SURVEY OF GROUND-DWELLING INVERTEBRATE FAUNA AT CHURCH FEN, CREMERS MEADOW, COUNTRYSIDE PARK AND LOW FARM WOOD, BRUNDALL

BRUNDALL PARISH COUNCIL BIODIVERSITY WORKING GROUP, SEPTEMBER 2024

1 INTRODUCTION

1.1. A survey of the habitats and vegetation species present at each of the Brundall Parish Council owned/leased managed 'green' sites (Church Fen, Cremers Meadow, Countryside Park and Low Farm Wood) was carried out during 2023 by BPC Biodiversity Working Group (BWG). The results of this survey were reported to BPC in December 2023 [1].

1.2. One of the recommendations arising from the BWG Report was that some investigations of the invertebrate fauna at each site should be carried out. This would provide useful additional information on the biodiversity status of the sites.

1.3. Ground-dwelling invertebrates are important elements of terrestrial habitats, being responsible for a wide range of activities, including contributing to the decomposition of vegetation, nutrient cycling and soil improvement as well as providing a source of food for birds and other animals. Invertebrate communities are therefore integral to the ecology and biodiversity of an area. Assessing the status of the invertebrate communities at specific locations and their biodiversity, contributes to our understanding of the ecological health of an area. Investigations of the invertebrate communities present in an area can be used to provide baseline data against which any changes in biodiversity can be measured in the future.

1.4. This report presents the findings of an investigation of the invertebrate communities present at each of the four sites. The investigation was carried out during May 2024.

2. METHODOLOGY

2.1. The invertebrate communities at each site were investigated using pitfall trapping. Pitfall traps comprise a simple open ended collection jar, sunk into the soil with its open end flush with ground level. The traps are left in situ for a period of a few days during which any ground dwelling invertebrates that encounter the trap will fall to the bottom of the collection jar and are unable to get out. The arrangement is illustrated in Figure 2.1.

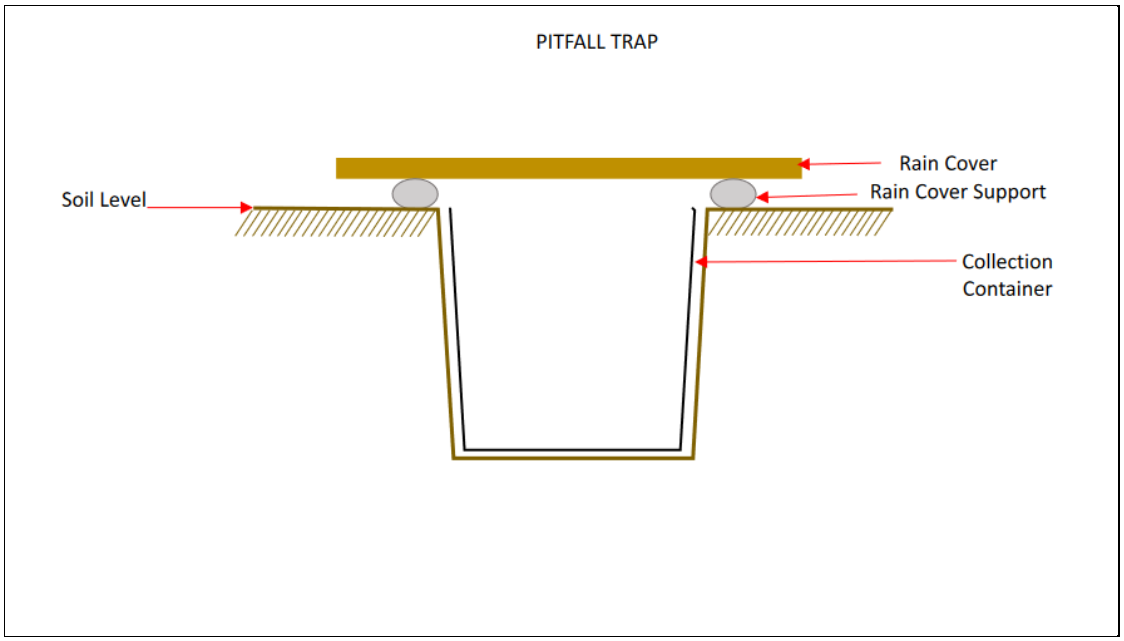
2.2. Traps were deployed at several individual locations at each of the four sites during May 2024. The individual trap locations were generally deployed on a systematic grid sampling plan and chosen so as to cover the range of habitat types found at each of the four sites. The sampling plan was modified where necessary to accommodate site specific issues such as obstructions or unsuitable ground conditions. Trap positions were geo-located using satellite generated GPS coordinates. Following exposure, the traps were retrieved and the collected specimens sorted and identified down to the lowest practical taxonomic level using a stereoscopic binocular microscope. Most specimens were identified down to the level of Class or Order which enabled a good comparative assessment of diversity to be made between the individual locations.

2.3. There are several thousand species of invertebrates found in the UK (circa 40,000), spread amongst a number of separate taxonomic groups. Identification of individual species requires input from individual specialists with knowledge and expertise of the individual groups. At the time of reporting on this study, such specialist resources were not available and hence identification to species level was not possible. Individual specimens were therefore preserved in iso-propyl alcohol for more detailed identification at a later date.

2.4. Figures 2.2 -2.5 show the locations of individual trap sites at each of the four sites

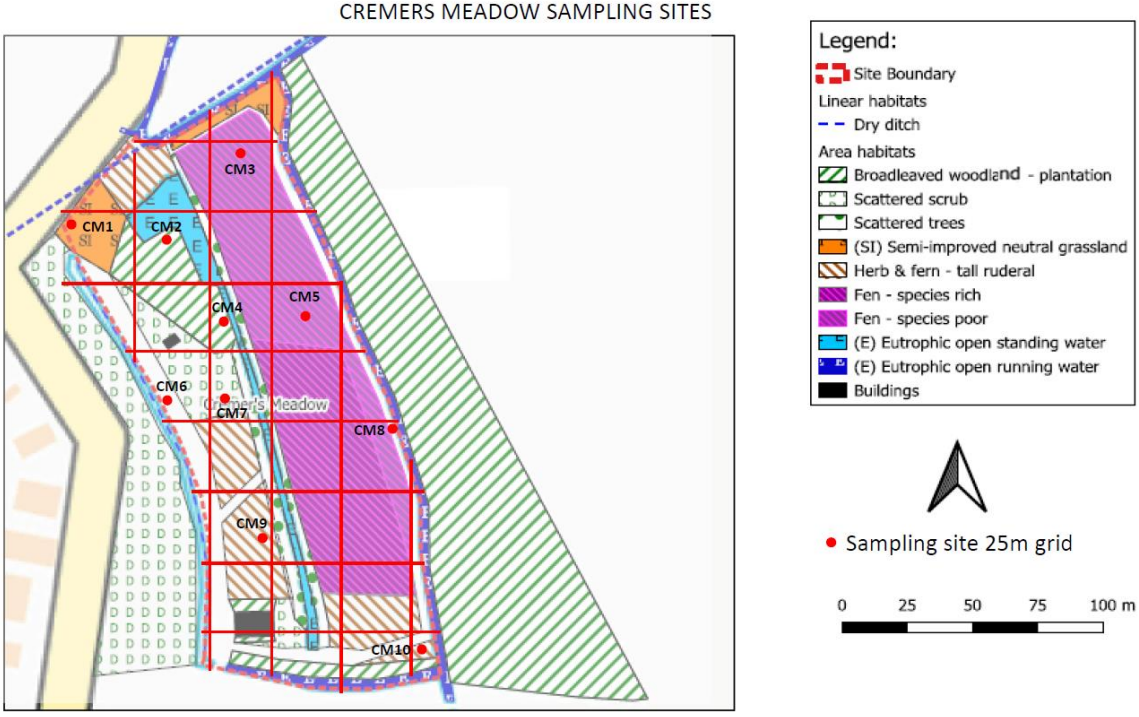
2.5. The trap recovery rate during the survey period was 100% i.e. all traps with collected material were successfully retrieved with no losses.

FIG.2.1 PITFALL TRAP SCHEMATIC

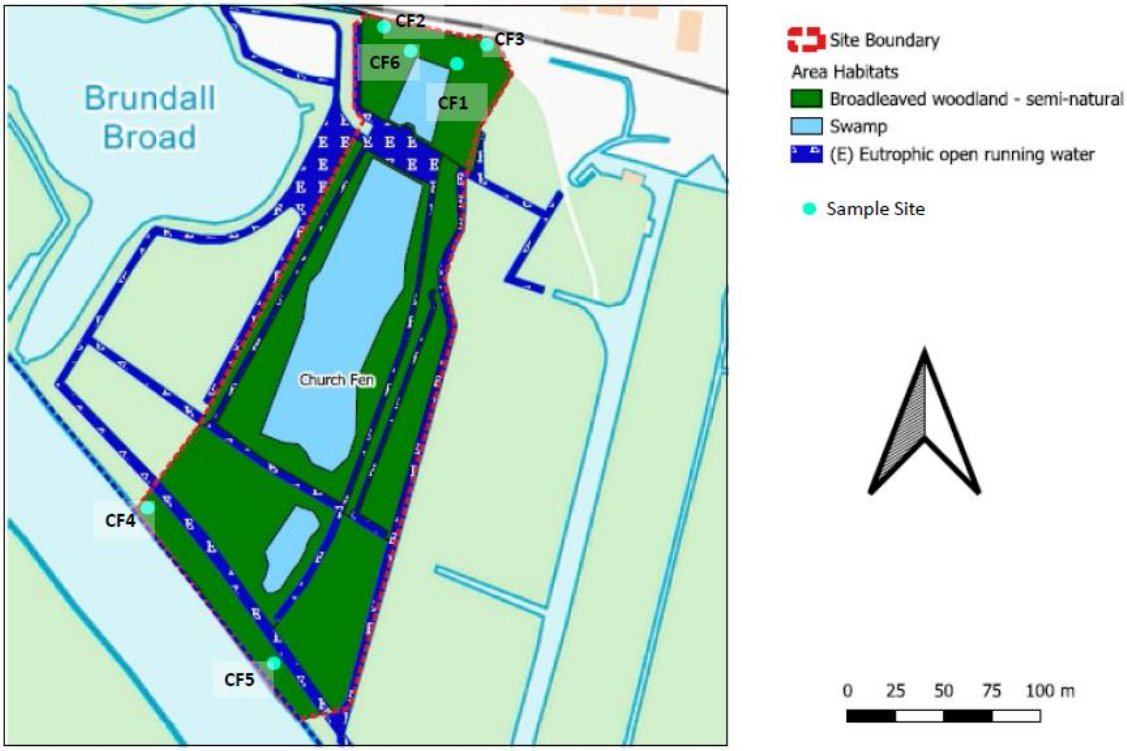


FIGURES 2.2 -2.5: PITFALL TRAP SAMPLING LOCATIONS

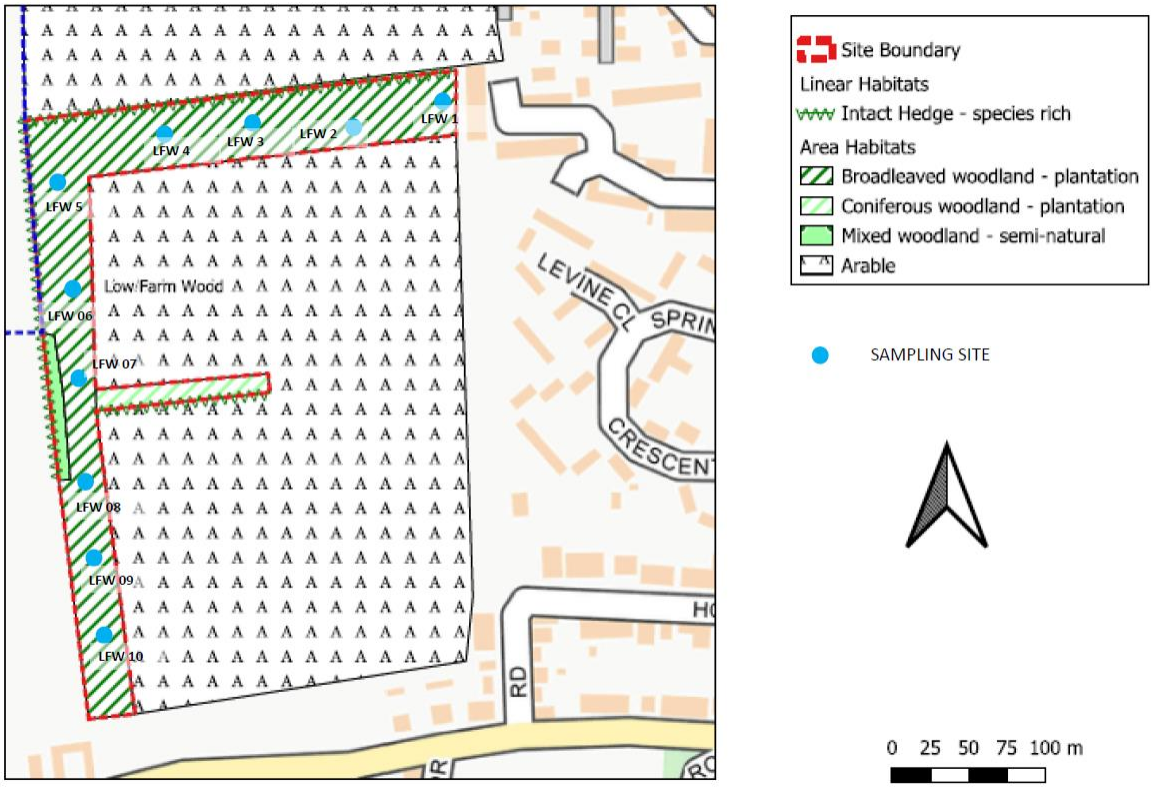
CREMERS MEADOW SAMPLING SITES



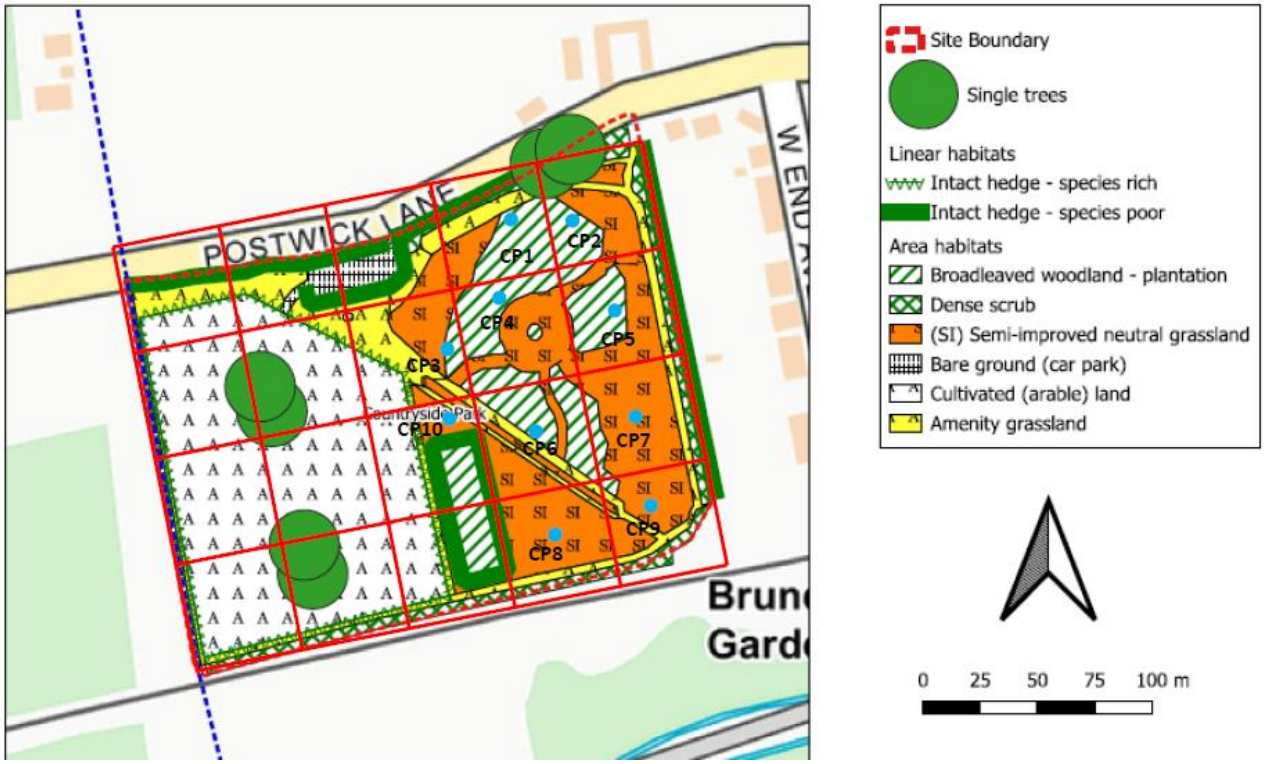
CHURCH FEN PITFALL TRAPPING SITES



LOW FARM WOOD PITFALL TRAPPING SITES



COUNTRYSIDE PARK PITFALL TRAPPING SITES



3. RESULTS

3.1. The survey resulted in the collection of 362 individuals, representing 13 different taxonomic groups. The results of the survey are presented in Tables 3.1 -3.2 and summarised in figure 3.1. Appendix A provides a guide to the various terrestrial invertebrate groups typically found in soil environments and in this survey.

3.2. Figure 3.1 shows the relative proportions of the various taxonomic groups found at each of the four study locations, which provides an indication of the biodiversity at each of the sites. The relative proportions of individual taxa differed across the four locations, as did the dominant taxon represented in individual samples. This result is a reflection of the different conditions/habitats at the sites, including differences within the sites and microclimate variations. For example, many woodland and other invertebrate species will avoid areas that are liable to dry out in warm weather and favour moist conditions where drying out is less likely. Hence habitat that offers protection from desiccation, such as leaf litter debris or fallen trees/ logs, will generally support greater numbers of invertebrates than open areas.

3.3. Long established woodland with native tree species also tends to support more diverse wildlife communities than recently planted woods. The results of this survey at Low Farm Wood compared with Church Fen are consistent with this.

3.4. Meadows also support a wide range of insects and other invertebrates, depending on the vegetation present and the presence of water/moisture.

Table 3.1: PITFALL TRAPS- ANALYSIS OF CONTENTS

TABLE 3.1 BRUNDALL PITFALL TRAP SURVEY 2024														
Site	Sample No.	Location	Annelida	Araneae	Opiliones	Diplopoda	Isopoda	Mollusca	Collembola	Hymenoptera	Coleoptera	Hemiptera	other	TOTAL
Cremers Meadow														
	CM01	TG3322 0877		1			8		10					
	CM02	TG3326 0877		1		1	3						3	
	CM03	TG3328 0280		3					1		2		1	
	CM04	TG3337 0874		5										
	CM05	TG3330 0878											1	
	CM06	TG3326 0870				1	5							
	CM07	TG3327 0870			1	1	2				1			
	CM08	TG3333 0872		3			9	1			3		1	
	CM09	TG3328 0866		1		1				2				
	CM10	TG3335 0862		36			4							
	Total			50	1	4	31	1	11	2	6		6	112
Church Fen														
	CF01	TG3212 0837									3			
	CF02	TG3209 0831	1	1								1	1	
	CF03	TG3213 0230		1		2	1		1				1	
	CF04	TG3197 0807		3	1				1					
	CF05	TG3204 0798					9							
	CF06	TG3210 0828		4		1								
	Total		1	9	1	3	10		2		3	1	2	32
Low Farm Wood	LFW01	TG3158 0897				7	3				5		1	
	LFW02	TG3154 0896									4			
	LFW03	TG3149 0896		1		2	3				3			
	LFW04	TG3144 0896		1		2					1			
	LFW05	TG3133 0890				1	13				6		1	
	LFW06	TG3133 0884		1			2				4			
	LFW07	TG3134 0880		1		1	24						1	
	LFW08	TG3136 0869		1		2	3				2			
	LFW09	TG3136 3865					10							
	LFW10	TG3136 0862				2	1				2			
	Total			5		17	59				27		3	111
Countryside Park														
	CP01	TG3127 0847				1					12			
	CP02	TG3131 0849								5				
	CP03	TG3125 0843		3		1	9				4			
	CP04	TG3129 0845		1		1								
	CP05	TG3135 0847				4				16				
	CP06	TG3131 0838				1	7			1	5		3	
	CP07	TG3137 0837		3		2	11			1	4			
	CP08	TG3131 0833								4				
	CP09	TG3136 0834		1		5	1			2	2		2	
	CP10	TG3127 0838		1						2	2			
	Total			9		14	28			31	29		5	111

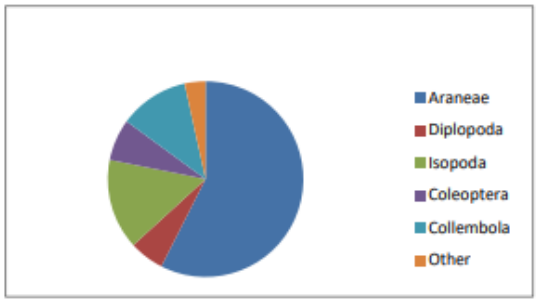
TABLE 3.2: SUMMARY OF PITFALL TRAP COLLECTION DATA

SITE	No. of Taxa Represented	No. of individuals
Cremers Meadow	9 (7.1%)	112
Church Fen	9(28.1%)	32
Low Farm Wood	5 (4.5%)	111
Countryside Park	6 (5.4%)	111

FIGURE 3.1: DISTRIBUTION OF INDIVIDUAL TAXONOMIC GROUPS

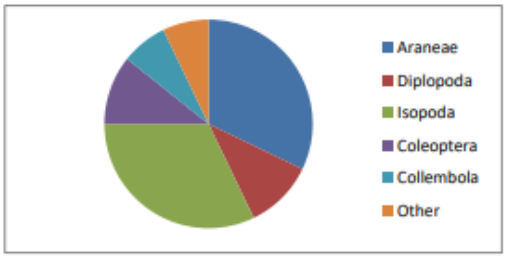
Cremers Meadow

Araneae	50
Diplopoda	5
Isopoda	13
Coleoptera	6
Collembola	10
Other	3



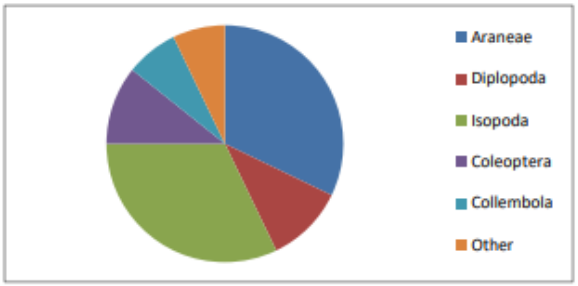
Church Fen

Araneae	9
Diplopoda	3
Isopoda	9
Coleoptera	3
Collembola	2
Other	2



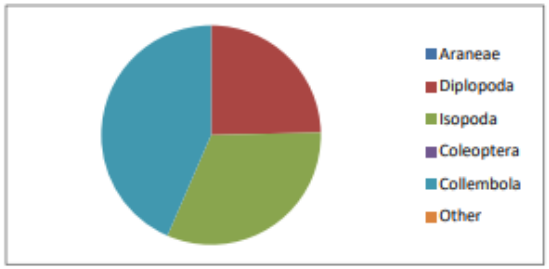
Low Farm Wood

Araneae	9
Diplopoda	3
Isopoda	9
Coleoptera	3
Collembola	2
Other	2



Countryside Park

Araneae	0
Diplopoda	17
Isopoda	22
Coleoptera	0
Collembola	30
Other	0



3.5. The results show generally rich invertebrate communities at each of the four sites, although the composition of the communities varies between sites. This is to be expected, given the different nature of the habitat at each site, and within sites. The total number of individuals collected at Church Fen was lower than at the other three sites, but this is explained by the smaller number of traps deployed at Church Fen , due to a lack of suitable locations to place traps, because of ground conditions and the presence of water. However, the number of taxa represented at Church Fen as a proportion of the total individuals collected is high (28%), in comparison with the other sites. Low Farm Wood showed the lowest diversity of invertebrate taxa. The number of different taxa represented at Countryside Park was similar to that recorded at Low Farm Wood.

3.6. Invertebrate communities at any particular location vary depending upon environmental conditions during the year and availability of food resources. Hence the findings of the present survey only represent a snap-shot of those communities during the spring of 2024. To have a more complete picture of the communities at each of the four sites, additional surveys at other times of the year will be required.

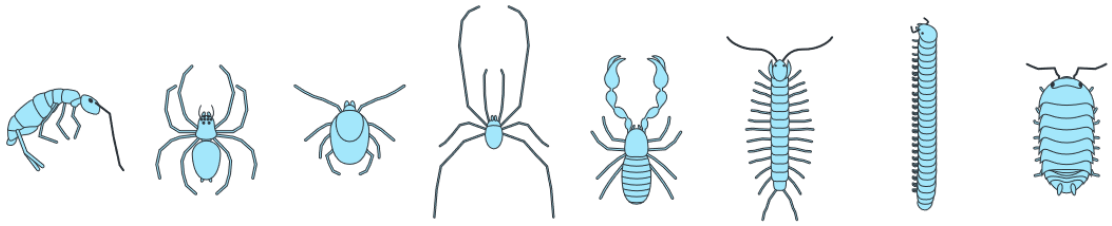
REFERENCES

1. Brundall Biodiversity Working Group. Report by BWG on Biodiversity at Church Fen, Cremers Meadow, Low Farm Wood and Countryside Park, December 2023.

APPENDIX A: PRINCIPAL TERRESTRIAL INVERTEBRATE TAXONOMIC GROUPS

Invertebrates are animals without backbones. They have been classified into a number of different groups, depending upon their structure and other attributes. The main groups of terrestrial invertebrates are summarised in the following figures **(***Source: Natural History Museum Identification Guide to UK Invertebrates*)

Identification diagrams – Non-insect Arthropod Orders



Collembola
Springtails

Araneae
Spiders

Acari
Mites and ticks

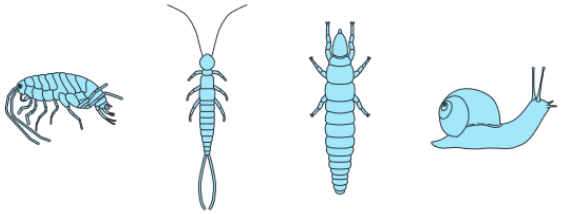
Opiliones
Harvestmen

Arachnida
Pseudoscorpion

Chilopoda
Centipedes

Diplopoda
Millipedes

Isopoda
Woodlice



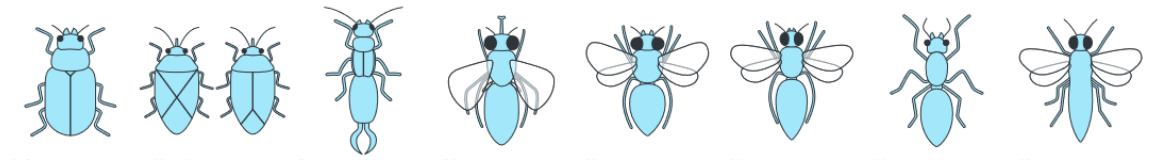
Amphipoda
Landhopper

Diplura
Two-pronged bristletails

Protura
Proturans

Gastropoda
Snails and slugs

Identification diagrams – Insect Orders



Coleoptera
Beetles

Hemiptera
True bugs

Dermaptera
Earwigs

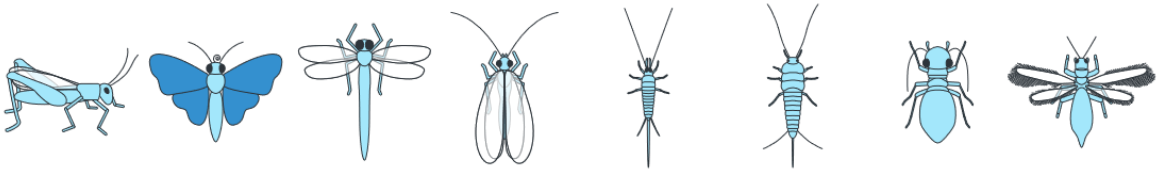
Diptera
True flies

Hymenoptera
Bees

Hymenoptera
Wasps

Hymenoptera
Ants

Hymenoptera
Sawflies



Orthoptera
Grasshoppers and crickets

Lepidoptera
Butterflies and moths

Odonata
Dragonflies and damselflies

Neuroptera
Lacewings

Archaeognatha
Bristletails

Thysanura
Silverfish

Psocoptera
Barklice and booklice

Thysanoptera
Thrips

Mecoptera
Scorpionflies

Raphidioptera
Snakeflies