

REPORT OF A SURVEY OF THE TERRESTRIAL INVERTEBRATES OF TRAP GROUNDS, OXFORD, 2013

Steve Gregory, December 2013

This report was produced for Friends of Trap Grounds

by
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SUMMARY

- Trap Grounds, Oxford: The area surveyed comprises three distinct habitats: dry secondary woodland, wet woodland and open grassy clearings.
- Two visits were made in early June and early July to sample terrestrial invertebrates by hand-searching, sweeping/beating and hand netting. Pitfall traps were also used.
- 207 species of terrestrial invertebrate were identified from the samples.
- This includes 26 species of slugs & snails, 32 woodlice, millipedes & centipedes, 43 spiders & allies, 34 true flies and 31 bees, wasps & ants.
- Additional specimens of beetle (Coleoptera), true fly (Diptera) and true bug (Hemiptera) have been preserved in alcohol for subsequent identification.
- Three species recorded are Nationally Scarce/Nb, including Ray Spider *Theridiosoma gemmosum* previously recorded in the 1980s, and are considered to be of conservation significance.
- The Irish Silk Millipede *Anamastigona pulchella* and Irish Yellow Slug *Limacus maculatus* are recorded from Oxfordshire (vc23) for the first time.
- Considering its small size, the results suggest that the site supports a diverse invertebrate fauna. The species recorded reflect the mixture of habitats present; marshy woodland, scrubby ‘woodland edge’ and open grassy clearings.
- There is a strong ‘synanthropic’ element to the fauna (i.e. species associated with man-made habitats), reflecting the sites location within Oxford City.
- Further survey work, in different seasons, could further enhance the understanding of the site’s fauna.

INTRODUCTION

In 2013, the author was commissioned by Friends of Trap Grounds to undertake a general assessment of the terrestrial invertebrates inhabiting the site to the west of the reedbed (i.e. beyond the area designated as a Local Wildlife Site (LWS) (Figure 1).

METHODS

Survey Areas

The area surveyed comprises a mixture of three main habitats (Figure 1).

- Dry secondary woodland on higher ground, often rooted into rubble and other debris, such as Sparrowhawk, Periwinkle and Railway Woods.
- Wet carr woodland (dominated by *Salix*, etc) in low lying hollows, often peaty, bordering Heron Swamp and Tim’s Pond.
- Grassy clearings dominated by tussocky grasses, such as Foxglove & School Meadows, and Sycamore & Slow-worm Glades.

Hand-searching, sweeping and beating

Two sites visits, each of about 3 hours duration, were made on 4th June and 9th July to collect terrestrial invertebrates (night-flying moths were not collected). All three habitat types (dry woodland, wet woodland and open grassland) were sampled. Both days were warm with sunny

intervals. Methods included hand searching for ground dwelling invertebrates, sweep netting of vegetation, and netting of individual insects from flowers.

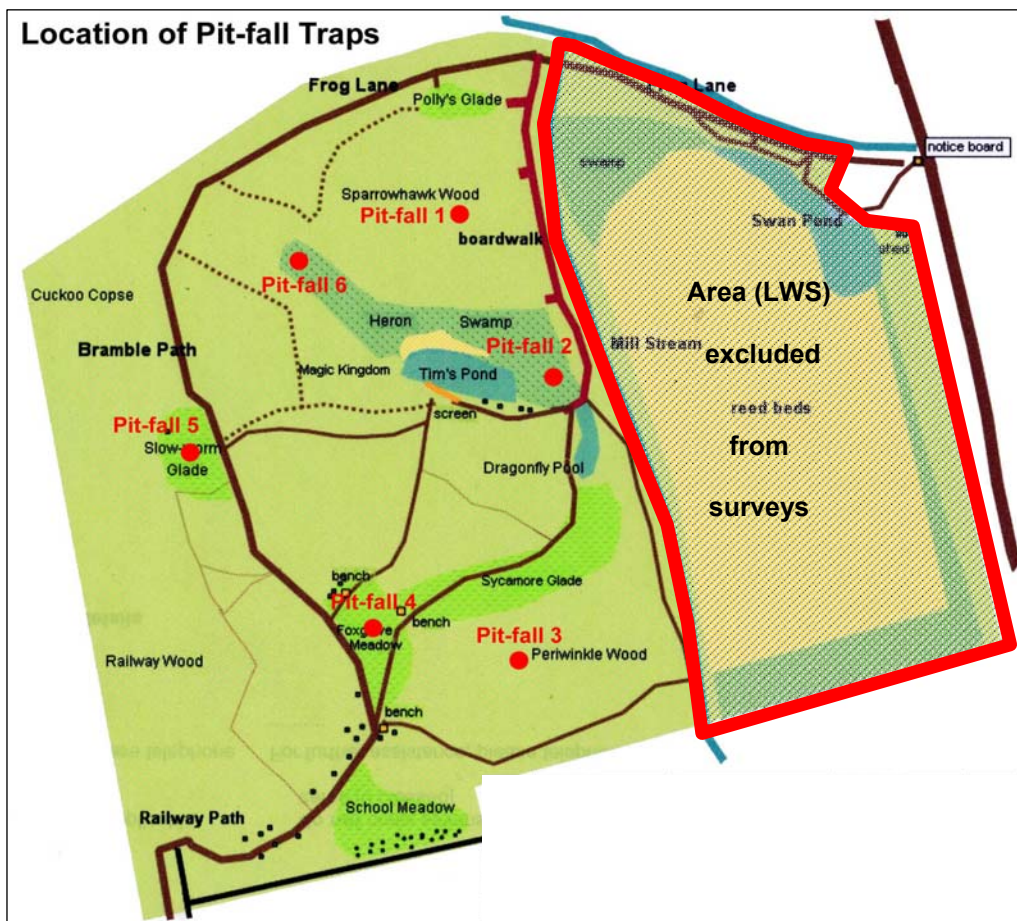


Figure 1: Map of Trap Grounds indicating area surveyed and location of pitfall traps

Pitfall trapping

Pitfall traps were set on 4th June to capture surface active invertebrates. These were 7cm diameter plastic vending cups buried in the ground (with the rim flush with soil surface). They were filled to about 1/3 with 70% alcohol (IDA) as a preservative. Traps were set in pairs, about 5m apart, at six separate sample sites, as indicated in Table 1. The location of each site is indicated in Figure 1. The samples were collected 19th June and 9th July (when the traps were removed).

Table 1: Details of pitfall trap locations

Pitfall Site	No. of traps	Habitat	Site Name	OS Grid Ref	acc.
1	1 pair	Dry Woodland	Sparrowhawk Wood	SP 50320 08180	± 4m
2	1 pair	Wet Woodland	Herons Swamp (east)	SP 50326 08155	± 4m
3	1 pair	Dry Woodland	Periwinkle Wood	SP 50317 08111	± 4m
4	1 pair	Grassland	Foxglove Meadow	SP 50300 08086	± 4m
5	1 pair	Grassland	Slow-worm Glade	SP 50253 08121	± 4m
6	1 pair	Wet Woodland	Herons Swamp (east)	SP 50273 08174	± 4m

Species identification

Where practical, invertebrates were identified in the field. Some specimens were collected for microscopic examination to ensure accurate identification. All pit-fall samples, preserved in 70% alcohol, were taken home for sorting and/or identification.

The author undertook identification of most taxa: including Slugs & Snails (Mollusca); Spiders and allies (Arachnida); Millipedes, Centipedes & Woodlice (Myriapoda & Isopoda); Grasshoppers & allies (Orthoptera); Craneflies, Soldierflies & Hoverflies (Diptera: Tipulidae, Limoniidae, Stratiomyidae & Syrphidae); and Bumblebees & Ants (Social Aculeate Hymenoptera). Solitary Bees and Wasps (Solitary Aculeate Hymenoptera) were identified by Ivan Wright (Oxon recorder). These species are detailed in the Results, below.

Unidentified Beetles (Coleoptera) have forwarded to Linda Lisito (Friends of Trap Grounds). Additional unidentified material of True Flies (Diptera) and True Bugs (Hemiptera) has been retained in 70% alcohol pending identification by specialists.

RESULTS

To date 207 species of invertebrate have been identified from the samples (see Appendix I). This includes 26 species of Slug & Snail; 43 Spiders; 32 Centipedes, Millipedes & Woodlice; 34 True Flies; and 31 Bees, Wasps & Ants.

The ‘Nationally Scarce’ Ray Spider *Theridiosoma gemmosum*, first recorded at Trap Grounds in the 1980’s, was refound. However, the ‘Local’ Spider *Nesticus cellulans* was not refound.

Of the 207 species identified, 172 species are considered ‘common’, 28 are ‘local’ and three are Nationally Scarce/Nb. In addition to Ray Spider *Theridiosoma gemmosum*, these are Pallid Running Crab Spider *Philodromus albidus* and Large Yellow-faced Bee *Hylaeus signatus*.

Common: Taxa that are widespread in Great Britain and are known to occur in more than 500 10km squares.

Local: Taxa with a localised distribution in Great Britain and are known to occur in between 101 and 500 10km squares

Nationally Scarce/Nb: Taxa which do not fall within the Red Data Book categories but which are none-the-less uncommon in Great Britain and are known to occur in between 31 and 100 hectares.

Four species are naturalised introductions in the UK. Of these Irish Yellow Slug *Limacus maculatus* and Irish Silk Millipede *Anamastigona pulchella* are new county records for Oxfordshire (vc23).

These five named species are discussed further under the heading ‘Key Invertebrates’ below.

KEY INVERTEBRATES

***Philodromus albidus* (Araneae: Philodromidae), Running Crab Spider, Nationally Scarce (Nb)**

This spider is locally common in eastern southern England. It is typically found on lower branches of deciduous trees at the edges of clearings in woodland, but also recorded from old hedgerows and green-lanes. Conservation of this species requires the retention of woodland edge through rotational management or periodic scrub control (Harvey, *et al*, 2002). A single female was swept from bushes bordering a ride near Heron Swamp on 9th July 2013.

***Theridiosoma gemmosum* (Araneae: Theridiosomatidae), Ray Spider, Nationally Scarce (Nb)**

A small spider that is widespread, but very localised, across southern England. It occurs in damp places, such as bogs, wet heath, ditches, fens and marshes. It spins a small orb web among low

herbage, but the egg-sac is placed high up in bushes. Conservation of this species entails the maintenance of a high water table and low vegetation with bushes (Harvey, *et al*, 2002). A single female was swept on 4th June 2013 from rough vegetation beneath scrub bordering Heron Swamp.

***Hylaeus signatus* (Hymenoptera: Colletidae), Large Yellow-faced Bee, Nationally Scarce (Nb)**

This bee is mainly recorded from southern England, typically on calcareous soils, and often on post-industrial habitats or disused mineral extraction sites (Collins & Roy, 2012). Its nests are typically excavated from dead stems such as bramble and rose, or into hard clay banks. These are provisioned with pollen collected from Weld *Reseda luteola* or Wild Mignonette *Reseda lutea*. Thus, conservation of this scarce bee is dependant upon the presence of substantial stands of these plants for nest provision. A single male was netted from Slow-worm Glade on 9th July 2013 (determined by Ivan Wright). A potential host plant, Weld *Reseda luteola*, is included on the site species list (www.trap-grounds.org.uk).

***Limacus maculatus* (Gastropoda: Limacidae), Irish Yellow Slug, New county record (vc23, naturalised)**

This slug is native to south-eastern Europe, but has been widely spread by human activity. In the 20th century it became common in Ireland, typically associated with ‘man-made’ synanthropic habitats. In recent decades it has begun to expand its range throughout Britain too (Kerney, 1999). As a naturalised introduction it is of limited conservation significance.

Many specimens were seen in Sycamore and Slow-worm Glades, under bark on trees, under logs and in pitfall traps. This is the first recorded occurrence of this species in Oxfordshire.

***Anamastigona pulchella* (Chordeumatida: Anthroleucosomatidae) Irish Silk Millipede, Second British record, New county record (vc23, naturalised)**

This millipede is native to Italy, but is well known as a naturalised introduction in Northern Ireland (Lee, 2006). It has recently been discovered at RHS Wisley Gardens (pers.obsv., unpublished). As a naturalised introduction it is of limited conservation significance. Two females were collected from a pit-fall trap set between 4-19th June in dry secondary woodland (Sparrowhawk Wood). This is the first recorded occurrence of this species in Oxfordshire.

OTHER INVERTEBRATES RECORDED

Marsh and wet woodland fauna

A number of Local spiders recorded are associated with damp or waterlogged habitats (Harvey, *et al*, 2002). This includes Cobweb Spider *Cicurina cicur*, Crab Spider *Xysticus ulmi*, Comb-footed Spider *Theridion pictum* (and also the Nationally Scarce *Theridiosoma gemmosum* – see above). Six species of soldier fly (Diptera: Stratiomyidae) were found at Trap Grounds in 2013 (46 occur in Britain). The Local Yellow-legged Black *Pachygaster leachii* (and its common congener *P. atra*) are associated with deadwood in damp locations. The remainder require wet rotting vegetation or mud for their larvae (Stubbs & Drake, 2001). The Local crane fly *Epiphragma ocellaris* also favours dead wood in damp woodland.

Coarse vegetation and woodland edge fauna

Coarse vegetation and scrub occurring around the edges of the open grassy areas of Trap Grounds is important for many of the recorded invertebrates. Many of the spiders mentioned above, in addition to the Local Comb-footed Spider *Theridion tinctum* and Long-jawed Spider *Tetragnatha nigrita*, require coarse vegetation and scrub for their survival. Overhanging trees provide valuable

‘woodland edge’ habitat for the Local Tree Hopper *Centrotus cornutus* and the Scarce/Nb Spider *Philodromus albidus*.

Open grassland fauna

There is a good range of species associated with open sunny habitats, including many solitary bees and wasps (Aculeate Hymenoptera). The Scarce/Nb Yellow Face Bee *Hylaeus signatus* is mentioned above (under ‘Key Invertebrates’). Other species include the Local Harebell Carpenter Bee *Chelostoma campanularum* (which only collects pollen from *Campanula* or *Geranium* flowers (Edwards & Roy, 2011) and Solitary Wasp *Rhopalum coarctatum* (which feeds its larvae on small flies, such as midges). The presence of associated cleptoparasites, such as Solitary Wasp *Sapyga quinquepunctata* and Conopid Fly *Sicus ferrugineus*, suggests that Trap Grounds supports a relatively robust community of Aculeate Hymenoptera. The Local Hoverfly *Xanthogramma citrofascia* has larvae associated with ant’s nests in open situations (Stubbs & Falk, 2002).

Synanthropic fauna

There is a strong synanthropic element to the fauna (i.e. species associated with man-made habitats). Of particular note are Irish Silk Millipede (second British record) and Irish Yellow Slug (first record for Oxfordshire). Other naturalised introductions include Girdled Snail *Hygromia cinctella* and Worm Slug *Boettgerilla pallens*. Other species considered native, such as the Local Striped Pill-woodlouse *Armadillidium nasatum* (often associated with greenhouses) and Nano-flatback Millipede *Macrosternodesmus palicola*, are heavily synanthropic in Oxfordshire (Gregory, 1996; 2001).

DISCUSSION

Although three Nationally Scarce species from 207 species recorded is not exceptional, it is clear that the area of Trap Grounds that was surveyed (Fig. 1) does support a varied and interesting invertebrate assemblage. The survey area consists of three main habitat types: dry secondary woodland on higher ground, often rooted into rubble and other debris; wet carr woodland (*Salix*, etc) on low lying, often peaty, hollows; and grassy clearings dominated by tussocky grasses. The scarcer invertebrates recorded during this survey, including the three Nationally Scarce species, were collected from all three habitats. This highlights the importance of the whole range of habitats found at Trap Grounds.

All these habitats have the potential to support large numbers of invertebrates. The site comprises an intimate mix of these habitats, each too small to be considered in its own right. However, together they form an important mosaic of complementary vegetation zonation, providing a large number of ‘micro-habitats’ each with its own specialised invertebrate species.

When considering invertebrates it is important to consider the habitat requirements of the larval stage, in addition to the (typically) more obvious adult stage. For example adult solitary bees and wasps may require flowers to forage for nectar and pollen (often of a narrow range of plant species). However, many species recorded from Trap Grounds also require dead wood (such as logs) or hollow stems (such as bramble patches) in sunny situations. Without both foraging sites and breeding sites, currently present at Trap Grounds, these species cannot survive.

There is a strong synanthropic element to the Trap Grounds fauna (i.e. species associated with man-made habitats). Given the close proximity to Oxford city and the sites past use as a rubbish dump this is to be expected. Even today a walk of the site’s perimeter indicates that garden rubbish (dead plants, lawn/hedge trimmings, etc) are regularly discarded onto the site and cultivated plants have been introduced to diversify the grassland sward. These are all potential routes of colonisation by both native and naturalised invertebrate (and plant) species. It is unrealistic to consider that Trap Grounds can be maintained as an ecologically ‘natural’ island in

the midst of Oxford City. Most synanthropic species are readily dispersed to new sites, both passively (i.e. by their own means) or by accidental introduction (i.e. human facilitated).

Much of our fauna (and flora) has been accidentally (sometimes deliberately) introduced. In the case of Slugs and Snails (which have a good archeologically record) this has been happening since the Neolithic (Kerney, 1999) and continues to the present day (Gregory, 2000). The Irish Yellow Slug *Limacus maculatus* (the first record for Oxfordshire reported herein) is merely the latest phase of this ongoing process. Although a very small minority of (often over-publicised) naturalised species may cause ecological problems (e.g. Harlequin Ladybird), the vast majority live unnoticed, and harmlessly, wherever humans occur. Considering the past events that have shaped the habitats seen at Trap Grounds today, it can be argued that the site is biologically, even ecologically, enhanced by their presence.

The spider *Nesticus cellulans* was previously recorded in the 1980s when it was recorded from the reedbed. Although it was not re-found in 2013 the reedbed was excluded from the survey area (see Fig. 1). This species may still be present there. This spider is officially designated as a Local species (srs.britishtspiders.org.uk/), and is therefore (officially) considered to be of little conservation concern. Recent surveys have shown that it can be a very frequent spider within sewers and in cellars (another synanthropic species), and it is not as rare as previously thought.

ACKNOWLEDGEMENTS

I am grateful to Catherine Robinson for providing details of the site and to Norman Gregory for showing me around the site. I thank Ivan Wright (Aculeate Hymenoptera Recorder for Oxfordshire) for identifying specimens of sawflies, solitary bees and solitary wasps.

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APPENDIX I: LIST OF INVERTEBRATE SPECIES RECORDED FROM TRAP GROUNDS BETWEEN 4TH JUNE AND 9TH JULY 2013.

Collected and identified by Steve Gregory (except * indicates identified by Ivan Wright)

Order	Family	Scientific name	Common name	GB status...	Comments	4th June	Pitfall traps	9th July
Mollusca	Arionidae	<i>Arion ater</i> agg.	Great Black Slug	Common	Hand searching & Pitfalls	#	1,3,5	
Mollusca	Arionidae	<i>Arion distinctus</i>	Common Garden Slug	Common	Hand searching & Pitfalls	#	1,3,4,5	
Mollusca	Arionidae	<i>Arion intermedius</i>	Hedgehog Slug	Common	Hand searching	#		
Mollusca	Arionidae	<i>Arion subfuscus</i>	Dusky Slug	Common	Hand searching	#		
Mollusca	Cochlicopidae	<i>Cochlicopa lubrica</i>	Slippery Moss Snail	Common	Hand searching & Pitfalls	#	4	
Mollusca	Ellobiidae	<i>Carychium minimum</i> agg.	a hollow-shelled snail	Common	Hand searching	#		
Mollusca	Endodontidae	<i>Discus rotundatus</i>	Rounded Snail	Common	Hand searching	#		
Mollusca	Helicidae	<i>Cepaea hortensis</i>	White Lipped Snail	Common	Hand searching	#		
Mollusca	Helicidae	<i>Cepaea nemoralis</i>	Brown Lipped Snail	Common	Hand searching	#	3,4,5	
Mollusca	Helicidae	<i>Cornu aspersum</i>	Garden Snail	Common	Hand searching	#		
Mollusca	Helicidae	<i>Hygromia cinctella</i>	Girdled Snail	Naturalised	Hand searching	#		
Mollusca	Helicidae	<i>Monacha cantiana</i>	Kentish snail	Common	Hand searching & Pitfalls	#	4,5	
Mollusca	Helicidae	<i>Trochulus hispida</i>	Hairy Snail	Common	Hand searching	#		
Mollusca	Helicidae	<i>Trochulus striolatus</i>	Strawberry Snail	Common	Hand searching	#		
Mollusca	Limacidae	<i>Deroceras laeve</i>	Marsh Slug	Common	Hand searching	#		
Mollusca	Limacidae	<i>Deroceras reticulatum</i>	Grey Field Slug	Common	Hand searching & Pitfalls	#	4,5	
Mollusca	Limacidae	<i>Limacus maculatus</i>	Irish Yellow Slug	Naturalised, NCR (vc23)	Hand searching & Pitfalls	#	5	
Mollusca	Limacidae	<i>Limax maximus</i>	Leopard Slug	Common	Hand searching	#		
Mollusca	Limnaeidae	<i>Radix balthica</i>	Wandering Snail	Common	Hand searching	#		
Mollusca	Milacidae	<i>Boettgerilla pallens</i>	Worm Slug	Naturalised	Hand searching	#		
Mollusca	Milacidae	<i>Tandonia budapestensis</i>	Budapest Slug	Common	Hand searching & Pitfalls	#	5	
Mollusca	Succineidae	<i>Oxyloma elegans</i>	Pfeiffer's Amber Snail	Common	Hand searching & swept Herons Swamp	#		#
Mollusca	Zonitidae	<i>Aegopinella nitidula</i>	Smooth Glass Snail	Common	Hand searching	#		
Mollusca	Zonitidae	<i>Oxychilus cellarius</i>	Cellar Snail	Common	Hand searching	#		
Mollusca	Zonitidae	<i>Oxychilus navarricus</i>	Glossy Glass snail	Common	Hand searching	#		
Mollusca	Zonitidae	<i>Vitrea crystallina</i> agg.	Crystal Snail	Common	Hand searching	#		
Araneae	Anyphaenidae	<i>Anyphaena accentuata</i>	a buzzing spider	Common	Swept damp woodland			#
Araneae	Araneidae	<i>Araniella cucurbitina</i>	an orb-weaver spider	Common	Swept grassland			#
Araneae	Araneidae	<i>Larinioides cornutus</i>	an orb-weaver spider	Common	Swept damp woodland			#
Araneae	Clubionidae	<i>Clubiona lutescens</i>	a foliage spider	Common	Swept damp woodland			#

Order	Family	Scientific name	Common name	GB status...	Comments	4th June	Pitfall traps	9th July
Araneae	Clubionidae	<i>Clubiona terrestris</i>	a foliage spider	Common	Swept grassland			#
Araneae	Dictynidae	<i>Cicurina cicur</i>	a cobweb spider	Local	Hand searching damp woodland	#		
Araneae	Dictynidae	<i>Dictyna arundinacea</i>	a mesh webbed spider	Common	Swept grassland			#
Araneae	Linyphiidae	<i>Bathyphantes gracilis</i>	a money spider	Common	Pitfalls & swept damp woodland	#	2,6	#
Araneae	Linyphiidae	<i>Diplocephalus picinus</i>	a money spider	Common	Pitfalls		2,6	
Araneae	Linyphiidae	<i>Erigone atra</i>	a money spider	Common	Swept grassland & damp woodland	#		#
Araneae	Linyphiidae	<i>Gnathonarium dentatum</i>	a money spider	Common	Swept damp woodland		2,6	#
Araneae	Linyphiidae	<i>Hypomma bituberculatum</i>	a money spider	Common	Swept damp woodland			#
Araneae	Linyphiidae	<i>Lepthyphantes tenuis</i>	a money spider	Common	Pitfalls & swept grassland		2	#
Araneae	Linyphiidae	<i>Leptorhoptrum robustum</i>	a money spider	Common	Swept damp woodland			#
Araneae	Linyphiidae	<i>Microneta viaria</i>	a money spider	Common	Pitfalls		2,3	
Araneae	Linyphiidae	<i>Neriere clathrata</i>	a money spider	Common	Swept damp woodland			#
Araneae	Linyphiidae	<i>Neriere peltata</i>	a money spider	Common	Swept damp woodland			#
Araneae	Linyphiidae	<i>Oedothis gibbosus</i>	a money spider	Common	Pitfalls		6	
Araneae	Linyphiidae	<i>Oedothis retusus</i>	a money spider	Common	Swept grassland			#
Araneae	Linyphiidae	<i>Pocadicnemis juncea</i>	a money spider	Common	Pitfalls		6	
Araneae	Linyphiidae	<i>Porrhomma pygmaeum</i>	a money spider	Common	Swept damp woodland			#
Araneae	Lycosidae	<i>Alopecosa pulverulenta</i>	a wolf spider	Common	Pitfalls		4,5	
Araneae	Lycosidae	<i>Pardosa prativaga</i>	a wolf spider	Common	Pitfalls		5	
Araneae	Lycosidae	<i>Pardosa pullata</i>	a wolf spider	Common	Pitfalls		4,5	
Araneae	Lycosidae	<i>Pirata hygrophilus</i>	a wolf spider	Common	Pitfalls		6	
Araneae	Philodromidae	<i>Philodromus albidus</i>	a running crab spider	Scarce/Nb	Swept damp woodland edge			#
Araneae	Pisauridae	<i>Pisaura mirabilis</i>	Tent Spider	Common	Swept grassland			#
Araneae	Tetragnathidae	<i>Metellina mengei</i>	an orb-weaver spider	Common	Swept grassland & damp woodland			#
Araneae	Tetragnathidae	<i>Pachygnatha clercki</i>	a long-jawed spider	Common	Pitfalls		6	
Araneae	Tetragnathidae	<i>Pachygnatha degeeri</i>	a long-jawed spider	Common	Pitfalls		4	
Araneae	Tetragnathidae	<i>Tetragnatha extensa</i>	a long-jawed spider	Common	Swept grassland & damp woodland			#
Araneae	Tetragnathidae	<i>Tetragnatha montana</i>	a long-jawed spider	Local	Swept grassland & damp woodland			#
Araneae	Tetragnathidae	<i>Tetragnatha nigrita</i>	a long-jawed spider	Local	Swept damp woodland			#
Araneae	Theridiidae	<i>Anelosimus vittatus</i>	a comb-footed spider	Common	Swept grassland			#
Araneae	Theridiidae	<i>Enoplognatha ovata</i>	a comb-footed spider	Common	Swept grassland			#
Araneae	Theridiidae	<i>Enoplognatha thoracica</i>	a comb-footed spider	Local	Swept grassland			#

Order	Family	Scientific name	Common name	GB status...	Comments	4th June	Pitfall traps	9th July
Araneae	Theridiidae	<i>Paidiscura pallens</i>	a comb-footed spider	Common	Swept woodland edge			#
Araneae	Theridiidae	<i>Theridion mystaceum</i>	a comb-footed spider	Common	Swept damp woodland			#
Araneae	Theridiidae	<i>Theridion pictum</i>	a comb-footed spider	Local	Swept grassland			#
Araneae	Theridiidae	<i>Theridion tinctum</i>	a comb-footed spider	Local	Swept grassland			#
Araneae	Theridiosomatidae	<i>Theridiosoma gemmosum</i>	a ray spider	Scarce/Nb	Swept damp woodland, from vegetation			#
Araneae	Thomisidae	<i>Xysticus cristatus</i>	a crab spider	Common	Pitfalls		5	
Araneae	Thomisidae	<i>Xysticus ulmi</i>	a crab spider	Local	Swept damp woodland			#
Opiliones	Leiobunidae	<i>Dicranopalpus ramosus</i>	a harvestman, nymph	Local	Swept damp woodland			#
Opiliones	Leiobunidae	<i>Leiobunum rotundum</i>	a harvestman, nymph	Common	Swept damp woodland			#
Opiliones	Phalangidae	<i>Lacinius ephippiatus</i>	a harvestman, nymph	Common	Pitfalls		1	
Opiliones	Phalangidae	<i>Lophopilio palpinalis</i>	a harvestman, nymph	Common	Pitfalls		1,3	
Opiliones	Phalangidae	<i>Phalangium opilio</i>	a harvestman, sub-adult	Common	Swept grassland			#
Opiliones	Phalangidae	<i>Platybunus triangularis</i>	a harvestman	Common	Hand searching & Pitfalls	#	1,3	
Chilopoda	Cryptopidae	<i>Cryptops hortensis</i>	a centipede	Common	Hand searching	#		
Chilopoda	Geophilidae	<i>Geophilus flavus</i>	a centipede	Common	Hand searching	#	3	
Chilopoda	Geophilidae	<i>Geophilus truncorum</i>	a centipede	Common	Hand searching	#		
Chilopoda	Himantariidae	<i>Stigmatogaster subterranea</i>	a centipede	Common	Hand searching	#		
Chilopoda	Lithobiidae	<i>Lithobius forficatus</i>	a centipede	Common	Hand searching	#	1	
Chilopoda	Lithobiidae	<i>Lithobius melanops</i>	a centipede	Common	Hand searching	#		
Chilopoda	Lithobiidae	<i>Lithobius microps</i>	a centipede	Common	Hand searching	#	1	
Chilopoda	Schendylidae	<i>Schendyla nemorensis</i>	a centipede	Common	Hand searching	#		
Diplopoda	Anthroleucosomatidae	<i>Anamastigona pulchellum</i>	Irish Silk Millipede	Naturalised, NCR (vc23)	Pitfalls		1	
Diplopoda	Blaniulidae	<i>Blaniulus guttulatus</i>	Spotted Snake Millipede	Common	Hand searching	#		
Diplopoda	Blaniulidae	<i>Proteroiulus fuscus</i>	Snake Millipede	Common	Hand searching	#		
Diplopoda	Julidae	<i>Brachyiulus pusillus</i>	a julid snake millipede	Common	Hand searching		1,2,3	
Diplopoda	Julidae	<i>Cylindroiulus britannicus</i>	a julid snake millipede	Common	Hand searching	#		
Diplopoda	Julidae	<i>Cylindroiulus caeruleocinctus</i>	a julid snake millipede	Local	Hand searching	#	1,3,4,5	
Diplopoda	Julidae	<i>Cylindroiulus punctatus</i>	Blunt-tailed Millipede	Common	Hand searching	#		
Diplopoda	Julidae	<i>Ophiulus pilosus</i>	a julid snake millipede	Common	Hand searching	#	1,2,3,4,5,6	
Diplopoda	Julidae	<i>Tachypodoiulus niger</i>	White-legged Millipede	Common	Hand searching	#	1,2,3,4,5	
Diplopoda	Macrostermesmidae	<i>Macrostermesmus palicola</i>	a flat-back millipede	Local	Hand searching	#	3	
Diplopoda	Nemasomatidae	<i>Nemasoma varicorne</i>	a thread millipede	Common	Hand searching	#		
Diplopoda	Polydesmidae	<i>Brachydesmus superus</i>	a flat-back millipede	Common	Hand searching	#	3	

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Diplopoda	Polydesmidae	<i>Polydesmus coriaceus</i>	a flat-back millipede	Common	Hand searching	#	1,2,3,4,5,6	
Isopoda	Armadillidiidae	<i>Armadillidium nasatum</i>	Striped Pill-woodlouse	Local	Hand searching & pitfalls	#	5	
Isopoda	Armadillidiidae	<i>Armadillidium vulgare</i>	Common Pill-woodlouse	Common	Hand searching & pitfalls	#	5	
Isopoda	Asellidae	<i>Asellus aquaticus</i>	Two-spot Waterlouse	Common	Hand searching	#		
Isopoda	Oniscidae	<i>Oniscus asellus</i>	Shiny Woodlouse	Common	Hand searching & pitfalls	#	1,2,3,4,5,6	
Isopoda	Philosciidae	<i>Philoscia muscorum</i>	Striped Woodlouse	Common	Hand searching & pitfalls	#	1,2,3,4,5,6	
Isopoda	Platyarthridae	<i>Platyarthrus hoffmannseggii</i>	Ant Woodlouse	Common	Hand searching	#		
Isopoda	Porcellionidae	<i>Porcellio scaber</i>	Rough Woodlouse	Common	Hand searching & pitfalls	#	1,3,6	
Isopoda	Trichoniscidae	<i>Androniscus dentiger</i>	Rosy Woodlouse	Common	Hand searching	#		
Isopoda	Trichoniscidae	<i>Haplophthalmus danicus</i>	Spurred Ridgeback	Local	Hand searching	#		
Isopoda	Trichoniscidae	<i>Trichoniscus pusillus</i>	Common Pygmy Woodlouse	Common	Hand searching & pitfalls	#	5	
Isopoda	Trichoniscidae	<i>Trichoniscus pygmaeus</i>	Least Pygmy Woodlouse	Common	Hand searching	#		
Coleoptera	Carabidae	<i>Loricera pilicornis</i>	a ground beetle	Common	Pitfalls		2	
Coleoptera	Carabidae	<i>Nebria brevicollis</i>	a ground beetle	Common	Pitfalls		1,2,3,5,6	
Coleoptera	Carabidae	<i>Notiophilus biguttatus</i>	a ground beetle	Common	Pitfalls		2,3	
Coleoptera	Carabidae	<i>Pterostichus madidus</i>	Black Clock	Common	Pitfalls		1,2,3,4,5	
Coleoptera	Carabidae	<i>Pterostichus niger</i>	a ground beetle	Common	Pitfalls		6	
Coleoptera	Cerambycidae	<i>Clytus arietis</i>	Wasp Beetle	Common	Swept grassland, off sunny log			#
Coleoptera	Cerambycidae	<i>Rutpela maculata</i>	a longhorn beetle	Common	Swept grassland, off brambles			#
Coleoptera	Coccinellidae	<i>Propylea 14-punctata</i>	14-spot Ladybird	Common	Swept grassland			#
Coleoptera	Melyridae	<i>Malachius bipustulatus</i>	Malachite Beetle	Common	Swept grassland			#
Coleoptera	Oedemeridae	<i>Oedemera lurida</i>	a flower beetle	Local	Swept grassland			#
Coleoptera	Oedemeridae	<i>Oedemera nobilis</i>	a flower beetle	Common	Swept grassland			#
Coleoptera	Tenebrionidae	<i>Lagria hirta</i>	a darkling beetle	Common	Swept grassland			#
Dermaptera	Forficulidae	<i>Forficula auricularia</i>	Common Earwig	Common	Hand searching grassland & woodland	#	1,5	
Diptera	Conopidae	<i>Sicus ferrugineus</i>	a conopid fly	Local	Swept grassland			#
Diptera	Stratiomyidae	<i>Beris chalybata</i>	Black Legionnaire	Common	Swept damp woodland			#
Diptera	Stratiomyidae	<i>Beris vallata</i>	Orange Legionnaire	Common	Swept damp woodland			#
Diptera	Stratiomyidae	<i>Chloromyia formosa</i>	Broad Centurion	Common	Swept grassland			#
Diptera	Stratiomyidae	<i>Microchrysa flavicornis</i>	Green Gem	Common	Swept grassland	#		#
Diptera	Stratiomyidae	<i>Pachygaster atra</i>	Dark-winged Black	Common	Swept grassland			#
Diptera	Stratiomyidae	<i>Pachygaster leachii</i>	Yellow-legged Black	Local	Swept grassland			#
Diptera	Syrphidae	<i>Baccha elongata</i>	a hoverfly	Common	Swept grassland			#

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Diptera	Syrphidae	<i>Cheilosia illustrata</i>	a hoverfly	Common	Swept grassland			#
Diptera	Syrphidae	<i>Cheilosia pagana</i>	a hoverfly	Common	Swept grassland			#
Diptera	Syrphidae	<i>Episyrphus balteatus</i>	a hoverfly	Common	Swept grassland			#
Diptera	Syrphidae	<i>Eristalis horticola</i>	a hoverfly	Common	Swept grassland			#
Diptera	Syrphidae	<i>Eristalis pertinax</i>	a hoverfly	Common	Swept grassland			#
Diptera	Syrphidae	<i>Eristalis tenax</i>	a hoverfly	Common	Swept grassland			#
Diptera	Syrphidae	<i>Eupeodes corollae</i>	a hoverfly	Common	Swept grassland			#
Diptera	Syrphidae	<i>Helophilus pendulus</i>	a hoverfly	Common	Swept grassland			#
Diptera	Syrphidae	<i>Melanostoma scalare</i>	a hoverfly	Common	Swept grassland			#
Diptera	Syrphidae	<i>Merodon equestris</i>	Greater Bulb-fly	Common	Swept damp woodland			#
Diptera	Syrphidae	<i>Myathropa florea</i>	a hoverfly	Common	Swept grassland			#
Diptera	Syrphidae	<i>Neoascia podagrica</i>	a hoverfly	Common	Swept grassland			#
Diptera	Syrphidae	<i>Neoascia tenur</i>	a hoverfly	Local	Swept damp woodland			#
Diptera	Syrphidae	<i>Platycheirus albimanus</i>	a hoverfly	Common	Swept grassland			#
Diptera	Syrphidae	<i>Rhingia campestris</i>	a hoverfly	Common	Swept grassland			#
Diptera	Syrphidae	<i>Sphaerophoria scripta</i>	a hoverfly	Common	Swept grassland			#
Diptera	Syrphidae	<i>Syritta pipiens</i>	a hoverfly	Common	Swept grassland			#
Diptera	Syrphidae	<i>Syrphus ribesii</i>	a hoverfly	Common	Swept grassland			#
Diptera	Syrphidae	<i>Volucella bombylans</i>	a hoverfly	Common	Swept grassland			#
Diptera	Syrphidae	<i>Volucella pellucens</i>	a hoverfly	Common	Swept grassland			#
Diptera	Syrphidae	<i>Xanthogramma citrofascia</i>	a hoverfly	Local	Swept grassland			#
Diptera	Syrphidae	<i>Xylota segnis</i>	a hoverfly	Common	Swept grassland			#
Diptera	Limoniidae	<i>Epiphragma ocellaris</i>	a crane fly	Local	Swept damp woodland			#
Diptera	Tipulidae	<i>Nephrotoma appendiculata</i>	a crane fly	Common	Swept grassland			#
Diptera	Tipulidae	<i>Nephrotoma flavescens</i>	a crane fly	Common	Swept grassland			#
Diptera	Tipulidae	<i>Tipula oleracea</i>	a crane fly	Common	Swept grassland			#
Hemiptera	Coreidae	<i>Coreus marginatus</i>	Dock Squash Bug	Common	Swept grassland			#
Hemiptera	Membracidae	<i>Centrotus cornutus</i>	Tree Hopper	Local	Swept woodland edge			#
Hemiptera	Miridae	<i>Grypocoris (= Calocoris) stysi</i>	Scissor Bug	Common	Swept woodland edge			#
Hymenoptera	Symphyta	<i>Arge pagana</i> *	Saw Fly	Local	Slow-worm Glade			#
Hymenoptera	Symphyta	<i>Nematus myosotidis</i> *	Saw Fly	Common	Slow-worm Glade			#
Hymenoptera	Chrysididae	<i>Chrysis ignita</i> group	a rubytail wasp	Common	Swept sunny log in grassland			#
Hymenoptera	Chrysididae	<i>Trichrysis cyanea</i>	a rubytail wasp	Common	Swept sunny log in grassland			#
Hymenoptera	Crabronidae	<i>Ectemnius cavifrons</i> *	Solitary Wasp	Common	Swept sunny log in grassland	#		

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Hymenoptera	Crabronidae	<i>Ectemnius continuus</i> *	Solitary Wasp	Common	Swept grassland	#		
Hymenoptera	Crabronidae	<i>Rhopalum coarctatum</i> *	Solitary Wasp	Local	Swept Slow-worm Glade & grassy areas	#		#
Hymenoptera	Formicidae	<i>Lasius flavus</i>	Yellow Meadow Ant	Common	Hand searching	#		
Hymenoptera	Formicidae	<i>Lasius niger s.l.</i>	Small Black Ant	Common	Hand searching	#		
Hymenoptera	Formicidae	<i>Leptothorax acervorum</i>	Slender Ant	Common	Hand searching	#		
Hymenoptera	Formicidae	<i>Myrmica rubra</i>	Red Ant	Common	Swept Grassland	#		#
Hymenoptera	Pompilidae	<i>Anoplius nigerrimus</i>	Spider Wasp	Local	Other Grassy areas	#		
Hymenoptera	Sapygidae	<i>Sapyga quinquepunctata</i>	Solitary Wasp	Local	Swept sunny log in grassland	#		
Hymenoptera	Vespiniae	<i>Vespula vulgaris</i>	Common Wasp	Common	Swept Grassland			#
Hymenoptera	Apidae	<i>Andrena bicolor</i> *	Solitary Bee	Common	Swept Slow-worm Glade			#
Hymenoptera	Apidae	<i>Andrena haemorrhoa</i> *	Solitary Bee	Common	Swept grassland	#		
Hymenoptera	Apidae	<i>Andrena minutula</i> *	Solitary Bee	Common	Swept Slow-worm Glade			#
Hymenoptera	Apidae	<i>Andrena semilaevis</i> *	Solitary Bee	Common	Swept grassland	#		
Hymenoptera	Apidae	<i>Apis mellifera</i>	Honey Bee	Common	Swept grassland	#		#
Hymenoptera	Apidae	<i>Bombus hortensis</i>	Garden Bumble Bee	Common	Seen grassland areas	#		#
Hymenoptera	Apidae	<i>Bombus hypnorum</i>	Tree Bumblebee	Local	Seen grassland areas	#		#
Hymenoptera	Apidae	<i>Bombus pascuorum</i>	Common Carder Bee	Common	Swept grassland	#		#
Hymenoptera	Apidae	<i>Bombus pratorum</i>	Early Bumble Bee	Common	Swept grassland	#		#
Hymenoptera	Apidae	<i>Chelostoma campanularum</i>	Solitary Bee	Local	Swept Slow-worm Glade & grassy areas			#
Hymenoptera	Apidae	<i>Halictus tumulorum</i> *	Solitary Bee	Common	Swept grassland	#		
Hymenoptera	Apidae	<i>Hylaeus communis</i> *	Solitary Bee	Local	Swept Slow-worm Glade			#
Hymenoptera	Apidae	<i>Hylaeus signatus</i> *	Solitary Bee	Scarce/Nb	Swept Slow-worm Glade			#
Hymenoptera	Apidae	<i>Lasioglossum calceatum</i> *	Solitary Bee	Common	Swept grassland	#		
Hymenoptera	Apidae	<i>Lasioglossum leucopus</i> *	Solitary Bee	Local	Swept Slow-worm Glade			#
Hymenoptera	Apidae	<i>Megachile willughbiella</i> *	Solitary Bee	Common	Swept Slow-worm Glade			#
Hymenoptera	Apidae	<i>Nomada flavoguttata</i>	Solitary Bee	Common	Swept grassland	#		
Hymenoptera	Apidae	<i>Osmia caerulescens</i> *	Solitary Bee	Common	Slow-worm Glade & sunny logs	#		#
Hymenoptera	Apidae	<i>Osmia leaiana</i> *	Solitary Bee	Common	Slow-worm Glade & sunny logs	#		#
Lepidoptera	Hesperiidae	<i>Ochlodes venata</i>	Large Skipper	Common	Seen			#
Lepidoptera	Pieridae	<i>Anthocharis cardamines</i>	Orange Tip	Common	Seen	#		
Lepidoptera	Pieridae	<i>Pieris napi</i>	Green-veined White	Common	Seen			#
Lepidoptera	Satyridae	<i>Aphantopus hyperantus</i>	Ringlet	Common	Seen			#
Lepidoptera	Satyridae	<i>Maniola jurtina</i>	Meadow Brown	Common	Seen			#

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Lepidoptera	Zygaenidae	<i>Zygaena filipendulae</i>	Six-spot Burnet	Common	Swept Grassland			#
Odonata	Coenagriidae	<i>Coenagrion puella</i>	Azure Damselfly	Common	Swept grassland			#
Odonata	Coenagriidae	<i>Enallagma cyathigerum</i>	Common Blue	Common	Swept grassland			#
Odonata	Coenagriidae	<i>Ischnura elegans</i>	Blue-tailed Damselfly	Common	Swept grassland			#
Odonata	Coenagriidae	<i>Pyrrhosoma nymphula</i>	Large Red Damselfly	Common	Seen grassland areas			#
Orthoptera	Acrididae	<i>Chorthippus parallelus</i>	Meadow Grasshopper	Common	Swept grassland			#
Orthoptera	Meconematidae	<i>Meconema thalassinum</i>	Oak Bush Cricket, juv	Common	Swept damp woodland			#
Orthoptera	Phaneropteridae	<i>Leptophyes punctatissima</i>	Speckled Bush Cricket, juv	Common	Swept grassland			#
Orthoptera	Tetrigidae	<i>Tetrix subulata</i>	Slender Ground Hopper	Local	Hand searching, Heron Marsh	#		
Orthoptera	Tettigoniidae	<i>Pholidoptera griseoptera</i>	Dark Bush Cricket, juv	Common	Swept grassland & damp woodland			#
Psocoptera	Mesopsocidae	<i>Mesopsocus immunis</i>	a barkfly	Common	Swept woodland edge			#
Psocoptera	Stenopsocidae	<i>Stenopsocus immaculatus</i>	a barkfly	Common	Swept woodland edge			#
		Total 207 species			No. species each date:	85	48	115