

APPENDIX 3

INVERTEBRATE REPORT

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Parc Pelenna
Neath Port Talbot

INVERTEBRATE
SURVEY
REPORT

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APPENDIX

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1.0 INTRODUCTION

1.1 Introductory comments

Liam Olds (Colliery Spoil Biodiversity Initiative) was commissioned by **Ramboll UK Ltd** to undertake an invertebrate survey of land at Parc Pelenna, near Neath, South Wales, in 2020. The primary aim of this survey was to assess the suitability (i.e. quality) of habitats present at Parc Pelenna for invertebrates and whether these habitats have the potential to support species of ‘conservation interest’ (i.e. species considered Nationally Local, Nationally Scarce or Nationally Rare, and/or listed under Section 7 of Environment (Wales) Act 2016 as ‘species of principal importance’ in Wales).

Surveying was undertaken by the author of this report (Liam Olds) – an experienced entomologist, and former entomological apprentice at Amgueddfa Cymru (National Museum of Wales), who is familiar with the invertebrate fauna of South Wales. Liam has been working as a freelance entomological consultant across Wales for over 5 years, alongside his role as ‘Conservation Officer’ for Buglife – The Invertebrate Conservation Trust.

Surveying at Parc Pelenna involved a site walk-over to become familiar with the habitats present, and a visual assessment of the ‘quality’, and therefore importance, of these habitats for invertebrates. Limited amounts of invertebrate sampling were deployed in areas considered to be of ‘greatest importance’ to invertebrates in an attempt to locate any species of ‘conservation interest’ that may be present. This report details the results of that survey, which was conducted over a single daytime visit in September 2020. It is anticipated that the results presented in this report will assist with masterplanning development on the site (Laura Sanderson, personal communication).

1.2 Site description

Parc Pelenna is an area of predominately former plantation woodland situated on the south side of the Neath Valley, South Wales (NGR SS8099; [Google Map](#)). The site covers an area of approximately 83.5 acres (or ~ 33.8 hectares) and is located around 1 kilometer (km) south of the village of Clyne, Neath Port Talbot. The boundary of Parc Pelenna is indicated in **Map 1** (outlined in white).

At its centre, Parc Pelenna is composed of a series of residential dwellings and farm buildings (with associated infrastructure), two large areas of poor semi-improved grassland, and a series of ponds. Away from these areas, a mix of semi-natural habitats has seemingly established through natural succession following the clear-felling of plantation woodland – these are now predominately areas of dense scrub and young, secondary woodland. Some sizeable blocks of mixed woodland and former coniferous plantation woodland also exist. A phase 1 habitat survey map showing the habitats present at Parc Pelenna can be found in **Map 2**.

Map 1. An aerial photograph showing the study site, Parc Pelenna (the site boundary is outlined in white). Image © 2020 Google.



Map 2. An aerial photograph showing the study site, Parc Pelenna, with overlaid Phase I Habitat Survey data (courtesy of Ramboll UK Ltd). Image © 2020 Google.



1.3 Survey limitations

There are a number of limitations associated with the survey at Parc Pelenna. The first of these is the late survey date. As the author of this report (Liam Olds) was not approached to conduct invertebrate surveys at Parc Pelenna until late August, the first (and final) site visit was not made until early September 2020. This meant that no site visits were made during the spring and summer months when most invertebrates (especially insects) are active. As such, only species active in late summer and early autumn could be accounted for. Some caution needs to be taken, therefore, when interpreting the results of this report as there will undoubtedly be further species present at Parc Pelenna that have not yet been accounted for.

A further limitation was the restricted time available to fully explore Parc Pelenna and assess the 'quality' of available habitats. Only a single day was made available to walk the entire site (~83.5 acres), much of which is located on uneven terrain that is difficult to navigate. Though all broad habitats identified from the Phase I Habitat Survey (**Map 2**) were visited to visually assess their 'quality' for invertebrates, the limited time available did not allow for invertebrate sampling in each of these habitats. Instead, invertebrate sampling focused on a smaller number of habitats representative of the wider habitats present at Parc Pelenna.

As the primary aim of the survey at Parc Pelenna was to assess the suitability, and therefore 'quality', of habitats present for invertebrates, I am of the impression, however, that the limitations described above are not likely to significantly alter the overall conclusions drawn here. All broad habitats present at Parc Pelenna were visited and visually assessed for their suitability and importance for invertebrates. As discussed later in this report, much of Parc Pelenna is dominated by habitats deemed to be little value to invertebrates and of Local importance only. Though further survey effort (especially in spring and summer) would undoubtedly discover further invertebrate species at Parc Pelenna, the habitats remain of 'low quality' and are unlikely to support many (or indeed, any) species of 'conservation interest' that would need consideration in future development proposals.

2.0 SAMPLING

2.1. Survey dates

The invertebrate survey at Parc Pelenna was conducted over a single daytime visit in September 2020. Surveying time was approximately 4 hours and 45 minutes. Weather conditions during the survey, and the activities undertaken, are provided in **Table I**. The sampling techniques deployed at Parc Pelenna are discussed in Section 2.2.

Table I. Weather conditions during the survey at Parc Pelenna.

Survey Date	Survey Time	Activity	Weather conditions
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6th Sept 2020	4 hours, 45 mins	Familiarisation with habitats present by walking around survey area. Visual assessments made of the quality of available habitats for invertebrates. A variety of sampling techniques were deployed in areas of 'greatest importance' to invertebrates in order to sample for as many invertebrate taxa as possible.	Sunshine and heavy showers. Maximum air temperature of 18°C. Moderate breeze with wind speeds of 11 MPH (miles per hour) coming from an easterly direction.
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2.2 Survey methodology

Based on the professional opinion of the surveyor, habitats at Parc Pelenna were visually inspected and their importance for invertebrates considered within a defined geographical context following CIEEM (2018) guidelines (i.e. International importance, National importance, Regional importance, Local importance etc.).

Where possible, terrestrial invertebrates were sampled in these habitats using several different active sampling techniques including:

- **Aerial netting** - a lightweight 40cm diameter net mounted on a meter long pole was used to catch flying insects as and when encountered.
- **Beating trees and bushes** - a beating tray, consisting of a white cloth sheet supported by a frame, was positioned below branches of trees and bushes which were subsequently tapped with a stick to dislodge insects within the foliage. Target taxa were then selectively removed using an aspirator (or pooter).
- **Hand searching** - this involved looking under/inside rotting logs, and looking under stones/boulders for invertebrates that may be feeding, resting or sheltering.
- **Sweep netting** - a sturdy 40cm diameter net mounted on a meter long pole was moved vigorously through long vegetation and over bushes and tree foliage to dislodge invertebrates. Target invertebrates were then selectively removed from the sweep net using an aspirator.

All sampling was undertaken by the author – an experienced entomologist familiar with the invertebrate fauna of South Wales. Where possible, invertebrates were identified to species level in the field using a x10 hand lens. Due to the difficulties in species identification among some taxa, a limited number of specimens were collected and retained for subsequent identification. Most samples were stored dry and later pinned to aid identification. All specimens were identified by the author using an x20-x40 binocular microscope and the

appropriate identification keys (see Section 8.0). Specimens were also compared against verified reference material in the personal entomological collections of the author.

2.3 Target groups

Principal target groups for the survey were:

- **Coleoptera** → Apionidae (seed weevils), Chrysomelidae (leaf beetles) and Curculionidae ('true' weevils)
- **Diptera** → Cylindrotomidae (long-bodied craneflies), Limoniidae (limonid craneflies), Pediciidae (hairy-eyed craneflies), Ptychopteridae (phantom craneflies), Syrphidae (hoverflies) and Tipulidae (craneflies)
- **Hemiptera** → Heteroptera ('true bugs')
- **Hymenoptera** → Aculeata (bees and wasps)

These target groups were chosen as they support species with varied life histories and could be presumed to be present within habitats at Parc Pelenna at the time of surveying. These groups also partly reflect the interests and experience of the surveyor (Liam Olds).

Areas considered to be of greatest importance to invertebrates were targeted in order to achieve coverage of the target groups. Incidental records of other invertebrate taxa were recorded when encountered. This included taxa such as Lepidoptera (butterflies and day-flying moths) and Orthoptera (grasshoppers and crickets), in addition to additional Coleopteran (beetle) and Dipteran (fly) families.

2.4 Sampling locations

Invertebrate sampling at Parc Pelenna focussed on, but was not limited to, four major areas (see areas 1 to 4 in **Map 3**). These areas were selected for targeted invertebrate sampling as they were deemed representative of the wider habitats present at Parc Pelenna.

Map 3 (below). An aerial photograph showing the study site, Parc Pelenna (site boundary outlined in white), and the location of the four main invertebrate sampling locations (outlined in green, yellow, blue and red respectively). Image © 2020 Google.



Area 1: An area of recently clear-felled plantation woodland that is currently in the early stages of natural regeneration (Image 1). Much of this regeneration is dominated by grasses, rushes, ferns and bramble scrub, though further plant diversity is present. This area also includes a number of young birch trees. This area is outlined in green in Map 3.



Image 1. View looking north-east across Area 1 towards the gatehouse.

Area 2: An area of disturbed ground and semi-improved grassland (Image 2) situated between two blocks of broadleaf scrub/woodland. This area is outlined in yellow in Map 3.



Image 2. View looking north-east across Area 2.

Area 3: A grassy pathway through an area of mixed woodland which terminates at a raised mound within a small woodland glade, below which are a series of water bodies (Image 3) which could prove valuable to aquatic invertebrates and amphibians. This area is outlined in blue in Map 3.



Image 3. Vegetated water body within woodland glade in Area 3.

Area 4: A vehicle access track heading down the valley hillside in a north to north-easterly direction. This track is bounded on either side by dense corridors of scrub (predominately

broadleaf trees, bramble and bracken), with scattered mature broadleaf and coniferous trees (Image 4 & 5). It is presumed that these tracks are forestry tracks associated with former plantation woodland at Parc Pelenna. Several quarries and exposed cliff faces also exist along these tracks. This area is outlined in red in Map 3.



Image 4. View looking up the vehicle access track in a south-westerly direction.



Image 5. View looking up the vehicle access track in a south-westerly direction from another point along Area 4.

3.0 RESULTS

3.1 Overview

A total of **51** terrestrial invertebrate species were positively identified from the survey at Parc Pelenna – a full list of all recorded invertebrate species is presented in **Appendix I**. The list is annotated with formal National Status codes, where applicable. These status codes are also explained in Appendix I.

Of the **51** terrestrial invertebrate species recorded, **none are 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 in Wales).

3.2 Section 7 species

Two additional non-invertebrate species were recorded during the survey, however, both of which are listed under Section 7 of the Environment (Wales) Act 2016 as a ‘*species of principal importance for conservation of biological diversity in Wales*’. These are **Brown Hare (*Lepus europaeus*)** and **Common Lizard (*Zootoca vivipara*)**. The former was first sighted in an area of dense broadleaf scrub around NGR SS80009920 and then again in mixed woodland around NGR SS80039924 (very likely to be the same individual on both instances). The latter species was sighted under reptile refugia in an area of open grassland and heath mosaic at NGR SS8033099423.

4.0 SITE EVALUATION

4.1 Overview

The survey at Parc Pelenna identified just **51 species of invertebrate** (Appendix I) – a disappointing total given the respectable size of the study site. Of these 51 species, none are considered to be of ‘conservation interest’. On the basis of the results presented here, I am of the opinion that Parc Pelenna is of **Local importance for invertebrates** only. Though the limited time available for invertebrate sampling at Parc Pelenna and the late sampling date are likely to have contributed to the low species diversity reported above, the habitats present at Parc Pelenna are predominately of ‘poor quality’ to invertebrates. Visual assessments of the broad habitats examined at Parc Pelenna are discussed below.

4.2 Coniferous and recently felled woodland

Coniferous plantation woodland appears to have historically dominated much of Parc Pelenna. Where such plantation woodland remains, it is typical of many other plantation woodlands in Wales and is of local importance to invertebrates, supporting densely packed trees, a closed canopy and little ground flora. Most areas of former plantation woodland at Parc Pelenna appear to have now been clear-felled (Map 2). It appears that this clear-felling has occurred relatively recently, leaving little time for natural regeneration to take effect. All

areas of recently felled woodland at Parc Pelenna were found to be in the early stages of natural regeneration and dominated largely by grasses, rushes, bramble and/or bracken (e.g. Image 1). All areas of recently felled woodland at Parc Pelenna are thus deemed to be of site importance to invertebrates in their current state. Given an opportunity, however, these areas could naturally regenerate into an interesting mosaic of semi-natural habitats (e.g. fridd) of value to invertebrates and wider wildlife. Though difficult to define, *fridd* (also known as ‘coedcae’ in South Wales) refers to a mix of vegetation communities found at the lowland-upland interface (UK NEA, 2011). Ffridd usually contains a combination of various habitats including a diverse mixture of grass and heathland with bracken, scrub (often hawthorn and gorse) or rock exposures; it may also include flushes, mires, streams and standing water (UK NEA, 2011).

4.3 Mixed Woodland

Numerous blocks of mixed woodland also exist at Parc Pelenna (Map 2). It was not possible to enter all of these woodland blocks (particularly those in the north-west corner of Parc Pelenna) due to the steep terrain and physical barriers to entry (i.e. dense scrub). Of those that could be entered included the large block of mixed woodland in the south-east corner of Parc Pelenna (NGR SS804994). Though evidently supporting both coniferous and broadleaf woodland, it appears to be predominately occupied by young broadleaf woodland and scrub; this has presumably developed through natural regeneration following historic clear-felling of plantation woodland. This woodland is of local importance to invertebrates in its current state, dominated by young, closely packed broadleaf trees (especially birches and willows) and a dense bramble understory (Image 6).



Image 6. View looking north-east into the mixed woodland block at approximately NGR SS80329935.

To improve its value to invertebrates, this woodland would benefit from targeted tree/scrub removal to create woodland rides and glades in some areas. Such rides and glades will open up the woodland canopy, bringing sunny conditions into the heart of the woodland and encourage more flowery conditions that are particularly valuable for pollinator foraging. It is important to note, however, that shaded wet woodland is also important to invertebrates (especially as breeding locations for some pollinators) and so it is useful to maintain both open and shaded areas. As such, any woodland ride or glade creation should ideally target dry areas. It may also be beneficial to create wetland features within the woodland (e.g. a new pond or non-draining ditch) where such features are currently absent.

This woodland block was also found to support smaller sections of other habitats such as grassland and heathland. Efforts should be made to conserve these habitats by preventing further scrub encroachment, and ideally looking to enhance and extend these habitats through targeted woodland/scrub clearance in and around them.

The mixed woodland block at the northern entrance to Parc Pelenna (NGR SS801997) was also found to be of local importance to invertebrates on the basis of its young, densely packed trees (predominately willows *Salix spp.*) and its dense bramble understory. This woodland could benefit from similar interventions as those described above.

4.4 Scrub

Several areas of scrub exist at Parc Pelenna, the majority of which are located on the north side of Parc Pelenna (Map 2). These areas were found to be dominated largely by bracken and scattered broadleaved trees. It was not possible to enter these areas due to the physical barrier created by the scrub which prevented entry. As such, it was not possible to evaluate the importance of these areas for invertebrates. It is presumed, however, that these areas support some invertebrate value on the basis of the broadleaved trees they support, some of which are valuable sources of blossom for insects in spring (sallows *Salix spp.*, Hawthorn *Crataegus monogyna* etc.), and so they could prove to be important habitats for invertebrates at Parc Pelenna. Further survey effort in spring/summer would be needed to explore this further. In light of an absence of such information, avoiding development in these areas is recommended at present.

It is important to note that these bracken covered slopes could potentially provide suitable breeding habitat for fritillary butterflies such as Small pearl-bordered fritillary (*Boloria selene*) and Dark green fritillary (*Speyeria aglaja*) – the former of which is considered a Section 7 priority species in Wales. Targeted surveys would be needed in spring and early summer to determine whether such species are present at Parc Pelenna and to fully assess the importance of these areas. Given that these bracken covered slopes are of a northerly aspect, in contrast to their ‘favoured’ south-facing aspect for breeding, the presence of these butterfly species does seem unlikely however.

A linear strip of broadleaf scrub towards the south-east of the site (NGR centred at SS80049922) was also visually examined to assess its invertebrate ‘importance’ (Map 2). This

strip, which borders a block of mixed woodland to the north and disturbed ground to the south (Area 2, Image 2), was found to be largely of poor quality and of site importance to invertebrates only owing to its young, densely-packed broadleaved trees with little to no understory (Image 7). A natural cliff face does exist within this scrub block, however, around NGR SS80029921. Here, the rocky substrate has seemingly limited natural regeneration, hindering tree establishment and creating somewhat of a woodland glade amongst the scrub (Image 8). This area was deemed to be of local importance to invertebrates and is likely to be among the most important locations for invertebrates at Parc Pelenna owing to its diverse woodland understory (in comparison to other woodland habitats at Parc Pelenna), supporting good stands of plants such as Bilberry (*Vaccinium myrtillus*). As such, development in this area should be avoided wherever possible. The removal of young trees is advisable in this area to maintain and further extend this woodland glade. Either side of this woodland glade, targeted scrub removal and thinning is advised to open-up the woodland canopy and ensure the Bilberry understory is not lost – heavy shading caused by the densely packed trees is evidently resulting in the decline of woodland flora. Without management intervention, this woodland understory is likely to be lost in future years.



Image 7. Dense broadleaf scrub at approximately NGR SS79999918.



Image 8. A natural woodland glade with Bilberry understory at NGR SS80029921.

4.5 Other habitats

All areas of grassland habitat at Parc Pelenna were found to be relatively species-poor and of negligible importance to invertebrates. Opportunities exist to enhance these grasslands, however, especially around the residential dwellings. Here, the implementation of better grassland management (such as a reduction in the frequency of mowing, or leaving some areas uncut for much of the year) would likely boost invertebrate interest. Should the soil nutrient levels be too high to encourage a diverse and flower-rich sward, turf stripping or topsoil removal (approximately the upper 20 cm) may be needed to reveal the nutrient-poor subsoil. These areas can then be seeded with native, 'pollinator-friendly' plants or simply left to encourage the natural seed bank. Should any seed sowing be implemented, native plants of local provenance should be selected as these better reflect the local area.

Though not sampled for their invertebrate fauna, a visual assessment of the three ponds present at Parc Pelenna suggests that they are likely to be of local importance to invertebrates. Any proposed development should ensure that works do not hinder these water bodies.

5.0 RECOMMENDATIONS

The author was not made aware of the proposed development plans at Parc Pelenna and, as such, it is not possible to provide specific recommendations regarding this development and its impact on invertebrates. It is suggested, however, that the following recommendations could be implemented in any development proposal to enhance the habitats currently present at Parc Pelenna to ensure there is no net loss of biodiversity. This could include:

- Allowing areas of recently felled woodland to naturally regenerate, encouraging native flora wherever possible;
- The creation of glades and rides in areas of scrub and woodland (coniferous, broadleaved and mixed) to open up the woodland canopy and encourage more flowery conditions;
- The creation of wetland features (e.g. a new pond or non-draining ditch) within woodlands where such features are currently absent, and the conservation of these features where they do exist;
- Encouraging a diversity of habitats within woodlands by conserving, enhancing and extending other semi-natural habitats (e.g. grassland, heathland, wetlands) present in these woodlands through targeted tree and scrub removal in and around them;
- Implementation of a more sympathetic grassland management regime in amenity grassland areas to encourage a more diverse, flower-rich sward. Turf-stripping and seed sowing may be required;
- Strategic planting of native blossoming tree and shrub species to boost floral resources for invertebrates. This would be best implemented in areas currently devoid of blossoming plants such as amenity grassland areas around residential dwellings. Spring blossoming trees and scrubs such as willows, blackthorn, hawthorn and wild cherry are recommended as these are important for pollinating insects. Any other 'pollinator friendly' plants are also advised;
- Incorporation of sparsely-vegetated, south-facing banks and slopes (i.e. bee banks) into development plans to provide invertebrate nesting, hunting and basking opportunities – this will also benefit reptiles such as Common Lizard *Zootoca vivipara*;
- Incorporation of 'green roofs' into any development design plans, where possible, as a means of providing additional forage habitat for flower-visiting insects;
- Considering the introduction of 'bee bricks' into any development (where applicable) as additional nesting habitat for aerial-nesting insects such as solitary bees and wasps. These 'bee bricks' should ideally be placed in warm, sheltered locations (i.e. a southerly aspect). The erection of bee hotels may also provide additional nesting habitat for solitary bees and wasps;
- Retaining as much semi-natural habitat at Parc Pelenna as possible – the greater the area of habitat retained, the greater the opportunities available to invertebrates; and
- Generally seeking to maintain or create a diversity of habitats including bare ground, grassland, scrub, wetland and woodland – such habitat mosaics are important to invertebrates, many of which require two or more habitats to complete their lifecycle.

6.0 SUMMARY

To summarise, Parc Pelenna is currently considered to be of **Local importance for invertebrates** only. This appears justified given the low invertebrate species diversity

encountered during the survey, and the general low suitability (i.e quality) of habitats present for invertebrates. Though Parc Pelenna will undoubtedly be of local significance (providing a refuge for species in an otherwise very sterilised, agricultural setting), it is not considered of significant importance in a county, regional or national context and any loss of habitats is unlikely to be significantly detrimental to local invertebrate populations. Significant opportunities exist, however, to enhance the habitats currently present at the Parc Pelenna and such measures should be implemented during any development to ensure there is no net loss of biodiversity and, ideally, a net gain. Simple measures such as a better grassland management, strategic planting of blossoming trees and shrubs across the site, the implementation of woodland management to create woodland rides and glades, and encouraging the natural regeneration of recently-felled plantation woodland, will all act to enhance invertebrates and wider wildlife at Parc Pelenna.

7.0 REFERENCES

CIEEM. 2018. *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Chartered Institute of Ecology and Environmental Management, Winchester.

UK NEA (UK National Ecosystem Assessment). 2011. *The UK National Ecosystem Assessment: Synthesis of Key Findings*. UNEP-WCMC, Cambridge (Chapter 20 - Status and Changes in the UK's Ecosystems and their Services to Society: Wales).

8.0 IDENTIFICATION KEYS

The following identification keys were used to identify invertebrate specimens collected at Parc Pelenna, in addition to unpublished keys sourced from organisers of national recording schemes:

Arachnida

- Roberts, M. J. (2001). *Collins Field Guide to the Spiders of Britain and Northern Europe*. London: HarperCollins Publishers Ltd.

Coleoptera

- Duff, A. G. (2016). *Beetles of Britain and Ireland, Volume 4: Cerambycidae to Curculionidae*. A. G. Publishing.
- Luff, M. L. (2007). *The Carabidae (ground beetles) of Britain and Ireland*. RES Handbook Volume 4, Part 2 (2nd edition). Shrewsbury: Field Studies Council.

Diptera

- Boardman, P. (2016). *Shropshire Craneflies*. Shrewsbury: Field Studies Council.

- Stubbs, A. E. & Falk, S. (2002). British hoverflies, an illustrated identification guide. Second edition. Reading: British Entomological and Natural History Society.

Hemiptera

- Southwood, T. R. E. & Leston, D. (1959). Land and Water Bugs of the British Isles. Frederick Warne & Co. Ltd.

Hymenoptera

- Falk, S. J. & Lewington, R. (2015). Field Guide to the Bees of Great Britain and Ireland. British Wildlife Field Guide. London: British Wildlife Publishing.

APPENDIX I: List of invertebrate species positively identified at Parc Pelenna in 2020. An explanation of the status categories used is given below. Species of ‘conservation interest’ are highlighted in red. Note that the species list also contains two non-invertebrate species recorded during the survey.

Status

- **Section 7** = Species considered to be ‘of principal importance for conservation of biological diversity in Wales’ under Section 7 of the Environment (Wales) Act 2016.
- Where Status is blank, this species is considered to be common and widespread.

Species	Common Name	Family	Order	Conservation status	Broad biotope	Habitat	Area Recorded (if known)
<i>Agalenatea redii</i>	A orbweaver spider	Araneidae	Araneae		open habitats		1
<i>Araneus diadematus</i>	Garden cross spider	Araneidae	Araneae				1, 4
<i>Araneus quadratus</i>	Four-spotted orbweaver spider	Araneidae	Araneae				4
<i>Dictyna sp.</i>	A spider	Dictynidae	Araneae				2
<i>Linyphia triangularis</i>	A money spider	Linyphiidae	Araneae				4
<i>Metellina sp.</i>	A spider	Tetragnathidae	Araneae				1, 4
<i>Neocrepidodera transversa</i>	A flea beetle	Chrysomelidae	Coleoptera		open habitats	tall sward & scrub	1
<i>Ocypus olens</i>	Devil's coach horse	Staphylinidae	Coleoptera		open habitats	tall sward & scrub	1
<i>Otiorhynchus sulcatus</i>	Black vine weevil	Curculionidae	Coleoptera				1
<i>Psylliodes napi</i>	A flea beetle	Chrysomelidae	Coleoptera		open habitats	tall sward & scrub	1

<i>Pterostichus strenuus</i>	A ground beetle	Carabidae	Coleoptera		open habitats	tall sward & scrub	1
<i>Strophosoma melanogrammum</i>	A weevil	Curculionidae	Coleoptera		tree-associated	arboreal	1
<i>Dicranomyia autumnalis</i>	A crane fly	Limoniidae	Diptera		wetland	peatland	1
<i>Episyrphus balteatus</i>	Marmalade fly	Syrphidae	Diptera		open habitats	tall sward & scrub	2
<i>Erioconopa trivialis</i>	A crane fly	Limoniidae	Diptera		wetland	marshland; peatland	1
<i>Eristalis pertinax</i>	A hoverfly	Syrphidae	Diptera		wetland	peatland	4
<i>Helophilus sp.</i>	A hoverfly	Syrphidae	Diptera				4
<i>Melanostoma mellinum</i>	A hoverfly	Syrphidae	Diptera		open habitats	tall sward & scrub	2
<i>Melanostoma scalare</i>	A hoverfly	Syrphidae	Diptera		open habitats	tall sward & scrub	2
<i>Pedicia occulta</i>	A crane fly	Pediciidae	Diptera		wetland	running water	3
<i>Platycheirus angustatus</i>	A hoverfly	Syrphidae	Diptera		open habitats; wetland	tall sward & scrub	2
<i>Platycheirus scutatus sens. lat.</i>	A hoverfly	Syrphidae	Diptera				4
<i>Sphaerophoria sp.</i>	A hoverfly	Syrphidae	Diptera				4
<i>Tachina fera</i>	A tachinid fly	Tachinidae	Diptera				4
<i>Tipula oleracea/paludosa</i>	A crane fly	Tipulidae	Diptera				1
<i>Tricyphona immaculata</i>	A crane fly	Pediciidae	Diptera		wetland	marshland; peatland	4
<i>Cicadula</i>	A leafhopper	Cicadellidae	Hemiptera				1

<i>Dolycoris baccarum</i>	Hairy shieldbug	Pentatomidae	Hemiptera		open habitats	tall sward & scrub	2
<i>Lygus rugulipennis</i>	A mirid bug	Miridae	Hemiptera		open habitats	tall sward & scrub	2
<i>Monalocoris (Monalocoris) filicis</i>	Bracken bug	Miridae	Hemiptera		open habitats	tall sward & scrub	1
<i>Nabis (Dolichonabis) limbatus</i>	A damsel bug	Nabidae	Hemiptera		open habitats	tall sward & scrub	4
<i>Neophilaenus lineatus</i>	A froghopper	Aphrophoridae	Hemiptera		open habitats	tall sward & scrub	1
<i>Philaenus spumarius</i>	Common froghopper	Aphrophoridae	Hemiptera				4
<i>Stenodema (Brachystira) calcarata</i>	A mirid bug	Miridae	Hemiptera		open habitats	tall sward & scrub	1
<i>Stenodema (Stenodema) holsata</i>	A mirid bug	Miridae	Hemiptera		open habitats	tall sward & scrub; upland	2, 4
<i>Stenodema (Stenodema) laevigata</i>	A mirid bug	Miridae	Hemiptera		open habitats	tall sward & scrub	2
<i>Bombus pascuorum</i>	Common carder bee	Apidae	Hymenoptera		open habitats	tall sward & scrub	4
<i>Hylaeus confusus</i>	White-jawed yellow-face bee	Colletidae	Hymenoptera		open habitats; tree-associated	decaying wood	2
<i>Lasioglossum cupromicans</i>	Turquoise furrow bee	Halictidae	Hymenoptera		open habitats	short sward & bare ground	
<i>Oniscus asellus</i>	Common shiny woodlouse	Oniscidae	Isopoda				1
<i>Trichoniscus pusillus</i> agg.	Common pygmy	Trichoniscidae	Isopoda				1

	woodlouse						
<i>Lepus europaeus</i>	Brown hare	Leporidae	Lagomorpha	Section 7			3
<i>Aglais urticae</i>	Small tortoiseshell	Nymphalidae	Lepidoptera		open habitats	tall sward & scrub	4
<i>Pararge aegeria</i>	Speckled wood	Nymphalidae	Lepidoptera		open habitats	tall sward & scrub	4
<i>Vanessa atalanta</i>	Red admiral	Nymphalidae	Lepidoptera				4
<i>Lithobius (Lithobius) variegatus</i>	Banded centipede	Lithobiidae	Lithobiomorpha		tree-associated	shaded woodland floor	1
<i>Nemastoma bimaculatum</i>	A harvestman	Nemastomatidae	Opiliones		tree-associated	shaded woodland floor	1
<i>Paroligolophus agrestis</i>	A harvestman	Phalangiidae	Opiliones				2
<i>Omocestus viridulus</i>	Common green grasshopper	Acrididae	Orthoptera		open habitats	tall sward & scrub	2
<i>Polydesmus sp.</i>	A millipede	Polydesmidae	Polydesmida				1
<i>Arion sp.</i>	A slug	Arionidae	Pulmonata				1
<i>Oxychilus (Oxychilus) alliarius</i>	Garlic snail	Oxychilidae	Pulmonata		conifer or broadleaved	woodland habitat	1
<i>Zootoca vivipara</i>	Common lizard	Lacertidae	Squamata	Section 7			