates from flowers and vegetation, and in flight using a sweep net. Other methods of collecting invertebrates such as the use of light traps, pitfall traps, pheromone traps, malaise traps, collection of dead wood and leaf litter, etc were not used.

It is recognised that the general approach and survey methodology will result in limitations in the results. In particular, the limited number of survey days will significantly restrict the ability to detect species which have a short flight period or which are only detectable at times of year outside of the survey period. The survey team included specialists with good identification skills in a wide range of invertebrate groups but this did not include all groups and some will therefore be under-represented in the results. It is also important to point out that the survey methodology adopted will tend to result in low representation of saproxylic invertebrates, moths, canopy-dwelling species and species associated with fungi. It should also be noted that a relatively small amount of survey time was spent in areas of closed-canopy woodland, which makes up a large proportion of these woods and so species associated with this habitat will be under-represented in the data.

Coleoptera were identified by Jo Hackman and Julian Small, Diptera by Pete Boardman and Julian Small, Hemipteran bugs by Natural England volunteer Keith Fowler, Julian Small and Pete Boardman, Hymenoptera by Ian Cheeseborough (bees and wasps), Adrian Gardiner, Des Sussex and Natural England volunteer Richard Becker (ants), and Orthoptera by Pete Boardman, Vicky Gilson, Julian Small and Natural England volunteer David Williams. Arachnids were identified by Vicky Gilson. Butterflies, moths and dragonflies were identified in the field by the surveyors, with Tim Bernhard specifically concentrating on locating Black and Brown Hairstreak.

All species records arising from the survey were added to the on-line database iRecord so that they are available to county recorders and researchers, and, once verified, will proceed to the National Biodiversity Network to be publicly available.

Except for one case all data used in the analysis has been derived from the field surveys carried out in 2017 to 2019. Some of the woods are well-recorded by local volunteers but others are not and so a decision was made not to include data from external sources because of this variability. Black Hairstreak was not seen at Rushbeds Wood during the field surveys but its presence was reliably reported by the local butterfly recorder and so this record was used in the data analysis.

A Black Hairstreak captured during the survey. Photo: © Pete Boardman.

Species statuses allocated in Tables 4, 6, 8, 10, 12, 14 and 16, relate to the number of records per hectad (10km x 10km) that a species occurs in (an Area of Occupancy). Species listed as rare or scarce are found in fewer than 100 hectads in the UK. The most rare species (old Red Data Book – Shirt, 1987) or more modern IUCN categories (Vulnerable VU is used in a number of cases) mean distributions are in fewer than 17 hectads, or species have declined rapidly, or are associated with a particular habitat that is under threat. Where a species is already recorded in more than 100 hectads, no Conservation Status is assigned and the relevant cell in the Table is left intentionally blank.

Once identified, the lists of invertebrates recorded were analysed using Pantheon software. Pantheon works by assigning each species a 'score' relative to its rarity and a relative affinity to specific habitat types (where this is known). Pantheon provides an interpretation of the assemblage types apparently present according to the data and their relative affinity to habitat features, grouping the output into specific assemblage types (SATs). Each of these is given a score termed SQI (site quality index) assigned to the assemblage types which the data suggests are present, from which it is determined whether the assemblage meets the threshold for it to be considered to be in favourable condition. The following threshold scores are assigned to the SATs of particular conservation interest in the woodlands surveyed: scrub edge assemblage (F001) = 11, bark and sapwood decay (A212) = 19.

The system also provides a summary of the number of species with conservation status recorded, thus providing an indication of the relative conservation importance of the site, based on the available data.

Pantheon is still in development and has limitations. Most importantly, the system 'ignores' records for species which do not show a clear affinity to any one particular habitat type, species whose ecology is poorly known, species (and species groups) which are generally under-recorded, such as sawflies, springtails and certain groups of flies, so that their status is not well understood, as well as species whose taxonomy is disputed. Thus, the outputs may be derived from analysis of a small proportion of the total records entered. Despite these limitations the system has been widely adopted, including by Natural England, and is regarded as a good basis for comparative assessment of invertebrate

assemblages in a wide range of habitats, avoiding a reliance on surveys targeted on particular species.

Of the species recorded, 672 were used by Pantheon in assemblage analysis. The remainder were species not currently used by Pantheon. Table 2 shows the taxonomic breakdown of the species recorded across all sites surveyed and used in the Pantheon analysis. The full list of species recorded is provided in Appendix I of this report.

Table 2: Number of species recorded per species group/order

Species group	No. recorded
Insect – true fly (Diptera)	185
Insect – beetle (Coleoptera)	152
Insect – true bug (Hemiptera)	104
Insect – butterflies and moths (Lepidoptera)	89
Spiders and harvestmen (Araneae & Opiliones)	84
Insect – bees, ants and wasps (Hymenoptera)	28
Insect – dragonflies and damselflies (Odonata)	15
Other orders	15
Total	672

Observations were made of habitat structure in each of the woods and a record made of suitability for the 'target' assemblages. Comments on this aspect are included later in the report. However, as this was carried out on an *ad hoc* basis rather than in a structured, repeatable manner this information should be treated with caution.

Results

Finemere Wood

This wood is situated at the north east end of the survey area. The woodland has undergone major habitat restoration work in recent times involving the removal of conifers which were planted for commercial timber production when the site was owned by the Forestry Commission. The woodland has recovered very well following this work and has a wide range of structural elements of high value to invertebrates associated with scrub-edge type habitat, as well as those associated with mature woodland. There is on-going

management specifically intended to benefit warmth-demanding invertebrates, such as ride-side coppicing and maintenance of grassy glades.

The SSSI citation places emphasis on the importance of the wood for the variety of butterflies that it supports, reflecting the fact that this group was better recorded than other invertebrates at the time of SSSI designation. However, there is also reference to individual moth, spider and hoverfly species which can be interpreted to indicate that the site is important for a number of scarce and notable invertebrates.

The woodland has only two main rides but has extensive areas of good quality woodland edge on the south side, areas of scrub, grassy glades and areas of scrub-stage re-growth following tree-felling. The survey was not able to cover all of these in the time available.

Only two days of survey were carried out at this site, on 11 May and 13 July 2017, which is lower survey effort than for the other woods, which is reflected in the results.

A total of 196 species were recorded at Finemere Wood of which six have conservation status.

Table 3. Pantheon output for Finemere Wood

SAT	Code	No. of species	SQI	Species with conservation status	Conservation status	Reported condition
Bark & sapwood decay	A121	10	130	1	NS	Unfavourable
Scrub edge	F001	7	100	1		Unfavourable
Slow-flowing rivers	W125	2	450	1	RDB 3	Unfavourable
Open short sward	F112	2	100	1	NT Section 41 Priority Species	Unfavourable

Table 4. Species with conservation status recorded at Finemere Wood

Species	Vernacular	Family	Order	Conservation status	SAT
Agrilus (Anambus) angustulus	A jewel beetle	Buprestidae	Coleoptera	NS	A212
Dolichopus arbustorum	A long-legged fly	Dolichopodidae	Diptera	NR; NT	
Erioptera verralli	A cranefly	Limoniidae	Diptera	RDB 3	W125
Satyrium pruni	Black Hairstreak	Lycaenidae	Lepidoptera	EN; NS	
Coenonympha pamphilus	Small Heath	Nymphalidae	Lepidoptera	NT; Section 41 Priority species	F112
Limenitis camilla	White Admiral	Nymphalidae	Lepidoptera	Section 41 Priority species; VU	

Grendon and Doddershall Woods

This site is comprised of a large extent of good quality woodland with remnant coppice-with-standards structure and, generally, a well-developed understory of hawthorn, Midland hawthorn, hazel, aspen and holly. The woodland has an extensive ride system, parts of which have very species-rich grassland and good habitat structure for warmth-demanding invertebrates. The site has long been regarded as an important stronghold for scarce butterflies including Black Hairstreak.

The citation describing the special interest of this SSSI emphasises the wide range of butterfly species recorded, including several species which are now extinct in Buckinghamshire. However, a modern interpretation of this document is that it is describing a woodland which supports an outstanding diversity of invertebrates, particularly species associated with warm, sheltered areas of the site.

A total of 235 species were recorded which included 14 species with conservation status.

Table 5. The Pantheon output for Grendon and Doddershall Woods

SAT	Code	No. of species	SQI	Species with conservation status	Conservation status	Reported condition
Bark & sapwood decay	A121	10	130	1	NS	Unfavourable
Scrub edge	F001	7	100	1		Unfavourable
Rich flower resource	F002	4	100			Unfavourable
Scrub-heath & moorland	F003	3	200	1	NS	Unfavourable
Heartwood decay	A211	2	250			Unfavourable
Bare sand & chalk	F111	2	250	1	Nb	Unfavourable

Table 6. Species with conservation status

Species	Vernacular	Family	Order	Conservation status	SAT
Araniella inconspicua	A spider	Araneidae	Araneae	NS	
Clubiona norvegica	A sac spider	Clubionidae	Araneae	NS	F003, F221
Philodromus longipalpis	A crab spider	Philodromidae	Araneae	NS	
Marpissa muscosa	Fence-post jumper	Salticidae	Araneae	NS	
Oxystoma cerdo	A weevil	Apionidae	Coleoptera	[Nb]	
Anaglyptus mysticus	Rufous-shouldered	Cerambycidae	Coleoptera	Nb	A212

Species	Vernacular	Family	Order	Conservation status	SAT
	longhorn beetle				
Psylliodes chalcomera	A flea beetle	Chyrsomelidae	Coleoptera	NS	
Rhinocyllus conicus	A weevil	Curculionidae	Coleoptera	[Nb]	F111
Lasius brunneus	A brown ant	Formicidae	Hymenoptera	NA	A211
Pyrgus malvae	Grizzled skipper	Hesperiidae	Lepidoptera	Section 41 Priority Species; VU	
Satyrium pruni	Black hairstreak	Lycaenidae	Lepidoptera	EN; NS	
Thecla betulae	Brown Hairstreak	Lycaenidae	Lepidoptera	Section 41 Priority Species;VU	
Coenonympha pamphilus	Small heath	Nymphalidae	Lepidoptera	NT; Section 41 Priority Species	F112
Synanthedon formiecaeforimis	Red-tipped clearwing	Sesiidae	Lepidoptera	NB	

Ham Home-cum-Hamgreen Woods

This is a relatively small but high quality area of woodland with a pronounced remnant coppice-with-standards structure in which mature oak is prominent in the canopy. A feature of the woodland is the presence of a well-developed understory composed of a wide range of species. The woodland is an important national stronghold for Black Hairstreak with particularly strong colonies centred on Oxford Lane, a section of an ancient by-way on the eastern edge of the site.

A total of 272 species were recorded and 13 of these have conservation status.

Table 7. Pantheon output for Ham Home cum Hamgreen Woods

SAT	Code	No. of species	SQI	Species with conservation status	Conservation status	Reported condition
Bark & sapwood decay	A121	25	124	2	Nb|Nb	**Favourable**
Scrub edge	F001	5	100			Unfavourable
Heartwood decay	A211	4	425	2	NR|NS	Unfavourable
Rich flower resource	F002	4	100			Unfavourable

Table 8. Species with conservation status recorded at Ham Home cum Hamgreen Woods

Species	Vernacular	Family	Order	Conservation status	SAT
Hypomma fulvum	A money spider	Linyphiidae	Araneae	NS	
Theridiosoma gemmosum	A ray spider	Theridiosomatidae	Araneae	NS	F003, F221
Anaglyptus mysticus	Rufous-shouldered longhorn beetle	Cerambycidae	Coleoptera	Nb	A212
Phytoecia cylindrica	A longhorn beetle	Cerambycidae	Coleoptera	Nb	
Helophorus (Helophorus) strigifrons	A water beetle	Hyrophillidae	Coleoptera	NS	
Ischnomera cinerascens	A false blister beetle	Oedemeridae	Coleoptera	NR	A211

Species	Vernacular	Family	Order	Conservation status	SAT
Ischnomera sanguinicollis	A false blister beetle	Oedemeridae	Coleoptera	NS	A211
Silvanus bidentatus	A flat bark beetle	Silvanidae	Coleoptera	Nb	A212
Dryodromya testacea	A dance fly	Empididae	Diptera	(LR);NS	A211
Tachypeza fuscipennis	A fly	Hybotidae	Diptera	(LR);NS	
Lasius brunneus	A brown ant	Formicidae	Hymenoptera	NA	A211
Satyrium pruni	Black hairstreak	Lycaenidae	Lepidoptera	EN; NS	
Macrogastra (Pseudovestia) rolphii	Rolph's door snail	Clausiliidae	Pulmonata	NS	

Rushbeds Wood

This wood is situated midway between the group of woodlands in the northern part of the survey area and the Shabbington/Waterperry/Whitecross Green group. It is rather different in character from the other woodlands in the complex as it has a pronounced 'damp' character and has a relatively poorly developed ride structure. Even so, the woodland supports a remarkable diversity of invertebrates. The SSSI citation refers specifically to a number of butterflies, moths, bees and beetles, primarily because these groups were particularly well-recorded when the SSSI was designated. However, as in the case of other woods in the area, a modern interpretation of the citation would be that it is emphasising the importance of the site for its outstanding diversity of invertebrates and its particular value for invertebrates associated with both sheltered, warm areas and mature, undisturbed woodland.

Surveys were carried out on three occasions at this wood, on 10 May, 28 June and 29 June 2017 so this represents lower survey effort and less coverage through the year than most of the other sites, which is reflected in the results. A total of 143 species were recorded and six of these have conservation status.

A typical view of the main ride in Rushbeds Wood. The ride is mostly narrow with a mix of open, slightly shaded and heavily shaded sections, so provides a range of habitat conditions. Photo: © Pete Boardman.

Table 9. Pantheon output for Rushbeds Wood

SAT	Code	No. of species	SQI	Species with conservation status	Conservation status	Reported condition
Scrub edge	F001	5	100	0	n/a	Unfavourable

Table 10. Species with conservation status recorded at Rushbeds Wood

Species	Vernacular	Family	Order	Conservation status	SAT
Phytoecia cylindrica	A longhorn beetle	Cerambycidae	Coleoptera	Nb	
Atypophthalmus inustus	A cranefly	Limoniidae	Diptera	Notable	A213
Tetanocera punctifrons	A snail killing fly	Sciomyzidae	Diptera	Notable	

Species	Vernacular	Family	Order	Conservation status	SAT
Dolichopus arbustorum	A long legged fly	Dolichopodidae	Diptera	NR;NT	
Rhagonycha lutea	A solider beetle	Cantharidae	Coleoptera	NS	
Erynnis tages	Dingy Skipper	Hesperiidae	Lepidoptera	Section 41 Priority Species; VU	

Whitecross Green and Oriel Woods

This long, narrow woodland has two distinctly different elements, with lower parts situated on poorly-draining alluvial soils and a section on sloping ground on Corallian limestones, sandstones and siltstones. The lower parts suffered from significant modification in the 1960s through clear felling and re-planting with non-native conifers. However, the woodland is subject to a long-term restoration plan which is gradually restoring the native tree cover and in the process is creating a highly structurally-diverse habitat.

The SSSI citation for this site emphasises the presence of a wide range of butterfly species (one of which is now extinct) as this group was much better recorded than other groups at the time of SSSI designation. However, the citation also specifically refers to the presence of a range of notable species from other groups including moths, flies and crickets indicating that it is this high diversity of species which is of particular conservation interest.

The wood was surveyed on three occasions on 10 May, 16 June and 7 September 2017, so giving reasonably good coverage through the year.

A view of the main north-south ride in Whitecross Green and Oriel Woods. There is good quality ride-side habitat and areas with excellent structural diversity in many parts of the wood. Photo © Pete Boardman

A total of 174 species were recorded in the surveys of which six have conservation status, including Black Hairstreak.

Table 11. Pantheon output for Whitecross Green and Oriel Woods

SAT	Code	No. of species	SQI	Species with conservation status	Conservation status	Reported condition
Bark & Sapwood decay	A212	7	150	1	NS	Unfavourable
Scrub edge	F001	7	143			Unfavourable

Table 12. Species with conservation status recorded at Whitecross Green and Oriel Woods

Species	Vernacular	Family	Order	Conservation status	SAT
Phytoecia cylindrica	A longhorn beetle	Cerambycidae	Coleoptera	Nb	
Agrilus (Anambus) angustulus	A jewel beetle	Buprestidae	Coleoptera	NS	A212

Species	Vernacular	Family	Order	Conservation status	SAT
Dolichopus arbustorum	A long legged fly	Dolichopodidae	Diptera	NR;NT	
Helina abdominalis	A house fly	Muscidae	Diptera	pNS	
Satyrium pruni	Black Hairstreak	Lycaenidae	Lepidoptera	EN; NS	
Limenitis camilla	White Admiral	Nymphalidae	Lepidoptera	Section 41 Priority species; VU	

Shabbington Woods Complex

This is a large area of Plantation on Ancient Woodland (PAWS) which is primarily designated as SSSI because of the presence of important invertebrate assemblages associated with its extensive ride system (although the site also includes an area of species-rich grassland). The woodlands are subject to a programme of conversion back to predominantly broadleaf composition. The overall character of the site differs from the woodlands in the north of the Bernwood complex due to the absence of the characteristic coppice-with-standards structure and a prevalence of more acidic soils, although there are also similarities in the frequent occurrence of blackthorn in ride edges and scattered occurrence of wild service tree. Black Hairstreak has been regularly recorded at this wood over a long period but it appears to be restricted in its distribution to small, discrete patches of blackthorn in ride-edge and woodland edge habitat. The woods have been the subject of quite intensive survey effort and a wide variety of invertebrates have been recorded, including many deadwood specialists and species associated with old trees, despite the scarcity of very old trees in the wood.

A total of 276 species and nine species with conservation status were recorded in the current surveys:

Table 13. Pantheon output for Shabbington Woods Complex

SAT	Code	No. of species	SQI	Species with conservation status	Conservation status	Reported condition
Bark & sapwood decay	A121	10	130	1	NS	Unfavourable
Scrub edge	F001	10	100			Unfavourable
Rich flower resource	F002	9	100			Unfavourable
Open short sward	F112	3	100			Unfavourable

Table 14. Species with conservation status recorded at Shabbington Woods Complex

Species	Vernacular	Family	Order	Conservation status	SAT
Trachys minuta	A jewel beetle	Buprestidae	Coleoptera	NR;NT	
Agrilus (Anambus) angustulus	A jewel beetle	Buprestidae	Coleoptera	NS	A212
Merzomyia westermanni	A picture-winged fly	Tephritidae	Diptera	[Notable];Notable	
Dolichopus arbustorum	A long legged fly	Dolichopodidae	Diptera	NR;NT	
Satyrium pruni	Black Hairstreak	Lycaenidae	Lepidoptera	EN; NS	
Apatura iris	Purple Emperor	Nymphalidae	Lepidoptera	NS;NT	
Cupido minimus	Small Blue	Lycaenidae	Lepidoptera	Section 41 Priority Species	
Thecla betulae	Brown Hairstreak	Lycaenidae	Lepidoptera	Section 41 Priority Species; VU	

Species	Vernacular	Family	Order	Conservation status	SAT
Limenitis camilla	White Admiral	Nymphalidae	Lepidoptera	Section 41 Priority species; VU	

This view of part of the ride system in Shabbington Wood shows the poor habitat quality present in much of this site. There are areas where there is good quality species-rich grassland along ride margins and scrub-stage transitions between track and mature woodland but many areas lack good composition and structure for invertebrates. Photo: © Vicky Gilson.

Waterperry Wood

This wood is situated close to the Shabbington Woods Complex and is very similar in character. It has a very similar management history in being largely felled and replanted with a conifer/broadleaf mix. It is under restoration to a more natural broadleaf composition but has been very heavily impacted by high levels of deer browsing over a long period. This has had profound impacts on both the composition and structure of the wood.

A total of 108 species were recorded of which two have conservation status. One of these is Black Hairstreak but it is important to note that suitable supporting habitat for this species has a very restricted distribution at the site and its future here is highly vulnerable.

Table 15. Pantheon output for Waterperry Wood

SAT	Code	No. of species	SQI	Species with conservation status	Conservation status	Reported condition
Bark & sapwood decay	A121	8	175	1	NS	Unfavourable
Scrub edge	F001	9	133			Unfavourable

Table 16. Species with conservation status recorded at Waterperry Wood

Species	Vernacular	Family	Order	Conservation status	SAT
Trachys minuta	A jewel beetle	Buprestidae	Coleoptera	NR;NT	n/a
Satyrium pruni	Black Hairstreak	Lycaenidae	Lepidoptera	EN; NS	

As with Shabbington Woods Complex, Waterperry Wood generally lacks good habitat structure for invertebrates of ride edges, open glades, young woodland and scrub. There are localised areas of flower-rich ride side habitat with seasonally wet ditches and small areas with scrub transition alongside rides but such features are scarce.

Discussion

The survey has demonstrated that all of the woodlands have habitat structures supporting a range of important species of butterflies and moths, flies, beetles, etc. The split of species per broad habitat category is shown in Table 17. This highlights the high diversity of species found in the open areas in the woods. The important contribution made by wetland features in the woods is also highlighted. Wetland features such as ditches, ponds, streams and seasonally wet hollows are very important in supporting a wide range of specialised invertebrates and often make a significant contribution to overall invertebrate diversity. It is also important to note that many invertebrates associated with wetlands in the wider landscape will utilise woodlands for part of their lifecycle.

Table 17. Number of species recorded per broad habitat

Broad biotope	No. of species	Species with conservation status
Open habitats	325	12

Broad biotope	No. of species	Species with conservation status
Tree-associated	255	21
Wetland	92	6

A breakdown of the survey data by species group provides a useful insight into the value of the rides and similar habitats, although this of course is directly related to the survey method and specialisms of the surveyors. The analysis highlights the high diversity of beetles, flies, spiders and bugs present in the ride systems of the woods. The relatively low number of hymenoptera (bees, wasps, ants and sawflies) recorded is a function of the survey method and is not a true reflection of the importance of the woodlands for this group. Further work specifically targeting this group was subsequently carried out in 2021.

Table 18. Pantheon output showing breakdown of combined data by species group for the Finemere, Grendon and Doddershall and Ham Home cum Hamgreen woodland complex

Species group	Number analysed	% of total analysed
Insect – beetle (Coleoptera)	114	26
Insect – true fly (Diptera)	113	25
Spider (Araneae)	63	14
Insect – true bug (Hemiptera)	52	11
Insect – moth	28	6
Insect – butterfly	22	5
Insect – hymenopteran	16	3
Insect – dragonfly (Odonata)	6	1
Harvestmen (Opiliones)	5	1
Insect – orthopteran	5	1
Insect – snakefly (Raphidioptera)	3	0
Mollusc	3	0

Species group	Number analysed	% of total analysed
Insect – lacewing (Neuroptera)	2	0
Insect – scorpion fly (Mecoptera)	1	0
Centipede	1	0
Insect – earwig (Dermaptera)	1	0

It is acknowledged that the analysis by Pantheon indicates that, apart from a single case, the assemblages of particular interest are all reported as being in unfavourable condition when assessed at individual woodland level, based on the survey data. However, when the data are combined for the northern group of woodlands, ie Finemere Wood, Grendon and Doddershall Woods and Ham Home cum Hamgreen Woods the results suggest a more favourable situation.

Table 19. Results of Pantheon analysis of combined data for Finemere Wood, Grendon and Doddershall Woods and Ham Home cum Hamgreen Woods

Broad biotope	Code	SAT	No. of species	SQI	Species with conservation status	Reported condition
Tree associated	A121	Bark & sapwood decay	29	131	3	Favourable (19 spp required)
Open habitats	F001	Scrub edge	100	100		Favourable (11 spp required)
Tree associated	A211	Heartwood decay	350	350	2	Unfavourable (6 spp required)
Tree associated	A213	Fungal fruiting bodies	100	100		Unfavourable (7 spp required)

The northern group of woodlands (Finemere Wood, Grendon and Doddershall Woods and Ham Home cum Hamgreen Woods) have close similarities in terms of woodland composition, canopy structure and ride structure. Good quality open habitat and woodland edge habitat is present and there is evidence of sympathetic management in all three woodlands. Black hairstreak was confirmed through sightings of adult butterflies to be present at all three woodlands, sometimes in significant numbers. These woodlands

support a significant number of other scarce and notable species. **There is a good case in support of an assessment that the scrub edge F001 and bark and sapwood decay A212 assemblages are of special interest in this complex of woodlands and that they are in favourable condition**.

2021 Survey

The scope of the survey

During May, June and July 2021 invertebrate survey work was carried out by personnel of the Natural England Field Unit at several woodlands in the Bernwood area of north Buckinghamshire. This was to complete coverage of the woodland complex as work had previously been carried out at other woodlands in the area between 2017 and 2019 (as described above). The woodlands included in the surveys of 2021 are Sheephouse Wood, Hewin's Wood, Romer, Greatsea and Balmore Woods (treated as a single group), Runt's Wood, Shrubs Wood, Decoypond Wood and Home Wood. Of these only Sheephouse Wood is currently designated as SSSI. All of the woodlands are privately-owned. Hewin's Wood is very nearly contiguous with Grendon and Doddershall Woods SSSI. There is relatively good habitat connectivity between the various woodland blocks in the form of mature hedgerows, flower-rich grassland and similar features. The surrounding landscape is rural and largely unspoilt, made up of permanent pastures, grass leys and arable fields. However, there is active construction work taking place along the line of HS2 which has resulted in some loss of habitat, including areas of scrub known to support Black Hairstreak.

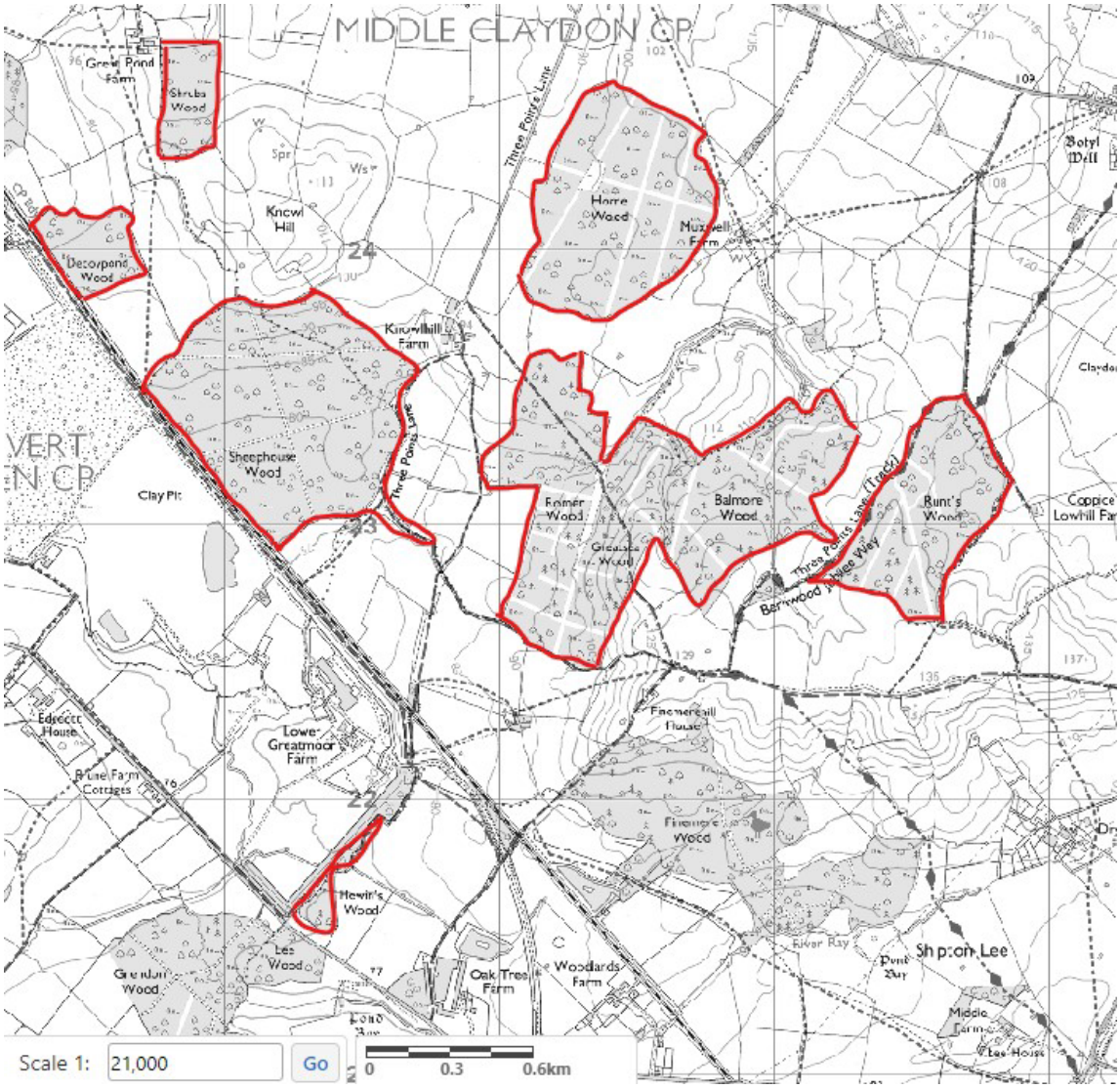

Figure 2. The northern Bernwood area showing the woodlands surveyed outlined in red: Shrubs Wood, Home Wood, Runt's Wood, Sheephouse Wood, Decoypond Wood, Hewin's Wood, Romer, Greatsea & Balmore Woods. Contains, or is derived from, information supplied by Ordnance Survey. © Crown copyright and database rights 2022. Ordnance Survey 100022021

Separate survey work was also carried out in 2021 specifically focussed on saproxylic invertebrates at Grendon and Doddershall Woods and Ham Home cum Hamgreen Woods, and further work was undertaken specifically searching for Black Hairstreak. The results of those surveys are written up as separate reports (Martin Harvey. 2022. Bernwood Invertebrate Surveys 2021. NECR426. Natural England, Bernhard, 2022).

Methods

The survey work was carried out by specialist invertebrate surveyors attached to the Natural England Field Unit, a team of specialists employed by Natural England whose work is focused on habitat and species survey. Three of the surveyors were also involved

in the earlier 2017-2019 surveys. The surveyors have a range of specialist knowledge, as set out in Table 20.

Table 20. Natural England Field Unit survey team and areas of expertise

Staff Member	Area of expertise
Pete Boardman	Diptera, Hemiptera, Odonata, Lepidoptera, Isopoda
Nick Button	Coleoptera, Lepidoptera
Jo Hackman	Coleoptera, Lepidoptera
Krisztina Fekete	Aculeate Hymenoptera
Vicky Gilson	Araneae (spiders), Lepidoptera, Odonata

The initial aim was to undertake three visits to all of the woodlands spread through the early summer to late summer period, to replicate the method used in the previous surveys. However, the start of the survey work was delayed, which meant that only one site visit was conducted in May, and later visits had to be curtailed due to staffing issues. In addition, because forestry operations were taking place in Shrubs Wood and Runt's Wood, and disturbance was being caused by vegetation clearance alongside the railway at Decoypond Wood, it was decided that further work in these woods was unsafe or unlikely to give an accurate picture of invertebrate diversity. Thus, there is variation in the degree of survey effort between woodlands and coverage through the season was lower than would normally be desirable for surveys of this nature. The date of survey at each location is set out in table 21.

Table 21. Name of site and date of survey

Site	Date of survey
Hewin's Wood	25/05/21 & 29/07/21
Home Wood	22/06/21 & 26/07/21
Romer, Greatsea, Balmore Woods	22/06/21 & 23/06/21, 27/07/21 & 29/07/21
Runt's Wood	23/06/21 & 28/07/21
Sheephouse Wood SSSI	24/06/21
Shrubs Wood	24/06/21
Decoypond Wood	24/06/21

Ideally, a minimum of three survey visits per year are normally recommended to gain enough information to ascertain which assemblage types are present and to judge whether an assemblage is in favourable condition. Even so, except for Hewin's Wood, sufficient data was collated for the woodland blocks to ensure that analysis using Pantheon provided reliable output. In the case of Hewin's Wood, the small size of the wooded area and relatively low habitat diversity meant that the data set of species recorded was correspondingly lower in comparison with the other woodlands. In response, a decision was made to amalgamate the data for this site with data collated in 2018 from surveys of Grendon and Doddershall Woods, on the basis that the woodlands are more or less contiguous, separated only by a narrow road.

The surveys specifically targeted the following groups: Coleoptera (beetles), Diptera (true flies), Hemiptera (bugs) and Arachnids (spiders and harvestmen). These groups are considered the most appropriate taxonomic orders for judging the conservation status and condition assemblages in woodlands. Lepidoptera (butterflies and moths) were noted but, with the exception of Black Hairstreak, were not specifically searched for. Orthoptera (grasshoppers and crickets) and other orders were only recorded if casually encountered.

Visits were only undertaken in suitable weather conditions, ie not in heavy rain or very windy or cold conditions.

The general procedure adopted was to focus on the ride system or habitat features with similar structural characteristics such as woodland/scrub transitions, scrubby areas or tracksides. The surveyors focussed attention on areas identified as good quality habitat likely to support the highest diversity of invertebrates associated with warm, sheltered, flower-rich habitat in woodland. This is based on the general assumption, based on the reasons that several woodlands in the Bernwood area are designated as SSSI, that they support invertebrate assemblages of high diversity and high nature conservation interest which are particularly associated with ride-edge, scrub margin and woodland edge type features, as well as mature woodland.

The general approach was to collect invertebrates from flowers and vegetation, and in flight using a sweep net. Other methods of collecting invertebrates such as the use of light traps, pitfall traps, pheromone traps, malaise traps, vane traps, collection of dead wood and leaf litter, etc were not used.

It is recognised that the general approach and survey methodology will result in limitations in the results. In particular, the limited number of survey days will significantly restrict the ability to detect species which have a short flight period or which are only detectable at times of year outside of the survey period. The survey team included specialists with identification skills in a wide range of invertebrate groups but this did not include all groups and some will therefore be under-represented in the results. It is also important to point out that the survey methodology adopted will tend to result in low representation of saproxylic invertebrates, moths, canopy-dwelling species and species associated with fungi. It should also be noted that a relatively small amount of survey time was spent in areas of closed-canopy woodland, which makes up a large proportion of these woods and so species associated with this habitat will be under-represented in the data.

Specimens collected were stored dry or in 70% industrial methylated spirit (IMS) and identified over the winter of 2021/22. Identifications were carried out as follows: Coleoptera by Jo Hackman and Nick Button, Diptera by Pete Boardman, Hemipteran bugs by Natural England volunteer Keith Fowler, Julian Small and Pete Boardman, Hymenoptera by Krisztina Fekete (bees and wasps). Arachnids were identified by Vicky Gilson. Butterflies, moths, dragonflies and other groups by Pete Boardman. All species records arising from the survey were added to the on-line database iRecord so that they are available to county recorders and researchers and, once verified, will be available to the public via the National Biodiversity Network.

All data used in the analysis has been derived from the field surveys carried out in 2021, except in the case of Hewin's Wood where data was amalgamated with survey data collected in 2018 at Grendon and Doddershall Woods. Parts of the complex, where there is public access, are well-recorded by local Butterfly Conservation volunteers but most is not and so a decision was made not to include data from external sources because of this variability.

Once identified the lists of invertebrates recorded were analysed using Pantheon software. Pantheon works by assigning each species a 'score' relative to its rarity and relative affinity to specific habitat types (where this is known). Pantheon provides an interpretation of the assemblage types apparently present according to the data and their relative affinity to habitat features, grouping the output into specific assemblage types (SATs). Each of these is given a score termed SQI (site quality index) assigned to the assemblage types which the data suggests are present, from which it is determined whether the assemblage meets the threshold for it to be considered to be in favourable condition. The following threshold scores are assigned to the SATs of particular conservation interest in the woodlands surveyed: scrub edge assemblage (F001) = 11, bark and sapwood decay (A212) = 19. The system also provides a summary of the number of species with conservation status recorded, thus providing an indication of the relative conservation importance of the site, based on the available data. Pantheon is still in development and

has limitations. Most importantly, the system 'ignores' records for species which do not show a clear affinity to any one particular habitat type, species whose ecology is poorly known, species (and species groups) which are generally under-recorded, such as sawflies, springtails and certain groups of flies, so that their status is not well understood, as well as species whose taxonomy is disputed. Thus, the outputs may be derived from analysis of a small proportion of the total records entered. Despite these limitations the system has been widely adopted, including by Natural England, and is regarded as a good basis for comparative assessment of invertebrate assemblages in a wide range of habitats, avoiding a reliance on surveys targeted on particular species.

Of the species recorded, 222 were used by Pantheon in assemblage analysis. The remainder are species not currently used by Pantheon. Table 5 shows the taxonomic breakdown of the species recorded across all sites surveyed and used in the Pantheon analysis. The full list of species recorded is provided in Appendix I of this report, and a combined list of species resulting from an amalgamation of records for Hewin's Wood and Grendon and Doddershall Woods is provided at Appendix II.

Results

A total of 436 species were recorded during the survey. The number of species recorded at each location is presented in Table 22.

Table 22. Number of species recorded in the 2021 surveys at each location

Site	Number of species recorded
Romer, Greatsea & Balmore Woods	234
Home Wood	233
Runts Wood	139
Sheephouse Wood SSSI	131
Hewin's Wood	129
Shrubs Wood	57
Decoypond Wood	50

Pantheon is able to provide an indication of whether the survey data supplied suggests that the assemblages present are in 'favourable condition' or not. The output from Pantheon is presented in table 23. However, this information should be treated with caution given the varying levels of survey effort at each of the woodlands and differences

in the size of the woodlands. The categorisation of ‘favourable’ or ‘unfavourable’ by Pantheon is based solely on the number of species of conservation importance in the data set which are associated with the assemblage type, not on overall species diversity or abundance, nor does it take into account the condition or extent of the supporting habitat.

Table 23. Results of assemblage condition analysis from Pantheon

Site Name	Pantheon SAT	
	A212 bark & sapwood decay	F001 scrub edge
Romer/Greatsea/Balmore	favourable	favourable
Home Wood	favourable	favourable
Decoypond Wood	unfavourable	unfavourable
Sheephouse Wood	unfavourable	unfavourable
Shrubs Wood	unfavourable	unfavourable
Runts Wood	unfavourable	probably favourable
Grendon and Doddershall Woods/Hewin’s Wood	favourable	favourable

Note that results for Decoypond Wood, Sheephouse Wood, Shrubs Wood and Runts Wood are based upon limited data in comparison with the other sites.

Note that the results for Grendon and Doddershall Woods and Hewin’s Wood are based upon a combined dataset for contiguous woodlands.

Romer, Greatsea and Balmore Woods

Romer, Greatsea and Balmore Woods were treated as a single woodland block for the purposes of this work as they are directly connected to each other, although the composition and structure varies throughout. Habitat quality and value for invertebrates associated with ride edge type habitat is highly variable across the woodland block. There are areas of even-aged plantation with little structural diversity but there are also examples of good quality ride edge and grassy areas, as well as areas of good quality semi-natural woodland with mature trees, good representation of standing and fallen dead wood and other features of value to invertebrates such as small watercourses with undisturbed woodland alongside. There was good coverage of this group of woods with visits made on four occasions, which was reflected in a large number of records being made here (234 species in total). The taxonomic detail of invertebrate groups recorded is shown in table 24.

Table 24. Taxonomic breakdown of species recorded at Romer, Greatsea & Balmore Woods

Species group	Number of species used in analysis by Pantheon
Coleoptera (beetles)	62
Araneae (spiders)	48
Diptera (true flies)	24
Hymenoptera (bees, wasps, ants)	21
Lepidoptera (butterflies)	20
Hemiptera (true bugs	13
Odonata (dragonflies)	12
Lepidoptera (moths)	8
Orthoptera (grasshoppers & crickets)	4
Opiliones (harvestmen)	3
Molluscs	2
Centipedes	1
Dermaptera (earwigs)	1

Table 25. Pantheon assessment of survey data for Romer, Greatsea & Balmore Woods

SAT	No. of species	Species with conservation status	Code	Reported condition
bark & sapwood decay	21	10	A212	Favourable (19 required)
scrub edge	11	6	F001	Favourable (11 required)

Ten species of conservation importance were noted including Black Hairstreak.

Table 26. Species of conservation importance recorded at Romer, Greatsea and Balmore Woods.

Species	Vernacular Name	Order	Conservation status
Satyrium pruni	Black Hairstreak	Lepidoptera	Nationally Scarce; Endangered (UK); Endangered (Global)
Magdalis cerasi	A beetle	Coleoptera	Notable
Ampedus elongantulus	A click beetle	Coleoptera	Notable (UK); Near-Threatened (Europe)
Ampedus quercicola	A click beetle	Coleoptera	Notable
Tipula helvola	A cranefly	Diptera	Notable
Phrurolithus minimus	A spider	Araneae	Nationally Scarce
Xerolycosa nemoralis	Burnt wolf spider	Araneae	Nationally Scarce
Aplocnemus impressus	A beetle	Coleoptera	Nationally Scarce
Epiphanis cornutus	A false click-beetle	Coleoptera	Near-Threatened (Europe)
Limenitis camilla	White Admiral	Lepidoptera	NERC Section 41 Priority Species; Vulnerable (UK)

Magdalis cerasi is a saproxylic beetle whose larvae feed on dying branches of hawthorn and blackthorn. It has a scattered distribution in the UK, mostly associated with south east England. *Ampedus elongantulus* is a click beetle associated with mature to over-mature oak trees. It has a restricted distribution in the UK centred on south central England. *Ampedus quercicola* is a brightly-coloured click beetle which often forms part of a rich saproxylic invertebrate assemblage. It has a stronghold in the New Forest and has been recorded from Stowe Park in Northamptonshire and at woodland near Tring but this appears to be the only recent record for the species in Buckinghamshire. *Tipula helvola* is a small, little-known cranefly associated with deciduous woodland. *Phrurolithus minimus* is a rare spider which in the UK is found mainly in the south east of England. It inhabits leaf litter and short vegetation in sheltered, sunny places at the edge of woodland rides and open spaces. *Xerolycosa nemoralis* the burnt wolf spider has similar habitat preferences and distribution, mostly associated with sunny clearings in woods. *Aplocnemus impressus* is a small, saproxylic beetle which in the UK is most often associated with mature oak trees with decaying wood. It is thought to have undergone a decline in the UK though

remains quite widespread in Europe where it is associated with a wider range of tree species. *Epiphanis cornutus* is a false click-beetle native to North America which was accidentally introduced to Europe in the 1960s and which is now quite widespread in southern parts of the UK. It is not considered harmful and is most often recorded in woodlands which are rich in other saproxylic invertebrates as it feeds on decaying wood.

Home Wood

Home Wood is situated on the north side of the complex and is a fairly large wood with an extensive ride system. Parts of this ride system have good quality ride-edge habitat with a range of shrub species including large amounts of blackthorn. Significant numbers of Black Hairstreak were observed in places indicating that the wood is an important stronghold for this species. Suitable habitat conditions are also present for Brown Hairstreak though none were seen during the surveys. A total of 233 species were recorded based on two days of survey, which is indicative of the presence of high invertebrate diversity. Pantheon analysis reports that the bark and sapwood decay (A212) and scrub edge (F001) assemblages are present and both are in favourable condition. A breakdown of the data analysed by Pantheon by species group is shown in Table 27.

Table 27. Taxonomic breakdown of species recorded at Home Wood

Species group	Number of species used in analysis by Pantheon
Diptera (true flies)	50
Coleoptera (beetles)	46
Araneae (spiders)	35
Hemiptera (true bugs	28
Lepidoptera (butterflies)	20
Hymenoptera (bees, wasps, ants)	17
Odonata (dragonflies)	9
Lepidoptera (moths)	8
Opiliones (harvestmen)	4
Orthoptera (grasshoppers & crickets)	3
Neuroptera (lacewings)	1

Species group	Number of species used in analysis by Pantheon
Dermaptera (earwigs)	1

Table 28. Pantheon analysis of data for Home Wood

SAT	No. of species	Species with conservation status	Code	Reported condition
bark & sapwood decay	23	11	A212	Favourable (19 required)
scrub edge	12	5	F001	Favourable (11 required)

A total of 9 species of conservation importance were recorded at Home Wood.

Table 29. Species of conservation importance at Home Wood

Species	Vernacular name	Order	Conservation status
Satyrium pruni	Black Hairstreak	Lepidoptera	Nationally Scarce; Endangered (UK); Endangered (Global)
Agrilus angustulus	A jewel beetle	Coleoptera	Nationally Scarce
Abdera quadrifasciata	A false darkling	Coleoptera	Nationally Scarce
Uleiota planatus	A beetle	Coleoptera	Notable
Gnophomyia viridipennis	A cranefly	Diptera	Notable
Deraeocoris olivaceus	Hawthorn bug	Hemiptera	Notable
Megachile versicolor	Brown-footed leafcutter bee	Hymenoptera	Near-Threatened (Global)
Limenitis camilla	White Admiral	Lepidoptera	NERC Section 41 Priority Species; Vulnerable (UK); Vulnerable (Global)

Species	Vernacular name	Order	Conservation status
Eulagius filicornis	A beetle	Coleoptera	Data Deficient (European)

Agrilus angustulus is a jewel beetle which is fairly widespread in south and central England. It is associated with broadleaf woodland and mostly favours oak, with the larvae feeding on the outer bark. *Abdera quadrifasciata* is a small member of a group of beetles known as false-darklings and these are saproxylic, feeding on dead or decaying wood, often where there is infection by tree fungi. It is rather rare in the UK though there are widely scattered records for the species in south central England. *Uleiota planatus* is a conspicuously flat beetle which feeds on decaying wood on recently-dead or damaged trees. This species was until recently considered very rare but there has been a major expansion of its range and it is now considered fairly common in southern parts of the UK. *Gnophomyia viridipennis* is a rare cranefly whose ecology is poorly known but it is thought to be associated with large-diameter dead wood in damp woodland. It has a mainly southern distribution in the UK. *Deraeocoris olivaceus* is a large plant bug which is strongly associated with heavily fruiting hawthorn bushes and therefore often recorded from mature hedges and woodland edges. Until recently this species was considered very rare but it appears to be increasing in south east England. *Megachile versicolor* (brown-footed leafcutter bee) is fairly frequent in south east England but is scarce elsewhere. It is known to utilise crevices in tree trunks for nesting. *Eulagius filicornis* is a small, nocturnal beetle associated with oak. It is thought to feed on decaying wood infected with fungi. The species was first recorded in the UK in 1993 in Berkshire but is now thought to be fairly widespread in south east England.

Runt's Wood

Survey effort here was limited as tree-felling operations were taking place during the days planned for survey in mid-summer but the scrub which runs along the western margin of the wood was surveyed and this provided good results, including sightings of Black Hairstreak. The total number of species recorded is relatively low (139) because of the limited scope of the survey. Nevertheless, the wood has good quality ride edge habitat which was not affected by the forestry works. The limited data available means that the output from Pantheon is less reliable than for the other large woodland blocks. However, given the significant extent of good ride edge habitat present it is reasonable to assert that, given comparable survey effort, it is very likely that the scrub edge invertebrate assemblage would be found to be of similar high quality to that present in other parts of the complex and to meet the threshold for favourable condition.

Table 30. Taxonomic breakdown of species recorded at Runt's Wood

Species group	Number of species used in analysis by Pantheon
Diptera (true flies)	38
Coleoptera (beetles)	34
Hemiptera (true bugs	15
Lepidoptera (butterflies)	15
Araneae (spiders)	8
Hymenoptera (bees, wasps, ants)	6
Odonata (dragonflies)	6
Lepidoptera (moths)	6
Orthoptera (grasshoppers & crickets)	3
Opiliones (harvestmen)	2

Table 31. Pantheon assessment of Runt's Wood

SAT	No. of species	Species with conservation status	Code	Reported condition
scrub edge	7	3	F001	Unfavourable (7 species, 11 required)
bark & sapwood decay	7	2	A212	Unfavourable (7 species, 19 required)
rich flower resource	3	3	F002	Unfavourable (3 species, 15 required)

Black Hairstreak was not recorded in the body of Runt's Wood, but several adults were seen on trackside vegetation along the public bridleway which runs along the western margin of the wood. This habitat corridor continues south to another, smaller woodland with good quality habitat and also links to Balmore Wood to the west. This habitat linkage is likely to be very important in facilitating movement of Black Hairstreak across the landscape.

Table 32. Species of conservation importance recorded at Runt's Wood

Species	Vernacular name	Order	Conservation status
Satyrium pruni	Black Hairstreak	Lepidoptera	Nationally Scarce; Endangered (UK); Endangered (Global)
Oedemera virescens	A false blister beetle	Coleoptera	Nationally Rare
Oxystoma cerdo	A seed weevil	Coleoptera	Notable
Coeliodes transversealbofasciatus	A tree dwelling weevil	Coleoptera	Notable
Tachyporus formosus	A rove beetle	Coleoptera	Nationally Scarce (UK); Least Concern (Global)
Limenitis camilla	White Admiral	Lepidoptera	NERC Section 41; Vulnerable (UK)

Oedemera virescens is a small, green beetle which is most frequently seen feeding on the pollen of yellow flowers in grassy places such as ride edges, but is much less common than the closely-related *Oedemera lurida*. *Oxystoma cerdo* is a small, dark grey weevil which is mostly associated with woodland rides, hedgerows and track edges where its favoured foodplant of tufted vetch is frequent. It has a mainly south and southeastern distribution in the UK. *Coeliodes transversealbofasciatus* is another small weevil with a distinctive appearance which is mostly associated with oak trees in woodland and hedgerows, feeding on flower buds and young leaves. It is considered locally common in south and south east England but is scarce in other parts of the UK. *Tachyporus formosus* is a small rove beetle whose ecology is poorly known. It is recorded from a range of habitats in the UK, including broadleaved woodland spending a lot of time amongst leaf litter but adults can be found on vegetation and flowers in rides and glades. It has a very widely scattered occurrence in the UK but may be poorly recorded.

Sheephouse Wood

For various reasons Sheephouse Wood was only surveyed on a single day (24th June). The southern margins of the wood had been subject to a significant amount of disturbance during the winter of 2020/2021 involving the clearance of scrub and young trees along the railway corridor which resulted in significant changes in the character of this part of the wood (as the previously windfirm edge had been removed). Even so, it is considered likely that the A212 bark and sapwood decay assemblage would be found to be 'favourable' had a comparable amount of survey work been carried out. This assertion is based on the large size of the wood, the presence of good quality habitat including extensive rides, the

occurrence of a number of veteran or near-veteran trees, the presence of moderate habitat diversity, and good availability of standing and fallen dead wood. The taxonomic detail of invertebrate orders is shown in Table 33.

Table 33. Taxonomic breakdown of species recorded at Sheephouse Wood SSSI

Species group	Number of species analysed by Pantheon
Coleoptera (beetles)	36
Araneae (spiders)	19
Hemiptera (true bugs	16
Diptera (true flies)	13
Lepidoptera (butterflies)	5
Hymenoptera (bees, wasps, ants)	4
Odonata (dragonflies)	2
Lepidoptera (moths)	2
Opiliones (harvestmen)	1
Molluscs	1
Orthoptera (grasshoppers & crickets)	1

Table 34. Pantheon assessment of Sheephouse Wood

SAT	No. of species	Species with conservation status	Code	Reported condition
scrub edge			F001	Unfavourable
bark & sapwood decay	12	4	A212	Unfavourable (12 species, 19 required)

Of particular note is the importance of Sheephouse Wood for Black Hairstreak. There is good evidence that the wood is a stronghold for this species as it was found here in moderate numbers.

Table 35. Species of conservation importance identified in Pantheon at Sheephouse Wood SSSI

Species	Order	Vernacular	Conservation status
Satyrium pruni	Lepidoptera	Black Hairstreak	Endangered (UK); Nationally Scarce
Limenitis camilla	Lepidoptera	White Admiral	NERC Section 41 Priority Species; Vulnerable (UK)
Microrhagus pygmaeus	Coleoptera	a false click beetle	RDB 3
Lygus pratensis	Hemiptera	a plant bug	RDB 3

Microrhagus pygmaeus is a nocturnal false-click beetle with a distinctive appearance. It is of very local occurrence in the UK, most often recorded from long-established woodlands and parkland with old oaks, but there is some evidence of a recent expansion of its range. *Lygus pratensis* is a sap-sucking plant bug which was previously confined to a few heathland sites in southern parts of the UK but it has significantly expanded its range in recent years and is now found in a range of habitats, including open areas in woodlands, hedgerows and scrubby areas.

Decoypond Wood and Shrubs Wood

Decoypond Wood and Shrubs Wood also received limited survey effort. This is because Shrubs Wood was subject to felling operations on the first day of visit and it was deemed unsafe to spend more than a brief period there, and, given the amount of habitat disturbance taking place it was considered that any further visits might produce unreliable results. Decoypond Wood lacks a ride structure. Supporting habitat for the F001 assemblage type is limited to parts of the southern margin of the wood and adjoining rough grassland. Unfortunately, vegetation clearance work was taking place very close to the wood alongside the railway on the day of visit, which was not conducive to producing reliable survey results.

No species of conservation importance were found at Decoypond Wood and only one species of importance found at Shrubs Wood, the deadwood cranefly *Atypophthalmus inustus* which is Nationally Scarce. The taxonomic detail of invertebrate orders is shown for Decoypond Wood and Shrubs Wood respectively in tables 36 and 37.

Table 36. Taxonomic breakdown of species recorded at Decoypond Wood

Species group	Number analysed
Coleoptera (beetles)	15
Diptera (true flies)	14
Araneae (spiders)	13
Opiliones (harvestmen)	3
Hemiptera (true bugs	2
Lepidoptera (moths)	1
Hymenoptera (bees, wasps, ants)	1

Table 37. Taxonomic breakdown of species recorded at Shrubs Wood

Species group	Number analysed
Coleoptera (beetles)	15
Diptera (true flies)	14
Araneae (spiders)	7
Hymenoptera (bees, wasps, ants)	6
Lepidoptera (butterflies)	2
Lepidoptera (moths)	1
Opiliones (harvestmen)	1

Atypophthalmus inustus is very likely to be generally under-recorded but it is widely-distributed across the UK. It has also been recorded at Rushbeds Wood, in similar shady, humid woodland habitat but there are few other records for this species in Buckinghamshire.

Pantheon reports that both the A212 and F001 assemblage types are in unfavourable condition but, given the very limited dataset, this should be considered unreliable.

Hewin's Wood

Hewin's Wood is a comparatively small area of mixed habitat mostly made up by oak plantation contiguous with a linear bridleway with mature, near-veteran trees, secondary woodland, scrub and small grassy patches. For the purposes of this report Hewin's Wood is treated as a component part of the much larger Grendon and Doddershall woodland block as it is separated only by a minor road, ie the survey data was combined for Pantheon analysis.

The oak plantation area has extensive fringing blackthorn scrub around its southern and eastern margin and blackthorn, together with other flowering shrubs, is frequent along the bridleway corridor. This fringing habitat has been previously reported to be important for Black Hairstreak. The oak plantation has no internal ride structure but there is more available light than perhaps expected because of the presence of a relatively open canopy. The linear bridleway feature provides something of a ride-type structure and Black Hairstreak has been previously noted here. Brown Hairstreak was not recorded during the 2021 survey, which finished before the flight season of the butterfly, but larvae were previously encountered close by in Grendon and Doddershall Woods, so it seems reasonable to predict that this species also utilises blackthorn in the hedges and woodland edge at Hewin's Wood.

The taxonomic detail of invertebrate orders is shown in Table 38 and Invertebrates of conservation importance are listed in Table 39.

Table 38. Taxonomic breakdown of species recorded at Hewin's Wood

Species group	Number analysed
Coleoptera (beetles)	37
Diptera (true flies)	33
Hemiptera (true bugs	15
Araneae (spiders)	15
Lepidoptera (butterflies)	12
Lepidoptera (moths)	4
Odonata (dragonflies)	3
Hymenoptera (bees, wasps, ants)	2
Orthoptera (grasshoppers & crickets)	2

Species group	Number analysed
Opiliones (harvestmen)	2

Table 39. Species of conservation importance identified in Pantheon at Hewin's Wood

Species	Order	Vernacular	Conservation status
Satyrium pruni	Lepidoptera	Black Hairstreak	Endangered (UK); Nationally Scarce
Ischnomera cinerascens	Coleoptera	a beetle	Nationally Rare
Pterostichus longicollis	Coleoptera	a beetle	Nationally Scarce
Aptocnemus impressus	Coleoptera	a beetle	Nationally Scarce
Limenitus camilla	Lepidoptera	White Admiral	NERC Section 41 Priority Species, Vulnerable

Ischnomera cinerascens is a rarely-recorded green beetle whose ecology is poorly-known but adult beetles are most often swept from vegetation and flowers suggesting that this is a species of woodland glades and ride edges. It has previously been recorded in woodland at the Ashridge Estate on the Bucks/Hertfordshire border. *Pterostichus (Pedius) longicollis* is a small predatory beetle which is reported to occur in association with a range of habitats including woodland edges and hedgerows. It has a fairly wide distribution in the UK but with a distinctly south eastern emphasis. *Aplocnemus impressus* is a small, saproxylic beetle whose larvae feed on decaying wood and the adults visit flowers to feed on pollen. In the UK the species is reported to be most often associated with oak, usually in woodland where there is a relatively open canopy. It has been previously recorded from the extensive woodlands at Aspley Heath to the south east of Milton Keynes but this appears to be the first record for Buckinghamshire.

The oak plantation area of Hewin's Wood is small in extent but some important coleoptera (beetle) species were noted here, including the glow worm *Lampyris noctiluca*, which has a very limited distribution in Buckinghamshire outside of its main Chiltern Hills stronghold.

Grendon and Doddershall Woods with Hewin's Wood is favourable for the A212 barkwood and sapwood decay, and F001 scrub edge assemblage types.

Table 40. shows the Pantheon assessment for the combined data for Grendon and Doddershall Woods and Hewin's Wood

SAT	No. of species	Species with conservation status	Code	Reported condition
bark & sapwood decay	30	10	A212	Favourable (19 required)
scrub edge	12	3	F001	Favourable (11 required)

Discussion

The survey and analysis carried out demonstrates the importance of the northern complex of woodlands in the Bernwood area for the A212 barkwood and sapwood decay assemblage (mostly deadwood beetles), and the F001 scrub edge assemblage (a mixture of various taxa). The results match the assessment of other woodlands surveyed previously by the Natural England Field Unit in the southern part of Bernwood (as described above). It is most likely that further survey work and better coverage through the season would provide even more conclusive results.

This work should be viewed in the context of the additional invertebrate survey work carried out in the Bernwood complex in recent years (Martin Harvey. 2022. Bernwood Invertebrate Surveys 2021. NECR426. Natural England, Bernhard, 2022).

Species of particular note in these woodlands are Black Hairstreak and White Admiral butterfly, and an array of uncommon and notable deadwood beetles and flies.

Key structural features of the woodlands supporting the invertebrate assemblages of special interest are the grassy, flowery rides, track edges, woodland margins with dense scrub (particularly those with a southerly aspect), and mature trees with barkwood and sapwood decay. The presence of large-diameter fallen dead wood, rotting stumps and windthrown trees is another valuable feature. And the presence of humid, shady areas, small ponds (even if ephemeral in nature), ditches and natural streams in these woods provides valuable habitat diversity as many of the notable species are dependent upon both cool, moist areas in woodland as well as warm, sheltered areas with lots of flowers.

The rides in these woods are of variable quality. Parts have good structure with transitions between short grass through taller, herb-rich margin, to a shrubby edge before grading into mature woodland. Other parts are over-shaded and have little in the way of structured transition between grass and woodland. So there is scope for enhancement through management, which would benefit a wide range of species, including bats, in addition to invertebrates. For the most part the rides in these woods provide good habitat connectivity

to nearby woodlands and other habitats in the wider landscape, which is an important aspect and one which increases the value of the whole complex.

Although the surveys confirm that these woodlands are of special importance for Black Hairstreak there is scope for enhancement of this value through targeted action. Black Hairstreak is particularly vulnerable to local extinction through management neglect (resulting in larval habitat becoming overgrown and shaded), or conversely, through excessive management, ie cutting of blackthorn too frequently. Parts of the complex would benefit from careful management of mature blackthorn to stimulate fresh, vigorous growth, the planting of blackthorn where this would help to provide new areas of supporting habitat, and sensitive woodland management to reduce over-shading of rides.

It is important that consideration is given to the impacts on the invertebrate assemblages of special interest in the course of planning woodland management and initiatives in the wider landscape. Particularly important aspects which will provide long-term benefits are measures which seek to ensure the retention of mature trees in the canopy and to avoid felling whole blocks where possible, to seek to retain standing and fallen dead wood when it does not pose a safety risk, to seek to minimise disturbance in areas with a rich ground flora and well-developed shrub layer, and to seek to retain undisturbed corridors alongside streams. In a wider landscape context sensitive management of hedgerows, the retention of hedgerow trees (especially veterans) and the planting of new woodlands where this will not harm existing habitat of value would be particularly beneficial.

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Appendices

Appendix 1 – Complete list of all species recorded in 2017- 2019 surveys.

For Appendix 1, see additional spreadsheet on Access to Evidence, NERR129 Appendix 1.

Appendix 2 – Complete list of all species recorded in 2021 survey, excluding Hewin's Wood

Blank cells are intentional, where a species does not have a Conservation status or Associated SAT

Species	Family	Order	Conservation status	Associated SAT
Agelena labyrinthica	Agelenidae	Araneae		F001
Agalenatea redii	Araneidae	Araneae		F003
Araneus quadratus	Araneidae	Araneae		
Araniella cucurbitina sensu lato	Araneidae	Araneae		
Araniella opisthographa	Araneidae	Araneae		
Cyclosa conica	Araneidae	Araneae		
Gibbaranea gibbosa	Araneidae	Araneae		
Larinioides cornutus	Araneidae	Araneae		
Mangora acalypha	Araneidae	Araneae		
Nuctenea umbratica	Araneidae	Araneae		
Zilla diodia	Araneidae	Araneae		
Clubiona brevipes	Clubionidae	Araneae		
Clubiona comta	Clubionidae	Araneae		
Clubiona lutescens	Clubionidae	Araneae		
Clubiona reclusa	Clubionidae	Araneae		
Clubiona terrestris	Clubionidae	Araneae		
Phrurolithus minimus	Corinnidae	Araneae	Nationally Scarce	

Species	Family	Order	Conservation status	Associated SAT
Dictyna arundinacea	Dictynidae	Araneae		
Dismodicus bifrons	Linyphiidae	Araneae		
Erigone atra	Linyphiidae	Araneae		
Erigone dentipalpis	Linyphiidae	Araneae		
Linyphia hortensis	Linyphiidae	Araneae		
Maso sundevalli	Linyphiidae	Araneae		
Meioneta rurestris	Linyphiidae	Araneae		
Neriene peltata	Linyphiidae	Araneae		
Oedothorax apicatus	Linyphiidae	Araneae		
Oedothorax retusus	Linyphiidae	Araneae		
Tenuiphantes tenebricola	Linyphiidae	Araneae		
Tenuiphantes tenuis	Linyphiidae	Araneae		
Alopecosa pulverulenta	Lycosidae	Araneae		
Pardosa amentata	Lycosidae	Araneae		
Pardosa hortensis	Lycosidae	Araneae		F111
Pardosa prativaga	Lycosidae	Araneae		
Pardosa pullata	Lycosidae	Araneae		
Pardosa saltans	Lycosidae	Araneae		
Pirata hygrophilus	Lycosidae	Araneae		
Xerolycosa nemoralis	Lycosidae	Araneae	Nationally Scarce	

Species	Family	Order	Conservation status	Associated SAT
Cheiracanthium erraticum	Miturgidae	Araneae		
Philodromus albidus	Philodromidae	Araneae		
Philodromus aureolus	Philodromidae	Araneae		
Philodromus cespitum	Philodromidae	Araneae		
Philodromus dispar	Philodromidae	Araneae		
Tibellus oblongus	Philodromidae	Araneae		
Pisaura mirabilis	Pisauridae	Araneae		
Euophrys frontalis	Salticidae	Araneae		
Evarcha falcata	Salticidae	Araneae		
Heliophanus flavipes	Salticidae	Araneae		F001
Metellina mengei	Tetragnathidae	Araneae		
Pachygnatha degeeri	Tetragnathidae	Araneae		
Tetragnatha extensa	Tetragnathidae	Araneae		
Tetragnatha montana	Tetragnathidae	Araneae		
Anelosimus vittatus	Theridiidae	Araneae		
Enoplognatha latimana	Theridiidae	Araneae		
Enoplognatha ovata sensu lato	Theridiidae	Araneae		
Episinus angulatus	Theridiidae	Araneae		
Neottiura bimaculata	Theridiidae	Araneae		
Parasteatoda simulans	Theridiidae	Araneae		

Species	Family	Order	Conservation status	Associated SAT
Phylloneta sisyphia	Theridiidae	Araneae		
Platnickina tincta	Theridiidae	Araneae		
Theridion mystaceum	Theridiidae	Araneae		
Theridion varians	Theridiidae	Araneae		
Diaea dorsata	Thomisidae	Araneae		
Misumena vatia	Thomisidae	Araneae		
Xysticus cristatus	Thomisidae	Araneae		
Xysticus ulmi	Thomisidae	Araneae		
Anobium fulvicorne	Anobiidae	Coleoptera		A212
Anobium punctatum	Anobiidae	Coleoptera		A212
Ochina ptinoides	Anobiidae	Coleoptera		A212
Omonadus floralis	Anthicidae	Coleoptera		
Ischnopterapion loti	Apionidae	Coleoptera		
Oxystoma cerdo	Apionidae	Coleoptera	Notable	
Oxystoma pomonae	Apionidae	Coleoptera		
Agrilus angustulus	Buprestidae	Coleoptera	Nationally Scarce	A212
Agrilus cyanescens	Buprestidae	Coleoptera		
Byturus ochraceus	Byturidae	Coleoptera		F001
Byturus tomentosus	Byturidae	Coleoptera		
Cantharis decipiens	Cantharidae	Coleoptera		

Species	Family	Order	Conservation status	Associated SAT
Cantharis flavilabris	Cantharidae	Coleoptera		
Cantharis nigricans	Cantharidae	Coleoptera		
Cantharis pellucida	Cantharidae	Coleoptera		
Cantharis rufa	Cantharidae	Coleoptera		
Malthinus balteatus	Cantharidae	Coleoptera		A212
Malthinus flaveolus	Cantharidae	Coleoptera		A212
Malthinus seriepunctatus	Cantharidae	Coleoptera		A212
Malthodes minimus	Cantharidae	Coleoptera		A212
Rhagonycha fulva	Cantharidae	Coleoptera		
Rhagonycha lignosa	Cantharidae	Coleoptera		
Rhagonycha limbata	Cantharidae	Coleoptera		
Rhagonycha testacea	Cantharidae	Coleoptera		
Asaphidion curtum	Carabidae	Coleoptera		
Calodromius spilotus	Carabidae	Coleoptera		
Dromius quadrimaculatus	Carabidae	Coleoptera		
Leistus rufomarginatus	Carabidae	Coleoptera		
Loricera pilicornis	Carabidae	Coleoptera		
Nebria brevicollis	Carabidae	Coleoptera		
Ocys harpaloides sens.str.	Carabidae	Coleoptera		
Paradromius linearis	Carabidae	Coleoptera		

Species	Family	Order	Conservation status	Associated SAT
Platynus assimilis	Carabidae	Coleoptera		
Pterostichus madidus	Carabidae	Coleoptera		
Pterostichus melanarius	Carabidae	Coleoptera		
Trechus obtusus	Carabidae	Coleoptera		
Agapanthia villosoviridescens	Cerambycidae	Coleoptera	Least Concern (Global)	
Alosterna tabacicolor	Cerambycidae	Coleoptera	Least Concern (Global)	A212
Anaglyptus mysticus	Cerambycidae	Coleoptera	Least Concern (Global)	A212
Clytus arietis	Cerambycidae	Coleoptera	Least Concern (Global)	A212
Grammoptera ruficornis	Cerambycidae	Coleoptera	Least Concern (Global)	A212
Leiopus linnei	Cerambycidae	Coleoptera		
Molorchus minor	Cerambycidae	Coleoptera	Notable (Global)	
Obrium brunneum	Cerambycidae	Coleoptera	Notable (Global)	A212
Rutpela maculata	Cerambycidae	Coleoptera	Least Concern (Global)	A212
Stenocorus meridianus	Cerambycidae	Coleoptera	Least Concern (Global)	A212
Stenurella melanura	Cerambycidae	Coleoptera	Least Concern (Global)	A212
Bruchus rufimanus	Chrysomelidae	Coleoptera		

Species	Family	Order	Conservation status	Associated SAT
Crepidodera aurata	Chrysomelidae	Coleoptera		
Crepidodera aurea	Chrysomelidae	Coleoptera		
Crepidodera fulvicornis	Chrysomelidae	Coleoptera		
Cryptocephalus moraei	Chrysomelidae	Coleoptera		F112
Cryptocephalus pusillus	Chrysomelidae	Coleoptera		
Neocrepidodera transversa	Chrysomelidae	Coleoptera		
Oulema obscura	Chrysomelidae	Coleoptera		
Psylliodes napi	Chrysomelidae	Coleoptera		
Pyrrhalta viburni	Chrysomelidae	Coleoptera		
Cis boleti	Ciidae	Coleoptera		A213
Thanasimus formicarius	Cleridae	Coleoptera		A212
Adalia bipunctata	Coccinellidae	Coleoptera		
Adalia decempunctata	Coccinellidae	Coleoptera		
Calvia quattuordecimguttata	Coccinellidae	Coleoptera		
Chilocorus renipustulatus	Coccinellidae	Coleoptera		
Coccinella septempunctata	Coccinellidae	Coleoptera		
Harmonia axyridis	Coccinellidae	Coleoptera		
Propylea quattuordecimpunctata	Coccinellidae	Coleoptera		
Psyllobora vigintiduopunctata	Coccinellidae	Coleoptera		

Species	Family	Order	Conservation status	Associated SAT
Subcoccinella vigintiquattuorpunctata	Coccinellidae	Coleoptera		
Tytthaspis sedecimpunctata	Coccinellidae	Coleoptera		
Archarius pyrrhoceras	Curculionidae	Coleoptera		
Barypeithes pellucidus	Curculionidae	Coleoptera		
Ceutorhynchus pallidactylus	Curculionidae	Coleoptera		
Coeliodes rana	Curculionidae	Coleoptera		
Coeliodes transversealbofasciatus	Curculionidae	Coleoptera	Notable	
Curculio glandium	Curculionidae	Coleoptera		
Curculio venosus	Curculionidae	Coleoptera		
Dorytomus dejeani	Curculionidae	Coleoptera		
Magdalis cerasi	Curculionidae	Coleoptera	Notable	A212
Nedyus quadrimaculatus	Curculionidae	Coleoptera		
Phyllobius virideaeris	Curculionidae	Coleoptera		
Polydrusus cervinus	Curculionidae	Coleoptera		
Sitona lineatus	Curculionidae	Coleoptera		
Sitona suturalis	Curculionidae	Coleoptera		
Aplocnemus impressus	Dasytidae	Coleoptera	Nationally Scarce	A212
Agriotes acuminatus	Elateridae	Coleoptera		
Agriotes lineatus	Elateridae	Coleoptera		

Species	Family	Order	Conservation status	Associated SAT
Agriotes pallidulus	Elateridae	Coleoptera		
Ampedus elongantulus	Elateridae	Coleoptera	Near Threatened (Europe)	A211
Ampedus quercicola	Elateridae	Coleoptera	Notable	A211
Athous haemorrhoidalis	Elateridae	Coleoptera		
Dalopius marginatus	Elateridae	Coleoptera		
Denticollis linearis	Elateridae	Coleoptera		
Endomychus coccineus	Endomychidae	Coleoptera		A212
Epiphanis cornutus	Eucnemidae	Coleoptera	Near Threatened (Europe)	A211
Microrhagus pygmaeus	Eucnemidae	Coleoptera	RDB 3	A211
Helophorus aequalis	Hydrophilidae	Coleoptera		
Cryptolestes ferrugineus	Laemophloeidae	Coleoptera		A212
Axinotarsus marginalis	Malachiidae	Coleoptera		A212
Malachius bipustulatus	Malachiidae	Coleoptera		A212
Abdera quadrifasciata	Melandryidae	Coleoptera	Nationally Scarce	A212
Orchesia undulata	Melandryidae	Coleoptera		A212
Mordellochroa abdominalis	Mordellidae	Coleoptera		A212
Eulagius filicornis	Mycetophagidae	Coleoptera	Data Deficient (Europe)	A213

Species	Family	Order	Conservation status	Associated SAT
Meligethes aeneus	Nitidulidae	Coleoptera		
Meligethes atratus	Nitidulidae	Coleoptera		
Oedemera lurida	Oedemeridae	Coleoptera		
Oedemera nobilis	Oedemeridae	Coleoptera		
Oedemera virescens	Oedemeridae	Coleoptera	Nationally Rare	
Pyrochroa serraticornis	Pyrochroidae	Coleoptera		A212
Deporaus betulae	Rhynchitidae	Coleoptera		
Cyphon coarctatus	Scirtidae	Coleoptera		
Cyphon ochraceus	Scirtidae	Coleoptera		
Microcara testacea	Scirtidae	Coleoptera		
Odeles marginata	Scirtidae	Coleoptera		
Anaspis fasciata	Scraptiidae	Coleoptera		A212
Anaspis frontalis	Scraptiidae	Coleoptera		A212
Anaspis maculata	Scraptiidae	Coleoptera		A212
Anaspis pulicaria	Scraptiidae	Coleoptera		A212
Anaspis rufilabris	Scraptiidae	Coleoptera		A212
Silvanus unidentatus	Silvanidae	Coleoptera		A212
Uleiota planatus	Silvanidae	Coleoptera	Notable	A212
Atrecus affinis	Staphylinidae	Coleoptera		
Gabrius splendidulus	Staphylinidae	Coleoptera		

Species	Family	Order	Conservation status	Associated SAT
Sepedophilus marshami	Staphylinidae	Coleoptera	Least Concern (Global)	
Stenus flavipes	Staphylinidae	Coleoptera		
Stenus picipes	Staphylinidae	Coleoptera		
Tachyporus formosus	Staphylinidae	Coleoptera	Nationally Scarce	
Tachyporus hypnorum	Staphylinidae	Coleoptera	Least Concern (Global)	
Tasgius globulifer	Staphylinidae	Coleoptera		
Xantholinus elegans	Staphylinidae	Coleoptera		
Labia minor	Spongiphoridae	Dermaptera		
Sylvicola cinctus	Anisopodidae	Diptera		
Dioctria linearis	Asilidae	Diptera		F001
Leptogaster cylindrica	Asilidae	Diptera		
Conops quadrifasciatus	Conopidae	Diptera		
Sicus ferrugineus	Conopidae	Diptera		
Argyra leucocephala	Dolichopodidae	Diptera		
Dolichopus griseipennis	Dolichopodidae	Diptera		
Dolichopus plumipes	Dolichopodidae	Diptera		
Neurigona quadrifasciata	Dolichopodidae	Diptera		
Poecilobothrus nobilitatus	Dolichopodidae	Diptera		

Species	Family	Order	Conservation status	Associated SAT
Scellus notatus	Dolichopodidae	Diptera		
Empis livida	Empididae	Diptera		
Empis lutea	Empididae	Diptera		
Empis tessellata	Empididae	Diptera		
Atypophthalmus inustus	Limoniidae	Diptera	Notable	A213
Austrolimnophila ochracea	Limoniidae	Diptera		
Epiphragma ocellare	Limoniidae	Diptera		
Erioptera lutea	Limoniidae	Diptera		
Gnophomyia viridipennis	Limoniidae	Diptera	Notable	A212
Limonia flavipes	Limoniidae	Diptera		
Limonia nubeculosa	Limoniidae	Diptera		
Limonia phragmitidis	Limoniidae	Diptera		
Limonia trivittata	Limoniidae	Diptera	Notable	
Molophilus griseus	Limoniidae	Diptera		
Molophilus ochraceus	Limoniidae	Diptera		
Neolimonia dumetorum	Limoniidae	Diptera		
Rhipidia maculata	Limoniidae	Diptera		
Symplecta stictica	Limoniidae	Diptera		
Lonchoptera lutea	Lonchopteridae	Diptera		
Graphomya maculata	Muscidae	Diptera		

Species	Family	Order	Conservation status	Associated SAT
Mesembrina meridiana	Muscidae	Diptera		
Phaonia pallida	Muscidae	Diptera		
Opomyza germinationis	Opomyzidae	Diptera		
Ptychoptera albimana	Ptychopteridae	Diptera		
Chrysopilus cristatus	Rhagionidae	Diptera		
Rhagio scolopaceus	Rhagionidae	Diptera		
Scathophaga furcata	Scathophagidae	Diptera		
Scathophaga stercoraria	Scathophagidae	Diptera		
Limnia unguicornis	Sciomyzidae	Diptera		
Trypetoptera punctulata	Sciomyzidae	Diptera		
Sepsis punctum	Sepsidae	Diptera		
Chloromyia formosa	Stratiomyidae	Diptera		
Stratiomys potamida	Stratiomyidae	Diptera		
Baccha elongata	Syrphidae	Diptera		
Cheilosia antiqua	Syrphidae	Diptera		
Cheilosia illustrata	Syrphidae	Diptera		
Cheilosia pagana	Syrphidae	Diptera		
Chrysotoxum bicinctum	Syrphidae	Diptera		
Episyrphus balteatus	Syrphidae	Diptera		

Species	Family	Order	Conservation status	Associated SAT
Eristalis arbustorum	Syrphidae	Diptera		
Eristalis horticola	Syrphidae	Diptera		
Eristalis nemorum	Syrphidae	Diptera		
Eristalis pertinax	Syrphidae	Diptera		
Eristalis tenax	Syrphidae	Diptera		
Eupeodes luniger	Syrphidae	Diptera		
Helophilus pendulus	Syrphidae	Diptera		
Leucozona laternaria	Syrphidae	Diptera		
Melanostoma scalare	Syrphidae	Diptera		
Myathropa florea	Syrphidae	Diptera		A211
Parasyrphus vittiger	Syrphidae	Diptera		
Platycheirus albimanus	Syrphidae	Diptera		
Rhingia campestris	Syrphidae	Diptera		
Sericomyia silentis	Syrphidae	Diptera		
Sphaerophoria interrupta	Syrphidae	Diptera		
Sphaerophoria scripta	Syrphidae	Diptera		
Syritta pipiens	Syrphidae	Diptera		
Syrphus ribesii	Syrphidae	Diptera		
Volucella bombylans	Syrphidae	Diptera		
Volucella pellucens	Syrphidae	Diptera		

Species	Family	Order	Conservation status	Associated SAT
Xylota segnis	Syrphidae	Diptera		
Xylota sylvarum	Syrphidae	Diptera		A212
Haematopota pluvialis	Tabanidae	Diptera		
Hybomitra bimaculata	Tabanidae	Diptera		
Eriothrix rufomaculata	Tachinidae	Diptera		
Phasia hemiptera	Tachinidae	Diptera		
Tachina fera	Tachinidae	Diptera		
Chaetorellia jaceae	Tephritidae	Diptera		
Tephritis formosa	Tephritidae	Diptera		
Urophora jaceana	Tephritidae	Diptera		
Nephrotoma flavescens	Tipulidae	Diptera		
Nephrotoma quadrifaria	Tipulidae	Diptera		
Tipula fascipennis	Tipulidae	Diptera		
Tipula flavolineata	Tipulidae	Diptera		A211
Tipula fulvipennis	Tipulidae	Diptera		
Tipula helvola	Tipulidae	Diptera	Notable	
Tipula oleracea	Tipulidae	Diptera		
Elasmostethus interstinctus	Acanthosomatidae	Hemiptera		
Elasmucha grisea	Acanthosomatidae	Hemiptera		

Species	Family	Order	Conservation status	Associated SAT
Aphrophora alni	Aphrophoridae	Hemiptera		
Philaenus spumarius	Aphrophoridae	Hemiptera		
Cercopis vulnerata	Cercopidae	Hemiptera		
Allygus mixtus	Cicadellidae	Hemiptera		F001
Aphrodes makarovi	Cicadellidae	Hemiptera		
Cicadella viridis	Cicadellidae	Hemiptera		
Eupteryx urticae	Cicadellidae	Hemiptera		
Thamnotettix dilutior	Cicadellidae	Hemiptera		F001
Javesella pellucida	Delphacidae	Hemiptera		
Kleidocerys resedae	Lygaeidae	Hemiptera		
Centrotus cornutus	Membracidae	Hemiptera		F001
Amblytylus nasutus	Miridae	Hemiptera		
Capsus ater	Miridae	Hemiptera		
Closterotomus fulvomaculatus	Miridae	Hemiptera		
Closterotomus norwegicus	Miridae	Hemiptera		
Cyllecoris histrionius	Miridae	Hemiptera		
Deraeocoris flavilinea	Miridae	Hemiptera		
Deraeocoris olivaceus	Miridae	Hemiptera	Notable	
Deraeocoris ruber	Miridae	Hemiptera		

Species	Family	Order	Conservation status	Associated SAT
Dryophilocoris flavoquadrimaculatus	Miridae	Hemiptera		
Grypocoris stysi	Miridae	Hemiptera		
Harpocera thoracica	Miridae	Hemiptera		
Leptopterna dolabrata	Miridae	Hemiptera		
Lygus pratensis	Miridae	Hemiptera	RDB 3	F003
Megaloceroea recticornis	Miridae	Hemiptera		
Notostira elongata	Miridae	Hemiptera		
Plagiognathus arbustorum	Miridae	Hemiptera		
Rhabdomiris striatellus	Miridae	Hemiptera		
Stenodema calcarata	Miridae	Hemiptera		
Stenodema laevigata	Miridae	Hemiptera		
Stenotus binotatus	Miridae	Hemiptera		
Himacerus mirmicoides	Nabidae	Hemiptera		
Himacerus apterus	Nabidae	Hemiptera		
Nabis limbatus	Nabidae	Hemiptera		
Nabis rugosus	Nabidae	Hemiptera		
Aelia acuminata	Pentatomidae	Hemiptera		
Neottiglossa pusilla	Pentatomidae	Hemiptera		
Palomena prasina	Pentatomidae	Hemiptera		
Pentatoma rufipes	Pentatomidae	Hemiptera		

Species	Family	Order	Conservation status	Associated SAT
Piezodorus lituratus	Pentatomidae	Hemiptera		F001, F003
Troilus luridus	Pentatomidae	Hemiptera		
Rhopalus subrufus	Rhopalidae	Hemiptera		F001
Eurygaster testudinaria	Scutelleridae	Hemiptera		
Tingis cardui	Tingidae	Hemiptera		
Andrena bicolor	Andrenidae	Hymenoptera	Least Concern (Global)	F002
Andrena haemorrhoa	Andrenidae	Hymenoptera	Least Concern (Global)	F002
Andrena wilkella	Andrenidae	Hymenoptera	Least Concern (Global)	F002
Apis mellifera	Apidae	Hymenoptera	Not Evaluated	F002
Bombus pascuorum	Apidae	Hymenoptera		
Bombus hortorum	Apidae	Hymenoptera	Least Concern (Global)	F002
Bombus hypnorum	Apidae	Hymenoptera	Least Concern (Global)	F002
Bombus lapidarius	Apidae	Hymenoptera	Least Concern (Global)	F002
Bombus lucorum	Apidae	Hymenoptera	Data Deficient	F002
Bombus pratorum	Apidae	Hymenoptera	Least Concern (Global)	F002
Bombus rupestris	Apidae	Hymenoptera	Least Concern (Global)	F002

Species	Family	Order	Conservation status	Associated SAT
Bombus sylvestris	Apidae	Hymenoptera	Least Concern (Global)	F002
Bombus terrestris	Apidae	Hymenoptera	Least Concern (Global)	F002
Bombus vestalis	Apidae	Hymenoptera	Least Concern (Global)	F002
Arge berberidis	Argidae	Hymenoptera		
Calameuta filiformis	Cephidae	Hymenoptera		
Cephus pygmeus	Cephidae	Hymenoptera		
Cephus spinipes	Cephidae	Hymenoptera		
Hylaeus brevicornis	Colletidae	Hymenoptera	Least Concern (Global)	F001, F002
Hylaeus communis	Colletidae	Hymenoptera	Least Concern (Global)	F002
Hylaeus confusus	Colletidae	Hymenoptera	Least Concern (Global)	A212, F001, F002
Ectemnius lituratus	Crabronidae	Hymenoptera	Least Concern (Global)	A212, F001
Diprion pini	Diprionidae	Hymenoptera		
Lasioglossum puncticolle	Halictidae	Hymenoptera	Least Concern (Global)	F002
Megachile ligniseca	Megachilidae	Hymenoptera	Least Concern (Global)	A212, F001, F002
Megachile versicolor	Megachilidae	Hymenoptera	Near Threatened	A212, F002

Species	Family	Order	Conservation status	Associated SAT
Anoplius nigerrimus	Pompilidae	Hymenoptera	Least Concern (Global)	
Auplopus carbonarius	Pompilidae	Hymenoptera	Least Concern (Global)	
Xeris spectrum	Siricidae	Hymenoptera		
Dolerus niger	Tenthredinidae	Hymenoptera		
Strongylogaster multifasciata	Tenthredinidae	Hymenoptera		
Vespa crabro	Vespidae	Hymenoptera	Least Concern (Global)	
Vespula vulgaris	Vespidae	Hymenoptera	Least Concern (Global)	
Xiphydria camelus	Xiphydriidae	Hymenoptera		
Oniscus asellus	Oniscidae	Isopoda		
Porcellio scaber	Porcellionidae	Isopoda		
Nemophora degeerella	Adelidae	Lepidoptera		
Drepana falcataria	Drepanidae	Lepidoptera	Least Concern (Global)	
Rivula sericealis	Erebidae	Lepidoptera	Least Concern (Global)	
Tyria jacobaeae	Erebidae	Lepidoptera	Least Concern (Global)	
Abraxas grossulariata	Geometridae	Lepidoptera	Least Concern (Global)	
Idaea biselata	Geometridae	Lepidoptera	Least Concern (Global)	

Species	Family	Order	Conservation status	Associated SAT
Odezia atrata	Geometridae	Lepidoptera	Least Concern (Global)	
Petrophora chlorosata	Geometridae	Lepidoptera	Least Concern (Global)	
Scotopteryx chenopodiata	Geometridae	Lepidoptera	Least Concern (Global)	
Korscheltellus lupulina	Hepialidae	Lepidoptera	Least Concern (Global)	
Ochlodes sylvanus	Hesperiidae	Lepidoptera	Least Concern (Global)	
Thymelicus sylvestris	Hesperiidae	Lepidoptera	Least Concern (Global)	
Celastrina argiolus	Lycaenidae	Lepidoptera	Least Concern (Global)	
Favonius quercus	Lycaenidae	Lepidoptera	Least Concern (Global)	
Lycaena phlaeas	Lycaenidae	Lepidoptera	Least Concern (Global)	
Polyommatus icarus	Lycaenidae	Lepidoptera	Least Concern (Global)	
Satyrium pruni	Lycaenidae	Lepidoptera	Endangered; Nationally Scarce	
Autographa gamma	Noctuidae	Lepidoptera		
Aglais io	Nymphalidae	Lepidoptera	Least Concern (Global)	
Aglais urticae	Nymphalidae	Lepidoptera	Least Concern (Global)	

Species	Family	Order	Conservation status	Associated SAT
Aphantopus hyperantus	Nymphalidae	Lepidoptera	Least Concern (Global)	
Argynnis paphia	Nymphalidae	Lepidoptera	Least Concern (Global)	F001
Limenitis camilla	Nymphalidae	Lepidoptera	Section 41 Priority Species; Vulnerable	
Maniola jurtina	Nymphalidae	Lepidoptera	Least Concern (Global)	
Melanargia galathea	Nymphalidae	Lepidoptera	Least Concern (Global)	
Pararge aegeria	Nymphalidae	Lepidoptera	Least Concern (Global)	F001
Polygonia c-album	Nymphalidae	Lepidoptera	Least Concern (Global)	
Pyronia tithonus	Nymphalidae	Lepidoptera	Least Concern (Global)	F001
Vanessa atalanta	Nymphalidae	Lepidoptera	Least Concern (Global)	
Vanessa cardui	Nymphalidae	Lepidoptera	Least Concern (Global)	
Gonepteryx rhamni	Pieridae	Lepidoptera	Least Concern (Global)	
Pieris brassicae	Pieridae	Lepidoptera	Least Concern (Global)	
Pieris napi	Pieridae	Lepidoptera	Least Concern (Global)	

Species	Family	Order	Conservation status	Associated SAT
Pieris rapae	Pieridae	Lepidoptera	Least Concern (Global)	
Sesia apiformis	Sesiidae	Lepidoptera	Least Concern (Global)	A212
Ancylis badiana	Tortricidae	Lepidoptera		
Archips crataegana	Tortricidae	Lepidoptera		
Notocelia uddmanniana	Tortricidae	Lepidoptera		
Pammene aurana	Tortricidae	Lepidoptera		
Tortrix viridana	Tortricidae	Lepidoptera		
Lithobius variegatus	Lithobiidae	Lithobiomorpha		
Chrysopa perla	Chrysopidae	Neuroptera		
Aeshna cyanea	Aeshnidae	Odonata		
Aeshna grandis	Aeshnidae	Odonata		
Aeshna mixta	Aeshnidae	Odonata		
Anax imperator	Aeshnidae	Odonata		
Calopteryx splendens	Calopterygidae	Odonata		
Calopteryx virgo	Calopterygidae	Odonata		
Coenagrion puella	Coenagrionidae	Odonata		
Ischnura elegans	Coenagrionidae	Odonata		
Libellula depressa	Libellulidae	Odonata		

Species	Family	Order	Conservation status	Associated SAT
Orthetrum cancellatum	Libellulidae	Odonata		
Orthetrum coerulescens	Libellulidae	Odonata		
Sympetrum striolatum	Libellulidae	Odonata		
Sympetrum striolatum	Libellulidae	Odonata		
Platycnemis pennipes	Platycnemididae	Odonata		W125
Dicranopalpus ramosus sensu lato (pre 2015)	Phalangiidae	Opiliones		
Lacinius ephippiatus	Phalangiidae	Opiliones		
Leiobunum rotundum	Phalangiidae	Opiliones		
Mitopus morio	Phalangiidae	Opiliones		
Nelima gothica	Phalangiidae	Opiliones		
Oligolophus tridens	Phalangiidae	Opiliones		
Paroligolophus agrestis	Phalangiidae	Opiliones		
Platybunus triangularis	Phalangiidae	Opiliones		
Chorthippus parallelus	Acrididae	Orthoptera		
Meconema thalassinum	Meconematidae	Orthoptera		F001
Leptophyes punctatissima	Phaneropteridae	Orthoptera		F001
Tetrix undulata	Tetrigidae	Orthoptera		
Roeseliana roeselii	Tettigoniidae	Orthoptera		

Species	Family	Order	Conservation status	Associated SAT
Cepaea nemoralis	Helicidae	Pulmonata		
Limax maximus	Limacidae	Pulmonata		
Discus rotundatus	Patulidae	Pulmonata		

Appendix 3 – Species recorded in Hewin's Wood (2021) and Grendon and Doddershall Woods (2018)

Species	Family	Order	Conservation status	SAT
Agalenatea redii	Araneidae	Araneae		F003
Araniella inconspicua	Araneidae	Araneae	Nationally Scarce	
Araniella opisthographa	Araneidae	Araneae		
Cyclosa conica	Araneidae	Araneae		
Gibbaranea gibbosa	Araneidae	Araneae		
Larinioides cornutus	Araneidae	Araneae		
Mangora acalypha	Araneidae	Araneae		
Zilla diodia	Araneidae	Araneae		
Zygiella atrica	Araneidae	Araneae		
Clubiona comta	Clubionidae	Araneae		
Clubiona lutescens	Clubionidae	Araneae		
Clubiona norvegica	Clubionidae	Araneae	Nationally Scarce	F003, F221
Clubiona reclusa	Clubionidae	Araneae		
Dictyna uncinata	Dictynidae	Araneae		
Erigone dentipalpis	Linyphiidae	Araneae		
Linyphia hortensis	Linyphiidae	Araneae		
Linyphia triangularis	Linyphiidae	Araneae		
Meioneta rurestris	Linyphiidae	Araneae		

Species	Family	Order	Conservation status	SAT
Microlinyphia pusilla	Linyphiidae	Araneae		
Oedothorax retusus	Linyphiidae	Araneae		
Alopecosa pulverulenta	Lycosidae	Araneae		
Pardosa prativaga	Lycosidae	Araneae		
Pardosa pullata	Lycosidae	Araneae		
Pardosa saltans	Lycosidae	Araneae		
Philodromus albidus	Philodromidae	Araneae		
Philodromus cespitum	Philodromidae	Araneae		
Philodromus dispar	Philodromidae	Araneae		
Philodromus longipalpis	Philodromidae	Araneae	Nationally Scarce	
Tibellus oblongus	Philodromidae	Araneae		
Pisaura mirabilis	Pisauridae	Araneae		
Marpissa muscosa	Salticidae	Araneae	Nationally Scarce	
Metellina mengei	Tetragnathidae	Araneae		
Metellina merianae	Tetragnathidae	Araneae		
Pachygnatha degeeri	Tetragnathidae	Araneae		
Pachygnatha listeri	Tetragnathidae	Araneae		
Tetragnatha extensa	Tetragnathidae	Araneae		
Tetragnatha montana	Tetragnathidae	Araneae		

Species	Family	Order	Conservation status	SAT
Tetragnatha pinicola	Tetragnathidae	Araneae		
Anelosimus vittatus	Theridiidae	Araneae		
Enoplognatha ovata sensu lato	Theridiidae	Araneae		
Neottiura bimaculata	Theridiidae	Araneae		
Phylloneta impressa	Theridiidae	Araneae		
Phylloneta sisyphia	Theridiidae	Araneae		
Theridion varians	Theridiidae	Araneae		
Diaea dorsata	Thomisidae	Araneae		
Misumena vatia	Thomisidae	Araneae		
Xysticus cristatus	Thomisidae	Araneae		
Xysticus lanio	Thomisidae	Araneae		
Xysticus ulmi	Thomisidae	Araneae		
Eutrichapion viciae	Apionidae	Coleoptera		
Oxystoma cerdo	Apionidae	Coleoptera	Notable	
Oxystoma subulatum	Apionidae	Coleoptera		
Protapion apricans	Apionidae	Coleoptera		
Protapion trifolii	Apionidae	Coleoptera		
Agrilus cyanescens	Buprestidae	Coleoptera		
Byturus ochraceus	Byturidae	Coleoptera		F001
Cantharis cryptica	Cantharidae	Coleoptera		

Species	Family	Order	Conservation status	SAT
Cantharis decipiens	Cantharidae	Coleoptera		
Cantharis figurata	Cantharidae	Coleoptera		
Cantharis pellucida	Cantharidae	Coleoptera		
Cantharis rufa	Cantharidae	Coleoptera		
Rhagonycha fulva	Cantharidae	Coleoptera		
Rhagonycha lignosa	Cantharidae	Coleoptera		
Rhagonycha limbata	Cantharidae	Coleoptera		
Rhagonycha testacea	Cantharidae	Coleoptera		
Paradromius linearis	Carabidae	Coleoptera		
Pterostichus longicollis	Carabidae	Coleoptera	Nationally Scarce	
Pterostichus madidus	Carabidae	Coleoptera		
Pterostichus niger	Carabidae	Coleoptera		
Agapanthia villosoviridescens	Cerambycidae	Coleoptera	Least Concern (Global)	
Alosterna tabacicolor	Cerambycidae	Coleoptera	Least Concern (Global)	A212
Anaglyptus mysticus	Cerambycidae	Coleoptera	Least Concern (Global)	A212
Clytus arietis	Cerambycidae	Coleoptera	Least Concern (Global)	A212
Grammoptera ruficornis	Cerambycidae	Coleoptera	Least Concern (Global)	A212

Species	Family	Order	Conservation status	SAT
Rutpela maculata	Cerambycidae	Coleoptera	Least Concern (Global)	A212
Stenocorus meridianus	Cerambycidae	Coleoptera	Least Concern (Global)	A212
Stenurella melanura	Cerambycidae	Coleoptera	Least Concern (Global)	A212
Cerylon ferrugineum	Cerylonidae	Coleoptera		A212
Batophila rubi	Chrysomelidae	Coleoptera		
Bruchidius varius	Chrysomelidae	Coleoptera		
Bruchus loti	Chrysomelidae	Coleoptera		
Bruchus rufimanus	Chrysomelidae	Coleoptera		
Crepidodera aurata	Chrysomelidae	Coleoptera		
Crepidodera aurea	Chrysomelidae	Coleoptera		
Gastrophysa viridula	Chrysomelidae	Coleoptera		
Lochmaea caprea	Chrysomelidae	Coleoptera		
Phaedon tumidulus	Chrysomelidae	Coleoptera		
Phratora vulgatissima	Chrysomelidae	Coleoptera		
Psylliodes chalcomera	Chrysomelidae	Coleoptera	Nationally Scarce	
Psylliodes napi	Chrysomelidae	Coleoptera		
Pyrrhalta viburni	Chrysomelidae	Coleoptera		
Adalia decempunctata	Coccinellidae	Coleoptera		

Species	Family	Order	Conservation status	SAT
Chilocorus renipustulatus	Coccinellidae	Coleoptera		
Coccinella septempunctata	Coccinellidae	Coleoptera		
Exochomus quadripustulatus	Coccinellidae	Coleoptera		
Scymnus interruptus	Coccinellidae	Coleoptera		
Subcoccinella vigintiquattuorpunctata	Coccinellidae	Coleoptera		
Tytthaspis sedecimpunctata	Coccinellidae	Coleoptera		
Curculio glandium	Curculionidae	Coleoptera		
Orchestes pilosus	Curculionidae	Coleoptera		
Phyllobius pomaceus	Curculionidae	Coleoptera		
Polydrusus cervinus	Curculionidae	Coleoptera		
Polydrusus pterygomalis	Curculionidae	Coleoptera		
Rhinocyllus conicus	Curculionidae	Coleoptera	Notable	F111
Scolytus scolytus	Curculionidae	Coleoptera		A212
Aplocnemus impressus	Dasytidae	Coleoptera	Nationally Scarce	A212
Dasytes aeratus	Dasytidae	Coleoptera		A212
Agriotes acuminatus	Elateridae	Coleoptera		
Agriotes obscurus	Elateridae	Coleoptera		

Species	Family	Order	Conservation status	SAT
Athous haemorrhoidalis	Elateridae	Coleoptera		
Dalopius marginatus	Elateridae	Coleoptera		
Denticollis linearis	Elateridae	Coleoptera		
Paromalus flavicornis	Histeridae	Coleoptera		A212
Lampyris noctiluca	Lampyridae	Coleoptera		F112
Malachius bipustulatus	Malachiidae	Coleoptera		A212
Rhizophagus bipustulatus	Monotomidae	Coleoptera		A212
Mordellochroa abdominalis	Mordellidae	Coleoptera		A212
Ischnomera cinerascens	Oedemeridae	Coleoptera	Nationally Rare	A211
Oedemera lurida	Oedemeridae	Coleoptera		
Oedemera nobilis	Oedemeridae	Coleoptera		
Pyrochroa coccinea	Pyrochroidae	Coleoptera		A212
Pyrochroa serraticornis	Pyrochroidae	Coleoptera		A212
Neocoenorrhinus germanicus	Rhynchitidae	Coleoptera		
Microcara testacea	Scirtidae	Coleoptera		
Anaspis fasciata	Scraptiidae	Coleoptera		A212
Anaspis frontalis	Scraptiidae	Coleoptera		A212
Anaspis maculata	Scraptiidae	Coleoptera		A212
Anaspis rufilabris	Scraptiidae	Coleoptera		A212

Species	Family	Order	Conservation status	SAT
Silvanus bidentatus	Silvanidae	Coleoptera	Notable	A212
Silvanus unidentatus	Silvanidae	Coleoptera		A212
Phloeonomus punctipennis	Staphylinidae	Coleoptera		A212
Scaphidium quadrimaculatum	Staphylinidae	Coleoptera		A212
Stenus flavipes	Staphylinidae	Coleoptera		
Forficula auricularia	Forficulidae	Dermaptera		
Anthomyza collini	Anthomyzidae	Diptera		
Bibio marci	Bibionidae	Diptera		
Dilophus femoratus	Bibionidae	Diptera		
Bombylius major	Bombyliidae	Diptera		
Calliphora vicina	Calliphoridae	Diptera		
Calliphora vomitoria	Calliphoridae	Diptera		
Argyra argentina	Dolichopodidae	Diptera		
Rhaphium appendiculatum	Dolichopodidae	Diptera		
Empis livida	Empididae	Diptera		
Empis nigritarsis	Empididae	Diptera		F001
Empis stercorea	Empididae	Diptera		
Empis tessellata	Empididae	Diptera		
Orfelia nemoralis	Keroplatidae	Diptera		

Species	Family	Order	Conservation status	SAT
Tricholauxania praeusta	Lauxaniidae	Diptera		
Austrolimnophila ochracea	Limoniidae	Diptera		
Dicranomyia chorea	Limoniidae	Diptera		W126
Dicranomyia lutea	Limoniidae	Diptera		
Dicranophragma nemorale	Limoniidae	Diptera		
Euphylidorea dispar	Limoniidae	Diptera		
Limonia nigropunctata	Limoniidae	Diptera		
Limonia nubeculosa	Limoniidae	Diptera		
Limonia phragmitidis	Limoniidae	Diptera		
Molophilus griseus	Limoniidae	Diptera		
Neolimonia dumetorum	Limoniidae	Diptera		
Ormosia nodulosa	Limoniidae	Diptera		
Pseudolimnophila sepium	Limoniidae	Diptera		
Graphomya maculata	Muscidae	Diptera		
Mesembrina meridiana	Muscidae	Diptera		
Geomyza balachowskyi	Opomyzidae	Diptera		
Opomyza florum	Opomyzidae	Diptera		
Opomyza germinationis	Opomyzidae	Diptera		
Tricyphona immaculata	Pediciidae	Diptera		

Species	Family	Order	Conservation status	SAT
Rhagio scolopaceus	Rhagionidae	Diptera		
Nanna fasciata	Scathophagidae	Diptera		
Limnia unguicornis	Sciomyzidae	Diptera		
Nemopoda nitidula	Sepsidae	Diptera		
Beris chalybata	Stratiomyidae	Diptera		
Chloromyia formosa	Stratiomyidae	Diptera		
Baccha elongata	Syrphidae	Diptera		
Chrysogaster cemiteriorum	Syrphidae	Diptera		
Chrysogaster solstitialis	Syrphidae	Diptera		
Chrysotoxum bicinctum	Syrphidae	Diptera		
Episyrphus balteatus	Syrphidae	Diptera		
Eristalis horticola	Syrphidae	Diptera		
Eristalis pertinax	Syrphidae	Diptera		
Eristalis tenax	Syrphidae	Diptera		
Helophilus pendulus	Syrphidae	Diptera		
Lejogaster metallina	Syrphidae	Diptera		
Melanostoma scalare	Syrphidae	Diptera		
Merodon equestris	Syrphidae	Diptera		
Myathropa florea	Syrphidae	Diptera		A211
Platycheirus albimanus	Syrphidae	Diptera		

Species	Family	Order	Conservation status	SAT
Platycheirus rosarum	Syrphidae	Diptera		
Rhingia campestris	Syrphidae	Diptera		
Syritta pipiens	Syrphidae	Diptera		
Syrphus ribesii	Syrphidae	Diptera		
Volucella bombylans	Syrphidae	Diptera		
Xylota segnis	Syrphidae	Diptera		
Xylota sylvarum	Syrphidae	Diptera		A212
Haematopota pluvialis	Tabanidae	Diptera		
Tachina fera	Tachinidae	Diptera		
Chaetostomella cylindrica	Tephritidae	Diptera		
Xyphosia miliaria	Tephritidae	Diptera		
Nephrotoma appendiculata	Tipulidae	Diptera		
Nephrotoma quadrifaria	Tipulidae	Diptera		
Tipula flavolineata	Tipulidae	Diptera		A211
Tipula lunata	Tipulidae	Diptera		
Tipula oleracea	Tipulidae	Diptera		
Tipula paludosa	Tipulidae	Diptera		
Tipula submarmorata	Tipulidae	Diptera		
Tipula varipennis	Tipulidae	Diptera		

Species	Family	Order	Conservation status	SAT
Tipula vernalis	Tipulidae	Diptera		
Orchesella cincta	Entomobryidae	Entomobryomorpha		
Pogonognathellus longicornis	Tomoceridae	Entomobryomorpha		
Aphrophora alni	Aphrophoridae	Hemiptera		
Aphrophora pectoralis	Aphrophoridae	Hemiptera		
Philaenus spumarius	Aphrophoridae	Hemiptera		
Aneurus laevis	Aradidae	Hemiptera		A212
Aradus depressus	Aradidae	Hemiptera		A212
Cercopis vulnerata	Cercopidae	Hemiptera		
Balclutha punctata	Cicadellidae	Hemiptera		
Cicadula frontalis	Cicadellidae	Hemiptera		
Macustus grisescens	Cicadellidae	Hemiptera		
Speudotettix subfusculus	Cicadellidae	Hemiptera		F001
Tachycixius pilosus	Cixiidae	Hemiptera		
Coreus marginatus	Coreidae	Hemiptera		
Centrotus cornutus	Membracidae	Hemiptera		F001
Deraeocoris ruber	Miridae	Hemiptera		
Deraeocoris scutellaris	Miridae	Hemiptera		F003
Harpocera thoracica	Miridae	Hemiptera		

Species	Family	Order	Conservation status	SAT
Miris striatus	Miridae	Hemiptera		
Stenodema laevigata	Miridae	Hemiptera		
Stenotus binotatus	Miridae	Hemiptera		
Himacerus apterus	Nabidae	Hemiptera		
Nabis limbatus	Nabidae	Hemiptera		
Aelia acuminata	Pentatomidae	Hemiptera		
Dolycoris baccarum	Pentatomidae	Hemiptera		
Eurydema oleracea	Pentatomidae	Hemiptera		
Eysarcoris venustissimus	Pentatomidae	Hemiptera		F001
Palomena prasina	Pentatomidae	Hemiptera		
Pentatoma rufipes	Pentatomidae	Hemiptera		
Corizus hyoscyami	Rhopalidae	Hemiptera		F111
Rhopalus subrufus	Rhopalidae	Hemiptera		F001
Eurygaster testudinaria	Scutelleridae	Hemiptera		
Trioza urticae	Triozidae	Hemiptera		
Andrena minutula	Andrenidae	Hymenoptera	Least Concern (Global)	F002
Bombus pascuorum	Apidae	Hymenoptera		
Bombus lapidarius	Apidae	Hymenoptera	Least Concern (Global)	F002

Species	Family	Order	Conservation status	SAT
Bombus pascuorum	Apidae	Hymenoptera	Least Concern (Global)	F002
Bombus pratorum	Apidae	Hymenoptera	Least Concern (Global)	F002
Nomada flava	Apidae	Hymenoptera	Least Concern (Global)	F002
Arge cyanocrocea	Argidae	Hymenoptera		
Bethylus cephalotes	Bethylidae	Hymenoptera	Nationally Scarce	
Agathis rufipalpis	Braconidae	Hymenoptera		
Calameuta filiformis	Cephidae	Hymenoptera		
Calameuta pallipes	Cephidae	Hymenoptera		
Cephus spinipes	Cephidae	Hymenoptera		
Abia lonicerae	Cimbicidae	Hymenoptera		
Lasius brunneus	Formicidae	Hymenoptera	Least Concern (Global)	A211
Lasius niger	Formicidae	Hymenoptera		
Myrmica ruginodis	Formicidae	Hymenoptera		
Halictus rubicundus	Halictidae	Hymenoptera	Least Concern (Global)	F002
Agrypon flaveolatum	Ichneumonidae	Hymenoptera		
Collyria trichophthalma	Ichneumonidae	Hymenoptera		
Exochus gravipes	Ichneumonidae	Hymenoptera		

Species	Family	Order	Conservation status	SAT
Herpestomus brunnicornis	Ichneumonidae	Hymenoptera		
Allantus cinctus	Tenthredinidae	Hymenoptera		
Athalia circularis	Tenthredinidae	Hymenoptera		
Dolerus niger	Tenthredinidae	Hymenoptera		
Macrophya annulata	Tenthredinidae	Hymenoptera		
Monophadnus pallescens	Tenthredinidae	Hymenoptera		
Nematus lucidus	Tenthredinidae	Hymenoptera		
Nesoselandria morio	Tenthredinidae	Hymenoptera		
Tenthredo temula	Tenthredinidae	Hymenoptera		
Tenthredopsis litterata	Tenthredinidae	Hymenoptera		
Vespa crabro	Vespidae	Hymenoptera	Least Concern (Global)	
Nemophora degeerella	Adelidae	Lepidoptera		
Euclidia glyphica	Erebidae	Lepidoptera	Least Concern (Global)	
Euproctis similis	Erebidae	Lepidoptera	Least Concern (Global)	
Orgyia antiqua	Erebidae	Lepidoptera	Least Concern (Global)	
Rivula sericealis	Erebidae	Lepidoptera	Least Concern (Global)	
Cabera pusaria	Geometridae	Lepidoptera	Least Concern (Global)	

Species	Family	Order	Conservation status	SAT
Erannis defoliaria	Geometridae	Lepidoptera	Vulnerable	
Phigalia pilosaria	Geometridae	Lepidoptera	Vulnerable	
Scotopteryx chenopodiata	Geometridae	Lepidoptera	Least Concern (Global)	
Timandra comae	Geometridae	Lepidoptera	Least Concern (Global)	
Korscheltellus lupulina	Hepialidae	Lepidoptera	Least Concern (Global)	
Ochlodes sylvanus	Hesperiidae	Lepidoptera	Least Concern (Global)	
Pyrgus malvae	Hesperiidae	Lepidoptera	NERC Section 41 Priority Species; Vulnerable	
Incurvaria masculella	Incurvariidae	Lepidoptera		
Euthrix potatoria	Lasiocampidae	Lepidoptera	Least Concern (Global)	
Favonius quercus	Lycaenidae	Lepidoptera	Least Concern (Global)	
Lycaena phlaeas	Lycaenidae	Lepidoptera	Least Concern (Global)	
Lycaena phlaeas phlaeas	Lycaenidae	Lepidoptera		
Satyrium pruni	Lycaenidae	Lepidoptera	Endangered (Global); Nationally Scarce	
Thecla betulae	Lycaenidae	Lepidoptera	NERC Section 41 Priority	

Species	Family	Order	Conservation status	SAT
			Species; Vulnerable	
Autographa gamma	Noctuidae	Lepidoptera		
Aglais io	Nymphalidae	Lepidoptera	Least Concern (Global)	
Aphantopus hyperantus	Nymphalidae	Lepidoptera	Least Concern (Global)	
Argynnis paphia	Nymphalidae	Lepidoptera	Least Concern (Global)	F001
Coenonympha pamphilus	Nymphalidae	Lepidoptera	Near Threatened; NERC Section 41 Priority Species	F112
Limenitis camilla	Nymphalidae	Lepidoptera	NERC Section 41 Priority Species; Vulnerable	
Maniola jurtina	Nymphalidae	Lepidoptera	Least Concern (Global)	
Melanargia galathea	Nymphalidae	Lepidoptera	Least Concern (Global)	
Pararge aegeria	Nymphalidae	Lepidoptera	Least Concern (Global)	F001
Pyronia tithonus	Nymphalidae	Lepidoptera	Least Concern (Global)	F001
Anthocharis cardamines	Pieridae	Lepidoptera	Least Concern (Global)	
Pieris brassicae	Pieridae	Lepidoptera	Least Concern (Global)	

Species	Family	Order	Conservation status	SAT
Pieris napi	Pieridae	Lepidoptera	Least Concern (Global)	
Synanthedon formicaeformis	Sesiidae	Lepidoptera	Least Concern (Global)	A212
Celypha lacunana	Tortricidae	Lepidoptera		
Ptycholoma lecheana	Tortricidae	Lepidoptera		
Chrysopa perla	Chrysopidae	Neuroptera		
Aeshna cyanea	Aeshnidae	Odonata		
Enallagma cyathigerum	Coenagrionidae	Odonata		
Libellula depressa	Libellulidae	Odonata		
Sympetrum striolatum	Libellulidae	Odonata		
Sympetrum striolatum	Libellulidae	Odonata		
Platycnemis pennipes	Platycnemididae	Odonata		W125
Dicranopalpus ramosus sensu stricto (post 2015)	Phalangiidae	Opiliones		
Leiobunum blackwalli	Phalangiidae	Opiliones		
Leiobunum rotundum	Phalangiidae	Opiliones		
Platybunus triangularis	Phalangiidae	Opiliones		
Meconema thalassinum	Meconematidae	Orthoptera		F001
Leptophyes punctatissima	Phaneropteridae	Orthoptera		F001
Pholidoptera griseoaptera	Tettigoniidae	Orthoptera		F001

Species	Family	Order	Conservation status	SAT
Roeseliana roeselii	Tettigoniidae	Orthoptera		
Loensia fasciata	Psocidae	Psocoptera		
Graphopsocus cruciatus	Stenopsocidae	Psocoptera		
Cepaea nemoralis	Helicidae	Pulmonata		
Subilla confinis	Raphidiidae	Raphidioptera		A212

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