KINGCOED MEADOWS
INVERTEBRATE SURVEY

CHRISTIAN OWEN

DECEMBER 2025

Commissioned by
Monmouthshire Meadows Group
A Charitable Incorporated Organisation
Registered charity number
1192542

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EXECUTIVE SUMMARY

Christian Owen (trading as Christian Owen Bio-surveys) was commissioned by the **Monmouthshire Meadows Group** (a registered charity) – to undertake invertebrate surveys across two Monmouthshire reserves in South Wales (**Kingcoed Meadows** and **Trellech Wet Meadows**) in 2025. **This report presents the results of the invertebrate survey conducted at Kingcoed Meadows.**

A total of **444** invertebrate species recorded at Kingcoed Meadows during the survey, of which **52** are deemed to be of 'conservation interest'. These comprise:

- 3 Section 7 priority species (Environment (Wales) Act 2016);
- 1 Vulnerable (RDB 2);
- 3 Nationally Rare (RDB 3);
- 8 Nationally Scarce/Notable (including one new to Wales and one new to VC35);
- 33 Nationally/Wales Local;
- 1 Insufficiently Known (RDB K);
- 3 Other species of interest.

Kingcoed Meadows is an important refuge for a number of rare and scarce invertebrates that are declining in the wider countryside, as well as for habitat specialists, many with restricted distributions. Some of these species are particularly significant in a regional (vice-county), Welsh, and/or British context.

For example, Kingcoed Meadows:

- Section 7 priority species: Long-horned Bee (*Eucera longicornis*) and two research-only moths – Blood-vein (*Timandra comae*) and Shaded Broad-bar (*Scotopteryx chenopodiata*).
- Vulnerable (RDB 2): Broad-banded Nomad Bee (*Nomada signata*).
- Nationally Rare (RDB 3): Downland Villa (*Villa cingulata*); mirid bug *Lygus pratensis*; spider *Xysticus acerbus*.
- Rich beetle assemblage (119 species, 16 of conservation interest), e.g. weevils *Hypera meles*, *Protapion difforme*, *Protapion varipes*, *Sitona ambiguus*; ground beetles *Acupalpus exiguus*, *Syntomus obscuroguttatus*; click beetle *Oedostethus quadripustulatus* (new to VC35); flea beetle *Phyllotreta astrachanica*.
- 13 species seldom recorded in Wales, including the above plus *Anthicus antherinus*, *Araneus triguttatus*, *Edwardsiana frustrator*, *Pilophorus perplexus*.
- Two species recently new to Britain: seed beetle *Bruchidius varius* and tachinid fly Yellow-clubbed Phasia.
- One species new to Wales: planthopper *Scottianella dalei*.

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1.0 INTRODUCTION

1.1 Introductory comments

In 2025, Christian Owen (trading as Christian Owen Bio-surveys) was commissioned by the Monmouthshire Meadows Group (a registered charity) to undertake invertebrate surveys at two Monmouthshire reserves: **Kingcoed Meadows** and **Trellech Wet Meadows**. These surveys aimed to assess the current ecological value of the sites for invertebrates and to inform future habitat management.

This report presents the results of the invertebrate survey undertaken at **Kingcoed Meadows**, which was conducted over four daytime visits in April, June, July, and August 2025. All sampling and specimen identification were carried out by the author, Christian Owen, an experienced entomologist based in South Wales.

The Monmouthshire Meadows Group was founded in spring 2003, inspired by the Parish Grasslands Project in Gloucestershire. Within just 18 months it had grown to more than 60 members who, between them, manage around 300 acres – ranging from tiny garden mini-meadows to sites of over 30 acres. Today, as a registered charity (a Charitable Incorporated Organisation, since 2020), the Monmouthshire Meadows Group has over 200 members with grasslands scattered across Monmouthshire. The group remains a small, friendly organisation whose members are passionate about restoring traditional flowering hay meadows and creating wildflower areas in their gardens. Each member's site is surveyed, and members receive individual botanical training and tailored advice on how to manage their land (Monmouthshire Meadows Group, 2021).

Their charitable aims are: *"To promote the conservation, protection and improvement of hay meadows, grasslands and unimproved pastures in the Wye Valley and elsewhere in Monmouthshire so as to conserve and restore the diversity of plant and animal species native to that environment, in particular but not exclusively, by facilitating and promoting the management of those lands consistent with that purpose"*.

1.2 Site description

With a combined area of 11.80 acres (approximately 4.80 hectares), Kingcoed Meadows (**Figure 1**) consists of two large, traditional, flower-rich, unimproved meadows (best seen in **Figure 3**). The site is located approximately 2 miles south-east of Raglan in the hamlet of Kingcoed, Usk, Monmouthshire, South Wales, NP15 1DS. The gated entrance to the meadows is centred at grid reference SO42770571.

Originally part of Kingcoed Farm, the meadows were purchased in April 2016 by the local community following a long fundraising campaign. The purchase was made possible through generous funding from a number of trusts and organisations, including the Alan Evans Memorial Trust, the Banister Trust, the Foyle Foundation, Gwent Wildlife Trust, Habitataid, New Grove Trust, the Ricardo Crawley Trust, the Waterloo Foundation, and the Waitrose Community Fund. In December 2015, confirmation of a major grant from Biffa Award provided the final funds needed to complete the acquisition. Many individuals, members, and supporters also contributed very generously to the appeal. Bee-friendly Monmouthshire and Raglan Community Council kindly sponsored the production of the site leaflet and display boards (Monmouthshire Meadows Group data, 2021).

The meadows are currently managed with a hay cut in late July, followed by sheep grazing from autumn until the end of March the following year.

Figure 1: Aerial view of Kingcoed Meadows. © 2025 Google Earth. Image captured December 2025.

1.3 Survey limitations

Guidelines for invertebrate surveys recommend visits between approximately May and September to obtain an adequate cross-seasonal representation of the invertebrate species present. Full coverage across this period was not achieved in the current survey, as sampling was conducted only in April, June, July, and August. However, the objective was never to produce a complete invertebrate species inventory; such an inventory would require visits at roughly two-weekly intervals throughout the entire active season, repeated at the same intensity for at least one or two further years.

The purpose of this survey was to obtain baseline invertebrate data to assess the efficacy of management interventions (i.e., hay cutting) on invertebrates, particularly species restricted to or strongly associated with flower-rich meadows. The survey also aimed to evaluate the current ecological value of the sites for invertebrates and to inform future habitat management. Given these limited aims, the restricted sampling period is not considered a significant limitation.

The main survey limitation arose from the cutting of the meadows (as shown in **Figure 5**) during the survey period (in July). This resulted in the temporary loss of foraging sources, floral structure, and other habitat features for many pollinating and non-ground-dwelling invertebrate species. Nevertheless, two wide uncut strips (as seen in **Figure 6**) were retained along the 'northern' hedgeline margins of both meadows, providing some continued sampling opportunities.

2.0 SAMPLING

2.1 Sampling methodology

Sampling at Kingcoed Meadows was conducted by walking in a zigzag (or "W") pattern across both fields, while employing a range of sampling techniques appropriate to the target invertebrate groups (outlined in **Section 2.3**). The aim was to achieve comprehensive spatial coverage of the site and its habitats during each visit, thereby maximising encounters with the target invertebrates. **Table 1** (below) provides details of the sampling methods used during each visit.

Sampling covered four main periods/seasons of the meadows to capture seasonal variations in flora and associated fauna. The first visit, in April, was timed to sample late-winter and early-spring active or mature species, coinciding with Hawthorn in flower (providing early nectar for pollinators), and when the meadows retained short turf (**Figure 2**) ideal for surveying ground-dwelling invertebrates. A June visit targeted a broader variety of species benefiting from peak flowering and fresh vegetative growth across many plants (**Figure 3**). A July visit focused on species that prefer mature plant stages, including seed production, older foliage, and those reaching maturity later in the season (**Figure 4**). An August visit sampled the area after its hay cut (**Figure 5**) and subsequent regrowth, allowing assessment of post-management recovery, and species adapted to shorter swards or late-season conditions. This multi-seasonal approach ensured good coverage of the site's dynamic biodiversity throughout part of the meadows annual cycle.

Terrestrial invertebrates were sampled using a suite of active sampling techniques, including:

Aerial netting – involved using a lightweight, 40 cm diameter net attached to a 1-meter-long pole to capture flying insects as they were encountered.

Beating – an open white umbrella was held upside down beneath tree or shrub branches, which were gently tapped with a stick to dislodge insects from the foliage. Taxa were then selectively removed using an aspirator (or pooter), or identified in the field.

Hand searching – this involved sifting through plant litter, inspecting under stones, tree bark, debris, etc., to locate invertebrates that may be feeding, resting, or sheltering.

Suction-sampling (vacuum sampling) – a modified leaf blower was employed to collect invertebrates from challenging habitats, such as very short grass or tree trunks, where sweep netting is less effective. This method excels at capturing non-flying species or those residing in deep vegetation or bark crevices. Samples were transferred into a large white tray, and target taxa were selectively extracted using an aspirator for identification.

Sweep-netting – a lightweight 40cm diameter net mounted on a 1-meter-long pole was moved vigorously through long vegetation and overhanging tree branches to dislodge invertebrates. Invertebrates were then selectively removed from the sweep net using an aspirator.

Visual searching – insects were observed foraging, basking, nesting, hunting, mating, etc., in their associated habitats without the need to deploy other sampling techniques (e.g., sweep-netting).

2.2 Survey dates

The invertebrate survey at Kingcoed Meadows was conducted over four daytime visits during the months of April, June, July and August 2025. Sampling was attempted under dry, calm, and sunny conditions, ideal for peak invertebrate activity, however, given the often-unpredictable weather in Wales, this was not always possible. A combined total of approximately **21** hours and **45** minutes was spent sampling.

Survey dates, times, and activities are presented in **Table 1** below. Sampling techniques used at both sites are described in **Section 2.1** above.

Table 1. Survey date, times, and activities undertaken at Kingcoed Meadows in 2025.

Survey Date	Survey Time	Activity	Weather Conditions
30th April 2025	09.45 am – 14.25 pm 4 hours 40 minutes	A variety of sampling techniques were deployed (as outlined in **section 2.1**) by Christian Owen in order to sample for as many invertebrate taxa as possible. Sweep-netting, suction-sampling, and visual searching were the most productive methods on the day.	Full Sun throughout the day. Max air temperature of 24°C. Wind speeds of around 4 miles per hour (mph) coming from an easterly direction.
10th June 2025	10.05 am – 16.25 pm 6 hours, 20 minutes	A variety of sampling techniques were deployed in order to sample for as many invertebrate taxa as possible. Sweep-netting, suction-sampling and visual searching the most productive methods on the day.	Overcast at the start (10.05 am), then proceeded to sunny intervals. Max air temperature of 21°C. Wind speeds of around 8 mph coming from a north-westerly direction.
9th July 2025	09.55 am – 14.55 pm 5 hours, 0 minutes	A variety of sampling techniques were deployed in order to sample for as many invertebrate taxa as possible. Beating, sweep-netting and suction-sampling the most productive methods on the day.	Full Sun throughout the day. Max air temperature of 26°C. Wind speeds of around 4 mph coming from a southerly direction.
20th August 2025	10.00 am – 15.45 pm 5 hours, 45 minutes	A variety of sampling techniques were deployed in order to sample for as many invertebrate taxa as possible. Suction-sampling, litter-sieving (Field B) and visual searching were the most productive methods on the day.	Overcast at the start (10 am), then proceeded to sunny intervals. Max air temperature of 21°C. Wind speeds of around 12 mph coming from a north-easterly direction.

2.3 Target groups

The survey aimed to target as many different invertebrate groups as possible, with particular attention paid to the following groups:

- **Arachnida** → Araneae (spiders), Opiliones (harvestman), etc.
- **Coleoptera** → Carabidae (ground beetles), Chrysomelidae (leaf beetles), Curculionidae ('true' weevils), and Staphylinidae (rove beetles).
- **Collembola** → Symphypleona, Entomobryomorpha etc. (springtails).
- **Diptera** (flies) → multiple families including Sciomyzidae (snail-killing flies), Stratiomyidae (soldier flies), Syrphidae (hoverflies) and Tephritidae (fruit flies).
- **Hemiptera** → Auchenorrhyncha (froghoppers, leafhoppers and planthoppers) and Heteroptera ('true bugs').
- **Hymenoptera** (bees, wasps, ants etc.).
- **Lepidoptera** (butterflies and day-flying moths).
- **Mollusca** (slugs and snails).
- **Orthoptera** → Tetrigidae (groundhoppers), Tettigoniidae (bush crickets) and Acrididae (typical grasshoppers) etc.

These target groups were selected because they encompass species with varied life histories and could reasonably be expected to occur at Kingcoed Meadows (see **Section 2.4**). The choice of groups also partly reflects the surveyor's existing expertise. Incidental records of other invertebrate taxa were also recorded when encountered. This included taxa such as Isopoda (woodlice), Mecoptera (scorpionflies), Neuroptera (lacewings), Plecoptera (stoneflies), and Psocoptera (barkflies).

Where practicable, invertebrates were identified in the field using a x10 or x20 hand lens. Where identification was not possible in the field, representative specimens were collected and later identified using a binocular microscope. Specimen collection was kept to a minimum to avoid adverse impacts on populations and excluded species that could be confidently identified in the field – particularly those with restricted distributions (e.g. Nationally Scarce or Nationally Rare species), those considered threatened (e.g. Endangered or Vulnerable species), and/or those listed under Section 7 of the Environment (Wales) Act 2016 as species "of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales."

Invertebrates were identified to species level wherever possible. In some cases, however, species-level identification could not be achieved because: the specimen was not sexually mature (certain species can only be identified by examination of adult genitalia, usually male); an individual of the opposite sex was required for comparison; or the specimen was damaged, faded, or excessively worn.

All collecting followed the Code of Conduct for Collecting Insects and Other Invertebrates (Invertebrate Link, 2002). Specimens were either preserved dry and later pinned (e.g. bees, wasps, and flies) or stored in 70-90 % isopropyl alcohol (e.g. leafhoppers, planthoppers, and spiders). All identifications were undertaken by Christian Owen, using the most appropriate and up-to-date identification keys (see **Section 5**), and were verified against reference voucher material wherever possible, particularly for difficult taxa.

2.4 Sample area

Kingcoed Meadows (**Figures 1**-**6**) comprise two large, traditional, flower-rich, unimproved meadows with a combined area of 11.80 acres (~ 4.80 hectares). Both fields are bounded by stock fencing and are accompanied by species-rich, mature hedgerows and standard trees.

Both fields were recorded individually and labelled as **Field A** (the topmost field) and **Field B** (the lower, larger of the two). Separate species lists for each field (**Fields A** and **B**; **Map 1**) are provided (**Appendices 2** and **3**).

Map 1*: Areas surveyed (**Fields A** and **B**) at Kingcoed Meadows in 2025 (highlighted and outlined in white). Total sampled area: 11.80 acres (~ 4.80 ha). Base imagery © 2025 Google Earth, captured December 2025.*

Fields A and B are both sloped, with Field B (**Figure 2**) being more steeply than Field A (**Figure 3**). Field A has a north-easterly aspect, while Field B has both southerly and south-easterly aspects.

The meadows, previously managed sympathetically for over a decade, have naturally developed a diverse flora characteristic of species-rich neutral to semi-improved grassland, containing species such as: Adder's-tongue Fern (*Ophioglossum vulgatum*), bird's-foot trefoils (*Lotus* spp.), buttercups (*Ranunculus* spp.), clovers (*Trifolium* spp.), Common Cat's-ear (*Hypochaeris radicata*), Common Hogweed (*Heracleum sphondylium*), Daisy (*Bellis perennis*), docks (*Rumex* spp.), grasses (Poaceae), Knapweed (*Centaurea nigra* agg.), Ladies Smock (*Cardamine pratensis*), orchids (*Dactylorhiza* spp.), Ox-eye Daisy (*Leucanthemum vulgare*), plantains (*Plantago* spp.), Rough Hawkbit (*Leontodon hispidus*), rushes (*Juncus* spp.), sedges (*Carex* spp.), vetches (*Vicia* spp.), and Yellow Rattle (*Rhinanthus minor*).

The presence of indicators such as Yellow Rattle, a hemiparasite that suppresses vigorous grasses and thereby promotes floral diversity, Adder's-tongue Fern, which is often associated with old or unimproved meadows, and orchids (Common Spotted Orchid – *Dactylorhiza fuchsia* etc.) underscores the site's ecological value and the benefits of long-term sympathetic management that has allowed these species to thrive without intensive fertilisation or reseeding. A small area of Field B, centred on SO43100575, contains marshy grassland that supports wetter-tolerant species such as certain rushes and sedges, adding further habitat diversity.

The surrounding species-rich hedgerows contain species such as Ash (*Fraxinus excelsior*), Blackthorn (*Prunus spinosa*), Dogwood (*Cornus sanguinea*), Elder (*Sambucus nigra*), Field Maple (*Acer campestre*), Hawthorn (*Crataegus monogyna*), Hazel (*Corylus avellana*), Pedunculate Oak (*Quercus robur*), Small-leaved Lime (*Tilia cordata*), and Wych Elm (*Ulmus glabra*) (Monmouthshire Meadows Group, n.d.). These are interspersed with scrambling climbers such as roses (*Rosa* spp.) and Bramble (*Rubus fruticosus* agg.), providing nectar sources and berries for a variety of invertebrates, as well as dense cover for nesting and hibernating. Such hedgerows are typical of traditional Monmouthshire landscapes and enhance connectivity for wildlife across the site.

Additional habitat features include small triangular wooded copses situated in several field corners (e.g., one centred on SO42930587), offering shaded refugia and potential for woodland flora and fauna, and a larger, more mature wooded copse located along part of the field boundary of Field B (wood centred on SO43100569), which likely supports a greater diversity of mature tree-associated species.

Figure 2: View looking westerly across Field B, showing a grassy meadow of short-sward. Photographed on 30th April 2025 at grid reference centred on SO43180576.

Figure 3: View looking ‘south-westerly’ across Field A, showing a flower-rich meadow in bloom. Photographed on 10th June 2025 at grid reference centred on SO42950582.

Figure 4: View looking west across Field A, showing a meadow at a more mature growth stage with seed production and older foliage. Photographed on 9th July 2025 at grid reference centred on SO42950579.

Figure 5: View looking 'south-westerly' across Field A, showing the meadow after a hay-cut. Photographed on 20th August 2025 at grid reference centred on SO42950582.

Figure 6: Image showing one of the uncut strips retained at Kingcoed Meadows. Photographed on 20th August in Field A, at grid reference centred on SO42790578.

3.0 RESULTS

3.1 Overview

An overall total of **444** invertebrate species were recorded during the 2025 survey at Kingcoed Meadows. A full species list is provided in **Appendix 1**, annotated with formal National Status codes where applicable (**Section 3.2**). **Table 2** provides a breakdown of species by invertebrate group.

The most species-rich orders recorded were Coleoptera (beetles), Diptera (flies), Hemiptera (true bugs), Arachnida (spiders and harvestmen), Lepidoptera (butterflies and moths), and Hymenoptera (bees, wasps, ants, etc.), represented by **119**, **83**, **69**, **50**, **41**, and **39** species respectively. Within these orders, **16**, **11**, **8**, **7**, **5**, and **4** species respectively were assessed as being of conservation interest. Other well-represented groups included Mollusca (slugs and snails), Collembola (springtails), and Orthoptera (grasshoppers, crickets, etc.), which were represented by **15**, **11**, and **6** species respectively. However, none of the species recorded in these groups were considered to be of 'conservation interest'. Neuroptera (lacewings) was represented by three species, one of which was assessed as being of 'conservation interest'.

Overall, **52** species (approximately **12**% of the total) were identified as being of conservation interest, highlighting the ecological significance of the site.

Table 2. Summary of species richness across invertebrate orders, including the number of species of conservation interest recorded within each group.

Invertebrate Group	Number of Species	Conservation Interest
Total species	444	52
Coleoptera (beetles)	119	16
Diptera (flies)	83	11
Hemiptera (true bugs)	69	8
Arachnida (harvestman, spiders etc.).	50	7
Lepidoptera (butterflies and moths)	41	5
Hymenoptera (bees, wasps, ants, etc.)	39	4
Mollusca (slugs and snails)	15	0
Collembola (springtails).	11	0
Other	7	0
Orthoptera (crickets, grasshoppers etc.)	6	0
Neuroptera (lacewings)	3	1

Note also (as partly mentioned in **Section 2.3**) that many Hemiptera encountered were either females or still in their nymphal stages, making identification to species level difficult or impossible without adult males. Consequently, the overall total recorded is likely to have been higher than presented here. The same applies to several other taxa, including Arachnida and Coleoptera. Additionally, a number of species encountered avoided capture or close inspection; their identities can therefore only be speculated upon, and they have been omitted from the report – for example, a possible chalcid wasp, *Brachymeria tibialis* (which parasitises various moths, particularly burnet moths (*Zygaena* spp.)), resting on Hogweed in Field B.

National Status codes

Local (Nationally/Wales) = Species which, whilst fairly common, are evidently less widespread than truly common species, but also not qualifying as Nationally Scarce having been recorded from over 100, but less than 300, ten-kilometre squares of the British National Grid system since 1970.

Nationally Rare (NR or RDB 3) = Taxa with small populations which are not at present endangered or vulnerable but which are at risk. These are species which are estimated to occur in 15 or fewer ten-kilometre squares of the British National Grid system since 1970.

Nationally Scarce (NS) or **Notable (Na** or **Nb)** = Species occurring within the range of 16 to 100 ten-kilometre squares of the British National Grid system since 1970.

Near Threatened (NT) = Species which do not qualify for Critically Endangered, Endangered or Vulnerable now but are close to qualifying for, or are likely to qualify for, a threatened category in the near future.

Section 7 = Species listed under Section 7 of Environment (Wales) Act 2016 as 'species of principal importance for conservation of biological diversity in Wales'.

Unknown or RDB K = Species that are suspected but not definitely known to belong to any of the following categories (Endangered, Vulnerable, Near Threatened, Rare) because of the lack of information.

Vulnerable (RDB 2 or **VU)** = Species considered to be facing a high risk of extinction in the wild.

Other = Species that are not considered threatened but are otherwise noteworthy (e.g. due to a lack of previous records or having been recently discovered new for Britain).

Table 3. List of species of 'conservation interest' recorded at Kingcoed Meadows in 2025 (ordered alphabetically by Order, Family, and then Species), along with their conservation statuses and habitat preferences (as determined by Pantheon) where applicable. Species considered to be of greatest conservation interest at Kingcoed Meadows are shown in bold.

Species	Family	Order	Conservation status	Broad biotope	Habitat
Araneus triguttatus	**Araneidae**	**Araneae**	**Local; scarce in Wales**	**tree-associated**	**arboreal**
Gibbaranea gibbosa	Araneidae	Araneae	Local	tree-associated	arboreal
Pardosa tenuipes	**Lycosidae**	**Araneae**	**NS**	**coastal; wetland**	**brackish pools & ditches; marshland**
Piratula latitans	Lycosidae	Araneae	Local	wetland	acid & sedge peats
Cheiracanthium erraticum	Miturgidae	Araneae	Local	open habitats	tall sward & scrub
Xysticus acerbus	**Thomisidae**	**Araneae**	**NR**	**open habitats**	**tall sward & scrub**
Xysticus kochi	Thomisidae	Araneae	Local	open habitats	short sward & bare ground
Anthicus antherinus	Anthicidae	Coleoptera	Local in Wales	coastal	saltmarsh

Protapion difforme	Apionidae	Coleoptera	Nb	open habitats	tall sward & scrub
Protapion varipes	**Apionidae**	**Coleoptera**	**[Nb]; Nb**	**open habitats**	**tall sward & scrub**
Acupalpus exiguus	**Carabidae**	**Coleoptera**	**NS**	**wetland**	**marshland**
Syntomus obscuroguttatus	**Carabidae**	**Coleoptera**	**Local in Wales**	**open habitats**	**tall sward & scrub**
Anaglyptus mysticus	Cerambycidae	Coleoptera	Local in Wales	tree-associated	decaying wood
Bruchidius varius	Chrysomelidae	Coleoptera	Other	open habitats	tall sward & scrub
Crepidodera aurea	Chrysomelidae	Coleoptera	Local in Wales	tree-associated	arboreal
Cryptocephalus moraei	Chrysomelidae	Coleoptera	Local in Wales	open habitats	short sward & bare ground
Phyllotreta astrachanica	**Chrysomelidae**	**Coleoptera**	**Local; scarce in Duff**	**open habitats**	**tall sward & scrub**
Barynotus obscurus	Curculionidae	Coleoptera	Local	open habitats	tall sward & scrub
Hypera meles	Curculionidae	Coleoptera	[Nb]	open habitats	tall sward & scrub
Sitona ambiguus	Curculionidae	Coleoptera	Local	open habitats	tall sward & scrub
Oedostethus quadripustulatus	**Elateridae**	**Coleoptera**	**Na; new for VC**	**open habitats**	**tall sward & scrub**
Anaspis pulicaria	Scraptiidae	Coleoptera	Local; scarce in Duff	tree-associated	decaying wood
Phyllodrepa floralis	Staphylinidae	Coleoptera	Local	tree-associated	decaying wood
Botanophila brunneilinea	Anthomyiidae	Diptera	Local in Wales		
Villa cingulata	**Bombyliidae**	**Diptera**	**NR**	**open habitats**	**tall sward & scrub**
Tricogena rubricosa	Calliphoridae	Diptera	Local	open habitats	tall sward & scrub
Chrysotus laesus	Dolichopodidae	Diptera	Local	wetland	marshland; running water
Pipunculus lenis	Pipunculidae	Diptera	Local	open habitats	tall sward & scrub
Pollenia amentaria	Polleniidae	Diptera	Local	wetland	marshland
Sphaerophoria taeniata	Syrphidae	Diptera	Local	wetland	
Exorista rustica	Tachinidae	Diptera	Local in Wales		
Phasia barbifrons	Tachinidae	Diptera	Other		
Phasia obesa	Tachinidae	Diptera	Local in Wales	open habitats	
Acanthiophilus helianthi	**Tephritidae**	**Diptera**	**[Notable]**	**open habitats**	**short sward & bare ground; tall sward & scrub**
Orius laticollis	Anthocoridae	Hemiptera	Other	tree-associated	arboreal
Anoscopus flavostriatus	Cicadellidae	Hemiptera	Local	open habitats	tall sward & scrub
Edwardsiana frustrator	Cicadellidae	Hemiptera	Local	tree-associated	arboreal

Scottianella dalei	**Delphacidae**	**Hemiptera**	**Nb; new for Wales**	**open habitats**	**tall sward & scrub**
Heterocordylus genistae	Miridae	Hemiptera	Local	open habitats	short sward & bare ground
Lygus pratensis	Miridae	Hemiptera	[RDB 3]	open habitats	
Miridius quadrivirgatus	Miridae	Hemiptera	Local	open habitats	tall sward & scrub
Pilophorus perplexus	Miridae	Hemiptera	Local	tree-associated	arboreal
Eucera longicornis	**Apidae**	**Hymenoptera**	**[Na]; Section 7 Priority Species**	**open habitats**	**short sward & bare ground**
Nomada signata	**Apidae**	**Hymenoptera**	**[RDB 2]**	**open habitats**	**short sward & bare ground**
Melitta leporina	Melittidae	Hymenoptera	Local in Wales	open habitats	short sward & bare ground
Dolichovespula saxonica	Vespidae	Hymenoptera	[RDB K]	tree-associated	arboreal
Scotopteryx chenopodiata	Geometridae	Lepidoptera	Section 7 Priority Species - research only	open habitats	tall sward & scrub
Timandra comae	Geometridae	Lepidoptera	Section 7 Priority Species - research only	open habitats	tall sward & scrub
Acrocercops brongniardella **(mines)**	**Gracillariidae**	**Lepidoptera**	**Local**	**tree-associated**	**arboreal**
Panemeria tenebrata	Noctuidae	Lepidoptera	Local	open habitats	tall sward & scrub
Pammene aurana	Tortricidae	Lepidoptera	Local	open habitats	tall sward & scrub
Micromus angulatus	Hemerobiidae	Neuroptera	Local	open habitats	tall sward & scrub

3.2 Species of conservation interest

Of the **444** invertebrate species recorded at Kingcoed Meadows in 2025, **52** (**~12**%) are deemed to be of 'conservation interest' (i.e., species considered to be Nationally Local, Scarce or Rare, and/or are listed under Section 7 of the Environment (Wales) Act 2016 as species of 'principal importance' for the conservation of biological diversity in Wales'). These species are summarised in **Table 3** above and some discussed in further detail below.

3.2.1 Section 7 species

Section 7 of the Environment (Wales) Act 2016 requires the Welsh Ministers to publish and maintain a list of living organisms and types of habitat that are of principal importance for the purpose of maintaining and enhancing biodiversity in Wales (commonly referred to as the 'Section 7 list'). This list replaced the Section 42 list under the Natural Environment and Rural Communities (NERC) Act 2006 that previously applied in Wales. Section 7 also imposes a duty on public authorities (including Welsh Ministers) to 'take all reasonable steps to maintain and enhance the features of the listed species and habitats, and to promote the taking of such steps by others' when exercising their functions.

A total of **three** species recorded during the survey are listed under **Section 7** of the Environment (Wales) Act 2016. These are discussed below in alphabetical order by Order and then Species. One of these species has an additional conservation status, being classified as **Nationally Scarce** (**Na**). Where a species had more than one conservation status, their Section 7 status was given precedence and they were included within this subsection only.

***Eucera longicornis* (Hymenoptera: Apidae), Long-horned Bee, [Na]; Section 7**

The Long-horned Bee (*Eucera longicornis*) (**Figure 7**) is listed under Section 7 of the Environment (Wales) Act 2016 as a species of 'principal importance for the conservation of biological diversity in Wales'. Once a widespread and locally common species in southern Britain, this bee has declined substantially and is now considered one of Britain's most endangered bees.

It is found in a variety of habitats, including coastal grasslands, grazing levels, soft-rock cliffs and slopes, hay meadows, saltmarshes, riverbanks, and fens. It also occurs in open rides within deciduous woodland and, occasionally, in agricultural settings where it is presumed to nest in riverbanks. Suitable nesting habitat tends to be in areas with an abundance of key legume forage plants, such as bird's-foot trefoils (*Lotus* spp.), clovers (*Trifolium* spp.), everlasting peas (*Lathyrus* spp.), Kidney Vetch (*Anthyllis vulneraria*), and Meadow Vetchling (*Lathyrus pratensis*) (Buglife Cymru, 2018).

During the survey, two adult males were recorded on 10th June 2025 – one in Field A and one in Field B.

Figure 7: A Male Long-horned Bee (*Eucera longicornis*) © Liam Olds.

***Scotopteryx chenopodiata* (Lepidoptera: Geometridae), Shaded Broad-bar, Section 7 Priority Species - research only**

Shaded Broad-bar is widespread and fairly common throughout Britain, inhabiting a range of open habitats (Kimber, 2025a). The larvae feed on vetches (*Vicia* spp.) and clovers (*Trifolium* spp.). Adults fly in July and August.

During the survey, an adult was recorded in Field A on 9th July 2025. It should be noted, however, that Shaded Broad-bar was originally included within Section 42 of the NERC Act 2006 – which was subsequently adopted into the Environment (Wales) Act 2016 – for 'research purposes only'. As such, its current inclusion under Section 7 of the Environment (Wales) Act 2016 is not deemed warranted and the species is not considered of conservation priority in Wales.

***Timandra comae* (Lepidoptera: Geometridae), Blood-vein, Section 7 Priority Species - research only**

Blood-vein (*Timandra comae*) is an attractive, readily identifiable moth that is fairly common in the southern counties of England and Wales, but becomes much scarcer further north – seemingly absent from large areas of Scotland. The moth inhabits damp places, including hedgerows, ditches, wet meadows, gardens and woodland rides (Butterfly Conservation, 2025). The larvae are associated with low-growing plants such as dock (*Rumex* spp.), Common Sorrel (*Rumex acetosa*) and Knotgrass (*Polygonum aviculare*). Blood-vein is listed under Section 7 of the Environment (Wales) Act 2016 as a species of 'principal importance for the conservation of biological diversity in Wales', but for research purposes only.

During the survey, an adult was recorded in Field A on 10th June 2025. It should be noted, however, that Blood-vein was originally included within Section 42 of the NERC Act 2006 – which was subsequently adopted into the Environment (Wales) Act 2016 – for 'research purposes only'. As such, its current inclusion under Section 7 of the Environment (Wales) Act 2016 is not deemed warranted and the species is not considered of conservation priority in Wales.

3.2.2 Red Data Book 2 species

A total of **one** species recorded during the survey is categorised as **Red Data Book 2** (**RDB 2**), which is a now outdated conservation status that is somewhat equivalent to **Vulnerable** (**VU**).

***Nomada signata* (Hymenoptera: Apidae), Broad-banded Nomad Bee, [RDB 2]**

Broad-banded Nomad Bee (**Figure 8**) is a scarce cuckoo bee that parasitises only the Tawny Mining Bee (*Andrena fulva*). It is listed as Vulnerable (RDB 2) in the last published Red Data Book review of British bees, wasps and ants (Falk, 1991). It has never been common in Britain, although records suggest a slight increase in southern England in recent decades (Falk, 2025a). Like its host, it occurs in a wide variety of open habitats, including grasslands, brownfield sites, parks, gardens and clearings in broad-leaved woodland. It is known to forage on Dandelions (*Taraxacum officinale* agg.), willows (*Salix* spp.) and Wood Spurge (*Euphorbia amygdaloides*). The flight period runs from early April to late May.

During the survey, several putative adults (only one male retained for detailed examination) were observed hawking the face of a hedge near main gate into Field B, at grid reference centred at SO42990579 on 30th April 2025.

Figure 8: The cuckoo bee Broad-banded Nomad Bee (*Nomada signata*) © Liam Olds.

3.2.3 Nationally Rare species

A total of **three** species recorded during the survey are designated as **Nationally Rare** (**NR** or **RDB 3**). These are discussed below in alphabetical order by Order and then Species.

***Xysticus acerbus* (Araneae: Thomisidae), a crab-spider, NR**

Xysticus acerbus (**Figure 9**) is a rare and very local spider in Britain, with scattered records in southern England and South Wales. However, there does seem to be a slight increase in its distribution, at least in some areas. It occurs in a range of grassland habitats, including chalk and limestone grassland in Dorset, Hampshire, and Somerset; short meadow grassland in Sussex and Glamorgan; and sand dunes at Braunton Burrows (Devon). The spider has also been recorded on heathland and coastal undercliffs in Dorset (Spider and Harvestman Recording Scheme data, 2025a). Current threats to this species are difficult to assess due to its varied habitats, but the loss of unimproved grassland in general is likely to be detrimental, and such grasslands should be best maintained by grazing.

During the survey, three adult females were encountered in Field A by sweep-netting: two on 30th April 2025 and one on 10th June 2025. All three were recorded at, or very close to, grid reference SO42830577.

***Villa cingulata* (Diptera: Bombyilidae), Downland Villa, NR**

Downland Villa (**Figure 10**) is a scarce species across southern Britain. It is recorded from scattered localities in south-central England and, since its discovery in 2018, is now known from several sites in south-east. Listed as Nationally Rare in Drake (2017), this thermophilic (warmth-loving) bee-fly is currently undergoing a significant range expansion and population increase, presumably in response to climate change.

Typical habitat comprises south-facing scrubby chalk and limestone grassland and large clearings in calcareous woodland (Falk, 2025a), but it has recently been spreading into neutral and slightly acidic grasslands. The flight period runs from June to August, peaking from mid-July to mid-August.

Little is known of its biology, but the host is suspected to be the caterpillar of a noctuid moth associated with calcareous grassland. Adults frequently visit flowers of umbellifers, particularly Wild Parsnip (*Pastinaca sativa*) and Hogweed (*Heracleum sphondylium*).

During the survey, three adults were recorded on umbellifers in Field B on 9th Jul 2025.

***Lygus pratensis* (Hemiptera: Miridae), a plant-bug, RDB 3**

The plant bug *Lygus pratensis* was previously a rare species and mostly confined to heaths in southern Britain, but it has undergone a rapid range expansion in recent decades and is now widespread and patchily distributed throughout much of Britain in various habitats (NatureSpot, 2025a). As such, it is now much commoner than its RDB 3 status suggests and its conservation status requires downgrading.

During the survey, adults were recorded in Fields A and B on 10th June 2025.

Figure 9: The crab spider *Xysticus acerbus* © Liam Olds.

Figure 10: Downland Villa (*Villa cingulata*) © Christian Owen.

3.2.4 Nationally Scarce species

A total of **eight** species recorded during the survey are designated as **Nationally Scarce** (**NS**, **Notable**, **Na** or **Nb**). These are discussed below in alphabetical order by Order and then Species.

***Pardosa tenuipes* (Araneae: Lycosidae), a wolf-spider, NS**

The wolf spider *Pardosa tenuipes* (previously known as *P. proxima*) is a very localised species in Britain and is categorised as Nationally Scarce (Harvey et al. 2017). It is chiefly recorded from southern and south-east England and South Wales, with scattered records reaching as far north as North Wales, the Midlands, and south-west Scotland (Spider Recording Scheme data, 2025b). It occurs in a variety of sparsely vegetated, usually damp habitats, but is most characteristic of coastal sites such as earthy cliffs, grazing marsh, saltmarsh, dune slacks, and streamside shingle or gravel. It is also known from lowland heathland, damp meadows, and occasionally gardens. Adults are mainly spring/summer species: males are mature from April to June (peak May-June), females from May to July and sometimes persist into August or very early September.

During the survey, an adult female was encountered by suction-sampling in Field A at grid reference centred around SO42850579 on 10th June 2025.

***Protapion difforme* (Coleoptera: Apionidae), a seed-weevil, Nb**

The seed weevil *Protapion difforme* is a local species in central and southern England and South Wales in damp grassland (Duff, 2016). Its biology is unknown but in continental Europe, it is associated with various clovers (*Trifolium* spp.).

During the survey, an adult female was encountered by sweep-netting in Field A on 10th June 2025.

***Protapion varipes* (Coleoptera: Apionidae), a seed-weevil [Nb]; Nb**

Protapion varipes (**Figure 11**) is a rare species in Britain, where it is found locally in central and southern England, becoming very local in northern England, Wales and south-east Scotland (Duff, 2016). The beetle is associated with Red Clover (*Trifolium pratense*); however, the biology of this species is currently unknown.

During the survey, adults were recorded in both fields: Field A on 30th April and 20th August 2025, and in Field B on 30th April and 10th June 2025.

Figure 11: A carded *Protapion varipes* © Liam Olds.

***Acupalpus exiguus* (Coleoptera: Carabidae), a ground-beetle, NS**

The ground beetle *Acupalpus exiguus* is a scarce species in Britain. It is local in the southern regions of south-east England and very local elsewhere (rare in Wales). The beetle is most frequently found on the coast – on seashores and in saltmarshes – but also occurs inland on river margins, in grassland on clay soils, and amongst debris on mud or silt at the edges of freshwater bodies (The Essex Field Club data, 2025).

During the survey, five adults were encountered by suction-sampling at various damp locations in both Fields A and B on 30th April 2025.

***Hypera meles* (Coleoptera: Curculionidae), Clover Head Weevil, Nb**

The Clover Head Weevil is a widespread but scarce species in southern Britain, where it can be found in a variety of habitats that support an abundance of its food plants, clovers (*Trifolium* spp.), especially Red Clover (*T. pratense*). It appears, however, to be increasing in abundance in England, though it remains scarce in Wales at present.

During the survey, two adults were encountered by suction-sampling: one in Field A on 10th June 2025 and in Field B on 30th April 2025.

***Oedostethus quadripustulatus* (Coleoptera: Elateridae), a click-beetle, Na; new for VC**

Oedostethus quadripustulatus (synonym: *Hypnoidus quadripustulatus*) is one of our smallest click beetles (3-3.5 mm), superficially resembling *Zorochros minimus* with its pale humeral and apical elytral spots. It is a widespread but local species in Britain (Mendel, 2024), becoming scarcer in western England, Wales, and Scotland; in Wales it is mostly found in the north. The beetle is associated with wet habitats, including wet meadows and fen margins. Mendel (2024), comments that *O. quadripustulatus* appears to be declining in recent decades, probably as result of flood-prevention measures, drainage works, and the general lowering of water-tables, which have led to the loss of many wet meadows. The larvae live in the soils and migrate to the upper surface to pupate. Adults can be found from April to September but are mostly recorded in second half of June and in July.

During the survey, two adults were encountered by suction-sampling along a field margin in Field A (grid reference centred around SO42770573) on 9th July 2025.

***Acanthiophilus helianthi* (Diptera: Tephritidae), Knapweed Ghost, Notable**

The Knapweed Ghost (**Figure 12**) is an uncommon fly in Britain, patchily recorded across southern England and Wales (NatureSpot, 2025b). It has a wide range of host plants including knapweeds, Musk Thistle (*Carduus nutans*), and Safflower (*Carthamus tinctorius*). Adults can be seen from May to October, peaking from July to August.

During the survey, two adults were encountered in Field B by sweep-netting vegetation at grid reference centred around SO42990575 on 9th July 2025.

Figure 12: Image of a Knapweed Ghost (*Acanthiophilus helianthi*) © Liam Olds.

***Scottianella dalei* (Hemiptera: Delphacidae), a planthopper, Nb; new for Wales**

Males of *Scottianella dalei* (**Figure 13**) are small a striking species of planthopper, being a yellowish to pale golden brown, with a black scutellum, and dominantly black abdomen. While females are entirely light yellow-brown. The planthopper is a relatively rare species in Britain, known mostly from the southern counties of England, where it is associated with open grassland (British Bugs, 2025a).

During the survey, two adult males and one possible female were encountered in Field A by sweep-netting and suction-sampling on 30th April 2025, and one adult male encountered by sweep-netting in Field B on 10th June 2025. **Note**: These appear to be among the first recorded occurrences of this species in Wales; an adult male had also been recorded during the Trellech Wet Meadows survey on 29th April 2025.

Figure 13: An adult male *Scottianella dalei* preserved in solution © Christian Owen

3.2.5 Nationally Local species

A total of **thirty-three** species recorded during the survey are considered **Nationally Local** or considered **Local in Wales**; of which **29** species are discussed below in alphabetical order by Order and then Species.

***Araneus triguttatus* (Araneae: Araneidae), an orb-weaver spider, Local; scarce in Wales**

Araneus triguttatus is a widespread but local species in Britain, with most recent records coming from central and southern England; it is rare in Wales. Older records for the spider from northern England and Scotland probably refer to the similar *Araneus sturmi*, the two species having often been confused in the past. The spider typically inhabits deciduous woodland, typically building its web on broad-leaved trees and shrubs, particularly oaks (*Quercus* spp.). Adults are present from early to mid-summer; some females persist into late summer (Spider Recording Scheme data, 2025c).

During the survey, an adult male was encountered by beating an oak in Field B at grid reference centred around SO43130573 on 30th April 2025.

***Gibbaranea gibbosa* (Araneae: Araneidae), an orb-weaver spider, Local in Wales**

The spider *Gibbaranea gibbosa* can be found on trees and shrubs (especially evergreens) in hedgerows, woodland, and in open scrubby areas (Spider and Harvestman Recording Scheme data, 2025d). Although never particularly common, it is widespread in eastern and southern England, with scattered records north to northern Scotland and west to Wales.

During the survey, an adult male was encountered in Field A by beating branches in the hedgerow at grid reference SO42760576 on 10th June 2025.

***Piratula latitans* (Lycosidae: Araneae), a wolf-spider, Local**

Piratula latitans is a widespread but local species of wolf spider in much of the southern half of Britain; it becomes very scattered in northern England and only just reaches south-west Scotland. The spider inhabits the ground layer of open marsh, fen, and damp grassy habitats. Compared with other *Pirata/Piratula* species, it is less closely associated with Sphagnum bogs, although it does occur on *Sphagnum*. It is frequently found at the edge of open water, across which it will readily run (Spider and Harvestman Recording Scheme data, 2025e).

During the survey, the spider was recorded in Field A along the damp area of taller grass at a grid reference centred at SO42770573 on 30th April 2025.

***Cheiracanthium erraticum* (Araneae: Miturgidae), a prowling-spider, Local**

The prowling spider *Cheiracanthium erraticum* has a widespread but scattered distribution in Britain, especially in the west. It occurs low down in rough vegetation and heather, where it can often be found in a retreat constructed from two or three leaves, or grass heads stitched together, which will hold the female and egg sac (Spider & Harvestman Recording Scheme data, 2024f).

During the survey, the spider was recorded in both Fields A and B, along the uncut strip on 20th August 2025. Field A at grid reference SO42910585 and Field B at grid reference SO43020580.

***Xysticus kochi* (Araneae: Thomisidae), a crab-spider, Local**

The crab spider *Xysticus kochi* is a widespread species in Britain but with a patchy and scattered distribution, found mainly in the south (Spider & Harvestman Recording Scheme data, 2024g). It tends to favour warm and dry conditions, in open and sparsely vegetated habitats such as dunes, ruderal habitats, vegetated shingle, old sand and chalk pits, and south facing escarpments.

During the survey, the spider was encountered by suction-sampling in Field B at grid reference centred around SO43020574 on 30th April 2025.

***Anaspis pulicaria* (Coleoptera: Scraptiidae), a false flower-beetle, Local; scarce in Duff**

The false flower beetle *Anaspis pulicaria* is one of eleven species in two subgenera currently recognised in Britain (Duff, 2020). The beetle is most often encountered in open habitats on flowers, especially the umbels of Apiaceae. According to Duff (2020), this species is local in central and southern England and Wales, and is considered scarce overall in Britain.

During the survey, adults were encountered in Field B by sweep-netting the lower hedge at grid reference centred around SO43160581 on 10th May 2025, and recorded in Field A on the flowers of rose (*Rosa* sp.) growing in the hedge at grid reference SO42760574 on 10th June 2025.

***Anthicus antherinus* (Anthicidae: Coleoptera), an ant-like flower beetle, Local in Wales**

Anthicus antherinus is a small (2.8-3.7 mm) ant-like flower beetle and one of five species in the genus known to occur in Britain (Duff, 2020). Both the larvae and adults are omnivorous scavengers and opportunistic predators, typically associated with dry, decaying vegetation. The species is widespread in central and southern England, becoming scarcer in the west. It appears scarce in Wales, where records are very patchy.

During the survey, an adult beetle was encountered by suction-sampling along the uncut strip (grid reference centred on SO42850582) in Field A on 20th August 2025.

***Cryptocephalus moraei* (Coleoptera: Chrysomelidae), a pot beetle, local**

The pot beetle *Cryptocephalus moraei* is mostly associated with st. john's-wort (*Hypericum* spp.), especially Perforate St. John's-wort (*Hypericum perforatum*) (UK Beetle Recording, 2025). It is typically found on calcareous grassland that contains an abundant mixture of herbaceous vegetation, especially on dry hillsides exposed to the sun, but it may also occur on heathland, road verges and embankments, wetland margins, and woodland. The beetle is widespread but local in southern Britain below The Wash; it is generally absent from the West Country, although it tends to be more sporadic and rare further north to Scotland's border.

During the survey, two adults were recorded in Field B on 10th June 2025.

***Phyllotreta astrachanica* (Coleoptera: Chrysomelidae), a flea-beetle, Local; scarce in Duff**

The flea beetle *Phyllotreta astrachanica* (synonym: *Phyllotreta diademata*) is associated with a variety of wild and cultivated Brassicaceae (Duff, 2016), including Garlic Mustard (*Alliaria petiolate*), Hoary Cress (*Lepidium draba*), Marsh Yellow-cress (*Rorippa palustris*), Radish (*Raphanus sativus*), and Woad (*Isatis tinctoria*). The beetle can also be encountered while hibernating in moss, leaf litter, old birds' nests, and under bark of trees. According to Duff

(2016), this species is local in south-west England and South Wales, and is considered to be scarce overall in Britain.

During the survey, one male and possible two females were encountered by sweep-netting in Field A on 30th April 2025.

***Phyllodrepa floralis* (Coleoptera: Staphylinidae), an omaliine rove-beetle, Local; scarce in Duff**

Phyllodrepa floralis is a rove beetle in the tribe Omaliini, and it is one of four species within the genus. It can be encountered in decaying vegetation and on flowering rosaceous trees and shrubs, especially hawthorn (*Crataegus* spp.), but it can also be found in bird droppings and nests in wooded situations (Duff, 2024). The beetle is considered to be local in central and south-east England and Wales, and very local elsewhere in Britain. According to Duff (2024), this species is scarce overall, but it can occasionally be frequent.

During the survey, an adult male was encountered by sweep-netting Hawthorn (*Crataegus monogyna*) flowers in Field A, at grid reference centred around SO42800579 on 30th April 2025.

***Sitona ambiguus* (Coleoptera: Curculionidae), a weevil, Local**

Sitona ambiguus is one of 15 species in the genus that are known to occur in Britain. This beetle is associated with various herbaceous Fabaceae, notably Bush Vetch (*Vicia sepium*) and Yellow Vetchling (*Lathyrus aphaca*). It is a widespread but localised weevil in Britain, though it can sometimes be abundant (Duff, 2016).

During the survey, several adult beetles were encountered in Field A by suction-sampling within grid reference SO428057 on 10th June 2025.

***Syntomus obscuroguttatus* (Coleoptera: Carabidae), a ground-beetle, Local in Wales**

Syntomus obscuroguttatus is one of three small (~3.0-3.8 mm) black beetles within the genus *Syntomus* known to occur in Britain. It is readily identified within the genus by the absence of elytral foveate punctures (which are present in *S. foveatus*) and obscure pale 'shoulder' patches. The beetle inhabits damp, vegetated clayish soils, often near water, or in litter on somewhat dry cultivated soils (Duff, 2012).

During the survey, the beetle was frequently encountered by suction-sampling various locations in Field A on 9th July 2025, and Field B on 9th July and 20th August 2025.

***Chrysotus laesus* (Diptera: Dolichopodidae), a long-legged fly, Local**

The long-legged fly *Chrysotus laesus* is a widespread but localised species in southern Britain, and is fairly scarce in northern England and Wales. There are a few very old Scottish records, approximately 217 miles north of the nearest English records; however, these may be misidentifications or otherwise erroneous (Drake, 2018).

During the survey, two adults were recorded in Field B on 10th June 2025.

***Exorista rustica* (Diptera: Tachinidae), the Sawfly Exorista, Local in Wales**

The Sawfly Exorista is a tachinid fly that lays eggs on the larvae of sawflies, species such as *Dolerus* spp. It is the most frequently encountered species of *Exorista* and is common throughout much of lowland England, but becomes much scarcer in Scotland and Wales (Falk, 2025c). The fly occurs in a wide range of open habitats, including grassland, heathland, woodland clearings, and rides. Adults are on the wing from May to September

and frequently visit flowers of various umbellifers, particularly Hogweed (*Heracleum sphondylium*), Wild Angelica (*Angelica sylvestris*), Wild Carrot (*Daucus carota*), and Wild Parsnip (*Pastinaca sativa*).

During the survey, an adult male was encountered by sweep-netting in Field A, at grid reference centred SO42930576 on 20th August 2025.

***Pipunculus lenis* (Diptera: Pipunculidae), a big-headed fly, Local**

Pipunculus lenis (synonym: *Pipunculus thomsoni*) is a species in the family Pipunculidae, commonly known as big-headed flies. The larvae of almost all members of this family develop as parasitoids, almost exclusively in Auchenorrhyncha (leafhoppers, planthoppers, etc.). The only exception is the genus *Nephrocerus* (currently represented by two species in Britain), whose larvae parasitise adult craneflies (Tipulidae) (Wikipedia, 2025).

The fly is widespread but patchily distributed in Britain. However, *P. lenis* (*P. thomsoni*) and *P. campestris* are regarded as the commonest and most widespread British species of the genus and may be more common than current maps suggest. They are frequently encountered on brambles along woodland edges on dry, sunny summer days, often together with another big-headed fly, *Verrallia aucta* (Coe, 1966).

During the survey, the fly was recorded in Field B on 20th August 2025.

***Phasia obesa* (Diptera: Tachinidae), Stripe-backed Phasia, Local in Wales**

Stripe-backed Phasia, a tachinid fly, is a parasitoid of various heteropteran bugs. Recorded hosts include: Blue Shieldbug (*Zicrona caerulea*) and Small Grass Shieldbug (*Neottiglossa pusilla*) (Pentatomidae); Short-winged Rhopalid (*Myrmus miriformis*) (Rhopalidae); Meadow Plant Bug (*Leptopterna dolabrata*), *Lygus pratensis* (Miridae); and Coastal Groundbug (*Beosus maritimus*) (Lygaeidae) (Falk, 2025d).

The fly is fairly common in the southern half of England but it is scarce in Wales, northern England, and Scotland. Adults are on the wing from May to October and frequently visit flowers of umbellifers, composites (especially daisy-family species), and ivies (*Hedera* spp.). It occurs in a wide range of habitats, including brownfield sites, dry grasslands, woodland rides and clearings, and even gardens, where it often occurs alongside *P. pusilla* (Falk, 2025d).

During the survey, a large adult male was encountered in Field A, at grid reference centred around SO42930576 on 20th August 2025.

***Pollenia amentaria* (Diptera: Polleniidae), Black-bellied Clusterfly, Local**

The Black-bellied Clusterfly (*Pollenia amentaria,* synonym: *P. vespillo*) is a widespread but localised species in Britain. It has become more frequent in recent years, especially in the north and west, where it occurs in a wide range of habitats. Like other Pollenia species, its larvae are believed to parasitise earthworms. Adults visit a variety of flowers. *P. amentaria* is the most easily recognised British clusterfly owing to the absence of obvious grey dusting on the abdomen – the tergites are entirely black (Falk, 2015e).

During the survey, the fly was recording in Field B on 9th July 2025.

***Sphaerophoria taeniata* (Diptera: Syrphidae), Broad-banded Globetail, Local**

Broad-banded Globetail is a widespread but localised southern species of hoverfly that is currently expanding its range (Falk, 2025f). It favours dry flowery habitats such as

calcareous and neutral grasslands, brownfield sites and arable margins but occasionally turns up in damper habitats or broader woodland rides.

During the survey, adult males were recording in Field A on 9th July 2025, and in Field B on 10th June and 9th July 2025.

***Tricogena rubricosa* (Diptera: Calliphoridae), Red-shinned Woodlouse-fly, Local**

The Red-shinned Woodlouse-fly is one of eight British species within the subfamily Rhinophorinae, all of which are internal parasitoids of woodlice. It occurs in a variety of habitats, including acid and chalk grassland, brownfield sites, heathland, and coastal dunes, particularly where coarse grassland is present. It is widespread but localised in Britain, with scattered records throughout central and southern England and Wales, becoming scarcer in Scotland. The fly has been reared from the Common Rough Woodlouse (*Porcellio scaber*), although, most species in the subfamily seem to use a range of host woodlice, and it is likely that humidity, insolation, and the precise nature of the ground conditions can influence which woodlouse-fly species are present (Falk, 2025g).

During the survey, an adult male was recorded on Hogweed in Field B, at grid reference SO43030579 on 10th June 2025.

***Anoscopus flavostriatus* (Hemiptera: Cicadellidae), a leafhopper, local**

The leafhopper *Anoscopus flavostriatus* is a locally distributed species in Britain, associated with various grass species and typically in damp places (British Bugs, 2025b). Males are distinctive: the forewings are patterned with alternating dark and pale streaks and have a dark band near the apex. The scutellum is orange-brown to pale orange, and the complex pattern on the vertex is characteristic and consistent.

During the survey, the leafhopper was recorded in Field B on 9th July 2025.

***Edwardsiana frustrator* (Hemiptera: Cicadellidae), a leafhopper, Local**

Edwardsiana frustrator is a small (3.5-4 mm) pale yellow, often yellow leafhopper that can be found widely across central England and south-east Wales (UK Bugs, 2025c). It is associated with a wide variety of trees, including, cherries (*Prunus* spp.), Beech (*Fagus sylvatica*), Hazel (*Corylus avellana*), and oaks (*Quercus* spp.), but often in small numbers.

During the survey, and adult male was encountered by sweep-netting a hedge in Field A at grid reference centered at SO42930587 20th August 2025.

***Heterocordylus genistae* (Hemiptera: Miridae), a plant-bug, Local**

The plant-bug *Heterocordylus genistae* has a widespread but scattered distribution across Britain, where it is associated with Dyer's Greenweed (*Genista tinctoria*), its primary host. Adults mainly occur from May-July.

During the survey, an adult male was recorded in Field B on 10th June 2025. There are seemingly few records of this species in Wales.

***Miridius quadrivirgatus* (Hemiptera: Miridae) a plant-bug, Local**

The plant-bug *Miridius quadrivirgatus* is a species with a predominantly southern distribution in Britain. It occurs locally from Pembrokeshire to Suffolk, where it is associated with various grasses in dry grasslands. Historically, this bug was mainly coastal, but in recent decades it has become more common inland. Population numbers tend to fluctuate greatly from year to year (British Bugs, 2025d).

During the survey, the bug was encountered by sweep-netting at various locations in Fields A and B on 9th July 2025.

***Pilophorus perplexus* (Hemiptera: Miridae), a plant-bug, Local**

The plant bug *Pilophorus perplexus* occurs widely across central and southern England, and scattered across south-east Wales. The is associated with a range of tree species, often on oaks (*Quercus* spp.) (British Bugs, 2025e).

During the survey, two adults were encountered by sweep-netting the lower branches of tree in Field B at grid reference on SO43130572 20th August 2025.

***Melitta leporina* (Hymenoptera: Melittidae), Clover Melitta, Local in Wales**

The Clover Melitta (*Melitta leporina*) (**Figure 14**), is one of Britain's two smaller (10-11 mm), banded *Melitta* (blunt-horned mining bees) species. It is widespread in southern Britain, north to Yorkshire, but is most frequently recorded in the southernmost counties. It occurs in a variety of legume-rich habitats, including acid and chalk grassland, brownfield sites, heathland, grazed upper saltmarsh, and coastal grazing marsh. The species shows a preference for habitats with abundant short-flowered clovers, such as Strawberry Clover (*Trifolium fragiferum*) and White Clover (*T. repens*). It also regularly visits bird's-foot trefoils (*Lotus* spp.), melilots (*Melilotus* spp.) and vetches (*Vicia* spp.), but will also forage on non-leguminous plants such as composites (Falk, 2025h). The Nationally Scarce nomad bee *Nomada flavopicta* is a confirmed host for this species.

During the survey, an adult male was recorded in Field A on 9th July 2025.

Figure 14: The Clover Melitta (*Melitta leporina*) © Liam Olds.

***Acrocercops brongniardella* (Lepidoptera: Gracillariidae), Oak Cloud, Local**

The Oak Cloud is a micromoth whose larvae produce large, characteristic silvery blotch mines on oak (*Quercus* spp.). In Britain, it is regarded as a very local species, occurring primarily in southern England and parts of Wales (Kimber, 2025b). It is typically found in open woodland and mature hedgerows. The species is univoltine (one brood or generation per year), with adults on the wing mainly from late July to early August, although individuals that have overwintered as adults may reappear in April and May.

During the survey, vacated mines (**Figure 15**) were observed on oak (*Quercus* sp.) in **Field B** at grid reference SO43130572 on 20th August 2025.

Figure 15: A vacated mine of the Oak Cloud micromoth (*Acrocercops brongniardella*) on Oak (*Quercus*) © Christian Owen.

***Panemeria tenebrata* (Lepidoptera: Noctuidae), Small Yellow Underwing, Local**

The Small Yellow Underwing moth typically inhabits – but is not limited to – open grassy areas, such as flower-rich meadows and grassy downland. It is a day-flying species and prefers sunny conditions to be on the wing. It is widespread but locally distributed in Britain as far north as southern Scotland (UK Moths data, 2025b). The larvae feed on the flowers and seeds of mouse-ears (*Cerastium* spp.), especially Common Mouse-ear (*Cerastium holosteoides*).

During the survey, the moth was disturbed on several occasions while walking through Field A on 30th April 2025.

***Pammene aurana* (Lepidoptera: Tortricidae), Double Orange-spot, Local**

The Double Orange-spot (**Figure 16**) is a distinctive moth species characterised by chocolate-coloured wings with three large yellow-orange blotches: one on each forewing and one centrally. It is a day-flying species whose larvae feed on the seeds of Hogweed (*Heracleum sphondylium*). The larvae spin the developing seeds together to form a protective cluster and feed inside this spinning. Adults are on the wing in June, July, and September, and can often be seen on the flowers of their foodplant. The species hibernates as a pupa in a cocoon on the ground. It is distributed throughout Britain, though it is often localised (Kimber, 2025c).

During the survey, an adult was observed on Hogweed in **Field B** at grid reference SO42990575 on 9th July 2025.

Figure 16: Double Orange-spot (*Pammene aurana*) on Hogweed © Christian Owen.

***Micromus angulatus* (Neuroptera: Hemerobiidae), a brown lacewing, Local**

This brown lacewing *Micromus angulatus* is widespread but very local, and usually scarce, in England and Wales (Plant, 1997); it appears to be absent from Scotland. The habitat preferences of this species remain unclear; it has been recorded from both acid and calcareous grasslands, as well as from gardens and scrub (Plant, 1997). My own observations suggest that it has a preference for dry, open areas, as I have collected it from dunes, heathland, and dry grassland – although this may differ for other recorders.

During the survey, a single adult was taken by suction-sampling in Field A at grid reference centred on SO42870578 on 9th July 2025.

3.2.6 Insufficiently Known (RDB K)

A total of **one** species recorded during the survey are considered as Red Data Book K (RDB K); this status denotes species in Great Britain that are suspected, but not definitely known, to belong to RDB 1, RDB 2 or RDB 3 categories because of a lack of information. This conservation status is a now outdated and has since been replaced by Data Deficient (DD).

***Dolichovespula saxonica* (Hymenoptera: Vespidae), Saxon Wasp, RDB K**

Saxon Wasp was first recorded in Britain from Surrey in 1987 and was subsequently categorised as RDB K in Falk (1991), but it has since become well established over much of Britain (Falk, 2025i). As such, its RDB K status requires review. Nests can be suspended from twigs in bushes and trees or located in cavities of various sorts. The males are usually seen on the flowers of umbellifers, brambles and thistles in late summer. Spring queens are particularly attracted by willows (*Salix* spp.) catkins and Bilberry (*Vaccinium myrtillus*) flowers.

During the survey, the wasp was recorded within Field B on flowering Hogweed on 9th July 2025.

3.2.7 Other species of interest

A total of **three** other species recorded during the survey were also considered noteworthy. Two of these have been discovered in Britain only fairly recently, so their conservation status remains unclear. They are discussed below in alphabetical order by Order and then by Species.

***Bruchidius varius* (Coleoptera: Chrysomelidae), a seed beetle, Other**

The seed beetle *Bruchidius varius* was first recorded from a single specimen found in East Sussex in 1994 (Hodge, 1997), and has since rapidly spread through much of the southern half of Britain. The beetle is mostly associated with Red Clover (*Trifolium pratense*) and Zigzag Clover (*T. medium*), but adults can sometimes be found feeding on pollen of flowering hawthorns (*Crataegus* spp.).

This species occurs in woods, chalk pits grasslands and roadside verges (Duff, 2016). In Wales, it is mostly known to occur in south-east Wales where it currently remains fairly local but seemingly spreading.

During the survey, three adults were encountered by sweep-netting and suction-sampling with Field A on 10th June 2025.

***Orius laticollis* (Hemiptera: Anthocoridae:), a minute pirate-bug, Other**

The minute pirate bug *Orius laticollis* is a patchily distributed and apparently local species in central and southern Britain, with few records from Wales; however, it may be under-recorded owing to identification difficulties. This predatory bug occurs on various trees, preferring willows (*Salix* spp.), where it feeds primarily on small insects, their larvae, and eggs – notably spider mites, thrips, and aphids – although it will also consume pollen and plant sap (Plant Parasites of Europe, 2025).

During the survey, two adult males were encountered by sweep-netting the hedgerow in Field A, at grid reference centred around SO42850582 on 9th July 2025.

***Phasia barbifrons* (Diptera: Tachinidae), Yellow-clubbed Phasia, a fly, Other**

Yellow-clubbed Phasia was added to the British list by Clemons (2001), based on specimens from Kent and Surrey. It has since proved to be widespread in southern Britain, with records extending north to Yorkshire. The species was previously confused with the apparently more common *Phasia pusilla*, and may simply have been overlooked rather than representing a recent colonist (Falk, 2025j).

The fly inhabits a wide range of habitats but appears to prefer damper and lusher situations compared to *P. pusilla*. Adults are on the wing from May to October and visit flowers of umbellifers (e.g. Hogweed – *Heracleum sphondylium*, Burnet-saxifrage – *Pimpinella saxifraga*), composites (e.g. Tansy – *Tanacetum vulgare*, goldenrods – *Solidago* spp.) and ivies (*Hedera* spp.). The larval hosts of this species remain unknown, but those of the closely related *P. pusilla* include species in the families Lygaeidae, Cydnidae, and Anthocoridae.

During the survey, an adult male was encountered on 9th July 2025 in Field A by sweep-netting the vegetation at grid reference centred on SO42860579.

Figure 17: Yellow-clubbed Phasia (*Phasia barbifrons*) on Hogweed © Christian Owen.

4.0 DISCUSSION

A total of **444** invertebrate species were identified during the 2025 survey of Kingcoed Meadows. Of these, **52** (**~12**%) are deemed to be of 'conservation interest'.

Species deemed to be of conservation interest recorded during the survey include:

- **3** x **Section 7** species (one of which is **Nationally Scarce** (**Na**), and two are research-only);
- **1** x **Vulnerable** (**VU** or **RDB 2**) species;
- **3** x **Nationally Rare** (**NR** or **RDB 3**) species;
- **8** x **Nationally Scarce** (**NS**) or **Notable** (**Na** or **Nb**) species (one of which in new to Wales, and another new for VC 35);
- **33** x **Nationally**/**Wales Local** species;
- **1** x **Insufficiently Known** (**RDB K**) species; and
- **3** x **Other** species of interest.

The presence of **52** species of 'conservation interest' – a notable total given the limitations highlighted in **Section 1.3** – clearly demonstrates that Kingcoed Meadows is an important refuge for a number of rare and scarce invertebrates that are declining in the wider countryside, as well as for habitat specialists, many with restricted distributions. Some of these species are particularly significant in a regional (vice-county), Welsh, and/or British context. For example, Kingcoed Meadows:

- Supports 3 x priority species listed under Section 7 of the Environment (Wales) Act 2016: the Long-horned Bee and two moths (Blood-vein and Shaded Broad-bar – both research-only species).

- Supports 1 x Red Data Book 2 (RDB 2) species: Broad-banded Nomad Bee.

- Supports 3 x 'Nationally Rare' (NR or RDB 3) species: Downland Villa, *Lygus pratensis,* and *Xysticus acerbus*.

- Supports good numbers of beetle species (119 in total), 16 of which are of 'conservation interest', including the weevils *Hypera meles*, *Protapion difforme*, *Protapion varipes*, and *Sitona ambiguus*; the ground beetles *Acupalpus exiguus*, and *Syntomus obscuroguttatus*; the click beetle *Oedostethus quadripustulatus*; and the flea beetle *Phyllotreta astrachanica*.

- Supports species that are seldom recorded in Wales (13 species in total): *Acupalpus exiguus*, *Anthicus antherinus*, *Araneus triguttatus*, *Hypera meles*, Downland Villa*, Edwardsiana frustrator*, *Oedostethus quadripustulatus*, *Syntomus obscuroguttatus*, *Protapion difforme*, *Pilophorus perplexus*, *Protapion varipes*, *Phyllotreta astrachanica,* and *Xysticus acerbus*.

- Supports two species that have only recently been recorded as new to Britain, namely the seed beetle *Bruchidius varius* and the tachinid fly Yellow-clubbed Phasia.

- Supports one species recorded as new to Wales – the planthopper *Scottianella dalei* – and one new for the vice-county of Monmouthshire (VC 35) – the click beetle *Oedostethus quadripustulatus*.

4.1 Analysis of Species Data

The complete list of **444** invertebrate species recorded was analysed using Pantheon, an analytical tool developed by Natural England and the Centre for Ecology & Hydrology (CEH) for assessing invertebrate assemblages. Of these, **387** species (approximately **87**%) were successfully assigned habitat scores, indicating a high matching success rate and enabling a robust analysis of habitat associations.

Pantheon was used to identify the key habitat assemblages at Kingcoed Meadows, focusing on those characterised by more widespread species. The Broad Assemblage Types (BATs) used in the predecessor system, ISIS, have been superseded by the more comprehensive "Habitats" category in Pantheon. These updated Habitats serve a similar role but incorporate a broader range of species, reflecting advancements in ecological knowledge and providing a more accurate representation of invertebrate-habitat relationships.

Using the 387 species with habitat allocations, Pantheon generated a summary of the main habitat assemblages (**Table 4**).

Table 4. Main habitat assemblages identified at Kingcoed Meadows from Pantheon analysis.

Broad biotope	Habitat	No. of species	% representation	SQI
open habitats	tall sward & scrub	215	8	115
open habitats	short sward & bare ground	34	3	126
tree-associated	arboreal	32	2	100
tree-associated	shaded woodland floor	22	2	100
tree-associated	decaying wood	20	2	100
wetland	marshland	19	2	147
wetland	acid & sedge peats	14	1	100
wetland	running water	6	<1	150
tree-associated	wet woodland	4	2	100
wetland	wet woodland	4	1	100
wetland	lake	1	<1	100
open habitats	upland	1	<1	100
coastal	saltmarsh	1	<1	100
coastal	brackish pools & ditches	1	<1	400

Table 4 lists broad biotopes and specific habitats, together with three key metrics: number of species, percentage representation (% representation), and Species Quality Index (SQI). These provide insights into species richness, the extent to which the sample represents characteristic species for each habitat, and the overall conservation quality of the assemblage based on rarity and threat status. Entries based on 15 or fewer species are flagged in Pantheon outputs (highlighted in red in Table 4) with a warning, as the SQI is calculated from a very small sample size and is therefore statistically unreliable. This caution prevents over-interpretation of the conservation significance of these minor or incidental habitat assemblages.

The dominant assemblage is open habitats – tall sward & scrub, with **215** species. This indicates that the site is primarily characterised by grassland with taller vegetation and scrub elements. The SQI of 115 is moderate (100 represents a typical assemblage of widespread

species), suggesting a reasonable presence of rarer or more threatened species, including the 'Nationally Rare' Downland Villa (*Villa cingulata*) and the spider *Xysticus acerbus*, along with several 'Nationally Scarce' species such as the weevils *Hypera meles*, *Protapion difformе*, and *P. varipes*; the click beetle *Oedostethus quadripustulatus*; and the planthopper *Scottianella dalei*. However, the % representation of only 8% is low; Pantheon guidelines indicate that 10-20% represents good quality and ≥21% a strong proportion of characteristic species. Values below 10% typically reflect incomplete sampling rather than poor habitat condition.

The next most species-rich assemblage is open habitats – short sward & bare ground (**34** species). This highlights patches of shorter turf and exposed substrate, most evident in Field A. It has a higher SQI (126) but an even lower % representation (3%), and includes notable species such as the Section 7 Priority Species Long-horned Bee (*Eucera longicornis*), the Red Data Book 2 (RDB 2) Broad-banded Nomad Bee (*Nomada signata*), and the 'Nationally Scarce' Knapweed Ghost (*Acanthiophilus helianthi*).

Tree-associated assemblages (arboreal, shaded woodland floor, decaying wood, and wet woodland) collectively contribute around **78** species, all with baseline SQIs of 100 and low % representation (1-2%). These are represented by notable species such as – the 'Nationally Local' Oak Cloud moth (*Acrocercops brongniardella*), the longhorn *beetle Anaglyptus mysticus*, the beetle *Anaspis pulicaria*, the spider *Araneus triguttatus*, the flea beetle *Crepidodera aurea*, the leafhopper *Edwardsiana frustrator*, the spider *Gibbaranea gibbosa*, the beetle *Phyllodrepa floralis*, and the bug *Pilophorus perplexus*. These species underscore the value of mature trees, woodland edges, and deadwood resources within or adjacent to the meadows.

Wetland habitats show varied patterns. Marshland (**19** species) has an elevated SQI (147), indicating better-than-average conservation quality with some scarcer species, though % representation is low (2%). Other wetland categories have few species and baseline SQIs but confirm the presence of damp areas and flushes that enhance habitat heterogeneity – most evident along the western boundary of Field A (centred on SO42770573) and within Field B (centred on SO43100575). Such habitats support species including the 'Nationally Scarce' ground beetle *Acupalpus exiguus*, the spiders *Pardosa tenuipes* and *Piratula latitans*, the 'Nationally Local' fly *Chrysotus laesus*, and the hoverfly *Sphaerophoria taeniata*.

Minor representations from upland, saltmarsh, lake, brackish pools & ditches, and running water (each ≤6 species) largely reflect broader ecological tolerances rather than core on-site habitats. The brackish pools & ditches entry is notable for its exceptionally high SQI (400), driven by a single scarce species, while examples from other minor categories include the 'Nationally Scarce' spider *Pardosa tenuipes* (assigned to brackish pools & ditches), the beetle *Anthicus antherinus* (saltmarsh), the snail-killing fly *Limnia unguicornis*, and the rove beetle *Paederus littoralis* (running water). Several entries were flagged with warnings in Pantheon outputs due to small sample sizes (≤15 species). Low species counts and % representation in these assemblages therefore require cautious interpretation.

Overall, Kingcoed Meadows supports a diverse invertebrate fauna dominated by open grassland habitats, with moderate conservation value enhanced by rarer species (most SQIs at or above 100). Secondary interests include wetland features (wet flushes and damp grassland) and minor tree-associated elements. The generally low percentage representations, combined with warnings for small sample sizes, suggest that the current dataset under-represents the site's full invertebrate potential, likely due to limitations in survey coverage, seasonal timing, methodological scope or simply habitats not present on site.

This Pantheon analysis confirms the site's importance as a habitat mosaic of unimproved meadows, with structural diversity provided by hedgerows, mature trees, deadwood, and wet features. To sustain and enhance its invertebrate interest, management should continue to prioritise the retention of flower-rich swards, varied vegetation heights, hydrological features, and deadwood resources, while future surveys could better reveal the full extent of its conservation significance.

4.2 Managing Kingcoed Meadows for Invertebrates

The primary objective when managing a species-rich hay meadow for invertebrates is to maintain diverse floristic composition while providing the structural and temporal resources required by pollinators, herbivorous insects, predators, and decomposers throughout their life cycles. Since many invertebrates live inside leaves, stems, flower heads, or seeds, cutting entire areas removes these resources and can negatively impact populations and diversity.

A key factor is the timing and execution of the annual hay cut. Meadows should be cut once per year, as late as practicable from mid-July to late September. This delay allows most plants to set seed and the majority of adult butterflies, solitary bees, and bumblebees to complete their flight periods.

To provide late season and overwintering habitat, 5-20% of the meadow should be left uncut each year. The location of this refuge should be rotated annually and should include areas with structural diversity and flowering plants, in order to minimise the loss of foraging opportunities for remaining pollinators and reduce competition for resources with the on-site beehive.

All cut material (arisings) should be removed to prevent thatch build-up suppressing flowering plants and to avoid nutrient enrichment. However, a small proportion of arisings may be retained and piled in modest heaps in field corners or similar locations to create additional localised habitats. Decaying matter and released nutrients from these piles benefit plants such as Common Nettle (*Urtica dioica*) and umbellifers (e.g., Common Hogweed) that support a range of insects. Piles should not be added to every year and should be placed in both sunny and shaded spots, but never in flood-prone areas, as these locations provide important overwintering sites for invertebrates.

Structural diversity should be encouraged through a mosaic of short (<10 cm), medium (10–30 cm), and tall (>30 cm) vegetation entering winter, plus uncut field margins and hedge bases. Cut on a 2-3-year rotation, and monitor margins that are prone to scrub encroachment from Bracken, Bramble, and suckering Blackthorn, and cut back when necessary. This should help to increase invertebrate richness. These intervals also benefit small rodents, whose runways, burrows, nests, debris, and droppings support beetles (e.g., Leiodidae such as *Catops* and *Choleva* spp.), overwintering invertebrates, and brood-rearing social bees. One study of 42 Harvest Mouse (*Micromys minutus*) nests in Poland recorded 6,544 individuals from at least 105 invertebrate species (Krawczyk et al., 2015).

No inorganic fertilisers or farmyard manure should be applied. Persistent ‘weeds’ should be controlled by hand-pulling or spot treatment only. If grazed livestock have been treated with avermectin-based anthelmintics (e.g., ivermectin), dung invertebrate communities can be severely depleted; prefer non-avermectin products, treat off-site where possible, and withhold animals for ~14 days.

Additional features that enhance biodiversity include: installing various nest boxes around the hedgerows. These nest boxes' will in turn provide breeding, feeding, and sheltering opportunities for a range of invertebrate species, especially if they are or have recently been occupied by birds or rodents. Boxes should not be cleared out every year, as this may disrupt the life cycles of the invertebrate species that are utilising these spaces. If, however, clearing is necessary, the resulting material should be retained on site – perhaps placed in a makeshift catch-all box or simply transferred to another nest box.

Create small areas of bare ground to support thermophilous invertebrates – species that require warm, open spaces for brood rearing, hunting, basking, and other activities. Examples include solitary wasps, mining bees, and various ground-nesting beetles and spiders. These patches can be created either by placing small square mats (ideally made of durable material such as rubber or coir) selectively in sunny locations within the least ecologically sensitive parts of the site, or simply by flattening selected molehills to expose the soil beneath. Both methods are low-cost, low-maintenance ways to boost biodiversity for these often-overlooked but important pollinators and predators.

If space allows, cut branches and logs from on-site management operations – or brought in from nearby – could be repurposed around the meadow edges to benefit a wide range of invertebrates. Stacked in small piles or placed individually, this material provides essential habitat for saproxylic (dead-wood-dependent) species, including numerous beetles (such as stag beetles, click beetles, and longhorn beetles), wood-boring larvae, hoverflies, solitary bees, and wasps that nest in pithy stems or beetle borings. Over time, fungi associated with decaying wood will also colonise the material, which in supports additional decomposer invertebrates and contribute to nutrient cycling.

For added structural diversity, reasonably sized logs (easy to handle, e.g., 50-60 cm in length and 10-20 cm in diameter) can be hung – some predrilled – vertically or horizontally in the hedgerows using sturdy rope, wire or simply weaved into the hedge. Hanging logs creates elevated dead-wood habitat that mimics natural tree cavities and branch breaks, benefiting species less tolerant of ground-level dampness, such as certain cavity-nesting bees, wood-boring beetles, and spiders. Positioning these features in dappled shade or partial sun will maximise their value across different microclimates, ensuring year-round habitat provision as the wood progresses through various stages of decay.

Long-term monitoring using standardised methods is recommended to assess the success of habitat management interventions. Suitable approaches include established protocols such as regular transect walks under the UK Butterfly Monitoring Scheme (UKBMS), which provide robust data on butterfly abundance and trends (link: UKBMS), or Flower-Insect Timed (FIT) Counts as part of the UK Pollinator Monitoring Scheme (UK PoMS), a simple 10-minute survey that records flower-visiting insects on target plants and can be conducted by volunteers anywhere in suitable weather (link: UK PoMS).

In addition, maintaining and regularly updating a site-specific species list within Pantheon—an online analytical tool developed by Natural England and the UK Centre for Ecology & Hydrology (UKCEH) – is strongly advised. Pantheon allows users to import invertebrate records, analyse them against a comprehensive database of habitat traits, resources, conservation statuses, and ecological associations for over 11,000 species (primarily focused on England). This helps identify key habitat features supporting the invertebrate assemblage, evaluate site quality, inform conservation priorities, and guide future management decisions to enhance biodiversity (link: Pantheon).

5.0 IDENTIFICATION KEYS

The following identification keys were used to identify invertebrate specimens collected during the survey at Kingcoed Meadows in 2025 in addition to unpublished keys sourced from organisers of national recording schemes:

Arachnida

- Hillyard, P.D. & Sankey, J.H.P. (1989). *Harvestmen*. Synopses of the British Fauna (New Series) 4 (2nd edition). London: Linnean Society of London.
- Roberts, M. J. (2001). *Collins Field Guide to the Spiders of Britain and Northern Europe*. London: HarperCollins Publishers Ltd.

Coleoptera

- Duff, A. G. (2012). *Beetles of Britain and Ireland, Volume 1: Sphaeriusidae to Silphidae.* A. G. Duff Publishing.
- Duff, A. G. (2016). *Beetles of Britain and Ireland, Volume 4: Cerambycidae to Curculionidae.* A.G. Duff Publishing.
- Duff, A. G. (2020). *Beetles of Britain and Ireland, Volume 3: Geotrupidae to Scraptiidae.* A.G. Duff Publishing.
- Duff, A.G. (2024*). Beetles of Britain and Ireland, Volume 2: Staphylinidae*. A.G. Duff Publishing.
- Lott, D. A. and Anderson, R. (2011). *Handbooks for the identification of British insects, vol. 12, part 7. The Staphylinidae (rove beetles) of Britain and Ireland. Parts 7 & 8: Oxyporinae, Steninae, Euaesthetinae, Pseudopsinae, Paederinae, Staphylininae*. Royal Entomological Society.
- Morris, M. G. (2008). True Weevils (Part I): Coleoptera: Curculionidae (Subfamilies Raymondionyminae to Smicronychinae). Handbooks for the Identification of British Insects, Vol. 5, Part 17b. Royal Entomological Society / Field Studies Council, London. 206 pp.

Collembola

- Hopkin, S. P. (2007). *A key to the Collembola (Springtails) of Britain and Ireland.* Shrewsbury*:* Field Studies Council.

Diptera

- Ball, S. and Morris, R. (2015). *Britain's hoverflies: a field guide*. Princeton University Press.
- Coe, R.L. (1966) *Diptera: Pipunculidae*. Handbooks for the Identification of British Insects, vol. 10, part 2c. London: Royal Entomological Society of London. [online] Available to download at: https://www.royensoc.co.uk/wp-content/uploads/2022/01/Vol10_Part02c.pdf
- Stubbs, A. E. & Falk, S. (2002). *British hoverflies, an illustrated identification guide. Second edition.* Reading: British Entomological and Natural History Society.
- White, I. M. (1988). *Handbooks for the Identification of British Insects. Tephritid Flies, Diptera: Tephritidae, 1-134. Vol. X, Part 5(a)*. Royal Entomological Society London.

Hemiptera

- Biedermann, R. & Niedringhaus, R. (2009). *The Plant and Leafhoppers of Germany – Identification key to all species.* Wissenschaftlich Akademischer Buchvertrieb-Fründ, Scheeßel.

- Southwood, T. R. E. & Leston, D. (1959). *Land and Water Bugs of the British Isles*. Frederick Warne & Co. Ltd.
- Wilson, M., Stewart, A., Biederman, R., Nickel, H. and Niedringhaus, R. (2015). *The Planthoppers and Leafhoppers of Britain and Ireland - Identification keys to all families and genera and all British and Irish species not recorded from Germany*. Wissenschaftlich Akademischer Buchvertrieb-Fründ, Scheeßel.

Isopoda

- Hopkin, S. P. (1991). *A key to the woodlice of Britain and Ireland*. Field Studies 7, 599–650.

Hymenoptera

- Benson, R.B., 1952. *Handbooks for the Identification of British Insects. Hymenoptera, Symphyta, Vol 6, Section 2 (a-c)*. Royal Entomological Society. London.
- Falk, S. J. (2015). *Field Guide to the Bees of Great Britain and Ireland*. British Wildlife Field Guide. London: British Wildlife Publishing.
- Skinner, G. J. & Allen, G. W. (1996). *Naturalists Handbooks 24: Ants*. Richmond Publishing Co. Ltd.
- Yeo, P. F. & Corbet, S. A. (1995). *Naturalists' Handbooks 3: Solitary Wasps*. Richmond Publishing Co. Ltd.

Myriapoda

- Blower, J. G. (1985). *Millipedes. Synopses of the British Fauna (New Series) 35*. London: The Linnean Society of London.
- Lee, P. (2015). *A review of the millipedes (Diplopoda), centipedes (Chilopoda) and woodlice (Isopoda) of Great Britain (NECR186)*. [online] Available at: https://publications.naturalengland.org.uk/publication/4924476719366144

Neuroptera

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National Status codes:

Data Deficient (DD) = When there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status.

Local (Nationally/Wales) = Species which, whilst fairly common, are evidently less widespread than truly common species, but also not qualifying as Nationally Scarce having been recorded from over 100, but less than 300, ten-kilometre squares of the British National Grid system since 1970.

Locally common = Indicates that while a species overall population across its entire geographic range might be sparse or unevenly distributed, in specific, concentrated areas (its "localities"), it can often be found in abundance.

Nationally Rare (NR or RDB 3) = Taxa with small populations which are not at present endangered or vulnerable but which are at risk. These are species which are estimated to occur in 15 or fewer ten-kilometre squares of the British National Grid system since 1970.

Nationally Scarce (NS) or Notable (Na or Nb) = Species occurring within the range of 16 to 100 ten-kilometre squares of the British National Grid system since 1970.

Near Threatened (NT) = Species which do not qualify for Critically Endangered, Endangered or Vulnerable now but are close to qualifying for, or are likely to qualify for, a threatened category in the near future.

Section 7 = Species listed under Section 7 of Environment (Wales) Act 2016 as ‘species of principal importance for conservation of biological diversity in Wales’.

Unknown or RDB K = Species that are suspected but not definitely known to belong to any of the following categories (Endangered, Vulnerable, Near Threatened, Rare) because of the lack of information.

Unknown or RDBK = Species that are suspected but not definitely known to belong to any of the following categories (Endangered, Vulnerable, Near Threatened, Rare) because of the lack of information.

Vulnerable (RDB 2 or VU) = Species considered to be facing a high risk of extinction in the wild.

Other = Species that are not considered threatened but are otherwise noteworthy (e.g. due to a lack of previous records or having been recently discovered new for Britain).

Where status is blank, this species is considered to be common and widespread.

Appendix 1. Full list of invertebrate species recorded from Kingcoed Meadows in 2025

Species	Family	Order	Conservation status	Broad biotope	Habitat
Agelena labyrinthica	Agelenidae	Araneae	Locally common	open habitats	tall sward & scrub
Agalenatea redii	Araneidae	Araneae	Locally common	open habitats	
Araneus diadematus	Araneidae	Araneae			
Araneus triguttatus	**Araneidae**	**Araneae**	**Local; scarce in Wales**	**tree-associated**	**arboreal**
Araniella opisthographa	Araneidae	Araneae		tree-associated	arboreal
Gibbaranea gibbosa	**Araneidae**	**Araneae**	**Local**	**tree-associated**	**arboreal**
Larinioides cornutus	Araneidae	Araneae		wetland	acid & sedge peats
Mangora acalypha	Araneidae	Araneae	Locally common and spreading	open habitats	tall sward & scrub
Zygiella atrica	Araneidae	Araneae		tree-associated	arboreal
Clubiona brevipes	Clubionidae	Araneae		tree-associated	arboreal
Dictyna arundinacea	Dictynidae	Araneae		open habitats	tall sward & scrub
Bathyphantes gracilis	Linyphiidae	Araneae			
Erigone atra	Linyphiidae	Araneae			
Erigone dentipalpis	Linyphiidae	Araneae			
Linyphia triangularis	Linyphiidae	Araneae			
Microlinyphia pusilla	Linyphiidae	Araneae		open habitats	tall sward & scrub
Tenuiphantes tenuis	Linyphiidae	Araneae		open habitats	tall sward & scrub
Alopecosa pulverulenta	Lycosidae	Araneae		open habitats	tall sward & scrub; upland
Pardosa palustris	Lycosidae	Araneae		open habitats	short sward & bare ground
Pardosa prativaga	Lycosidae	Araneae		open habitats	tall sward & scrub
Pardosa pullata	Lycosidae	Araneae		open habitats	tall sward & scrub
Pardosa tenuipes	**Lycosidae**	**Araneae**	**NS**	**coastal; wetland**	**brackish pools & ditches; marshland**

Piratula latitans	**Lycosidae**	**Araneae**	**Local**	**wetland**	**acid & sedge peats**
Cheiracanthium erraticum	**Miturgidae**	**Araneae**	**Local**	**open habitats**	**tall sward & scrub**
Philodromus cespitum	Philodromidae	Araneae		tree-associated	arboreal
Pisaura mirabilis	Pisauridae	Araneae		open habitats	tall sward & scrub
Metellina mengei	Tetragnathidae	Araneae			
Metellina segmentata	Tetragnathidae	Araneae			
Pachygnatha clercki	Tetragnathidae	Araneae		wetland	acid & sedge peats
Pachygnatha degeeri	Tetragnathidae	Araneae			
Anelosimus vittatus	Theridiidae	Araneae		tree-associated	arboreal
Enoplognatha latimana	Theridiidae	Araneae		open habitats	tall sward & scrub
Enoplognatha ovata sensu stricto	Theridiidae	Araneae			
Neottiura bimaculata	Theridiidae	Araneae		open habitats	tall sward & scrub
Paidiscura pallens	Theridiidae	Araneae		tree-associated	arboreal
Phylloneta impressa	Theridiidae	Araneae	Locally common	open habitats	tall sward & scrub
Phylloneta sisyphia	Theridiidae	Araneae		open habitats	tall sward & scrub
Theridion varians	Theridiidae	Araneae		tree-associated	arboreal
Misumena vatia	Thomisidae	Araneae	Locally common	open habitats	tall sward & scrub
Xysticus acerbus	**Thomisidae**	**Araneae**	**NR**	**open habitats**	**tall sward & scrub**
Xysticus cristatus	Thomisidae	Araneae			
Xysticus kochi	**Thomisidae**	**Araneae**	**Local**	**open habitats**	**short sward & bare ground**
Zora spinimana	Zoridae	Araneae		open habitats	tall sward & scrub
Anthicus antherinus	**Anthicidae**	**Coleoptera**	**Local in Wales**	**coastal**	**saltmarsh**
Ischnopterapion virens	Apionidae	Coleoptera		open habitats	tall sward & scrub
Perapion curtirostre	Apionidae	Coleoptera		open habitats	tall sward & scrub
Perapion hydrolapathi	Apionidae	Coleoptera		open habitats	tall sward & scrub
Perapion violaceum	Apionidae	Coleoptera		open habitats	tall sward & scrub
Protapion apricans	Apionidae	Coleoptera		open habitats	tall sward & scrub

Protapion assimile	Apionidae	Coleoptera		open habitats	tall sward & scrub
Protapion difforme	**Apionidae**	**Coleoptera**	**Nb**	**open habitats**	**tall sward & scrub**
Protapion fulvipes	Apionidae	Coleoptera		open habitats	tall sward & scrub
Protapion nigritarse	Apionidae	Coleoptera		open habitats	tall sward & scrub
Protapion trifolii	Apionidae	Coleoptera		open habitats	tall sward & scrub
Protapion varipes	**Apionidae**	**Coleoptera**	**[Nb]; Nb**	**open habitats**	**tall sward & scrub**
Byturus tomentosus	Byturidae	Coleoptera		open habitats	tall sward & scrub
Cantharis decipiens	Cantharidae	Coleoptera		open habitats	tall sward & scrub
Cantharis flavilabris	Cantharidae	Coleoptera		open habitats	tall sward & scrub
Cantharis rustica	Cantharidae	Coleoptera		open habitats	tall sward & scrub
Malthinus flaveolus	Cantharidae	Coleoptera		tree-associated	decaying wood
Malthodes marginatus	Cantharidae	Coleoptera		tree-associated	decaying wood
Rhagonycha fulva	Cantharidae	Coleoptera		open habitats	tall sward & scrub
Acupalpus dubius	Carabidae	Coleoptera		wetland	acid & sedge peats
Acupalpus exiguus	**Carabidae**	**Coleoptera**	**NS**	**wetland**	**marshland**
Amara aenea	Carabidae	Coleoptera		open habitats	short sward & bare ground
Amara familiaris	Carabidae	Coleoptera		open habitats	tall sward & scrub
Bembidion guttula	Carabidae	Coleoptera		wetland	marshland
Bembidion lampros	Carabidae	Coleoptera		open habitats	short sward & bare ground
Bembidion properans	Carabidae	Coleoptera		open habitats	short sward & bare ground
Dyschirius globosus	Carabidae	Coleoptera		wetland	acid & sedge peats
Poecilus versicolor	Carabidae	Coleoptera		open habitats	tall sward & scrub
Syntomus obscuroguttatus	**Carabidae**	**Coleoptera**	**Local in Wales**	**open habitats**	**tall sward & scrub**
Anaglyptus mysticus	**Cerambycidae**	**Coleoptera**	**Local in Wales**	**tree-associated**	**decaying wood**
Clytus arietis	Cerambycidae	Coleoptera		tree-associated	decaying wood
Grammoptera ruficornis	Cerambycidae	Coleoptera		tree-associated	decaying wood

Pachytodes cerambyciformis	Cerambycidae	Coleoptera	Common in Wales	tree-associated	decaying wood
Pogonocherus hispidus	Cerambycidae	Coleoptera		tree-associated	decaying wood
Rutpela maculata	Cerambycidae	Coleoptera		tree-associated	decaying wood
Bruchidius varius	**Chrysomelidae**	**Coleoptera**	**Other**	**open habitats**	**tall sward & scrub**
Cassida rubiginosa	Chrysomelidae	Coleoptera		open habitats	tall sward & scrub
Cassida vibex	Chrysomelidae	Coleoptera		open habitats	short sward & bare ground
Chaetocnema concinna	Chrysomelidae	Coleoptera		open habitats	tall sward & scrub
Chaetocnema hortensis	Chrysomelidae	Coleoptera		open habitats	tall sward & scrub
Crepidodera aurea	**Chrysomelidae**	**Coleoptera**	**Local in Wales**	**tree-associated**	**arboreal**
Cryptocephalus moraei	**Chrysomelidae**	**Coleoptera**	**Local in Wales**	**open habitats**	**short sward & bare ground**
Lema cyanella	Chrysomelidae	Coleoptera		open habitats	tall sward & scrub
Longitarsus luridus	Chrysomelidae	Coleoptera		open habitats	tall sward & scrub
Longitarsus suturellus	Chrysomelidae	Coleoptera		open habitats	tall sward & scrub
Neocrepidodera ferruginea	Chrysomelidae	Coleoptera		open habitats	tall sward & scrub
Oulema melanopus s.s.	Chrysomelidae	Coleoptera		open habitats	tall sward & scrub
Oulema obscura	Chrysomelidae	Coleoptera		open habitats	tall sward & scrub
Phaedon tumidulus	Chrysomelidae	Coleoptera		open habitats	tall sward & scrub
Phyllotreta astrachanica	**Chrysomelidae**	**Coleoptera**	**Local; scarce in Duff**	**open habitats**	**tall sward & scrub**
Phyllotreta exclamationis	Chrysomelidae	Coleoptera		open habitats	tall sward & scrub
Phyllotreta undulata	Chrysomelidae	Coleoptera		open habitats	tall sward & scrub
Sphaeroderma testaceum	Chrysomelidae	Coleoptera		open habitats	tall sward & scrub
Coccinella septempunctata	Coccinellidae	Coleoptera			
Propylea quattuordecimpunctata	Coccinellidae	Coleoptera			
Psyllobora vigintiduopunctata	Coccinellidae	Coleoptera		open habitats	tall sward & scrub
Rhyzobius litura	Coccinellidae	Coleoptera		open habitats	tall sward & scrub

Scymnus haemorrhoidalis	Coccinellidae	Coleoptera	Locally common	open habitats	tall sward & scrub
Tytthaspis sedecimpunctata	Coccinellidae	Coleoptera		open habitats	tall sward & scrub
Barynotus obscurus	**Curculionidae**	**Coleoptera**	**Local**	**open habitats**	**tall sward & scrub**
Hypera meles	**Curculionidae**	**Coleoptera**	**[Nb]**	**open habitats**	**tall sward & scrub**
Hypera nigrirostris	Curculionidae	Coleoptera		open habitats	tall sward & scrub
Hypera postica	Curculionidae	Coleoptera		open habitats	short sward & bare ground
Liophloeus tessulatus	Curculionidae	Coleoptera		open habitats	tall sward & scrub
Mecinus pascuorum	Curculionidae	Coleoptera		open habitats	tall sward & scrub
Rhamphus oxyacanthae	Curculionidae	Coleoptera		tree-associated	arboreal
Sitona ambiguus	**Curculionidae**	**Coleoptera**	**Local**	**open habitats**	**tall sward & scrub**
Sitona lineatus	Curculionidae	Coleoptera		open habitats	tall sward & scrub
Sitona obsoletus	Curculionidae	Coleoptera		open habitats	tall sward & scrub
Sitona sulcifrons	Curculionidae	Coleoptera		open habitats	tall sward & scrub
Sitona suturalis	Curculionidae	Coleoptera		open habitats	tall sward & scrub
Trichosirocalus troglodytes	Curculionidae	Coleoptera		open habitats	tall sward & scrub
Dryops ernesti	Dryopidae	Coleoptera		wetland	
Agriotes acuminatus	Elateridae	Coleoptera		open habitats	tall sward & scrub
Agriotes pallidulus	Elateridae	Coleoptera		open habitats	tall sward & scrub
Agriotes sputator	Elateridae	Coleoptera		open habitats	tall sward & scrub
Athous bicolor	Elateridae	Coleoptera		open habitats	tall sward & scrub
Dalopius marginatus	Elateridae	Coleoptera		open habitats	tall sward & scrub
Oedostethus quadripustulatus	**Elateridae**	**Coleoptera**	**Na; new for VC**	**open habitats**	**tall sward & scrub**
Anacaena globulus	Hydrophilidae	Coleoptera		wetland	marshland
Megasternum concinnum	Hydrophilidae	Coleoptera			
Brachypterus glaber	Kateretidae	Coleoptera		open habitats	tall sward & scrub
Cartodere bifasciata	Latridiidae	Coleoptera			
Corticarina minuta	Latridiidae	Coleoptera			

Malachius bipustulatus	Malachiidae	Coleoptera		tree-associated	decaying wood
Meligethes aeneus	Nitidulidae	Coleoptera			
Meligethes atratus	Nitidulidae	Coleoptera			
Meligethes carinulatus	Nitidulidae	Coleoptera	Locally common		
Meligethes nigrescens	Nitidulidae	Coleoptera	Locally frequent		
Oedemera lurida	Oedemeridae	Coleoptera		open habitats	tall sward & scrub
Oedemera nobilis	Oedemeridae	Coleoptera		open habitats	tall sward & scrub
Olibrus aeneus	Phalacridae	Coleoptera			
Anobium punctatum	Ptinidae	Coleoptera		tree-associated	decaying wood
Hoplia philanthus	Scarabaeidae	Coleoptera		open habitats	tall sward & scrub
Onthophagus similis	Scarabaeidae	Coleoptera		open habitats	tall sward & scrub
Phyllopertha horticola	Scarabaeidae	Coleoptera		open habitats	
Anaspis frontalis	Scraptiidae	Coleoptera		tree-associated	decaying wood
Anaspis maculata	Scraptiidae	Coleoptera		tree-associated	decaying wood
Anaspis pulicaria	**Scraptiidae**	**Coleoptera**	**Local; scarce in Duff**	**tree-associated**	**decaying wood**
Aleochara lanuginosa	Staphylinidae	Coleoptera		open habitats	tall sward & scrub
Anotylus rugosus	Staphylinidae	Coleoptera		wetland	marshland
Cypha longicornis	Staphylinidae	Coleoptera		tree-associated	shaded woodland floor
Drusilla canaliculata	Staphylinidae	Coleoptera	Locally common	open habitats	tall sward & scrub
Ocypus aeneocephalus	Staphylinidae	Coleoptera		open habitats	tall sward & scrub
Paederus littoralis	Staphylinidae	Coleoptera		wetland	running water
Philonthus cognatus	Staphylinidae	Coleoptera		open habitats	tall sward & scrub
Phyllodrepa floralis	**Staphylinidae**	**Coleoptera**	**Local**	**tree-associated**	**decaying wood**
Quedius persimilis	Staphylinidae	Coleoptera		open habitats	tall sward & scrub
Rugilus orbiculatus	Staphylinidae	Coleoptera		open habitats	tall sward & scrub
Stenus clavicornis	Staphylinidae	Coleoptera		open habitats	tall sward & scrub
Stenus flavipes	Staphylinidae	Coleoptera		tree-associated; wetland	shaded woodland floor; wet woodland

Stenus fulvicornis	Staphylinidae	Coleoptera		open habitats	tall sward & scrub
Stenus picipes	Staphylinidae	Coleoptera		open habitats	tall sward & scrub
Stenus providus	Staphylinidae	Coleoptera		wetland	marshland
Stenus tarsalis	Staphylinidae	Coleoptera		wetland	marshland
Sunius propinquus	Staphylinidae	Coleoptera		open habitats	tall sward & scrub
Tachyporus chrysomelinus	Staphylinidae	Coleoptera		open habitats	tall sward & scrub
Tachyporus dispar	Staphylinidae	Coleoptera		open habitats	tall sward & scrub
Tachyporus hypnorum	Staphylinidae	Coleoptera		open habitats	tall sward & scrub
Forficula auricularia	Forficulidae	Dermaptera			
Phytomyza ranunculi	Agromyzidae	Diptera			
Botanophila brunneilinea	**Anthomyiidae**	**Diptera**	**Local in Wales**		
Botanophila striolata s.str.	Anthomyiidae	Diptera			
Chirosia grossicauda	Anthomyiidae	Diptera			
Hylemya variata	Anthomyiidae	Diptera			
Dioctria atricapilla	Asilidae	Diptera		open habitats	short sward & bare ground; tall sward & scrub
Leptogaster cylindrica	Asilidae	Diptera		open habitats	short sward & bare ground; tall sward & scrub
Bibio marci	Bibionidae	Diptera		open habitats; tree-associated	shaded woodland floor; tall sward & scrub
Dilophus febrilis	Bibionidae	Diptera		open habitats	tall sward & scrub
Bombylius major	Bombyliidae	Diptera		open habitats	tall sward & scrub
Villa cingulata	**Bombyliidae**	**Diptera**	**NR**	**open habitats**	**tall sward & scrub**
Lucilia illustris	Calliphoridae	Diptera			
Tricogena rubricosa	**Calliphoridae**	**Diptera**	**Local**	**open habitats**	**tall sward & scrub**
Dasineura ulmaria	Cecidomyiidae	Diptera			
Cetema neglectum	Chloropidae	Diptera		open habitats	tall sward & scrub

Meromyza femorata sens. str.	Chloropidae	Diptera			
Sicus ferrugineus	Conopidae	Diptera		open habitats	short sward & bare ground
Chrysotus cilipes	Dolichopodidae	Diptera		wetland	acid & sedge peats; marshland
Chrysotus gramineus	Dolichopodidae	Diptera		wetland	marshland; running water
Chrysotus laesus	**Dolichopodidae**	**Diptera**	**Local**	**wetland**	**marshland; running water**
Dolichopus festivus	Dolichopodidae	Diptera		wetland	marshland
Dolichopus plumipes	Dolichopodidae	Diptera		wetland	marshland
Dolichopus wahlbergi	Dolichopodidae	Diptera		tree-associated; wetland	running water; shaded woodland floor; wet woodland
Poecilobothrus nobilitatus	Dolichopodidae	Diptera		wetland	marshland
Empis livida	Empididae	Diptera		open habitats	tall sward & scrub
Hybos culiciformis	Hybotidae	Diptera		tree-associated	shaded woodland floor
Calliopum tuberculosum	Lauxaniidae	Diptera		open habitats	
Meiosimyza decempunctata	Lauxaniidae	Diptera		tree-associated	shaded woodland floor
Minettia fasciata	Lauxaniidae	Diptera		open habitats	
Minettia longipennis	Lauxaniidae	Diptera		tree-associated	shaded woodland floor
Sapromyza sexpunctata	Lauxaniidae	Diptera		open habitats	
Eudasyphora cyanella	Muscidae	Diptera		tree-associated	shaded woodland floor
Helina impuncta	Muscidae	Diptera		tree-associated	shaded woodland floor
Musca autumnalis	Muscidae	Diptera			
Phaonia signata	Muscidae	Diptera		tree-associated	shaded woodland floor

Geomyza balachowskyi	Opomyzidae	Diptera		open habitats	tall sward & scrub
Opomyza petrei	Opomyzidae	Diptera		open habitats	tall sward & scrub
Pipunculus campestris	Pipunculidae	Diptera		open habitats	tall sward & scrub
Pipunculus lenis	**Pipunculidae**	**Diptera**	**Local**	**open habitats**	**tall sward & scrub**
Rivellia syngenesiae	Platystomatidae	Diptera	Locally common	open habitats; wetland	tall sward & scrub
Pollenia amentaria	**Polleniidae**	**Diptera**	**Local**	**wetland**	**marshland**
Pollenia rudis	Polleniidae	Diptera		wetland	marshland
Chrysopilus cristatus	Rhagionidae	Diptera		tree-associated; wetland	acid & sedge peats; shaded woodland floor; wet woodland
Scathophaga stercoraria	Scathophagidae	Diptera		open habitats	tall sward & scrub
Limnia unguicornis	Sciomyzidae	Diptera	Locally common	wetland	acid & sedge peats; marshland; running water
Tetanocera elata	Sciomyzidae	Diptera		open habitats	tall sward & scrub
Tetanocera ferruginea	Sciomyzidae	Diptera		wetland	acid & sedge peats
Chorisops nagatomii	Stratiomyidae	Diptera		open habitats	tall sward & scrub
Microchrysa flavicornis	Stratiomyidae	Diptera		open habitats	tall sward & scrub
Pachygaster atra	Stratiomyidae	Diptera	Locally common	tree-associated	shaded woodland floor
Cheilosia albitarsis	Syrphidae	Diptera			
Cheilosia scutellata	Syrphidae	Diptera		tree-associated	shaded woodland floor
Chrysogaster solstitialis	Syrphidae	Diptera		tree-associated; wetland	acid & sedge peats; running water; shaded woodland floor; wet woodland
Chrysotoxum bicinctum	Syrphidae	Diptera		open habitats	tall sward & scrub
Episyrphus balteatus	Syrphidae	Diptera		open habitats	tall sward & scrub
Eristalis pertinax	Syrphidae	Diptera		wetland	acid & sedge peats

Eristalis tenax	Syrphidae	Diptera		wetland	rich flower resource
Helophilus pendulus	Syrphidae	Diptera		wetland	acid & sedge peats
Melanostoma mellinum	Syrphidae	Diptera		open habitats	tall sward & scrub
Melanostoma scalare	Syrphidae	Diptera		open habitats	tall sward & scrub
Platycheirus clypeatus	Syrphidae	Diptera		open habitats; wetland	tall sward & scrub
Sphaerophoria interrupta	Syrphidae	Diptera		open habitats	tall sward & scrub
Sphaerophoria scripta	Syrphidae	Diptera		open habitats	tall sward & scrub
Sphaerophoria taeniata	**Syrphidae**	**Diptera**	**Local**	**wetland**	
Syritta pipiens	Syrphidae	Diptera		open habitats	tall sward & scrub
Syrphus ribesii	Syrphidae	Diptera			
Xanthogramma pedissequum sensu stricto	Syrphidae	Diptera	Locally common		
Xylota segnis	Syrphidae	Diptera		tree-associated	decaying wood
Xylota sylvarum	Syrphidae	Diptera		tree-associated	decaying wood
Tabanus bromius	Tabanidae	Diptera	Locally common	wetland	acid & sedge peats
Eriothrix rufomaculata	Tachinidae	Diptera			
Exorista rustica	**Tachinidae**	**Diptera**	**Local in Wales**		
Phasia barbifrons	**Tachinidae**	**Diptera**	**Other**	**open habitats**	
Phasia obesa	**Tachinidae**	**Diptera**	**Local in Wales**	**open habitats**	
Siphona geniculata	Tachinidae	Diptera			
Acanthiophilus helianthi	**Tephritidae**	**Diptera**	**[Notable]**	**open habitats**	**short sward & bare ground; tall sward & scrub**
Chaetostomella cylindrica	Tephritidae	Diptera		open habitats	short sward & bare ground; tall sward & scrub
Tephritis vespertina	Tephritidae	Diptera		open habitats	tall sward & scrub
Terellia ruficauda	Tephritidae	Diptera		open habitats	short sward & bare ground; tall sward & scrub

Urophora jaceana	Tephritidae	Diptera		open habitats	short sward & bare ground; tall sward & scrub
Urophora quadrifasciata	Tephritidae	Diptera		open habitats	short sward & bare ground; tall sward & scrub
Tipula paludosa	Tipulidae	Diptera		open habitats	tall sward & scrub
Tipula vernalis	Tipulidae	Diptera		open habitats	tall sward & scrub
Entomobrya nivalis	Entomobryidae	Entomobryomorpha			
Lepidocyrtus cyaneus	Entomobryidae	Entomobryomorpha			
Orchesella cincta	Entomobryidae	Entomobryomorpha			
Orchesella villosa	Entomobryidae	Entomobryomorpha			
Isotomurus maculatus	Isotomidae	Entomobryomorpha			
Isotomurus palustris	Isotomidae	Entomobryomorpha			
Pogonognathellus longicornis	Tomoceridae	Entomobryomorpha			
Anthocoris nemoralis	Anthocoridae	Hemiptera		tree-associated	arboreal
Anthocoris nemorum	Anthocoridae	Hemiptera			
Orius (Heterorius) laticollis	**Anthocoridae**	**Hemiptera**	**Other**	**tree-associated**	**arboreal**
Aphrophora alni	Aphrophoridae	Hemiptera			
Neophilaenus lineatus	Aphrophoridae	Hemiptera		open habitats	tall sward & scrub
Philaenus spumarius	Aphrophoridae	Hemiptera			
Berytinus (Berytinus) minor	Berytidae	Hemiptera		open habitats	short sward & bare ground
Alebra albostriella	Cicadellidae	Hemiptera		tree-associated	arboreal
Alebra wahlbergi	Cicadellidae	Hemiptera		tree-associated	arboreal
Anoscopus albifrons	Cicadellidae	Hemiptera		open habitats	tall sward & scrub
Anoscopus flavostriatus	**Cicadellidae**	**Hemiptera**	**Local**	**open habitats**	**tall sward & scrub**
Aphrodes bicincta	Cicadellidae	Hemiptera	Locally common	open habitats	tall sward & scrub
Aphrodes makarovi	Cicadellidae	Hemiptera		open habitats	tall sward & scrub

Arthaldeus pascuellus	Cicadellidae	Hemiptera		open habitats	tall sward & scrub
Deltocephalus pulicaris	Cicadellidae	Hemiptera		open habitats	tall sward & scrub
Edwardsiana frustrator	**Cicadellidae**	**Hemiptera**	**Local**	**tree-associated**	**arboreal**
Eupteryx urticae	Cicadellidae	Hemiptera		open habitats	tall sward & scrub
Eupteryx vittata	Cicadellidae	Hemiptera		open habitats	tall sward & scrub
Euscelis incisus	Cicadellidae	Hemiptera		open habitats	tall sward & scrub
Streptanus sordidus	Cicadellidae	Hemiptera		open habitats	tall sward & scrub
Typhlocyba quercus	Cicadellidae	Hemiptera		tree-associated	arboreal
Zyginidia scutellaris	Cicadellidae	Hemiptera		open habitats	tall sward & scrub
Coreus marginatus	Coreidae	Hemiptera		open habitats	tall sward & scrub
Javesella dubia	Delphacidae	Hemiptera		open habitats	tall sward & scrub
Javesella pellucida	Delphacidae	Hemiptera		open habitats	tall sward & scrub
Muellerianella fairmairei	Delphacidae	Hemiptera	Locally common	open habitats	tall sward & scrub
Scottianella dalei	**Delphacidae**	**Hemiptera**	**Nb; new for Wales**	**open habitats**	**tall sward & scrub**
Stenocranus minutus	Delphacidae	Hemiptera		open habitats	tall sward & scrub
Cymus claviculus	Lygaeidae	Hemiptera		open habitats	short sward & bare ground
Cymus melanocephalus	Lygaeidae	Hemiptera		open habitats	tall sward & scrub
Drymus (Sylvadrymus) sylvaticus	Lygaeidae	Hemiptera		open habitats	tall sward & scrub
Heterogaster urticae	Lygaeidae	Hemiptera		open habitats	tall sward & scrub
Acetropis (Acetropis) gimmerthalii	Miridae	Hemiptera	Locally common	open habitats	tall sward & scrub
Amblytylus nasutus	Miridae	Hemiptera		open habitats	tall sward & scrub
Apolygus spinolae	Miridae	Hemiptera		open habitats	tall sward & scrub
Atractotomus mali	Miridae	Hemiptera		tree-associated	arboreal
Campyloneura virgula	Miridae	Hemiptera		tree-associated	arboreal
Capsus ater	Miridae	Hemiptera		open habitats	tall sward & scrub
Closterotomus fulvomaculatus	Miridae	Hemiptera		open habitats	tall sward & scrub

Closterotomus norwegicus	Miridae	Hemiptera		open habitats	tall sward & scrub
Deraeocoris (Deraeocoris) flavilinea	Miridae	Hemiptera			
Deraeocoris (Deraeocoris) ruber	Miridae	Hemiptera		open habitats	tall sward & scrub
Harpocera thoracica	Miridae	Hemiptera		tree-associated	arboreal
Heterocordylus genistae	**Miridae**	**Hemiptera**	**Local**	**open habitats**	**short sward & bare ground**
Leptopterna dolabrata	Miridae	Hemiptera		open habitats	tall sward & scrub
Liocoris tripustulatus	Miridae	Hemiptera		open habitats	tall sward & scrub
Lopus decolor	Miridae	Hemiptera		open habitats	tall sward & scrub
Lygus pratensis	**Miridae**	**Hemiptera**	**[RDB 3]**	**open habitats**	
Miridius quadrivirgatus	**Miridae**	**Hemiptera**	**Local**	**open habitats**	**tall sward & scrub**
Monalocoris (Monalocoris) filicis	Miridae	Hemiptera		open habitats	tall sward & scrub
Pachytomella parallela	Miridae	Hemiptera		open habitats	short sward & bare ground
Phytocoris (Ktenocoris) ulmi	Miridae	Hemiptera		tree-associated	arboreal
Phytocoris (Ktenocoris) varipes	Miridae	Hemiptera		open habitats	tall sward & scrub
Pilophorus perplexus	**Miridae**	**Hemiptera**	**Local**	**tree-associated**	**arboreal**
Pithanus maerkelii	Miridae	Hemiptera		open habitats	tall sward & scrub
Plagiognathus arbustorum	Miridae	Hemiptera		open habitats	tall sward & scrub
Plagiognathus chrysanthemi	Miridae	Hemiptera		open habitats	short sward & bare ground
Psallus (Hylopsallus) perrisi	Miridae	Hemiptera		tree-associated	arboreal
Stenodema (Brachystira) calcarata	Miridae	Hemiptera		open habitats	tall sward & scrub
Stenodema (Stenodema) laevigata	Miridae	Hemiptera		open habitats	tall sward & scrub
Stenotus binotatus	Miridae	Hemiptera		open habitats	tall sward & scrub
Himacerus (Anaptus) major	Nabidae	Hemiptera		open habitats	tall sward & scrub

Nabis (Dolichonabis) limbatus	Nabidae	Hemiptera		open habitats	tall sward & scrub
Nabis (Nabis) rugosus	Nabidae	Hemiptera		open habitats	tall sward & scrub
Dolycoris baccarum	Pentatomidae	Hemiptera		open habitats	tall sward & scrub
Palomena prasina	Pentatomidae	Hemiptera		open habitats	tall sward & scrub
Psyllopsis fraxini	Psyllidae	Hemiptera			
Physatocheila dumetorum	Tingidae	Hemiptera		tree-associated	arboreal; decaying wood
Tingis (Tingis) ampliata	Tingidae	Hemiptera		open habitats	tall sward & scrub
Andrena haemorrhoa	Andrenidae	Hymenoptera		open habitats	short sward & bare ground
Bombus hortorum	Apidae	Hymenoptera		open habitats	tall sward & scrub
Bombus hypnorum	Apidae	Hymenoptera		open habitats; tree-associated	shaded woodland floor; tall sward & scrub
Bombus lapidarius	Apidae	Hymenoptera		open habitats	tall sward & scrub
Bombus lucorum/terrestris	Apidae	Hymenoptera			
Bombus pascuorum	Apidae	Hymenoptera		open habitats	tall sward & scrub
Bombus pratorum	Apidae	Hymenoptera		open habitats; tree-associated	shaded woodland floor; tall sward & scrub
Eucera longicornis	**Apidae**	**Hymenoptera**	**[Na]; Section 7 Priority Species**	**open habitats**	**short sward & bare ground**
Nomada signata	**Apidae**	**Hymenoptera**	**[RDB 2]**	**open habitats**	**short sward & bare ground**
Argogorytes mystaceus	Crabronidae	Hymenoptera		open habitats; tree-associated	shaded woodland floor; short sward & bare ground
Cerceris rybyensis	Crabronidae	Hymenoptera	Locally common	open habitats	short sward & bare ground
Ectemnius lituratus	Crabronidae	Hymenoptera		open habitats; tree-associated	decaying wood

Andricus foecundatrix (gall)	Cynipidae	Hymenoptera			
Andricus kollari (gall)	Cynipidae	Hymenoptera			
Andricus quercuscalicis (gall)	Cynipidae	Hymenoptera			
Cynips longiventris (gall)	Cynipidae	Hymenoptera			
Neuroterus numismalis (gall)	Cynipidae	Hymenoptera			
Neuroterus quercusbaccarum (gall)	Cynipidae	Hymenoptera			
Lasius flavus	Formicidae	Hymenoptera		open habitats	short sward & bare ground
Lasius niger	Formicidae	Hymenoptera		open habitats	short sward & bare ground
Myrmica rubra	Formicidae	Hymenoptera		open habitats	tall sward & scrub
Myrmica ruginodis	Formicidae	Hymenoptera		tree-associated	shaded woodland floor
Myrmica scabrinodis	Formicidae	Hymenoptera		open habitats	tall sward & scrub
Lasioglossum calceatum	Halictidae	Hymenoptera		open habitats	short sward & bare ground
Amblyteles armatorius	Ichneumonidae	Hymenoptera			
Osmia bicornis	Megachilidae	Hymenoptera		open habitats; tree-associated	shaded woodland floor; tall sward & scrub
Melitta leporina	**Melittidae**	**Hymenoptera**	**Local in Wales**	**open habitats**	**short sward & bare ground**
Dolerus nigratus	Tenthredinidae	Hymenoptera			
Profenusa pygmaea	Tenthredinidae	Hymenoptera			
Tenthredo amoena	Tenthredinidae	Hymenoptera			
Tenthredo brevicornis	Tenthredinidae	Hymenoptera			
Tenthredopsis coquebertii	Tenthredinidae	Hymenoptera			
Ancistrocerus gazella	Vespidae	Hymenoptera		open habitats; tree-associated	decaying wood

Dolichovespula saxonica	**Vespidae**	**Hymenoptera**	**[RDB K]**	**tree-associated**	**arboreal**
Dolichovespula sylvestris	Vespidae	Hymenoptera		open habitats; tree-associated	arboreal
Vespa crabro	Vespidae	Hymenoptera		tree-associated	decaying wood; shaded woodland floor
Vespula germanica	Vespidae	Hymenoptera		open habitats	tall sward & scrub
Vespula vulgaris	Vespidae	Hymenoptera		open habitats	tall sward & scrub
Oniscus asellus	Oniscidae	Isopoda			
Philoscia muscorum	Philosciidae	Isopoda			
Anthophila fabriciana	Choreutidae	Lepidoptera		open habitats	tall sward & scrub
Agriphila straminella	Crambidae	Lepidoptera			
Agriphila tristella	Crambidae	Lepidoptera			
Chrysoteuchia culmella	Crambidae	Lepidoptera			
Pyrausta purpuralis	Crambidae	Lepidoptera			
Cilix glaucata	Drepanidae	Lepidoptera		tree-associated	arboreal
Callistege mi	Erebidae	Lepidoptera		open habitats	tall sward & scrub
Hypena proboscidalis	Erebidae	Lepidoptera		open habitats	tall sward & scrub
Orgyia antiqua	Erebidae	Lepidoptera		tree-associated	arboreal
Camptogramma bilineata	Geometridae	Lepidoptera		open habitats	tall sward & scrub
Petrophora chlorosata	Geometridae	Lepidoptera		open habitats	tall sward & scrub
Scotopteryx chenopodiata	**Geometridae**	**Lepidoptera**	**Section 7 Priority Species - research only**	**open habitats**	**tall sward & scrub**
Timandra comae	**Geometridae**	**Lepidoptera**	**Section 7 Priority Species - research only**	**open habitats**	**tall sward & scrub**
Acrocercops brongniardella **(mines)**	**Gracillariidae**	**Lepidoptera**	**Local**	**tree-associated**	**arboreal**
Phyllonorycter coryli (mine)	Gracillariidae	Lepidoptera		tree-associated	arboreal
Triodia sylvina	Hepialidae	Lepidoptera		open habitats	tall sward & scrub

Ochlodes sylvanus	Hesperiidae	Lepidoptera		open habitats	tall sward & scrub
Lycaena phlaeas	Lycaenidae	Lepidoptera		open habitats	tall sward & scrub
Polyommatus icarus	Lycaenidae	Lepidoptera		open habitats	short sward & bare ground
Micropterix calthella	Micropterigidae	Lepidoptera		tree-associated	arboreal
Panemeria tenebrata	**Noctuidae**	**Lepidoptera**	**Local**	**open habitats**	**tall sward & scrub**
Xestia xanthographa	Noctuidae	Lepidoptera		open habitats	tall sward & scrub
Aglais io	Nymphalidae	Lepidoptera		open habitats	tall sward & scrub
Aglais urticae	Nymphalidae	Lepidoptera		open habitats	tall sward & scrub
Maniola jurtina	Nymphalidae	Lepidoptera		open habitats	tall sward & scrub
Melanargia galathea	Nymphalidae	Lepidoptera		open habitats	tall sward & scrub
Pararge aegeria	Nymphalidae	Lepidoptera		open habitats	tall sward & scrub
Pyronia tithonus	Nymphalidae	Lepidoptera		open habitats	tall sward & scrub
Vanessa atalanta	Nymphalidae	Lepidoptera			
Anthocharis cardamines	Pieridae	Lepidoptera		open habitats	tall sward & scrub
Pieris brassicae	Pieridae	Lepidoptera		open habitats	
Pieris napi	Pieridae	Lepidoptera		open habitats	
Pieris rapae	Pieridae	Lepidoptera		open habitats	
Acrobasis advenella	Pyralidae	Lepidoptera			
Agapeta hamana	Tortricidae	Lepidoptera		open habitats	short sward & bare ground
Celypha lacunana	Tortricidae	Lepidoptera			
Grapholita compositella	Tortricidae	Lepidoptera	Locally common	open habitats	tall sward & scrub
Grapholita funebrana	Tortricidae	Lepidoptera	Locally common		
Pammene aurana	**Tortricidae**	**Lepidoptera**	**Local**	**open habitats**	**tall sward & scrub**
Yponomeuta sp (adult)	Yponomeutidae	Lepidoptera			
Zygaena filipendulae	Zygaenidae	Lepidoptera		open habitats	tall sward & scrub
Panorpa germanica	Panorpidae	Mecoptera		open habitats	tall sward & scrub
Chrysoperla lucasina	Chrysopidae	Neuroptera	DD		

Micromus angulatus	**Hemerobiidae**	**Neuroptera**	**Local**	**open habitats**	**tall sward & scrub**
Micromus variegatus	Hemerobiidae	Neuroptera		open habitats	tall sward & scrub
Coenagrion puella	Coenagrionidae	Odonata		wetland	marshland
Nemastoma bimaculatum	Nemastomatidae	Opiliones		tree-associated	shaded woodland floor
Dicranopalpus ramosus sensu stricto	Phalangiidae	Opiliones			
Leiobunum rotundum	Phalangiidae	Opiliones		tree-associated	arboreal
Paroligolophus agrestis	Phalangiidae	Opiliones			
Rilaena triangularis	Phalangiidae	Opiliones		tree-associated	shaded woodland floor
Omocestus viridulus	Acrididae	Orthoptera		open habitats	tall sward & scrub
Pseudochorthippus parallelus	Acrididae	Orthoptera		open habitats	tall sward & scrub
Leptophyes punctatissima	Phaneropteridae	Orthoptera		open habitats	tall sward & scrub
Pholidoptera griseoaptera	Tettigoniidae	Orthoptera		open habitats	tall sward & scrub
Roeseliana roeselii	Tettigoniidae	Orthoptera		open habitats	tall sward & scrub
Nemoura cinerea	Nemouridae	Plecoptera		wetland	marshland
Polydesmus angustus	Polydesmidae	Polydesmida			
Ectopsocus briggsi sensu stricto	Ectopsocidae	Psocoptera			
Graphopsocus cruciatus	Stenopsocidae	Psocoptera			
Deroceras (Deroceras) invadens	Agriolimacidae	Pulmonata			
Deroceras (Deroceras) reticulatum	Agriolimacidae	Pulmonata		open habitats	tall sward & scrub
Arion (Arion) flagellus	Arionidae	Pulmonata		open habitats	tall sward & scrub
Arion (Arion) ater sub. rufus	Arionidae	Pulmonata			
Arion (Kobeltia) owenii	Arionidae	Pulmonata		open habitats	tall sward & scrub
Cochlicopa cf. lubrica sensu Anderson 2008	Cochlicopidae	Pulmonata		open habitats	tall sward & scrub

Cochlicopa cf. lubricella sensu Anderson 2008	Cochlicopidae	Pulmonata		open habitats	short sward & bare ground
Euconulus cf. alderi sensu Anderson 2008	Euconulidae	Pulmonata		wetland	marshland
Ambigolimax valentianus	Limacidae	Pulmonata			
Aegopinella nitidula	Oxychilidae	Pulmonata		open habitats	tall sward & scrub
Oxychilus (Oxychilus) alliarius	Oxychilidae	Pulmonata		conifer or broadleaved	woodland habitat
Oxychilus (Oxychilus) navarricus	Oxychilidae	Pulmonata			
Succinea putris	Succineidae	Pulmonata		wetland	acid & sedge peats; lake
Vallonia cf. excentrica sensu Anderson 2008	Valloniidae	Pulmonata		open habitats	short sward & bare ground
Vertigo (Vertigo) pygmaea	Vertiginidae	Pulmonata		open habitats	tall sward & scrub
Dicyrtomina saundersi	Dicyrtomidae	Symphypleona			
Sminthurinus aureus	Katiannidae	Symphypleona			
Sminthurinus elegans	Katiannidae	Symphypleona			
Sminthurus viridis	Sminthuridae	Symphypleona			
Aceria aceriscampestris (gall)	Eriophyidae	Trombidiformes			
Aceria macrochela (gall)	Eriophyidae	Trombidiformes			

Appendix 2. List of invertebrate species recorded from Field A (318 species in total).

Species	Family	Order	Conservation status	Habitat	Associations
Agelena labyrinthica	Agelenidae	Araneae	Locally common	tall sward & scrub	Arthropoda
Agalenatea redii	Araneidae	Araneae	Locally common		
Araneus diadematus	Araneidae	Araneae			
Gibbaranea gibbosa	Araneidae	Araneae	Local	arboreal	Arthropoda, Fagales
Larinioides cornutus	Araneidae	Araneae		acid & sedge peats	Arthropoda
Mangora acalypha	Araneidae	Araneae	Locally common and spreading	tall sward & scrub	Arthropoda
Zygiella atrica	Araneidae	Araneae		arboreal	Arthropoda, Fagales, *Prunus spinosa*
Dictyna arundinacea	Dictynidae	Araneae		tall sward & scrub	Arthropoda
Bathyphantes gracilis	Linyphiidae	Araneae			
Erigone atra	Linyphiidae	Araneae			
Erigone dentipalpis	Linyphiidae	Araneae			
Linyphia triangularis	Linyphiidae	Araneae			
Microlinyphia pusilla	Linyphiidae	Araneae		tall sward & scrub	Arthropoda
Tenuiphantes tenuis	Linyphiidae	Araneae		tall sward & scrub	
Pardosa palustris	Lycosidae	Araneae		short sward & bare ground	Arthropoda
Pardosa prativaga	Lycosidae	Araneae		tall sward & scrub	Arthropoda
Pardosa tenuipes	Lycosidae	Araneae	NS	brackish pools & ditches; marshland	Arthropoda
Piratula latitans	Lycosidae	Araneae	Local	acid & sedge peats	Arthropoda
Cheiracanthium erraticum	Miturgidae	Araneae	Local	tall sward & scrub	Arthropoda
Philodromus cespitum	Philodromidae	Araneae		arboreal	Arthropoda, Fagales
Pisaura mirabilis	Pisauridae	Araneae		tall sward & scrub	Arthropoda
Metellina mengei	Tetragnathidae	Araneae			
Pachygnatha degeeri	Tetragnathidae	Araneae			

Anelosimus vittatus	Theridiidae	Araneae		arboreal	
Enoplognatha ovata sensu stricto	Theridiidae	Araneae			
Neottiura bimaculata	Theridiidae	Araneae		tall sward & scrub	
Paidiscura pallens	Theridiidae	Araneae		arboreal	Arthropoda, Fagales, *Quercus*
Phylloneta impressa	Theridiidae	Araneae		tall sward & scrub	Arthropoda
Misumena vatia	Thomisidae	Araneae	Locally common	tall sward & scrub	Arthropoda
Xysticus acerbus	Thomisidae	Araneae	NR	tall sward & scrub	Arthropoda
Xysticus cristatus	Thomisidae	Araneae			
Zora spinimana	Zoridae	Araneae		tall sward & scrub	
Anthicus antherinus	Anthicidae	Coleoptera	Local in Wales	saltmarsh	
Ischnopterapion virens	Apionidae	Coleoptera		tall sward & scrub	
Perapion hydrolapathi	Apionidae	Coleoptera		tall sward & scrub	
Perapion violaceum	Apionidae	Coleoptera		tall sward & scrub	
Protapion apricans	Apionidae	Coleoptera		tall sward & scrub	*Trifolium*
Protapion assimile	Apionidae	Coleoptera		tall sward & scrub	*Trifolium*
Protapion difforme	Apionidae	Coleoptera	Nb	tall sward & scrub	*Trifolium*
Protapion fulvipes	Apionidae	Coleoptera		tall sward & scrub	*Trifolium*
Protapion nigritarse	Apionidae	Coleoptera		tall sward & scrub	*Trifolium*
Protapion trifolii	Apionidae	Coleoptera		tall sward & scrub	*Trifolium*
Protapion varipes	Apionidae	Coleoptera	[Nb]; Nb	tall sward & scrub	*Trifolium*
Byturus tomentosus	Byturidae	Coleoptera		tall sward & scrub	*Rubus*
Cantharis decipiens	Cantharidae	Coleoptera		tall sward & scrub	
Cantharis flavilabris	Cantharidae	Coleoptera		tall sward & scrub	
Cantharis rustica	Cantharidae	Coleoptera		tall sward & scrub	
Malthinus flaveolus	Cantharidae	Coleoptera		decaying wood	Fagales
Malthodes marginatus	Cantharidae	Coleoptera		decaying wood	Fagales
Rhagonycha fulva	Cantharidae	Coleoptera		tall sward & scrub	Arthropoda

Acupalpus exiguus	Carabidae	Coleoptera	NS	marshland	Arthropoda
Amara aenea	Carabidae	Coleoptera		short sward & bare ground	
Amara familiaris	Carabidae	Coleoptera		tall sward & scrub	
Bembidion properans	Carabidae	Coleoptera		short sward & bare ground	
Syntomus obscuroguttatus	Carabidae	Coleoptera	Local in Wales	tall sward & scrub	
Clytus arietis	Cerambycidae	Coleoptera		decaying wood	Fagales
Grammoptera ruficornis	Cerambycidae	Coleoptera		decaying wood	Fagales
Pachytodes cerambyciformis	Cerambycidae	Coleoptera	Common in Wales	decaying wood	*Alnus, Betula*
Rutpela maculata	Cerambycidae	Coleoptera		decaying wood	Fagales
Bruchidius varius	Chrysomelidae	Coleoptera	Other	tall sward & scrub	*Trifolium*
Cassida vibex	Chrysomelidae	Coleoptera		short sward & bare ground	*Centaurea*
Chaetocnema concinna	Chrysomelidae	Coleoptera		tall sward & scrub	Polygonaceae
Chaetocnema hortensis	Chrysomelidae	Coleoptera		tall sward & scrub	Poaceae
Lema cyanella	Chrysomelidae	Coleoptera		tall sward & scrub	*Cirsium*
Longitarsus luridus	Chrysomelidae	Coleoptera		tall sward & scrub	Asteraceae
Longitarsus suturellus	Chrysomelidae	Coleoptera		tall sward & scrub	Asteraceae
Neocrepidodera ferruginea	Chrysomelidae	Coleoptera		tall sward & scrub	Asteraceae
Oulema melanopus	Chrysomelidae	Coleoptera		tall sward & scrub	
Oulema obscura	Chrysomelidae	Coleoptera		tall sward & scrub	Poaceae
Phyllotreta astrachanica	Chrysomelidae	Coleoptera	Local; scarce in Duff	tall sward & scrub	Brassicaceae
Phyllotreta undulata	Chrysomelidae	Coleoptera		tall sward & scrub	Brassicaceae
Coccinella septempunctata	Coccinellidae	Coleoptera			
Propylea quattuordecimpunctata	Coccinellidae	Coleoptera			

Psyllobora vigintiduopunctata	Coccinellidae	Coleoptera		tall sward & scrub	
Rhyzobius litura	Coccinellidae	Coleoptera		tall sward & scrub	
Scymnus haemorrhoidalis	Coccinellidae	Coleoptera	Locally common	tall sward & scrub	
Tytthaspis sedecimpunctata	Coccinellidae	Coleoptera		tall sward & scrub	
Barynotus obscurus	Curculionidae	Coleoptera	Local	tall sward & scrub	Asteraceae
Hypera meles	Curculionidae	Coleoptera	[Nb]	tall sward & scrub	
Hypera postica	Curculionidae	Coleoptera		short sward & bare ground	Medicago
Liophloeus tessulatus	Curculionidae	Coleoptera		tall sward & scrub	Apiaceae
Mecinus pascuorum	Curculionidae	Coleoptera		tall sward & scrub	*Plantago*
Sitona ambiguus	Curculionidae	Coleoptera	Local	tall sward & scrub	*Lathyrus, Vicia*
Sitona lineatus	Curculionidae	Coleoptera		tall sward & scrub	*Vicia*
Sitona obsoletus	Curculionidae	Coleoptera		tall sward & scrub	*Trifolium*
Sitona suturalis	Curculionidae	Coleoptera		tall sward & scrub	*Lathyrus*
Trichosirocalus troglodytes	Curculionidae	Coleoptera		tall sward & scrub	*Plantago*
Agriotes acuminatus	Elateridae	Coleoptera		tall sward & scrub	Asteraceae
Agriotes sputator	Elateridae	Coleoptera		tall sward & scrub	Asteraceae
Athous bicolor	Elateridae	Coleoptera		tall sward & scrub	
Dalopius marginatus	Elateridae	Coleoptera		tall sward & scrub	
Oedostethus quadripustulatus	Elateridae	Coleoptera	Na; new for VC	tall sward & scrub	
Anacaena globulus	Hydrophilidae	Coleoptera		marshland	
Megasternum concinnum	Hydrophilidae	Coleoptera			
Brachypterus glaber	Kateretidae	Coleoptera		tall sward & scrub	Asteraceae
Cartodere bifasciata	Latridiidae	Coleoptera			
Corticarina minuta	Latridiidae	Coleoptera			
Malachius bipustulatus	Malachiidae	Coleoptera		decaying wood	Fagales

Meligethes aeneus	Nitidulidae	Coleoptera			
Meligethes carinulatus	Nitidulidae	Coleoptera	Locally common		
Meligethes nigrescens	Nitidulidae	Coleoptera	Locally common		
Oedemera lurida	Oedemeridae	Coleoptera		tall sward & scrub	
Oedemera nobilis	Oedemeridae	Coleoptera		tall sward & scrub	
Olibrus aeneus	Phalacridae	Coleoptera			
Hoplia philanthus	Scarabaeidae	Coleoptera		tall sward & scrub	Asteraceae
Onthophagus similis	Scarabaeidae	Coleoptera		tall sward & scrub	
Phyllopertha horticola	Scarabaeidae	Coleoptera			
Anaspis frontalis	Scraptiidae	Coleoptera		decaying wood	
Anaspis maculata	Scraptiidae	Coleoptera		decaying wood	
Anaspis pulicaria	Scraptiidae	Coleoptera	Local; scarce in Duff	decaying wood	
Cypha longicornis	Staphylinidae	Coleoptera		shaded woodland floor	Plantae
Drusilla canaliculata	Staphylinidae	Coleoptera	Locally common	tall sward & scrub	
Ocypus aeneocephalus	Staphylinidae	Coleoptera		tall sward & scrub	
Paederus littoralis	Staphylinidae	Coleoptera		running water	Arthropoda
Philonthus cognatus	Staphylinidae	Coleoptera		tall sward & scrub	
Phyllodrepa floralis	Staphylinidae	Coleoptera	Local	decaying wood	Plantae
Rugilus orbiculatus	Staphylinidae	Coleoptera		tall sward & scrub	
Stenus clavicornis	Staphylinidae	Coleoptera		tall sward & scrub	
Stenus fulvicornis	Staphylinidae	Coleoptera		tall sward & scrub	
Stenus picipes	Staphylinidae	Coleoptera		tall sward & scrub	
Stenus tarsalis	Staphylinidae	Coleoptera		marshland	
Tachyporus dispar	Staphylinidae	Coleoptera		tall sward & scrub	
Tachyporus hypnorum	Staphylinidae	Coleoptera		tall sward & scrub	
Phytomyza ranunculi	Agromyzidae	Diptera			
Botanophila brunneilinea	Anthomyiidae	Diptera	Local in Wales		

Botanophila striolata s.str.	Anthomyiidae	Diptera			
Chirosia grossicauda	Anthomyiidae	Diptera			
Leptogaster cylindrica	Asilidae	Diptera		short sward & bare ground; tall sward & scrub	Arthropoda
Dilophus febrilis	Bibionidae	Diptera		tall sward & scrub	Asteraceae
Dasineura ulmaria	Cecidomyiidae	Diptera			
Sicus ferrugineus	Conopidae	Diptera		short sward & bare ground	*Bombus*
Dolichopus festivus	Dolichopodidae	Diptera		marshland	Arthropoda
Dolichopus wahlbergi	Dolichopodidae	Diptera		running water; shaded woodland floor; wet woodland	Arthropoda, Fagales
Poecilobothrus nobilitatus	Dolichopodidae	Diptera		marshland	Arthropoda
Empis livida	Empididae	Diptera		tall sward & scrub	Arthropoda
Hybos culiciformis	Hybotidae	Diptera		shaded woodland floor	Diptera, Plantae
Calliopum tuberculosum	Lauxaniidae	Diptera			
Meiosimyza decempunctata	Lauxaniidae	Diptera		shaded woodland floor	Plantae
Minettia longipennis	Lauxaniidae	Diptera		shaded woodland floor	Plantae
Sapromyza sexpunctata	Lauxaniidae	Diptera			
Eudasyphora cyanella	Muscidae	Diptera		shaded woodland floor	Plantae
Helina impuncta	Muscidae	Diptera		shaded woodland floor	Arthropoda, *Fraxinus*, Plantae, *Quercus*
Musca autumnalis	Muscidae	Diptera			
Phaonia signata	Muscidae	Diptera		shaded woodland floor	Plantae
Geomyza balachowskyi	Opomyzidae	Diptera		tall sward & scrub	*Holcus*
Opomyza petrei	Opomyzidae	Diptera		tall sward & scrub	Poaceae

Pollenia rudis	Polleniidae	Diptera		marshland	*Allolobophora chlorotica,* Lumbricidae
Chrysopilus cristatus	Rhagionidae	Diptera		acid & sedge peats; shaded woodland floor; wet woodland	Fagales
Scathophaga stercoraria	Scathophagidae	Diptera		tall sward & scrub	*Bos*, Diptera
Tetanocera elata	Sciomyzidae	Diptera		tall sward & scrub	Mollusca
Tetanocera ferruginea	Sciomyzidae	Diptera		acid & sedge peats	Mollusca
Chorisops nagatomii	Stratiomyidae	Diptera		tall sward & scrub	
Pachygaster atra	Stratiomyidae	Diptera	Locally common	shaded woodland floor	Plantae, *Ulmus*
Cheilosia albitarsis	Syrphidae	Diptera			
Cheilosia scutellata	Syrphidae	Diptera		shaded woodland floor	*Boletus*, Plantae
Chrysogaster solstitialis	Syrphidae	Diptera		acid & sedge peats; running water; shaded woodland floor; wet woodland	Fagales, *Quercus*
Episyrphus balteatus	Syrphidae	Diptera		tall sward & scrub	Aphididae
Eristalis pertinax	Syrphidae	Diptera		acid & sedge peats	
Eristalis tenax	Syrphidae	Diptera		rich flower resource	
Helophilus pendulus	Syrphidae	Diptera		acid & sedge peats	
Melanostoma mellinum	Syrphidae	Diptera		tall sward & scrub	Arthropoda
Melanostoma scalare	Syrphidae	Diptera		tall sward & scrub	Arthropoda
Sphaerophoria taeniata	Syrphidae	Diptera	Local		
Syritta pipiens	Syrphidae	Diptera		tall sward & scrub	
Syrphus ribesii	Syrphidae	Diptera			Aphididae
Xylota segnis	Syrphidae	Diptera		decaying wood	Fagales
Xylota sylvarum	Syrphidae	Diptera		decaying wood	*Fagus*, Plantae

Tabanus bromius	Tabanidae	Diptera	Local in Wales	acid & sedge peats	Mammalia
Phasia barbifrons	Tachinidae	Diptera	Other		Heteroptera
Phasia obesa	Tachinidae	Diptera	Local in Wales		Heteroptera
Chaetostomella cylindrica	Tephritidae	Diptera		short sward & bare ground; tall sward & scrub	*Centaurea nigra sens. lat. (=nigra/debeauxii)*
Tephritis vespertina	Tephritidae	Diptera		tall sward & scrub	*Hypochaeris radicata*
Urophora jaceana	Tephritidae	Diptera		short sward & bare ground; tall sward & scrub	*Centaurea nigra sens. lat. (=nigra/debeauxii)*
Urophora quadrifasciata	Tephritidae	Diptera		short sward & bare ground; tall sward & scrub	*Centaurea nigra sens. lat. (=nigra/debeauxii)*
Tipula paludosa	Tipulidae	Diptera		tall sward & scrub	
Tipula vernalis	Tipulidae	Diptera		tall sward & scrub	Asteraceae
Entomobrya nivalis	Entomobryidae	Entomobryomorpha			
Orchesella cincta	Entomobryidae	Entomobryomorpha			
Orchesella villosa	Entomobryidae	Entomobryomorpha			
Isotomurus maculatus	Isotomidae	Entomobryomorpha			
Anthocoris nemoralis	Anthocoridae	Hemiptera		arboreal	Acari, Aphididae, Fagales
Anthocoris nemorum	Anthocoridae	Hemiptera			
Orius (Heterorius) laticollis	Anthocoridae	Hemiptera	Other	arboreal	Arthropoda, *Salix*
Aphrophora alni	Aphrophoridae	Hemiptera			
Neophilaenus lineatus	Aphrophoridae	Hemiptera		tall sward & scrub	Poaceae
Philaenus spumarius	Aphrophoridae	Hemiptera			
Berytinus (Berytinus) minor	Berytidae	Hemiptera		short sward & bare ground	*Ononis repens*
Alebra albostriella	Cicadellidae	Hemiptera		arboreal	*Quercus robur*
Alebra wahlbergi	Cicadellidae	Hemiptera		arboreal	*Acer, Aesculus, Ulmus*
Aphrodes bicincta	Cicadellidae	Hemiptera	Locally common	tall sward & scrub	Poaceae

Arthaldeus pascuellus	Cicadellidae	Hemiptera		tall sward & scrub	
Deltocephalus pulicaris	Cicadellidae	Hemiptera		tall sward & scrub	
Edwardsiana frustrator	Cicadellidae	Hemiptera	Local	arboreal	Asteraceae
Eupteryx urticae	Cicadellidae	Hemiptera		tall sward & scrub	*Urtica dioica*
Euscelis incisus	Cicadellidae	Hemiptera		tall sward & scrub	Poaceae
Typhlocyba quercus	Cicadellidae	Hemiptera		arboreal	*Betula, Carpinus, Prunus, Quercus*
Zyginidia scutellaris	Cicadellidae	Hemiptera		tall sward & scrub	
Coreus marginatus	Coreidae	Hemiptera		tall sward & scrub	*Rumex*
Javesella dubia	Delphacidae	Hemiptera		tall sward & scrub	Poaceae
Scottianella dalei	Delphacidae	Hemiptera	Nb; new for Wales	tall sward & scrub	Poaceae
Cymus claviculus	Lygaeidae	Hemiptera		short sward & bare ground	*Polygonum*
Drymus (Sylvadrymus) sylvaticus	Lygaeidae	Hemiptera		tall sward & scrub	*Ballota nigra*
Heterogaster urticae	Lygaeidae	Hemiptera		tall sward & scrub	*Urtica dioica*
Acetropis (Acetropis) gimmerthalii	Miridae	Hemiptera	Locally common	tall sward & scrub	Asteraceae
Apolygus spinolae	Miridae	Hemiptera		tall sward & scrub	
Capsus ater	Miridae	Hemiptera		tall sward & scrub	Poaceae
Closterotomus fulvomaculatus	Miridae	Hemiptera		tall sward & scrub	*Humulus lupulus*
Closterotomus norwegicus	Miridae	Hemiptera		tall sward & scrub	Asteraceae, *Trifolium, Urtica*
Deraeocoris (Deraeocoris) flavilinea	Miridae	Hemiptera			
Deraeocoris (Deraeocoris) ruber	Miridae	Hemiptera		tall sward & scrub	Arthropoda
Leptopterna dolabrata	Miridae	Hemiptera		tall sward & scrub	Poaceae
Liocoris tripustulatus	Miridae	Hemiptera		tall sward & scrub	*Urtica dioica*
Lopus decolor	Miridae	Hemiptera		tall sward & scrub	Poaceae

Lygus pratensis	Miridae	Hemiptera	[RDB 3]		
Miridius quadrivirgatus	Miridae	Hemiptera	Local	tall sward & scrub	*Hordeum*, Poaceae
Phytocoris (Ktenocoris) ulmi	Miridae	Hemiptera		arboreal	Animalia
Phytocoris (Ktenocoris) varipes	Miridae	Hemiptera		tall sward & scrub	Asteraceae
Pithanus maerkelii	Miridae	Hemiptera		tall sward & scrub	Arthropoda
Plagiognathus arbustorum	Miridae	Hemiptera		tall sward & scrub	*Urtica*
Plagiognathus chrysanthemi	Miridae	Hemiptera		short sward & bare ground	Asteraceae
Stenodema (Stenodema) laevigata	Miridae	Hemiptera		tall sward & scrub	Poaceae
Stenotus binotatus	Miridae	Hemiptera		tall sward & scrub	Poaceae
Himacerus (Anaptus) major	Nabidae	Hemiptera		tall sward & scrub	Arthropoda
Nabis (Dolichonabis) limbatus	Nabidae	Hemiptera		tall sward & scrub	Arthropoda
Nabis (Nabis) rugosus	Nabidae	Hemiptera		tall sward & scrub	Arthropoda
Dolycoris baccarum	Pentatomidae	Hemiptera		tall sward & scrub	Asteraceae
Palomena prasina	Pentatomidae	Hemiptera		tall sward & scrub	*Corylus*, Fagales
Tingis (Tingis) ampliata	Tingidae	Hemiptera		tall sward & scrub	*Cirsium arvense*
Bombus hypnorum	Apidae	Hymenoptera		shaded woodland floor; tall sward & scrub	Asteraceae, Fagales
Bombus lapidarius	Apidae	Hymenoptera		tall sward & scrub	
Bombus lucorum/terrestris	Apidae	Hymenoptera			
Bombus pascuorum	Apidae	Hymenoptera		tall sward & scrub	Asteraceae
Bombus pratorum	Apidae	Hymenoptera		shaded woodland floor; tall sward & scrub	Asteraceae, Fagales
Eucera longicornis	Apidae	Hymenoptera	[Na]; Section 7 Priority Species	short sward & bare ground	

Argogorytes mystaceus	Crabronidae	Hymenoptera		shaded woodland floor; short sward & bare ground	Homoptera, Plantae
Cerceris rybyensis	Crabronidae	Hymenoptera		short sward & bare ground	Apidae
Ectemnius lituratus	Crabronidae	Hymenoptera		decaying wood	
Andricus foecundatrix	Cynipidae	Hymenoptera			
Andricus kollari	Cynipidae	Hymenoptera			
Andricus kollari f. agamic	Cynipidae	Hymenoptera			
Cynips longiventris	Cynipidae	Hymenoptera			
Neuroterus numismalis	Cynipidae	Hymenoptera			
Neuroterus quercusbaccarum	Cynipidae	Hymenoptera			
Myrmica rubra	Formicidae	Hymenoptera		tall sward & scrub	
Myrmica scabrinodis	Formicidae	Hymenoptera		tall sward & scrub	
Amblyteles armatorius	Ichneumonidae	Hymenoptera			
Osmia bicornis	Megachilidae	Hymenoptera		shaded woodland floor; tall sward & scrub	Asteraceae, Fagales
Melitta leporina	Melittidae	Hymenoptera	Local in Wales	short sward & bare ground	*Trifolium*
Dolerus nigratus	Tenthredinidae	Hymenoptera			
Profenusa pygmaea	Tenthredinidae	Hymenoptera			
Tenthredo amoena	Tenthredinidae	Hymenoptera			
Tenthredo brevicornis	Tenthredinidae	Hymenoptera			
Tenthredopsis coquebertii	Tenthredinidae	Hymenoptera			
Dolichovespula sylvestris	Vespidae	Hymenoptera		arboreal	
Vespa crabro	Vespidae	Hymenoptera		decaying wood; shaded woodland floor	Arthropoda, Fagales, Plantae
Oniscus asellus	Oniscidae	Isopoda			

Philoscia muscorum	Philosciidae	Isopoda			
Anthophila fabriciana	Choreutidae	Lepidoptera		tall sward & scrub	*Urtica dioica*
Chrysoteuchia culmella	Crambidae	Lepidoptera			Poaceae
Pyrausta purpuralis	Crambidae	Lepidoptera			Lamiaceae
Callistege mi	Erebidae	Lepidoptera		tall sward & scrub	
Hypena proboscidalis	Erebidae	Lepidoptera		tall sward & scrub	*Urtica dioica*
Orgyia antiqua	Erebidae	Lepidoptera		arboreal	Asteraceae, Fagales
Camptogramma bilineata	Geometridae	Lepidoptera		tall sward & scrub	*Rumex, Stellaria media*
Petrophora chlorosata	Geometridae	Lepidoptera		tall sward & scrub	
Scotopteryx chenopodiata	Geometridae	Lepidoptera	Section 7 Priority Species - research only	tall sward & scrub	*Trifolium, Vicia*
Timandra comae	Geometridae	Lepidoptera	Section 7 Priority Species - research only	tall sward & scrub	Asteraceae, *Rumex*
Phyllonorycter coryli	Gracillariidae	Lepidoptera		arboreal	*Corylus*
Lycaena phlaeas	Lycaenidae	Lepidoptera		tall sward & scrub	*Rumex acetosa, Rumex acetosella, Rumex obtusifolius*
Polyommatus icarus	Lycaenidae	Lepidoptera		short sward & bare ground	*Lotus corniculatus, Lotus pedunculatus, Medicago lupulina, Ononis repens, Trifolium dubium, Trifolium repens*
Micropterix calthella	Micropterigidae	Lepidoptera		arboreal	
Panemeria tenebrata	Noctuidae	Lepidoptera	Local	tall sward & scrub	*Cerastium*
Aglais io	Nymphalidae	Lepidoptera		tall sward & scrub	*Humulus lupulus, Urtica dioica, Urtica urens*
Aglais urticae	Nymphalidae	Lepidoptera		tall sward & scrub	Plantae*, Urtica dioica, Urtica urens*

Maniola jurtina	Nymphalidae	Lepidoptera		tall sward & scrub	*Brachypodium sylvaticum, Dactylis glomerata, Helictotrichon pubescens*
Melanargia galathea	Nymphalidae	Lepidoptera		tall sward & scrub	*Brachypodium pinnatum, Festuca ovina, Festuca rubra, Holcus lanatus*
Pararge aegeria	Nymphalidae	Lepidoptera		tall sward & scrub	*Brachypodium sylvaticum, Dactylis glomerata, Elytrigia repens, Holcus lanatus*
Pyronia tithonus	Nymphalidae	Lepidoptera		tall sward & scrub	Plantae
Vanessa atalanta	Nymphalidae	Lepidoptera			*Humulus, Humulus lupulus, Parietaria judaica, Urtica, Urtica dioica, Urtica urens*
Anthocharis cardamines	Pieridae	Lepidoptera		tall sward & scrub	*Alliaria petiolata, Arabis hirsuta, Barbarea vulgaris, Brassica rapa, Cardamine amara, Cardamine pratensis, Plantae, Sinapis arvensis, Sisymbrium officinale*
Pieris brassicae	Pieridae	Lepidoptera			*Reseda lutea, Tropaeolum majus*
Pieris napi	Pieridae	Lepidoptera			*Alliaria petiolata, Brassica oleracea, Cardamine amara, Cardamine pratensis, Raphanus raphanistrum, Rorippa nasturtium-aquaticum,*

					Sinapis arvensis, Sisymbrium officinale, Tropaeolum majus
Pieris rapae	Pieridae	Lepidoptera			*Alliaria petiolata, Brassica oleracea, Lepidium draba, Reseda lutea, Sinapis arvensis, Sisymbrium officinale, Tropaeolum majus*
Agapeta hamana	Tortricidae	Lepidoptera		short sward & bare ground	*Cirsium*
Yponomeuta sp (adult)	Yponomeutidae	Lepidoptera			
Zygaena filipendulae	Zygaenidae	Lepidoptera		tall sward & scrub	*Lotus*
Chrysoperla lucasina	Chrysopidae	Neuroptera	DD		
Micromus angulatus	Hemerobiidae	Neuroptera	Local	tall sward & scrub	Aphididae
Coenagrion puella	Coenagrionidae	Odonata		marshland	Arthropoda
Nemastoma bimaculatum	Nemastomatidae	Opiliones		shaded woodland floor	Arthropoda, Plantae
Dicranopalpus ramosus sensu stricto	Phalangiidae	Opiliones			
Omocestus viridulus	Acrididae	Orthoptera		tall sward & scrub	
Pseudochorthippus parallelus	Acrididae	Orthoptera		tall sward & scrub	
Leptophyes punctatissima	Phaneropteridae	Orthoptera		tall sward & scrub	
Pholidoptera griseoaptera	Tettigoniidae	Orthoptera		tall sward & scrub	
Roeseliana roeselii	Tettigoniidae	Orthoptera		tall sward & scrub	
Nemoura cinerea	Nemouridae	Plecoptera		marshland	
Polydesmus angustus	Polydesmidae	Polydesmida			
Graphopsocus cruciatus	Stenopsocidae	Psocoptera			
Deroceras (Deroceras) invadens	Agriolimacidae	Pulmonata			

Deroceras (Deroceras) reticulatum	Agriolimacidae	Pulmonata		tall sward & scrub	Asteraceae
Arion (Arion) flagellus	Arionidae	Pulmonata		tall sward & scrub	Asteraceae
Arion (Arion) rufus	Arionidae	Pulmonata			
Arion (Kobeltia) owenii	Arionidae	Pulmonata		tall sward & scrub	Asteraceae
Cochlicopa cf. lubrica sensu Anderson 2008	Cochlicopidae	Pulmonata		tall sward & scrub	Asteraceae
Cochlicopa cf. lubricella sensu Anderson 2008	Cochlicopidae	Pulmonata		short sward & bare ground	
Ambigolimax valentianus	Limacidae	Pulmonata			
Aegopinella nitidula	Oxychilidae	Pulmonata		tall sward & scrub	Asteraceae
Oxychilus (Oxychilus) alliarius	Oxychilidae	Pulmonata		woodland habitat	Asteraceae
Oxychilus (Oxychilus) navarricus	Oxychilidae	Pulmonata			
Succinea putris	Succineidae	Pulmonata		acid & sedge peats; lake	
Vallonia cf. excentrica sensu Anderson 2008	Valloniidae	Pulmonata		short sward & bare ground	
Vertigo (Vertigo) pygmaea	Vertiginidae	Pulmonata		tall sward & scrub	Algae
Dicyrtomina saundersi	Dicyrtomidae	Symphypleona			
Sminthurinus aureus	Katiannidae	Symphypleona			
Sminthurus viridis	Sminthuridae	Symphypleona			
Aceria aceriscampestris	Eriophyidae	Trombidiformes			
Aceria macrochela	Eriophyidae	Trombidiformes			

Appendix 3. List of invertebrate species recorded from Field B (269 species in total).

Species	Family	Order	Conservation status	Habitat	Associations
Agelena labyrinthica	Agelenidae	Araneae	Locally common	tall sward & scrub	Arthropoda
Araneus triguttatus	Araneidae	Araneae	Local; scarce in Wales	arboreal	Arthropoda, Fagales
Araniella opisthographa	Araneidae	Araneae		arboreal	Arthropoda, Fagales, *Quercus*
Larinioides cornutus	Araneidae	Araneae		acid & sedge peats	Arthropoda
Mangora acalypha	Araneidae	Araneae	Locally common and spreading	tall sward & scrub	Arthropoda
Clubiona brevipes	Clubionidae	Araneae		arboreal	Arthropoda, Fagales
Microlinyphia pusilla	Linyphiidae	Araneae		tall sward & scrub	Arthropoda
Alopecosa pulverulenta	Lycosidae	Araneae		tall sward & scrub; upland	Arthropoda
Pardosa pullata	Lycosidae	Araneae		tall sward & scrub	Arthropoda
Cheiracanthium erraticum	Miturgidae	Araneae	Local	tall sward & scrub	Arthropoda
Pisaura mirabilis	Pisauridae	Araneae		tall sward & scrub	Arthropoda
Metellina mengei	Tetragnathidae	Araneae			
Metellina segmentata	Tetragnathidae	Araneae			
Pachygnatha clercki	Tetragnathidae	Araneae		acid & sedge peats	Arthropoda
Pachygnatha degeeri	Tetragnathidae	Araneae			
Anelosimus vittatus	Theridiidae	Araneae		arboreal	
Enoplognatha latimana	Theridiidae	Araneae		tall sward & scrub	Arthropoda
Neottiura bimaculata	Theridiidae	Araneae		tall sward & scrub	
Paidiscura pallens	Theridiidae	Araneae		arboreal	Arthropoda, Fagales, *Quercus*
Phylloneta sisyphia	Theridiidae	Araneae		tall sward & scrub	Arthropoda
Theridion varians	Theridiidae	Araneae		arboreal	Arthropoda, Fagales
Misumena vatia	Thomisidae	Araneae	Locally common	tall sward & scrub	Arthropoda

Xysticus cristatus	Thomisidae	Araneae			
Xysticus kochi	Thomisidae	Araneae	Local	short sward & bare ground	Arthropoda
Perapion curtirostre	Apionidae	Coleoptera		tall sward & scrub	
Perapion violaceum	Apionidae	Coleoptera		tall sward & scrub	
Protapion apricans	Apionidae	Coleoptera		tall sward & scrub	*Trifolium*
Protapion assimile	Apionidae	Coleoptera		tall sward & scrub	*Trifolium*
Protapion fulvipes	Apionidae	Coleoptera		tall sward & scrub	*Trifolium*
Protapion varipes	Apionidae	Coleoptera	[Nb]; Nb	tall sward & scrub	*Trifolium*
Cantharis decipiens	Cantharidae	Coleoptera		tall sward & scrub	
Cantharis flavilabris (=nigra auctt.) black scutellum	Cantharidae	Coleoptera		tall sward & scrub	
Cantharis rustica	Cantharidae	Coleoptera		tall sward & scrub	
Rhagonycha fulva	Cantharidae	Coleoptera		tall sward & scrub	Arthropoda
Acupalpus dubius	Carabidae	Coleoptera		acid & sedge peats	Arthropoda
Acupalpus exiguus	Carabidae	Coleoptera	NS	marshland	Arthropoda
Bembidion guttula	Carabidae	Coleoptera		marshland	
Bembidion lampros	Carabidae	Coleoptera		short sward & bare ground	
Dyschirius globosus	Carabidae	Coleoptera		acid & sedge peats	
Poecilus versicolor	Carabidae	Coleoptera		tall sward & scrub	
Syntomus obscuroguttatus	Carabidae	Coleoptera	Local in Wales	tall sward & scrub	
Anaglyptus mysticus	Cerambycidae	Coleoptera	Local in Wales	decaying wood	Fagales
Pogonocherus hispidus	Cerambycidae	Coleoptera		decaying wood	Fagales
Rutpela maculata	Cerambycidae	Coleoptera		decaying wood	Fagales
Cassida rubiginosa	Chrysomelidae	Coleoptera		tall sward & scrub	*Cirsium*
Cassida vibex	Chrysomelidae	Coleoptera		short sward & bare ground	*Centaurea*
Chaetocnema hortensis	Chrysomelidae	Coleoptera		tall sward & scrub	Poaceae

Crepidodera aurea	Chrysomelidae	Coleoptera	Local in Wales	arboreal	
Cryptocephalus moraei	Chrysomelidae	Coleoptera	Local in Wales	short sward & bare ground	*Hypericum*
Longitarsus luridus	Chrysomelidae	Coleoptera		tall sward & scrub	Asteraceae
Phaedon tumidulus	Chrysomelidae	Coleoptera		tall sward & scrub	Apiaceae
Phyllotreta exclamationis	Chrysomelidae	Coleoptera		tall sward & scrub	*Cardamine, Rorippa*
Sphaeroderma testaceum	Chrysomelidae	Coleoptera		tall sward & scrub	Asteraceae
Coccinella septempunctata	Coccinellidae	Coleoptera			
Propylea quattuordecimpunctata	Coccinellidae	Coleoptera			
Psyllobora vigintiduopunctata	Coccinellidae	Coleoptera		tall sward & scrub	
Rhyzobius litura	Coccinellidae	Coleoptera		tall sward & scrub	
Tytthaspis sedecimpunctata	Coccinellidae	Coleoptera		tall sward & scrub	
Hypera meles	Curculionidae	Coleoptera	[Nb]	tall sward & scrub	
Hypera nigrirostris	Curculionidae	Coleoptera		tall sward & scrub	
Mecinus pascuorum	Curculionidae	Coleoptera		tall sward & scrub	*Plantago*
Rhamphus oxyacanthae	Curculionidae	Coleoptera		arboreal	
Sitona lineatus	Curculionidae	Coleoptera		tall sward & scrub	*Vicia*
Sitona sulcifrons	Curculionidae	Coleoptera		tall sward & scrub	*Trifolium*
Sitona suturalis	Curculionidae	Coleoptera		tall sward & scrub	*Lathyrus*
Trichosirocalus troglodytes	Curculionidae	Coleoptera		tall sward & scrub	*Plantago*
Dryops ernesti	Dryopidae	Coleoptera			
Agriotes pallidulus	Elateridae	Coleoptera		tall sward & scrub	
Athous bicolor	Elateridae	Coleoptera		tall sward & scrub	
Corticarina minuta	Latridiidae	Coleoptera			
Meligethes atratus	Nitidulidae	Coleoptera			
Oedemera lurida	Oedemeridae	Coleoptera		tall sward & scrub	

Oedemera nobilis	Oedemeridae	Coleoptera		tall sward & scrub	
Anobium punctatum	Ptinidae	Coleoptera		decaying wood	Fagales
Hoplia philanthus	Scarabaeidae	Coleoptera		tall sward & scrub	Asteraceae
Phyllopertha horticola	Scarabaeidae	Coleoptera			
Anaspis frontalis	Scraptiidae	Coleoptera		decaying wood	
Anaspis maculata	Scraptiidae	Coleoptera		decaying wood	
Anaspis pulicaria	Scraptiidae	Coleoptera	Local; scarce in Duff	decaying wood	
Aleochara lanuginosa	Staphylinidae	Coleoptera		tall sward & scrub	
Anotylus rugosus	Staphylinidae	Coleoptera		marshland	
Paederus littoralis	Staphylinidae	Coleoptera		running water	Arthropoda
Philonthus cognatus	Staphylinidae	Coleoptera		tall sward & scrub	
Quedius persimilis	Staphylinidae	Coleoptera		tall sward & scrub	
Stenus clavicornis	Staphylinidae	Coleoptera		tall sward & scrub	
Stenus flavipes	Staphylinidae	Coleoptera		shaded woodland floor; wet woodland	
Stenus providus	Staphylinidae	Coleoptera		marshland	
Sunius propinquus	Staphylinidae	Coleoptera		tall sward & scrub	
Tachyporus chrysomelinus	Staphylinidae	Coleoptera		tall sward & scrub	
Tachyporus dispar	Staphylinidae	Coleoptera		tall sward & scrub	
Tachyporus hypnorum	Staphylinidae	Coleoptera		tall sward & scrub	
Forficula auricularia	Forficulidae	Dermaptera			
Hylemya variata	Anthomyiidae	Diptera			
Dioctria atricapilla	Asilidae	Diptera		short sward & bare ground; tall sward & scrub	
Leptogaster cylindrica	Asilidae	Diptera		short sward & bare ground; tall sward & scrub	Arthropoda

Bibio marci	Bibionidae	Diptera		shaded woodland floor; tall sward & scrub	Asteraceae, Fagales
Bombylius major	Bombyliidae	Diptera		tall sward & scrub	Andrena
Villa cingulata	Bombyliidae	Diptera	NR	tall sward & scrub	
Lucilia illustris	Calliphoridae	Diptera			
Tricogena rubricosa	Calliphoridae	Diptera	Local	tall sward & scrub	
Cetema neglectum	Chloropidae	Diptera		tall sward & scrub	
Meromyza femorata sens. str. post 1960	Chloropidae	Diptera			
Chrysotus cilipes	Dolichopodidae	Diptera		acid & sedge peats; marshland	Arthropoda
Chrysotus gramineus	Dolichopodidae	Diptera		marshland; running water	Arthropoda
Chrysotus laesus	Dolichopodidae	Diptera	Local	marshland; running water	Arthropoda
Dolichopus festivus	Dolichopodidae	Diptera		marshland	Arthropoda
Dolichopus plumipes	Dolichopodidae	Diptera		marshland	Arthropoda
Poecilobothrus nobilitatus	Dolichopodidae	Diptera		marshland	Arthropoda
Empis livida	Empididae	Diptera		tall sward & scrub	Arthropoda
Minettia fasciata	Lauxaniidae	Diptera			
Sapromyza sexpunctata	Lauxaniidae	Diptera			
Eudasyphora cyanella	Muscidae	Diptera		shaded woodland floor	Plantae
Helina impuncta	Muscidae	Diptera		shaded woodland floor	Arthropoda, *Fraxinus*, Plantae, *Quercus*
Geomyza balachowskyi	Opomyzidae	Diptera		tall sward & scrub	*Holcus*
Opomyza petrei	Opomyzidae	Diptera		tall sward & scrub	Poaceae
Pipunculus campestris	Pipunculidae	Diptera		tall sward & scrub	Cicadellidae
Pipunculus lenis	Pipunculidae	Diptera	Local	tall sward & scrub	Cicadellidae
Rivellia syngenesiae	Platystomatidae	Diptera	Locally common	tall sward & scrub	

Pollenia amentaria	Polleniidae	Diptera	Local	marshland	Lumbricidae
Scathophaga stercoraria	Scathophagidae	Diptera		tall sward & scrub	*Bos*, Diptera
Limnia unguicornis	Sciomyzidae	Diptera	Locally common	acid & sedge peats; marshland; running water	*Succinea*
Microchrysa flavicornis	Stratiomyidae	Diptera		tall sward & scrub	
Chrysogaster solstitialis	Syrphidae	Diptera		acid & sedge peats; running water; shaded woodland floor; wet woodland	*Fagales, Quercus*
Chrysotoxum bicinctum	Syrphidae	Diptera		tall sward & scrub	Aphididae
Episyrphus balteatus	Syrphidae	Diptera		tall sward & scrub	Aphididae
Eristalis pertinax	Syrphidae	Diptera		acid & sedge peats	
Helophilus pendulus	Syrphidae	Diptera		acid & sedge peats	
Melanostoma mellinum	Syrphidae	Diptera		tall sward & scrub	Arthropoda
Platycheirus clypeatus	Syrphidae	Diptera		tall sward & scrub	Arthropoda
Sphaerophoria interrupta	Syrphidae	Diptera		tall sward & scrub	Aphididae
Sphaerophoria scripta	Syrphidae	Diptera		tall sward & scrub	Aphididae
Sphaerophoria taeniata	Syrphidae	Diptera	Local		
Syritta pipiens	Syrphidae	Diptera		tall sward & scrub	
Xanthogramma pedissequum sensu stricto	Syrphidae	Diptera	Locally common		
Xylota segnis	Syrphidae	Diptera		decaying wood	Fagales
Xylota sylvarum	Syrphidae	Diptera		decaying wood	*Fagus*, Plantae
Tabanus bromius	Tabanidae	Diptera	Locally common	acid & sedge peats	Mammalia
Eriothrix rufomaculata	Tachinidae	Diptera			
Exorista rustica	Tachinidae	Diptera	Local in Wales		
Siphona geniculata	Tachinidae	Diptera			

Acanthiophilus helianthi	Tephritidae	Diptera	[Notable]	short sward & bare ground; tall sward & scrub	*Centaurea nigra sens. lat. (=nigra/debeauxii)*
Tephritis vespertina	Tephritidae	Diptera		tall sward & scrub	*Hypochaeris radicata*
Terellia ruficauda	Tephritidae	Diptera		short sward & bare ground; tall sward & scrub	*Cirsium*
Urophora jaceana	Tephritidae	Diptera		short sward & bare ground; tall sward & scrub	*Centaurea nigra sens. lat. (=nigra/debeauxii)*
Urophora quadrifasciata	Tephritidae	Diptera		short sward & bare ground; tall sward & scrub	*Centaurea nigra sens. lat. (=nigra/debeauxii)*
Tipula paludosa	Tipulidae	Diptera		tall sward & scrub	
Lepidocyrtus cyaneus	Entomobryidae	Entomobryomorpha			
Isotomurus palustris	Isotomidae	Entomobryomorpha			
Pogonognathellus longicornis	Tomoceridae	Entomobryomorpha			
Anthocoris nemorum	Anthocoridae	Hemiptera			
Aphrophora alni	Aphrophoridae	Hemiptera			
Philaenus spumarius	Aphrophoridae	Hemiptera			
Berytinus (Berytinus) minor	Berytidae	Hemiptera		short sward & bare ground	*Ononis repens*
Anoscopus albifrons	Cicadellidae	Hemiptera		tall sward & scrub	Poaceae
Anoscopus flavostriatus	Cicadellidae	Hemiptera	Local	tall sward & scrub	Poaceae
Aphrodes makarovi	Cicadellidae	Hemiptera		tall sward & scrub	*Cirsium, Taraxacum, Urtica dioica*
Arthaldeus pascuellus	Cicadellidae	Hemiptera		tall sward & scrub	
Eupteryx vittata	Cicadellidae	Hemiptera		tall sward & scrub	*Glechoma, Mentha, Ranunculus*
Euscelis incisus	Cicadellidae	Hemiptera		tall sward & scrub	Poaceae
Streptanus sordidus	Cicadellidae	Hemiptera		tall sward & scrub	Poaceae

Zyginidia scutellaris	Cicadellidae	Hemiptera		tall sward & scrub	
Javesella dubia	Delphacidae	Hemiptera		tall sward & scrub	Poaceae
Javesella pellucida	Delphacidae	Hemiptera		tall sward & scrub	*Lolium*
Muellerianella fairmairei	Delphacidae	Hemiptera	Locally common	tall sward & scrub	*Deschampsia cespitosa*
Scottianella dalei	Delphacidae	Hemiptera	Nb; new for Wales	tall sward & scrub	Poaceae
Stenocranus minutus	Delphacidae	Hemiptera		tall sward & scrub	
Cymus melanocephalus	Lygaeidae	Hemiptera		tall sward & scrub	*Juncus, Lythrum salicaria, Trifolium*
Drymus (Sylvadrymus) sylvaticus	Lygaeidae	Hemiptera		tall sward & scrub	*Ballota nigra*
Acetropis (Acetropis) gimmerthalii	Miridae	Hemiptera	Locally common	tall sward & scrub	Asteraceae
Amblytylus nasutus	Miridae	Hemiptera		tall sward & scrub	
Atractotomus mali	Miridae	Hemiptera		arboreal	Aphididae, *Crataegus, Malus*
Campyloneura virgula	Miridae	Hemiptera		arboreal	*Corylus, Crataegus, Quercus*
Capsus ater	Miridae	Hemiptera		tall sward & scrub	Poaceae
Closterotomus norwegicus	Miridae	Hemiptera		tall sward & scrub	Asteraceae, *Trifolium, Urtica*
Deraeocoris flavilinea	Miridae	Hemiptera			
Harpocera thoracica	Miridae	Hemiptera		arboreal	Arthropoda, *Quercus*
Heterocordylus genistae	Miridae	Hemiptera	Local	short sward & bare ground	*Cytisus*
Leptopterna dolabrata	Miridae	Hemiptera		tall sward & scrub	Poaceae
Liocoris tripustulatus	Miridae	Hemiptera		tall sward & scrub	*Urtica dioica*
Lopus decolor	Miridae	Hemiptera		tall sward & scrub	Poaceae
Lygus pratensis	Miridae	Hemiptera	[RDB 3]		
Miridius quadrivirgatus	Miridae	Hemiptera	Local	tall sward & scrub	*Hordeum*, Poaceae
Monalocoris filicis	Miridae	Hemiptera		tall sward & scrub	Polypodiales, *Pteridium aquilinum*

Pachytomella parallela	Miridae	Hemiptera		short sward & bare ground	
Phytocoris (Ktenocoris) varipes	Miridae	Hemiptera		tall sward & scrub	Asteraceae
Pilophorus perplexus	Miridae	Hemiptera	Local	arboreal	Aphididae, *Fagales, Quercus*
Pithanus maerkelii	Miridae	Hemiptera		tall sward & scrub	Arthropoda
Plagiognathus arbustorum	Miridae	Hemiptera		tall sward & scrub	*Urtica*
Plagiognathus chrysanthemi	Miridae	Hemiptera		short sward & bare ground	Asteraceae
Psallus (Hylopsallus) perrisi	Miridae	Hemiptera		arboreal	*Quercus*
Stenodema (Brachystira) calcarata	Miridae	Hemiptera		tall sward & scrub	Poaceae
Stenodema (Stenodema) laevigata	Miridae	Hemiptera		tall sward & scrub	Poaceae
Stenotus binotatus	Miridae	Hemiptera		tall sward & scrub	Poaceae
Himacerus (Anaptus) major	Nabidae	Hemiptera		tall sward & scrub	Arthropoda
Nabis (Dolichonabis) limbatus	Nabidae	Hemiptera		tall sward & scrub	Arthropoda
Nabis (Nabis) rugosus	Nabidae	Hemiptera		tall sward & scrub	Arthropoda
Dolycoris baccarum	Pentatomidae	Hemiptera		tall sward & scrub	Asteraceae
Palomena prasina	Pentatomidae	Hemiptera		tall sward & scrub	*Corylus, Fagales*
Psyllopsis fraxini	Psyllidae	Hemiptera			
Physatocheila dumetorum	Tingidae	Hemiptera		arboreal; decaying wood	
Andrena haemorrhoa	Andrenidae	Hymenoptera		short sward & bare ground	
Bombus hortorum	Apidae	Hymenoptera		tall sward & scrub	*Digitalis purpurea, Lonicera periclymenum, Trifolium pratense*

Bombus hypnorum	Apidae	Hymenoptera		shaded woodland floor; tall sward & scrub	Asteraceae, Fagales
Bombus lapidarius	Apidae	Hymenoptera		tall sward & scrub	
Bombus lucorum/terrestris	Apidae	Hymenoptera			
Bombus pascuorum	Apidae	Hymenoptera		tall sward & scrub	Asteraceae
Bombus pratorum	Apidae	Hymenoptera		shaded woodland floor; tall sward & scrub	Asteraceae, Fagales
Eucera longicornis	Apidae	Hymenoptera	[Na]; Section 7 Priority Species	short sward & bare ground	
Nomada signata	Apidae	Hymenoptera	[RDB 2]	short sward & bare ground	Apidae
Andricus foecundatrix	Cynipidae	Hymenoptera			
Andricus quercuscalicis	Cynipidae	Hymenoptera			
Neuroterus numismalis	Cynipidae	Hymenoptera			
Neuroterus quercusbaccarum	Cynipidae	Hymenoptera			
Lasius flavus	Formicidae	Hymenoptera		short sward & bare ground	
Lasius niger	Formicidae	Hymenoptera		short sward & bare ground	
Myrmica rubra	Formicidae	Hymenoptera		tall sward & scrub	
Myrmica ruginodis	Formicidae	Hymenoptera		shaded woodland floor	Arthropoda, Plantae
Myrmica scabrinodis	Formicidae	Hymenoptera		tall sward & scrub	
Lasioglossum calceatum	Halictidae	Hymenoptera		short sward & bare ground	
Amblyteles armatorius	Ichneumonidae	Hymenoptera			
Dolerus nigratus	Tenthredinidae	Hymenoptera			
Tenthredo brevicornis	Tenthredinidae	Hymenoptera			
Ancistrocerus gazella	Vespidae	Hymenoptera		decaying wood	Fagales, Lepidoptera

Dolichovespula saxonica	Vespidae	Hymenoptera	[RDB K]	arboreal	
Vespula germanica	Vespidae	Hymenoptera		tall sward & scrub	
Vespula vulgaris	Vespidae	Hymenoptera		tall sward & scrub	
Philoscia muscorum	Philosciidae	Isopoda			
Agriphila straminella	Crambidae	Lepidoptera			
Agriphila tristella	Crambidae	Lepidoptera			Poaceae
Chrysoteuchia culmella	Crambidae	Lepidoptera			Poaceae
Cilix glaucata	Drepanidae	Lepidoptera		arboreal	*Crataegus monogyna, Prunus spinosa*
Orgyia antiqua	Erebidae	Lepidoptera		arboreal	Asteraceae, Fagales
Camptogramma bilineata	Geometridae	Lepidoptera		tall sward & scrub	*Rumex, Stellaria media*
Acrocercops brongniardella (mines)	Gracillariidae	Lepidoptera	Local	arboreal	*Quercus*
Phyllonorycter coryli	Gracillariidae	Lepidoptera		arboreal	*Corylus*
Triodia sylvina	Hepialidae	Lepidoptera		tall sward & scrub	Asteraceae
Ochlodes sylvanus	Hesperiidae	Lepidoptera		tall sward & scrub	*Brachypodium pinnatum, Brachypodium sylvaticum, Dactylis glomerata, Molinia caerulea*
Polyommatus icarus	Lycaenidae	Lepidoptera		short sward & bare ground	*Lotus corniculatus, Lotus pedunculatus, Medicago lupulina, Ononis repens, Trifolium dubium, Trifolium repens*
Xestia xanthographa	Noctuidae	Lepidoptera		tall sward & scrub	Asteraceae
Aglais io	Nymphalidae	Lepidoptera		tall sward & scrub	*Humulus lupulus, Urtica dioica, Urtica urens*
Maniola jurtina	Nymphalidae	Lepidoptera		tall sward & scrub	*Brachypodium sylvaticum, Dactylis*

					glomerata, Helictotrichon pubescens
Melanargia galathea	Nymphalidae	Lepidoptera		tall sward & scrub	*Brachypodium pinnatum, Festuca ovina, Festuca rubra, Holcus lanatus*
Pyronia tithonus	Nymphalidae	Lepidoptera		tall sward & scrub	Plantae
Anthocharis cardamines	Pieridae	Lepidoptera		tall sward & scrub	*Alliaria petiolata, Arabis hirsuta, Barbarea vulgaris, Brassica rapa, Cardamine amara, Cardamine pratensis,* Plantae*, Sinapis arvensis, Sisymbrium officinale*
Pieris brassicae	Pieridae	Lepidoptera			*Reseda lutea, Tropaeolum majus*
Pieris rapae	Pieridae	Lepidoptera			*Alliaria petiolata, Brassica oleracea, Lepidium draba, Reseda lutea, Sinapis arvensis, Sisymbrium officinale, Tropaeolum majus*
Acrobasis advenella	Pyralidae	Lepidoptera			*Crataegus monogyna*
Celypha lacunana	Tortricidae	Lepidoptera			Asteraceae
Grapholita compositella	Tortricidae	Lepidoptera	Locally common	tall sward & scrub	*Lotus corniculatus, Trifolium*
Grapholita funebrana	Tortricidae	Lepidoptera	Locally common		*Prunus*
Pammene aurana	Tortricidae	Lepidoptera	Local	tall sward & scrub	*Heracleum*
Zygaena filipendulae	Zygaenidae	Lepidoptera		tall sward & scrub	*Lotus*
Panorpa germanica	Panorpidae	Mecoptera		tall sward & scrub	

Micromus variegatus	Hemerobiidae	Neuroptera	Local	tall sward & scrub	Aphididae
Leiobunum rotundum	Phalangiidae	Opiliones		arboreal	Aphididae, Coccidae, Fagales
Paroligolophus agrestis	Phalangiidae	Opiliones			
Rilaena triangularis	Phalangiidae	Opiliones		shaded woodland floor	Arthropoda, Plantae
Omocestus viridulus	Acrididae	Orthoptera		tall sward & scrub	
Pseudochorthippus parallelus	Acrididae	Orthoptera		tall sward & scrub	
Leptophyes punctatissima	Phaneropteridae	Orthoptera		tall sward & scrub	
Pholidoptera griseoaptera	Tettigoniidae	Orthoptera		tall sward & scrub	
Roeseliana roeselii	Tettigoniidae	Orthoptera		tall sward & scrub	
Ectopsocus briggsi sensu stricto	Ectopsocidae	Psocoptera			
Cochlicopa cf. lubrica sensu Anderson 2008	Cochlicopidae	Pulmonata		tall sward & scrub	Asteraceae
Euconulus alderi	Euconulidae	Pulmonata		marshland	
Vertigo (Vertigo) pygmaea	Vertiginidae	Pulmonata		tall sward & scrub	Algae
Sminthurinus elegans	Katiannidae	Symphypleona			
Aceria aceriscampestris	Eriophyidae	Trombidiformes			
Aceria macrochela	Eriophyidae	Trombidiformes			