

# An invertebrate survey of Scragh Bog, Co Westmeath



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Department of Arts, Heritage,  
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## An invertebrate survey of Scragh Bog, Co Westmeath

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## Executive Summary

The fauna of Scragh Bog reflects the diverse transitions from groundwater-fed areas of fen to acidic raised mire for which the site was designated as a Special Area of Conservation (SAC).

Lists of invertebrates with comments on notable species in this report, paint a picture of an exceptionally diverse natural landscape supporting a nationally significant fauna. Overall, 480 species were recorded, including 165 beetles, 109 moths and 98 spider species. When compared to earlier surveys and the available lists, the results of this survey have shown that most elements of the fen and wetland fauna are still present. Some additional notable species were found which adds to the information on the site. The conclusion from this study is that, based on the invertebrate fauna, the site remains in favourable conservation status. All the scarce or red-listed mire beetles found in earlier surveys (*Hydroporus glabriusculus*, *Hydroporus scalesianus*, *Laccornis oblongus*, *Stenus glabellus*) were re-found. An important transition fen species, the ground beetle, *Pterostichus aterrimus*, now extinct in Britain and declining in Europe, was added to the site list. In addition, 33 specimens of the rare aquatic weevil *Bagous lutosus* were taken in pitfalls and a single specimen of *Acalyptus carpini*, for which this is the second Irish record, by sweeping fen vegetation. Overall, the terrestrial beetle fauna of the Bog was found to be somewhat truncated i.e. a small number of fen species were widespread (e.g. *Staphylinus erythropterus* and *Paederus riparius*) but the majority were thinly scattered and often difficult to detect.

The other main group of terrestrial predators, the spiders, differed in having a more even distribution and greater biomass. The spider fauna of Scragh Bog is also intact. All the species of an earlier survey were re-found except *Porhomma oblitum* with the addition of several rare linyphiid spiders including *Barympha gowerense* and *Satilatlas britteni*. *Carorita limnaea* was found to be relatively widespread on the Bog and single adults of *Sitticus caricis* and *Dolomedes fimbriatus* were also captured.

A wide range of other invertebrates were recorded. These include the tabanid fly *Hybomitra bimaculata* which is an addition to the Irish list. The bug *Hallodapus rufescens* was found in the fen and is only the second modern record of this species in Ireland.

## Acknowledgements

The contract was set up by Dr Brian Nelson, Invertebrate Ecologist, NPWS, and the operation of the contract was assisted by Conservation Ranger, Triona Finnen.

Thanks are due for assistance with the identification of critical species of weevils by Prof Mike Morris and spiders by Peter Harvey. Background information on Irish spiders was kindly supplied by Myles Nolan.



## 1 Introduction

### 1.1 Transition mires

Undisturbed transition mires are of increasingly rare occurrence in Europe. The term refers to vegetation that in floristic composition and general ecology reflects a transition between acid bog and alkaline fen, in which surface conditions range from acidic to slightly base-rich i.e. the point of transition from groundwater-fed alkaline fen to ombrotrophic (rain-fed) bog. Scragh Bog is a particularly good example of a wet, actively growing transition fen where disturbance is minimal.

Such habitats have a characteristic fauna as well as flora. However, most invertebrates associated with these sites may also occur in a range of fen and mire types. The exact conditions which predispose invertebrates such as the ground beetle *Pterostichus aterrimus* to occur in transition mires are unknown as are their feeding habits and, for the most part, their life histories.

### 1.2 Scragh Bog ownership and designation

The greater part of the site was purchased by the Irish Peatland Conservation Council in 1992 with funds generously provided by the Dutch Foundation for the Conservation of Irish Bogs. It was then handed over to the State for management as a Nature Reserve.

The site has since been designated a Special Area of Conservation (SAC). SACs are strictly protected sites designated under the EC Habitats Directive. Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the 189 habitat types and 788 species identified in Annexes I and II of the Directive. The listed habitat types and species are those considered to be most in need of conservation at a European level (excluding birds).

Of the Annex I habitat types and Annex II species, the following occur at Scragh Bog and are listed as a Qualifying Interest for the SAC:

- Transition Mires
- Alkaline Fens
- Slender Green Feather Moss (*Drepanocladus vernicosus*)

Note that the Marsh Fritillary (*Euphydryas aurinia*) is no longer a Qualifying Interest for this SAC. A re-evaluation of the habitat on the site concluded that it is not of large enough extent or of sufficient quality to maintain a large or permanent population.

### 1.3 Scragh Bog habitats

The site is located about 6 km north-west of Mullingar and occupies a narrow valley running south-east to north-west parallel to the shore of nearby Lough Owel. The site occupies 22.8 ha and varies from planted conifer at the southern end through acid scrub dominated by willows and Downy Birch to transition mire dominated by Black Bog Rush and Long-stalked Yellow Sedge with areas of embryonic raised bog in the middle sections and back again to transition mire at the north end (Figure 1).

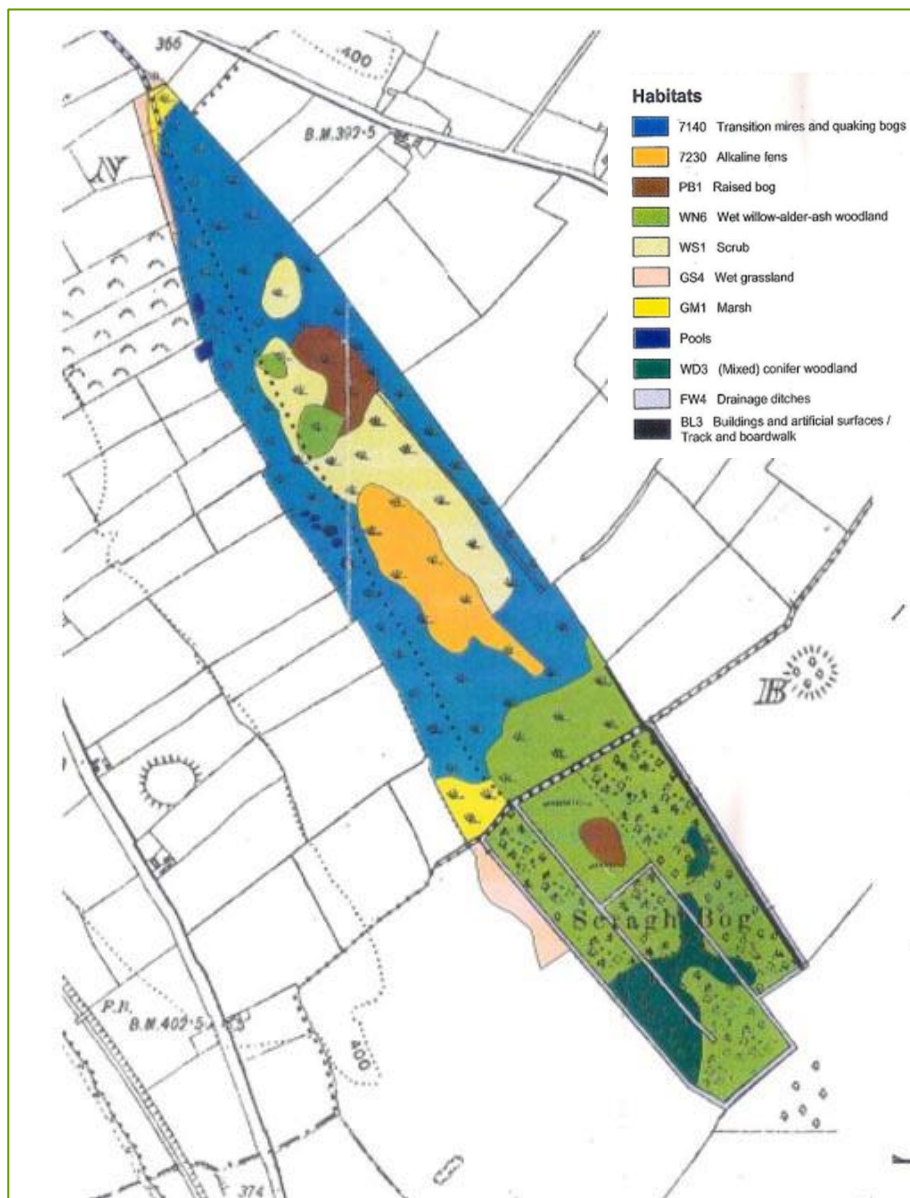


Figure 1: Indicative habitat map of Scragh Bog, Co Westmeath. Source NPWS SAC file, dated October 2005.

### 1.4 Previous knowledge of the invertebrates of Irish fens

The invertebrates of Irish fens are still poorly known as there have been few comprehensive studies. Species that inhabit Irish fens are listed as threatened amongst the water beetles (Foster *et al.* 2009),

molluscs (Byrne *et al.* 2009) and dragonflies (Nelson *et al.* 2010). The insects and spiders of fens have been most studied in Northern Ireland (Nelson and Anderson 1999; Nelson 2005) with some similar work in Co Monaghan which focused on dragonflies and water beetles (Woodrow and Nelson, 2009).

## 1.5 The 2015 invertebrate survey

Roy Anderson and Adam Mantell were contracted to carry out a survey of invertebrates with particular emphasis on fauna thought to be characteristic of transition mires.

Specific aims were:

- conduct an invertebrate survey at a scale appropriate to the site reflecting the habitats listed for the site
- using appropriate methodology search for the listed species as follows:
- produce a final report detailing the findings
- assess the effects of current management on the invertebrate assemblages
- suggest a monitoring protocol of the target groups and species to assess changes in the ecological status of the reserve

## 2 Methodology

### 2.1 Taxonomic groups surveyed

The groups surveyed reflect the interests and skills of the surveyors in this survey. Where invertebrates were collected beyond the skills of the surveyors other workers were consulted e.g. some weevils (Curculionidae) were sent to Prof Mike Morris for comment and/or identification and a few of the more difficult spiders were confirmed by Peter Harvey. The rest have been determined by one of the authors. Coverage was therefore biased towards ground-living and freshwater groups and the Diptera and Hymenoptera in particular were only partly covered. The choice of groups inevitably has to be balance between expertise available and survey time, the influence of weather and the interpretive value of the group.

### 2.2 Timing of visits and weather

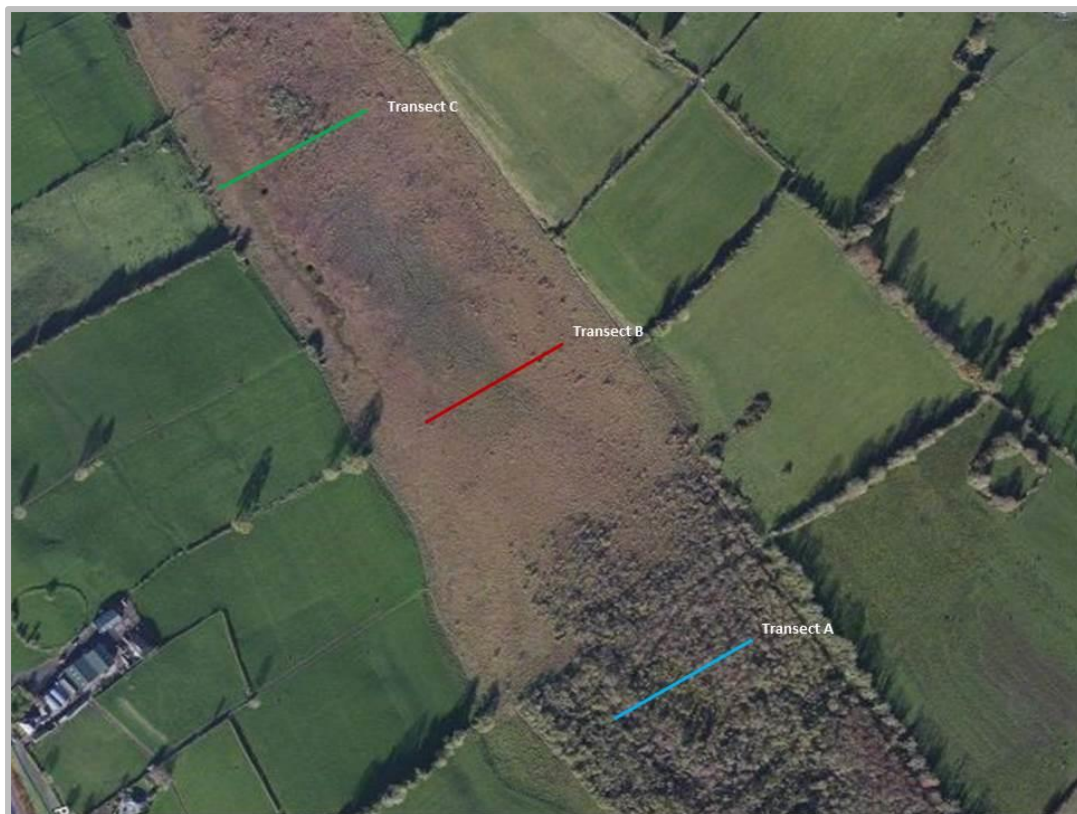
This was decided on the basis of:

- *Prevailing weather*

- *The needs of specific capture technology: pitfall-trapping, light trapping etc.*
- *The known seasonality within different groups*

With two field operatives (hereafter referred to as RA, Roy Anderson and AM, Adam Mantell) plus assistance from NPWS staff (BN, Brian Nelson) there was considered to be sufficient flexibility within the programme to deal with most eventualities.

RA was to take responsibility for collection and/or trapping of all invertebrates except moths (Lepidoptera) and spiders (Araneae). The main focus would be a) field collecting in suitable weather, b) the setting up and collection from pitfall traps. Pitfall traps were assembled on 12 May 2015 along three transects (Fig. 2).



**Figure 2.** Pitfall transects A-C operated at Scragh Bog in 2015. A series of ten traps per transect were installed in roughly a north-east to south-west trajectory. Transect A was intercepted by very wet conditions at its south-west end and two traps had to be installed in a line diverging north-west from the main group to avoid this obstacle.

AM was primarily concerned with moths and spiders. Moths would be collected by light trapping principally in the woodland to the south of the main site or in woodland edge habitat, supplemented by field collecting. Araneae would be collected primarily by field collecting supplemented by static collecting employing bark wrapping of suitable trees within the bog woodland.

BN added expertise in water beetles (Coleoptera), dragonflies and damselflies (Odonata), and true bugs (Heteroptera). These groups were investigated using pond netting, sweeping and beating with field-collected material in critical species retained for later identification.

2015 was an unusual year in Ireland notable for the cool, wet and often windy conditions that prevailed (Met Eireann, 2016). The spring and summer were particularly cool especially with late frosts into June and cool daytime conditions especially in July. This will undoubtedly have reduced the populations of many invertebrates. The spring of 2015 was late and cold with persistent northerly winds. Despite this, work on pitfalling began on 12 May. Other activities were, however, delayed because of the weather and plant growth and invertebrate activity were clearly restricted until well into June. After this slow start sampling progressed normally for the rest of spring and summer. Table 1 lists the survey visits by each participant and summarises the weather conditions.

**Table 1.** Schedule of entomological survey visits to Scragh Bog in 2015 by each participant with brief summary of the weather conditions and recording activity

RA	AM	BN	Recorded weather	Activity
12 May	12 May	12 May	Cold, very wet afternoon	Pitfall setup; treading vegetation; pond netting
	16 May		Cool, wet	Moss sieving, sweeping
		4 June	Cool, sunny	Pond netting, sweeping in fen, wooded fen and open pools; field recording for Odonata
10 June			Cool, dry	First pitfall collection, sweeping in fen
16 June			Settled, dry	Treading vegetation, in fen, pools visited
	17 June		Settled, dry	Bark wrapping, sieving sweeping in fen
8 July			Settled, warm, dry	Second pitfall collection, treading/sweeping in fen
	18 July		Settled, showery	MV light trap & actinic light trap
13 Aug			Dull, warm, settled	Sweeping, treading the full length of the bog

## 3 Results

In this section the findings are reported and discussed by taxonomic group. Species and groups of special interest will be discussed individually or collectively in more detail.

Table 2 presents a summary of the number of species recorded in the 2015 survey by taxonomic group. The detailed species data is displayed in Appendix 1 and Appendix 2. Appendix 1 lists species of Coleoptera that have been recorded at Scragh by previous recorders. Appendix 2 gives full details of all the records gathered in this survey. This data has been submitted to the National Biodiversity Data Centre, Waterford and is also held by NPWS.

**Table 2.** Taxonomic groups surveyed in 2015, species totals and main texts consulted

<b>Taxonomic Group</b>	<b>Species total</b>	<b>Text references</b>
Hirudinea (leeches)	3	Elliott & Mann (1979)
Mollusca (snails & slugs)	22	Cameron (2008); Rowson et al. (2014); Glöer (2002)
Chilopoda (centipedes)	1	Barber (2008)
Diplopoda (millipedes)	5	Gordon Blower (1985)
Isopoda (woodlice)	4	Hopkin (1991)
Araneae (spiders)	98	Roberts (1985)
Opiliones (harvestmen)	2	Sankey & Savory (1974)
Odonata (dragonflies)	6	BDS (2015)
Dermaptera (earwigs)	1	-
Heteroptera (true bugs)	28	Southwood & Leston (1959); Savage (1989)
Auchenorrhyncha (leaf hoppers)	1	Lequesne (1965)
Lepidoptera (butterflies)	5	Manley (2008)
Lepidoptera (moths)	109	Waring & Townsend (2009); Sterling & Parsons (2012)
Diptera (true flies)	22	Stubbs & Falk (1983); Stubbs & Drake (2001)
Symphyta (sawflies)	2	Wright (1990)
Aculeata (ants, bees & wasps)	6	Skinner & Allen (1996); Edwards & Jenner (2005)
Coleoptera (beetles)	165	Die Käfer Mitteleuropas (ser.) (1964-1989); RES Handbooks (ser.) (various)



### 3.1 Comparison of current results with previous studies

#### 3.1.1 Spiders (*Araneae*)

The spider fauna of Scragh Bog was investigated in the 1990s and a list of spiders from the site was provided by Van Helsdingen (1998). His list is here compared with that of the present survey (Table 3) and comment made thereon.

The difference in species recorded between the two surveys is almost certainly down to methodology. The present survey covered peripheral habitats on the bog so a much greater range of micro habitats was sampled, especially woodland, which Van Helsdingen did not sample at all. Pitfall trapping and bark wrappings were also used whereas Van Helsdingen relied exclusively on sweeping, sifting moss and litter and hand collecting. It is therefore to be expected that in the present survey many more species were recorded. The same is actually true for the next comparison, involving beetles (below).

Pleasingly all of the rare species from the 1998 list were re-found except one, *Porrhomma oblitum*, which was a first Irish record. The *Porhomma* genus contains a number of species that are notoriously hard to separate even for very experienced arachnologists using reference specimens, and not surprisingly Van Helsdingen explained his reasoning in some detail in the paper. It is worth noting however that during Van Helsdingen's survey only a single specimen was found so it was clearly very thinly distributed at the time of his survey. Unfortunately therefore, the current status of this species is hard to ascertain. It could easily still be present at a very low population levels or it could have been lost from the site. It may also have been a failed attempt to colonise the site from another meta-population as linyphiids are capable of travelling long distances by 'ballooning'.

**Table 3** Comparison of the lists of spiders from Scragh Bog identified in the present survey (2015) and given in Van Helsdingen (1998) (continued).

Spider species	2015 survey	Van Helsdingen (1998)
<i>Agroeca proxima</i>	+	
<i>Agyneta cauta</i>	+	
<i>Agyneta subtilis</i>	+	
<i>Alopecosa pulverulenta</i>	+	
<i>Antistea elegans</i>	+	+

**Table 3** Comparison of the lists of spiders from Scragh Bog identified in the present survey (2015) and given in Van Helsdingen (1998) (continued).

Spider species	2015 survey	Van Helsdingen (1998)
<i>Aphileta misera</i>	+	+
<i>Araeoncus crassiceps</i>	+	+
<i>Araniella cucurbitina</i>	+	+
<i>Argyroneta aquatica</i>	+	
<i>Barympha gowerense</i>	+	
<i>Baryphyma trifrons</i>		+
<i>Bathyphantes approximatus</i>	+	+
<i>Bathyphantes gracilis</i>	+	+
<i>Bathyphantes parvulus</i>		+
<i>Bathyphantes setiger</i>	+	
<i>Carorita limnaea</i>	+	+
<i>Centromerus arcanus</i>	+	
<i>Centromerus dilutus</i>	+	
<i>Ceratinella brevipipes</i>	+	
<i>Ceratinella scabrosa</i>	+	
<i>Clubiona comta</i>	+	
<i>Clubiona diversa</i>	+	
<i>Clubiona phragmitis</i>	+	
<i>Clubiona reclusa</i>	+	+
<i>Clubiona stagnatilis</i>	+	+
<i>Dictyna arundinacea</i>	+	+
<i>Dicymbium nigrum</i>	+	
<i>Diplocephalus permixtus</i>		+
<i>Diplocephalus picinus</i>	+	
<i>Dismodicus bifrons</i>	+	



**Table 3** Comparison of the lists of spiders from Scragh Bog identified in the present survey (2015) and given in Van Helsdingen (1998) (continued).

Spider species	2015 survey	Van Helsdingen (1998)
<i>Dolomedes fimbriatus</i>	+	+
<i>Drassodes cupreus</i>	+	
<i>Drepanotylus uncatulus</i>	+	+
<i>Enoplognatha ovata</i>	+	+
<i>Erigone atra</i>	+	
<i>Erigone dentipalpis</i>		+
<i>Erigonella ignobilis</i>		+
<i>Ero cambridgei</i>	+	+
<i>Gnathonarium dentatum</i>	+	+
<i>Gonatium rubens</i>	+	
<i>Gongylidiellum vivum</i>	+	
<i>Haplodrassus signifer</i>	+	
<i>Hypomma bituberculatum</i>	+	+
<i>Hypomma fulvum</i>	+	
<i>Kaestneria pullata</i>	+	+
<i>Larinioides cornutus</i>	+	+
<i>Lepthyphantes leprosus</i>	+	
<i>Leptorhoptrum robustum</i>	+	
<i>Lophomma punctatum</i>	+	+
<i>Maso sundevalli</i>	+	+
<i>Metellina mendei</i>	+	+
<i>Metellina merianae</i>	+	
<i>Metopobactrus prominulus</i>	+	
<i>Micrargus herbigradus</i>		+
<i>Microlinyphia impigra</i>		+

**Table 3** Comparison of the lists of spiders from Scragh Bog identified in the present survey (2015) and given in Van Helsdingen (1998) (continued).

Spider species	2015 survey	Van Helsdingen (1998)
<i>Microlinyphia pusilla</i>	+	
<i>Minyriolus pusillus</i>	+	
<i>Misumena vatia</i>	+	+
<i>Monocephalus fuscipes</i>	+	
<i>Neon reticulatus</i>	+	+
<i>Neriena clathrata</i>		+
<i>Nerienne montana</i>		+
<i>Nerienne peltata</i>	+	+
<i>Nuctenea umbratica</i>	+	
<i>Oedothorax gibbosus</i>	+	+
<i>Oethethorax retusus</i>		+
<i>Oryphantes angulatus</i>	+	
<i>Ozyptila trux</i>	+	+
<i>Pachygnatha clercki</i>	+	+
<i>Paidiscura pallens</i>	+	
<i>Palliduphantes ericaeus</i>	+	+
<i>Palliduphantes pallidus</i>	+	
<i>Pardosa amentata</i>	+	
<i>Pardosa pullata</i>	+	+
<i>Philodromus aureolus</i>		+
<i>Pirata hygrophilus</i>	+	+
<i>Pirata piraticus</i>	+	+
<i>Pirata piscatorius</i>	+	+
<i>Pirata tenuitarsis</i>	+	
<i>Pocadicnemis juncea</i>	+	

**Table 3** Comparison of the lists of spiders from Scragh Bog identified in the present survey (2015) and given in Van Helsdingen (1998) (continued).

Spider species	2015 survey	Van Helsdingen (1998)
<i>Pocadicnemis pumila</i>	+	+
<i>Porhomma oblitum</i>		+
<i>Porrhomma pygmaeum</i>	+	
<i>Robertus lividus</i>	+	
<i>Salticus cingulatus</i>	+	
<i>Satlatlas britteni</i>	+	
<i>Silometopus elegans</i>	+	+
<i>Silometopus reussi</i>	+	
<i>Sitticus caricis</i>	+	+
<i>Tallusia experta</i>	+	
<i>Tapinocyba pallens</i>	+	
<i>Taranucnus setosus</i>	+	+
<i>Tenuiphantes alacris</i>	+	
<i>Tenuiphantes flavipes</i>	+	
<i>Tenuiphantes mengei</i>	+	
<i>Tenuiphantes tenuis</i>	+	
<i>Tetragnatha extensa</i>	+	+
<i>Tetragnatha montana</i>		+
<i>Tetragnatha obtusa</i>	+	
<i>Theridion instabile</i>		+
<i>Theridion sisyphium</i>	+	+
<i>Tibellus maritimus</i>		+
<i>Trichopterna thorelli</i>	+	
<i>Trochosa ruricola</i>	+	
<i>Trochosa spinipalpis</i>	+	

**Table 3** Comparison of the lists of spiders from Scragh Bog identified in the present survey (2015) and given in Van Helsdingen (1998) (continued).

Spider species	2015 survey	Van Helsdingen (1998)
<i>Trochosa terricola</i>	+	
<i>Walckenaeria acuminata</i>	+	
<i>Walckenaeria atrotibialis</i>	+	
<i>Walckenaeria nudipalpis</i>	+	
<i>Walckenaeria vigilax</i>	+	
<i>Xysticus cristatus</i>	+	
<i>Xysticus ulmi</i>	+	+
<i>Zora spinimana</i>	+	
<b>TOTALS</b>	96	53
<b>GRAND TOTAL (BOTH SURVEYS)</b>	113	

A number of new or rare linyphiid spiders are added from the present survey which will be dealt with individually below. There are a number of other species recorded from this site which, if spider distribution in Ireland were better documented, would likely be of some significance in their own right. It is likely that a number of species from this site deserve red listing in Ireland.

Nelson (2005) identified a number of characteristic fen species found during surveys of 30 fens in Counties Armagh, Down and Tyrone. Two spiders, *Pirata piscatorius* and *Trochosa spinipalpis* feature on that multi-taxa list. Both species were found at Scragh Bog during the current survey, albeit with just a single example of *Trochosa spinipalpis*. While *Trochosa spinipalpis* is evidently present at Scragh Bog, it is present at much lower levels than at many of the fens sampled in Nelson (2005).

Other noteworthy points in relation to Nelson (2005) are:

- *Pirata hygrophilus* was the second most common lycosid spider at Scragh Bog, but was not recorded at any of 30 sites in Northern Ireland,
- The number of species recorded at Scragh Bog in the present survey exceeds the total number of species found in all the sites surveyed in the Northern Ireland survey.

There are probably several reasons for these differences. Firstly, sampling techniques differed, with a greater emphasis on hand searching at Scragh Bog. The Northern Ireland survey was exclusively a

pitfall survey. Secondly, Scragh Bog offers a very wide range of hydrological conditions, different vegetation types, gradients from basic conditions to acid that may provide opportunities for many more micro-habitats than at most other fen sites. Less easily explainable however is the absence of two comparatively common species, *Pachygnatha degeeri* and *Larinioides cornutus* which are associated with damp habitats. I can offer no convincing explanation for their absence from this site.

Overall it adds up to a picture of an undisturbed, long established species-diverse site of very high quality for spiders.

#### ***Baryphyma gowerense* (Lockett)**

*Baryphyma gowerense* is a Holarctic species (ASE, 2015) with a restricted distribution in Europe centred on the British Isles and Scandinavia. It is an extremely rare spider in a British context, found in just two hectads since 1992. In Ireland there are previous records from 8 Counties, with this record for Westmeath adding a ninth. The species shows a preference for two distinct ecological niches, saltmarsh and fen. There is no evidence to suggest whether there are two distinct ecotypes or whether these two habitat types are interchangeable, the spider may simply have a requirement for high humidity.

#### ***Carorita limnaea* (Crosby & Bishop)**

*Carorita limnaea* is a Holarctic species (ASE, 2015) with a widespread distribution in northern Europe, but it is not common anywhere. It was added to the Irish list from Scragh Bog (Van Helsdingen 1998) and has since been found at two sites in Co Armagh. It is equally rare in Britain where three sites are known. It is on the Northern Ireland Priority species list. It is found in mosses especially on Sphagnum bog, sometimes in association with *Erica tetralix*, *Eriophorum* and *Vaccinium oxycoccus*.

When Red Lists for spiders are finally prepared in Ireland this species will be a very strong candidate. A very rare species in Ireland, the UK and in the wider European context.

#### ***Centromerus arcanus* (O.P. Cambridge)**

A Palaearctic species with a wide distribution across Europe (ASE, 2015). It is a species which appears to have two ecological niches, in mountainous areas and secondly in acidic bogs with trees at lower altitudes amongst moss, leaf litter and pine needles. The reason this species is of significance is that while it has a rather local westerly and northerly distribution in Britain, it has only two previous county records from Ireland. It may therefore merit Red Listing. The reason for reduced abundance of this species between Ireland and the rest of Europe is not clear.

#### ***Pirata piscatorius* (Clerk)**

A Palearctic species that is widespread in Europe but thinly distributed, and a specialist of sphagnum bogs with standing water. Previously recorded from nine Irish Counties, but very local in its

distribution and confined to high quality sphagnum bog habitats. Some evidence of a long term decline in Britain, and although data is lacking, loss of peatland habitats, will undoubtedly have affected Irish populations.

### ***Hypomma fulvum* (Bösenberg)**

Another Palearctic species that is rare across its known range in Europe (ASE, 2015). It is a specialist fen species that is rarely recorded outside that habitat. While it has been recorded from 11 Counties in Ireland, it is nonetheless a significant find due to its wider rarity. In Britain for example it is almost entirely confined to fenland reed beds in the east of England.

### ***Satilatlas britteni* (Jackson)**

Another Palearctic species that is rare across its known European range (ASE, 2015; BSR, 2015). In Britain most records of this species are from the extreme west, although that appears not to be such a strong association in Ireland. Like *Baryphyma gowerense* mentioned above, this spider occurs in saltmarsh and *Sphagnum* bogs. A requirement for high humidity may play a role in determining its distribution. Previously recorded from six vice counties in Ireland, with this record in Westmeath making a seventh.

### ***Sitticus caricis* (Westring)**

Records of this species exist for just two Irish Counties. It has a very local distribution across its range in northern and central Europe. Typically found in among *Molinia* and *Sphagnum* in lowland bogs, and among low vegetation in marshes and fens. *Sitticus caricis* is a Biodiversity Action Plan species in Britain, and given its known distribution in Ireland is a candidate for Red Listing.

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### **3.1.2 Beetles (Coleoptera)**

A number of visitors (Bilton, 1988; Lott and Foster, 1990; Owen, 1997) have produced faunal lists for Scragh Bog, mainly of beetles. These are combined here and compared with results of the 2015 survey. There are some important differences between the two lists. Only one important species has been recorded by earlier workers but not in the current survey. This is *Philonthus furcifer* which, though widespread and not uncommon in Irish wetlands, does not occur in Britain. One important fen species, *Pterostichus aterrimus*, not seen by earlier visitors was recorded in pitfall traps on the western side of the bog in an area unlikely to have been reached by the casual visitor. It is a substantial addition to the list of specialist transition mire species recorded for the Bog.

During the survey a special attempt was made to find the characteristically very small *H. scalesianus* but the main small dytiscid encountered was *Graptodytes granularis*. *Hydroporus scalesianus* was seen by BN on one occasion whereas *G. granularis* appeared to be widespread on the Bog. The reason for this is unclear. Scragh Bog is unusual in that movement around the Bog by surveyors is greatly impeded by

the immense moss tussocks that have built up over time, with forward movement extremely difficult in some areas (e.g. the raised bog and wet scrub near the centre of the Bog shown in Fig. 1). Direct evidence from at least one earlier visitor (Prof Owen) suggests that visitors may have tended to sample near the easiest point of entry at the south-eastern end (around the walkway, N425588) and not venture far on to the bog surface. During the present survey an attempt was made to sample the whole bog as evenly as possible, and no particular attention was paid to areas around the main access point where some of the more interesting species were recorded.

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### 3.2.3 *Hemiptera, Heteroptera* (True Bugs)

#### ***Hallodapus rufescens* (Burmeister)**

This rare ant-mimic bug is associated with ants and heath vegetation and is very local in Britain ranging from the New Forest in Hampshire to the north-east Highlands of Scotland. In Ireland there are only two prior records, for Clonbrock, Co Galway in 1896 (Halbert, 1898) and Ower, West Galway in August 2006 (Nelson *et al.*, 2015). Its occurrence at Scragh Bog is interesting, in an undistinguished area of transition mire, lacking heather (N42215950). Heathers seen on the bog were *Calluna* which is concentrated on the raised part of the Bog (Fig. 1), and a small scattering of cross-leaved heath *Erica tetralix*. Bell heather *Erica cinerea* was not encountered. More research would be needed to ascertain exactly where it is established and breeding.

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### 3.2.4 *Hemiptera, Auchenorrhyncha* (Plant hoppers and relatives)

#### ***Cixius similis* Kirschbaum**

A local species in Ireland but with very little accessible information on its distribution. Alexander (2011) refers to its capture during a survey of St John's Wood, Roscommon. It is certainly very scarce in Northern Ireland but may be less so in central Ireland.

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### 3.2.5. *Lepidoptera* (butterflies and moths)

A total of 5 butterflies and 107 moths were recorded during the survey. This includes a number of notable records which are discussed briefly below. The sources for this information are mainly derived from the online Atlases and status categories published through the Moths Ireland web site (MI, 2015), UK Moths (UKM, 2015) and field guides by Sterling *et al.* (2012) and Waring & Townsend (2009).

***Ancylis geminana* (Donovan) [Tortricidae]**

*Ancylis geminana* has a widespread but very local distribution in Ireland, a pattern which is matched in Britain. It feeds on various *Salix* sp. This is perhaps the second record from Co Westmeath.

**Dark Tussock *Dicallomera fascelina* (Linnaeus)**

This species is primarily a moorland and coastal species, inhabiting heathland, sand-hills and shingle beaches. In Ireland it is primarily found on acidic peat habitats – bogs and wet heaths – and feeds on heather. It has a restricted distribution, mainly in north Leinster, with an isolated northern occurrence centred on Peatlands Park, in Co Armagh, Northern Ireland. This is Near Threatened on the Irish Red List (Allen *et al.*, 2016).

***Epermenia falciformis* Haworth**

Moths Ireland shows just a handful of Irish records and none from Westmeath. However, AM is aware of a small number of as yet unpublished records of this species. Likely to be a recent adventive addition to the Irish list that is expanding its range. It is well distributed in the southern half of England. The larvae feed on wild angelica (*Angelica sylvestris*) or ground-elder (*Aegopodium podagraria*).

**Sallow Kitten *Furcula furcula* (Clerck)**

Distributed throughout Ireland in a range of habitats but not common. The caterpillars feed on sallow (*Salix*), aspen (*Populus tremula*) and other poplars (*Populus spp.*). Noted on Moths Ireland as scarce in Ireland but assessed as Least Concern on the Irish Red List (Allen *et al.*, 2016). There has been just one previous record from Westmeath.

***Gypsonoma dealbana* Frölich**

A species which is widely distributed and reasonably common in Britain, but has few records from Ireland, mostly along the east coast. It is polyphagous, and mainly coastal in distribution. There are no records from Co Westmeath shown on the Moths Ireland maps.

**Beautiful Snout *Hypena crassalis* (Fabricius)**

This species is thinly distributed across Ireland in suitable habitat (open woodland, moor and heath including wet habitats). Described as scarce but may be reasonably abundant in suitable habitat. It feeds primarily on Bilberry (*Vaccinium myrtillus*). Assessed as Least Concern on the Irish Red List (Allen *et al.*, 2016)

**Small Rivulet *Perizoma alchemillata* (Linnaeus)**



Scarce in Ireland, it occurs in woodland and open habitats. The larvae feed mainly on the flowers of hemp nettle (*Galeopsis* spp.). This species has notably few records from the Irish Midlands. Assessed as Least Concern on the Irish Red List (Allen *et al.*, 2016)

***Piniphila bifasciana* (Haworth)**

A very scarce species in Ireland with a few records from east coastal counties sites. This record is new to Westmeath and the most westerly Irish record reported. It is worth noting that all records are post-2000 so there is a strong possibility that this species is recently adventive in Ireland and is expanding its range. The foodplants are Scots and maritime pines.

**Small Seraphim *Pterapherapteryx sexalata* (Retzius)**

The preferred habitats of this species are a variety of damp places including fens and marshes. This species is recorded as scarce in Ireland (but was assessed as Least Concern on the Irish Red List (Allen *et al.*, 2016)), but has a pronounced southerly distribution in Britain where it may be more common. Sallow (*Salix*) is the larval foodplant.

**Scallop Shell *Hydria undulata* (Linnaeus) (formerly *Rheumaptera undulata*)**

A highly distinctive moth, unlikely to be confused with any other British or Irish species. Its preferred habitat is damp open woodland with an undergrowth of bilberry. Larvae have been reported feeding on bilberry and *Salix* sp. The species is categorized as scarce in Ireland though it is widely distributed.

**Lepidoptera on the UK/Northern Irish Priority species list**

In addition to the notable species above, the following are all on the UK/Northern Irish Priority species list by reason of rarity, significant decline, or a significant proportion of international population:

- Garden Tiger *Arctia caja* (Linnaeus)
- Oblique Carpet *Orthonama vittata* (Borkhausen)
- Small Square-spot *Diarsia rubi* (Vieweg)
- Knot Grass *Acronicta rumicis* (Linnaeus)
- Small Phoenix *Ecliptopera silaceata* (Denis & Schiffermüller)
- Buff Ermine *Spilosoma lutea* (Hufnagel)
- White Ermine *Spilosoma lubricipeda* (Linnaeus)
- Dot Moth *Melanchra persicariae* (Linnaeus)

***Parhelophilus consimilis* (Malm)**

A very local hoverfly usually found near ponds in peaty mires favouring nutrient-poor sites (Ball & Morris, 2014). It is found at suitable habitat throughout Ireland especially in south Clare. A number of specimens apparently of this species were seen on the wing on two occasions (8 July, 13 August) around horsetail fen by the walkway, but were very elusive and difficult to catch. One specimen, a male, was eventually caught and identified as the present species. It formerly was considered Vulnerable in Britain but latest assessment was Nationally Scarce (Ball & Morris, 2014)



**Plate 1:** The wetland hoverfly *Parhelophilus consimilis* (Diptera: Syrphidae), Scragh Bog, Co Westmeath.

Photograph © Roy Anderson

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3.2.7 Diptera: Tabanidae (Horseflies)

***Hybomitra bimaculata* (Macquart) Plate 2**

This large horse fly is widespread and fairly common in southern Britain, becoming much less common in north-west England and the East Highlands of Scotland (Stubbs & Drake, 2001). There are no Irish records. While treading and sweeping very wet *Equisetum* swamp on the west side of the Bog (N42265912, 16 June) a large, freshly emerged tabanid was captured in a tangle of moss. This was keyed out using Stubbs & Drake (2001), to *Hybomitra bimaculata*. This is a first record for Ireland and because of the nature of the record and the site location suggests that this species could have been

overlooked in central Ireland. The voucher specimen for this record will be donated to the National Museum Collection.



**Plate 2:** The horsefly *Hybomitra bimaculata* (Diptera: Tabanidae), Scragh Bog, Co Westmeath. This is the first Irish record. Photograph © Roy Anderson

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### 3.2.8 Coleoptera (Beetles)

#### ***Acalyptus carpini* (Fabricius) [Curculionidae – a weevil]**

According to Alexander (2011) larvae of this weevil inhabit the female catkins of various willows *Salix* spp, and in Britain it is known from fens and bogs rather than woodlands. Its distribution there is scattered in the southern half of England and Wales, but most sites are in the East Anglian fens. One specimen was taken by treading fen vegetation and sweeping, in dense fen vegetation near the eastern fringe of the Bog at N42295920. This is the second Irish record, the first being reported by Alexander (2011) in a survey of St John's Wood, Co Roscommon. It is clearly rare but may be more widely spread in suitable wet woodland on mires in the midland counties. Would perhaps qualify for red listing and as a rare but characteristic indicator for partially wooded transition mires in Ireland.

#### ***Altica longicollis* (Allard) [Chrysomelidae – a leaf beetle]**

Older works use the names *Altica britteni* and *Altica ericeti* but Cox (2007) synonymised these with *A. longicollis* (Allard, 1860). This species is very rare in Ireland with about six records. Localities are:

Gortdirragh, North Kerry (RA, 1996); Big Dog, Lough Navar, Fermanagh (RA, 1992); Reilly Wood, Fermanagh (K.N.A. Alexander, 1992); Crom Castle (K.N.A. Alexander, 1992); Lough Oughter, Cavan (Johnson, 1893). None of these, except Johnson (1893) has previously been published. AM found a total of 8 specimens at sites scattered across the southern half of the open part of the Bog. The species is classified as Nb in Britain and associated with wet raised mire (Hyman in Parsons, 1992). It would certainly qualify for red-listing in Ireland.

***Bagous collignensis* (Herbst) [Curculionidae – a weevil]**

Recorded by Prof. Owen from wet moss on the south-east corner of the Bog on 22 May 1993. Some controversy attaches to records of this species (Foster *et al.*, 2009). It is only known with certainty from a W.F. Johnson record for Armagh in 1895. All other records for this species where vouchers could be located are now allocated to *Bagous frit* (Herbst), including several recent records for the Armagh/Down fens (Nelson, 2005). While not entirely discounting the Owen record it should be treated with reserve. The food plant is *Myriophyllum* which was not encountered on the Bog whereas that of *Bagous frit* is bogbean which is abundant on the Bog. *Bagous collignensis* is pRDB3 in Britain but DD (Data Deficient) in Ireland, due to past confusion and the mis-determination of older records.

***Bagous lutosus* (Gyllenhal) [Curculionidae – a weevil] Plate 3**

A total of 33 specimens were recorded from the pitfalls and one by hand searching. The food plant is reputed to be *Potamogeton gramineus* (Foster *et al.*, 2009) but this plant is certainly not common on the Bog. The determinations were confirmed by Prof M.G. Morris but at present no explanation of the discrepancy between the species' common occurrence and scarcity of the supposed food plant is forthcoming. It is possible that the Owen record of *B. collignensis* refers to this species as *Bagous* weevils are notoriously difficult to identify. The present species is pRDB1 in Britain but dd (Data Deficient) in Ireland. There have been several recent reports of *Bagous lutosus* in the midland counties of Ireland (Foster *et al.*, 2009).

***Cyphon punctipennis* Sharp [Scirtidae – a marsh beetle]**

The first modern record of this species in Ireland was from Scragh Bog (McCormack, 2006). A single female was taken from sieving moss in tussocks at N423590. It is assessed as nationally scarce in Britain (Foster 2010) and Vulnerable on the water beetle red list for Ireland (Foster *et al.* 2009).

***Gymnetron beccabungae* (L.) [Curculionidae – a weevil]**

This weevil feeds on Brooklime *Veronica beccabungae*, and Marsh Speedwell *Veronica scutellata* both of which occur at Scragh Bog with Brooklime being abundant around the margins. The weevil is widely spread but uncommon in Ireland despite the abundance and wide distribution of its food plants. Its small size and difficulty in identification may, however, have contributed to a perception of rarity.





**Plate 3:** The wetland weevil *Bagous lutosus* (Coleoptera: Curculionidae), Scragh Bog, Co Westmeath.

Photograph © Roy Anderson

***Hydroporus scalesianus* Stephens [Dytiscidae – a diving beetle]**

This tiny flightless water beetle is probably less rare in Ireland than anywhere in the rest of Europe and has been found widely across Ireland from Co Down in the north-east, across midland counties to Limerick in the south-west (Foster *et al.* 2015). Foster *et al.* (2009) classified it as Near Threatened, a step up from its first stage assessment of Least Concern, this higher category being justified on its rarity internationally. Recorded at Scragh Bog by several recorders and in 2015 by BN by treading in the flooded moss carpets.

***Hydroporus glabriusculus* Aubé [Dytiscidae – a diving beetle]**

This small water beetle has been described (Foster *et al.*, 2015) as confined to undisturbed relict fen and bog systems in Britain and Ireland. It is rare throughout its range in western Europe. It appears to be relatively widespread in the eastern half of Scragh Bog. It was assessed as Endangered in the water beetle red list for Ireland (Foster *et al.* 2009).

***Laccornis oblongus* (Stephens) [Dytiscidae – a diving beetle]**

This species is a quintessential fens species found throughout the Armagh/Down interdrumlin fens (Nelson, 2005) and widely in the midland Irish counties (Foster *et al.*, 2015). It appears to be rare at Scragh Bog being recorded by BN on one occasion in 2015. Listed as NT (Near Threatened) on the water beetle red list for Ireland (Foster *et al.* 2009).

***Malachius bipustulatus* (L.) [Malachiidae– a malachite beetle]**

The malachite beetle has a reputation for rarity in Ireland. Despite its bright colours it has only been reported three times since 1901, five times if the present site records are included. Nevertheless, it may have been overlooked since a remarkable abundance occurred in Waterstown park by the Liffey west of Dublin during a Bioblitz in May 2011.

***Noterus crassicornis* (Müller) [Noteridae – a diving beetle]**

This is the smaller and rarer of the two *Noterus* in Ireland and like *Laccornis oblongus* and *Hydroporus scalesianus* is much commoner in Ireland than in Britain (Foster *et al.*, 2015). Although designated Nationally Scarce in Britain (Foster 2010) it is classified as of Least Concern in Ireland (Foster *et al.*, 2009). This has not previously recorded from the Bog, but two individuals were swept in or near deep pools on the western side of the Bog. This area is unlikely to have been visited by other recorders because of difficulty of access and the dangers associated with variable thickness in the floating vegetation carpet near the pools.

***Pterostichus aterrimus* (Herbst) [Carabidae– a ground beetle]**

This is an extremely hygrophilous species and confined to particular kinds of wet humus soils in eutrophic or mesotrophic fens. There are no records for raised or blanket (ombrotrophic) bogs, except where peat-cutting has brought about the regeneration of fen conditions. In the absence of human interference it appears able to exist only in the early successional stages of raised bog formation, before contact with mineral-rich ground water is lost i.e. in transition mires. It has not previously been recorded from Scragh Bog which is surprising considering its habitat preferences. Five specimens were caught in pitfall traps on transect B, 10 June – 8 July. Specific grid references are: N42515875 (1); N42495874 (1); N42485874 (2); N42475872 (1). In Britain this species is assessed as Critically Endangered (possibly extinct) on the latest Red List (Telfer 2016).

***Stenus glabellus* Thomson [Staphylinidae – a rove beetle]**

The first record of *Stenus glabellus* in Britain and Ireland was reported by Lott & Foster (1990) and was made in 1987 and 1989 at Scragh Bog. The site was visited subsequently by Prof. J.A. Owen (1993) and others. Anderson (in Lott & Anderson, 2011) describes it as a species of “floating emergent vegetation characteristic of the early stages of raised bog formation in lake hollows”. A total of five specimens, one male and four females, were found in the survey. The distribution of records suggests a concentration in the middle area of the bog around the periphery of the raised bog section (Fig. 3). The species remains very rare in Ireland known from just two additional sites to Scragh Bog – Ballynafid, Co Westmeath and a site in Co Cavan (Denton & Foster, 2011). *Stenus glabellus* is endemic to Europe with a relict distribution of sites scattered across Scandinavia, Poland, Germany, the Low Countries and northern France (Lott & Foster 1990). It is unknown from Great Britain.



**Figure 3.** Distribution of the wetland beetle *Stenus glabellus* (Coleoptera, Staphylinidae) at Scragh Bog, Co Westmeath. Red diamonds indicate present survey and black diamond the possible location from earlier surveys.

#### ***Zyras collaris* (Märkel) [Staphylinidae – a rove beetle]**

*Zyras collaris* is rare in Britain and listed as Nb. It is a small colourful staphylinid associated with ants' nests on bogs. Probably not rare in Ireland with 29 records for the whole of Ireland, but mostly concentrated in the interdrumlin mires of Cos Down and Armagh.

It has not previously been recorded for Scragh Bog. Two individuals were swept from floating vegetation in fen at N424587 and N422592. Together with *Drusilla canaliculata*, which was common across the Bog, it comprises the ant-following community on the Bog. Bog ants were: *Myrmica ruginodis* (common throughout); *Formica lemani* (scattered, locally common); and *Myrmica rubra* (uncommon, bog woodland only) (Appendix II).

## 4 Discussion and Summary

The fauna of Scragh Bog reflects the diverse transitions from groundwater-fed areas of fen to acidic raised mire present on the bog. Lists of invertebrates with comment on notable species in this report paint a picture of an exceptionally diverse natural landscape. This is certainly true for the spiders but appearances can be deceptive with regard to the other major group of ground predators, the Coleoptera or beetles. The list of beetles (Appendices I and II) appears complete enough in itself but is contradicted by the experience of collecting on the bog surface. This is a rather different experience from that on many other transition mires in Ireland. The word truncated is apposite, with a preponderance of one or two species and a great scarcity of the majority of species. The water beetles (Dytiscidae, Hydrophilidae) are diverse enough but present only sparingly with, for example, the normally ubiquitous *Anacaena* spp seemingly absent from large areas. The field layer with its mix of ground and rove beetles is even stranger. The only aleocharine staphylinids found widely in the bog during the survey were *Atheta graminicola* (scarce) and *Ocyusa picina* with the ant follower *Drusilla canaliculata* occasional in pitfall catches. Almost all other species are represented by single records. It took considerable periods of sweeping fen vegetation to get anything coleopterous at all. The ground beetles were also noticeable by their virtual absence with only *Pterostichus gracilis* in the margins of wooded areas and *P. strenuus* and *P. diligens* present with a very occasional specimen of *Agonum fuliginosum* or *A. thoreyi* on the open bog. *Agonum gracile* was not seen at all, nor any of the larger ground beetles except *Pterostichus aterrimus* which was caught very sparingly in pitfalls. The only staphylinids that could be described as common were, rather surprisingly, *Staphylinus erythropterus* and *Paederus riparius*.

How to explain this? It is certainly not due to any lack of quality in the habitat but perhaps more to do with the availability of critical nutrients. It was noticeable that the ubiquitous water louse *Asellus aquaticus* was relatively scarce everywhere and specimen size was noticeably reduced compared to comparable sites. Freshwater snails were also much reduced in size and abundance, although calcium is unlikely to have been a limiting factor. This might be connected to the available food supply, mainly freshwater macrophytes, which were also scarce and low in biomass. So then, a mossy fen with a limited range of nutrients and of macrophytes, except on the margins where there is runoff from nearby agricultural land.

It was noticeable that algal growth was present in many pool areas of the middle and west side of the Bog. In one respect this contradicts observations above, suggesting that eutrophication from surrounding agricultural land is taking place. If so, it does not currently appear to be having a noticeable impact on plant communities in the middle of the bog. Algal growth is usually limited by



phosphorus, a key component in superphosphate enriched fertilisers used for silage swards in dairying enterprises. Such an enterprise exists on the west side of Scragh Bog and may be enriching the site by runoff, particularly from slurry spreading.

These two factors appear contradictory in their effects. A truncated beetle and invertebrate fauna possibly influenced by limited nutrients and/or range and biomass of macrophytes on the Bog. And a new development, potential eutrophication leading to rapid algal growth in some parts of the Bog. These contradictory elements may resolve rapidly in the future changing both the bog landscape and its fauna.

The survey showed that the principal elements of the rare beetle fauna are still present, with a few interesting additions. The discovery of *Pterostichus aterrimus* and *Acalyptus carpini* is noteworthy as is the re-recording of *Hydroporus glabriusculus*, *H. scalesianus*, *Laccornis oblongus* and *Stenus glabellus*. And this is despite comments above about the relative scarcity of beetles on the Bog. On the bog margins the malachite beetle *Malachius bipustulatus* was seen twice in June. This species is rarely recorded in Ireland and tends to be southern in distribution.

**Spiders** were for the most part much less scarce than beetles in all compartments within the Bog. This may be explained by the relatively easy movement of aerial plankton on to the Bog because of its long narrow shape, with nutrient restrictions not being so effective in limiting biomass as with other groups. All of the notable species recorded by Van Helsdingen (1998), with the exception of *Porhomma oblitum*, were re-found and several others discovered for the first time. From a spider perspective Scragh Bog is clearly a long-established, little-disturbed habitat that has acquired and retained a very diverse spider population. It also confirms that the site contains a good variety of micro-habitats in terms of the height and composition of the vegetation, gradients from wet to dry and cool to warm that would be required to support such a variety of arachnid within a relatively small geographic area.

Other fauna recorded tend to back up observations on the lack of beetles. 2015 was certainly a poor year for dragonflies Odonata. The Large Red Damselfly *Pyrrosoma nymphula* was common in May and June but other damselflies failed to appear in any numbers and the Irish Damselfly *Coenagrion lunulatum* was not seen. Larger species were conspicuous by their absence, with a single record of *Brachytron pratense* in June and with *Libellula quadrimaculata* making a brief appearance in mid-July. Other flying insects were similarly scarce. This could have been a reflection of a poor and late start to the season or to the prevailing trophic conditions on the Bog. Hoverflies (Diptera: Syrphidae) were uncommon and not very diverse and no *Anasimyia*, for instance, were seen. However *Parhelophilis consimilis* appeared in small numbers from mid-July to mid-August.

It is likely that the site holds many more species of **moth (Lepidoptera)** than have been recorded. The relatively brief adult lifespan and limits on trapping effort means that only a proportion has been

surveyed. A site like this could reasonably be expected to hold somewhere between 500 to 700 species, but intensive trapping across several years would be necessary to get a fuller picture of the fauna. It is possible to say however that the species list contains several notable finds amongst a good diversity of species and as with other taxonomic groups surveyed is indicative of a high quality site.

**Heteroptera** varied in frequency. *Pachybrachius fracticollis* was common everywhere in May and June. Several other common lygaeids were also recorded early despite the cold spring. *Hebrus ruficeps* occurred at about the same time as *Pachybrachius* but in very low numbers. *Cymus glandicolor* peaked in June but occurred sparingly, and *Acalypta parvula* about the same time, in pitfalls or in the moss. No other tingids were seen. *Drymus brunneus* and *D. sylvaticus* appeared late and *Hallodapus rufescens* was captured once in a pitfall in June/July. Water bugs were mainly seen in or near the ponds at the western side of the bog, but only common species. *Nepa cinerea* was scattered in ground water across the Bog but all specimens were very small, seemingly dwarfed by the oligotrophic conditions.

**Molluscs** were everywhere scarce. The greatest variety occurred at the ponds on the west side of the centre of the Bog and were taken to be relics of former lake conditions. Those living in the transition mire were small or under-developed and scarce e.g. *Stagnicola fuscus* the marsh snail. The usually abundant amber snail *Oxyloma elegans* was almost restricted to *Phragmites* stands in the north of the Bog and specimens were extremely small and under-developed. The transition from open lake conditions to bog with its fluctuating acidity and restricted nutrients is certainly not kind to snails.

A picture is therefore painted of a low nutrient environment with some unexpected imbalances but with the continuing presence of a diverse specialist fauna in what is an ancient and diverse site.

Future requirements for management of the site to maintain the status quo, is examined next.

## 4.1 Future management

Current management of the site could be described as minimum intervention. We agree that the slow evolution of conditions which has been taking place since the early Postglacial should be allowed to continue i.e. a continuation of this policy.

The question of management intervention arises only when external factors intervene to change the internal equilibrium of the site. Gross physical intervention by human agencies has been avoided and placing the site under protection as an SAC will probably secure its long term future in this regard.

A problem has been suggested by the survey work. Algal accumulations observed in surface water at the centre and west of the bog area may signal pollution from outside the site and ultimately cause damage to sensitive communities on the site. The cause of this is at present unknown but farm enterprises on the west shore of the site may be implicated. Some attempt should be made to investigate this further, perhaps by assaying SRP (soluble reactive phosphorus) in the affected waters.

## 4.2 Future monitoring

Chemical monitoring has been suggested above as a means of determining external pollution threats. This should also be done internally by the monitoring of sensitive invertebrate communities.

Ideally monitoring should take place every six years. It should involve at least two pitfall trapping transects as exemplified in Methodology above for a period of one month in the May-June period. Field collecting transects (three) laterally across the breadth of the site using Treading/Sweep Netting protocols (Methodology, above) should parallel the pitfall exercise at two points in the year, early (May-June) and late (July-August).

This will allow a judgment to be made about the status of a broad section of the fauna in comparison with results in the present survey.

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## Appendix 1: Historical records of beetles (Coleoptera) recorded from Scragh Bog, Co Westmeath

<i>Agabus affinis</i>	a water beetle	<i>Hydroporus tessellatus</i>	a water beetle
<i>Agabus bipustulatus</i>	a water beetle	<i>Hydroporus tristis</i>	a water beetle
<i>Agabus unguicularis</i>	a water beetle	<i>Hydroporus umbrosus</i>	a water beetle
<i>Agonum fuliginosum</i>	a ground beetle	<i>Hygronoma dimidiata</i>	a rove beetle
<i>Agonum thoreyi</i>	a ground beetle	<i>Ilybius ater</i>	a water beetle
<i>Aleochara lanuginosa</i>	a rove beetle	<i>Ilybius guttiger</i>	a water beetle
<i>Altica oleracea</i>	a leaf beetle	<i>Ilybius quadriguttatus</i>	a water beetle
<i>Anacaena limbata.</i>	a scavenger water beetle	<i>Laccornis oblongus</i>	a water beetle
<i>Anotylus rugosus</i>	a rove beetle	<i>Lathrobium brunnipes</i>	a rove beetle
<i>Bagous collignensis</i>	a weevil	<i>Lathrobium terminatum</i>	a rove beetle
<i>Cercyon convexiusculus</i>	a scavenger water beetle	<i>Lesteva sicula</i>	a rove beetle
<i>Chaetarthria seminulum</i>	a scavenger water beetle	<i>Myllaena dubia</i>	a rove beetle
<i>Coelostoma orbiculare</i>	a scavenger water beetle	<i>Ochtheophilum fracticorne</i>	a rove beetle
<i>Copelatus haemorrhoidalis</i>	a water beetle	<i>Ocyusa maura</i>	a rove beetle
<i>Cymbiodyta marginellus</i>	a scavenger water beetle	<i>Ocyusa picina</i>	a rove beetle
<i>Cyphon coarctatus</i>	a marsh beetle	<i>Olophrum fuscum</i>	a rove beetle
<i>Cyphon hilaris</i>	a marsh beetle	<i>Paederus riparius</i>	a rove beetle
<i>Cyphon variabilis</i>	a marsh beetle	<i>Philonthus fumarius</i>	a rove beetle
<i>Cytilus sericeus</i>	a pill beetle	<i>Philonthus furcifer</i>	a rove beetle
<i>Drusilla canaliculata</i>	a rove beetle	<i>Philonthus nigrita</i>	a rove beetle
<i>Dryops luridus</i>	a long-toed water beetle	<i>Platystethus nodifrons</i>	a rove beetle
<i>Enochrus coarctatus</i>	a scavenger water beetle	<i>Prasocuris phellandrii</i>	a leaf beetle
<i>Erichsonius cinerascens</i>	a rove beetle	<i>Pselaphus heisei</i>	a short-winged mould beetle
<i>Euconnus hirticollis</i>	a small antlike beetle	<i>Pterostichus nigrita</i>	a ground beetle
<i>Fagniezia impressa</i>	a short-winged mould beetle	<i>Pterostichus nigrita agg.</i>	A ground beetle
<i>Graptodytes granularis</i>	a water beetle	<i>Pterostichus strenuus</i>	a ground beetle
<i>Gymnusa brevicollis</i>	a rove beetle	<i>Quedius boopoides</i>	a rove beetle
<i>Gyrophypnus fracticornis</i>	a rove beetle	<i>Quedius fuliginosus</i>	a rove beetle
<i>Helophorus brevipalpis</i>	a scavenger water beetle	<i>Quedius maurorufus</i>	a rove beetle
<i>Helophorus flavipes</i>	a scavenger water beetle	<i>Rhantus grapii</i>	a water beetle
<i>Helophorus grandis</i>	a scavenger water beetle	<i>Rybaxis longicornis</i>	a short-winged mould beetle
<i>Hydraena riparia</i>	a small water beetle	<i>Staphylinus erythropterus</i>	a rove beetle
<i>Hydrobius fuscipes</i>	a scavenger water beetle	<i>Stenus cicindeloides</i>	a rove beetle
<i>Hydroporus angustatus</i>	a water beetle	<i>Stenus glabellus</i>	a rove beetle
<i>Hydroporus erythrocephalus</i>	a water beetle	<i>Stenus impressus</i>	a rove beetle
<i>Hydroporus glabriusculus</i>	a water beetle	<i>Stenus juno</i>	a rove beetle
<i>Hydroporus gyllenhalii</i>	a water beetle	<i>Stenus latifrons</i>	a rove beetle
<i>Hydroporus nigrita</i>	a water beetle	<i>Stenus nitens</i>	a rove beetle
<i>Hydroporus obscurus</i>	a water beetle	<i>Stenus nitidiusculus</i>	a rove beetle
<i>Hydroporus planus</i>	a water beetle	<i>Stenus palustris</i>	a rove beetle
<i>Hydroporus scalesianus</i>	a water beetle	<i>Suphrodytes dorsalis</i>	a water beetle
<i>Hydroporus striola</i>	a water beetle	<i>Tachyporus chrysomelinus</i>	a rove beetle

## Appendix 2: Complete list of invertebrates recorded in the 2015 survey of Scragh Bog, Co Westmeath

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<b>HIRUDINEA</b>						
<i>Erpobdella octoculata</i> (a leech)	N42105947	13.08.15	Fen: valley mire, basic	Medium-sized specimen at roots of vegetation.	RA	1
<i>Erpobdella testacea</i> (a leech)	N42275911	16.06.15	Open water: small mesotrophic ponds	Swept, deep pool.	RA	several
<i>Haemopis sanguisuga</i> (Horse Leech)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1
<i>Haemopis sanguisuga</i> (Horse Leech)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	2
<b>MOLLUSCA</b>						
<i>Acroloxus lacustris</i> (Lake Limpet)	N42275911	16.06.15	Open water: small mesotrophic ponds	Swept from deep pool.	RA	1
<i>Arion ater</i> (Great Black Slug)	N422592	12.05.15	Fen: basin mire, basic	In large tussock.	RA	1
<i>Arion ater</i> (Great Black Slug)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	3
<i>Arion ater</i> (Great Black Slug)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	17
<i>Arion ater</i> (Great Black Slug)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	6
<i>Arion ater</i> (Great Black Slug)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Arion ater</i> (Great Black Slug)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	70
<i>Arion distinctus</i> (Common Garden Slug)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	1
<i>Bathymphalus contortus</i> (a ramshorn snail)	N424587	12.05.15	Fen: basin mire, basic	Small acid pools.	RA	frequent
<i>Bathymphalus contortus</i> (a ramshorn snail)	N422592	12.05.15	Fen: basin mire, basic	Sweeping fen vegetation.	RA	frequent
<i>Bathymphalus contortus</i> (a ramshorn snail)	N42275911	16.06.15	Open water: small mesotrophic ponds	Shallow margins of deep pool.	RA	several
<i>Bathymphalus contortus</i> (a ramshorn snail)	N42235917	16.06.15	Open water: small mesotrophic ponds	Deep acid pool.	RA	occasional



Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Bathymphalus contortus</i> (a ramshorn snail)	N42055955	13.08.15	Fen: valley mire, basic	Tall fen vegetation; shallow water.	RA	occasional
<i>Bithynia tentaculata</i> (a spire snail)	N42215922	16.06.15	Fen: valley mire, basic	Swept in pools between moss tussocks/Typha.	RA	1
<i>Cochlicopa lubrica</i> (a moss snail)	N42215922	16.06.15	Fen: valley mire, basic	In moss tussock.	RA	1
<i>Deroceras invadens</i> (Chestnut Slug)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1
<i>Deroceras laeve</i> (Marsh Slug)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	several
<i>Deroceras laeve</i> (Marsh Slug)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	12
<i>Deroceras laeve</i> (Marsh Slug)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	10
<i>Deroceras laeve</i> (Marsh Slug)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	14
<i>Deroceras laeve</i> (Marsh Slug)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Deroceras laeve</i> (Marsh Slug)	N424587	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	several
<i>Deroceras laeve</i> (Marsh Slug)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	59
<i>Deroceras laeve</i> (Marsh Slug)	N42045955	13.08.15	Fen: valley mire, basic	Outflow of small pond.	RA	1
<i>Euconulus alderi</i> (a glass snail)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	1
<i>Euconulus alderi</i> (a glass snail)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Galba truncatula</i> (a pond snail)	N424587	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1
<i>Hippetis complanatus</i> (a ramshorn snail)	N42275911	16.06.15	Open water: small mesotrophic ponds	On Riccia , pool margins.	RA	frequent
<i>Limax maximus</i> (Great Grey Slug)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1
<i>Limax maximus</i> (Great Grey Slug)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	1
<i>Nesovitrea hammonis</i> (a glass snail)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	1

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Nesovitrea hammonis</i> (a glass snail)	N423592	10.06 – 08.07.15	Mire: valley bog, open Sphagnum carpets	Moss pillows with Cladium.	RA	3
<i>Nesovitrea hammonis</i> (a glass snail)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	3
<i>Nesovitrea hammonis</i> (a glass snail)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1
<i>Nesovitrea hammonis</i> (a glass snail)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Oxyloma elegans</i> (an amber snail)	N42235917	16.06.15	Open water: small mesotrophic ponds	Margins, deep pool.	RA	several
<i>Oxyloma elegans</i> (an amber snail)	N42105947	13.08.15	Fen: valley mire, basic	Very small specimens on vegetation.	RA	several
<i>Oxyloma elegans</i> (an amber snail)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	5
<i>Pisidium personatum</i> (a pea mussel)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1
<i>Punctum pygmaeum</i> (a discus snail)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Radix balthica</i> (Wandering Snail)	N422592	12.05.15	Fen: basin mire, basic	Scarce in fen vegetation.	RA	1
<i>Radix balthica</i> (Wandering Snail)	N42235917	16.06.15	Open water: small mesotrophic ponds	Deep acid pool.	RA	several
<i>Radix balthica</i> (Wandering Snail)	N42045955	13.08.15	Fen: valley mire, basic	Small size, by pond with bogbean.	RA	occasional
<i>Radix balthica</i> (Wandering Snail)	N42105947	13.08.15	Fen: valley mire, basic	Small specimens.	RA	several
<i>Sphaerium nucleus</i> (an orb mussel)	N422592	12.05.15	Fen: basin mire, basic	Treading shallow fen vegetation.	RA	2
<i>Sphaerium nucleus</i> (an orb mussel)	N42235917	16.06.15	Open water: small mesotrophic ponds	Outflow of pool.	RA	1
<i>Stagnicola fuscus</i> (a pond snail)	N422592	12.05.15	Fen: basin mire, basic	Very scarce in fen vegetation.	RA	several
<i>Stagnicola fuscus</i> (a pond snail)	N42235917	16.06.15	Open water: small mesotrophic ponds	Small; margins of deep acid pool.	RA	several
<i>Stagnicola fuscus</i> (a pond snail)	N42055955	13.08.15	Fen: valley mire, basic	Small.	RA	occasional
<i>Stagnicola fuscus</i> (a pond snail)	N42105947	13.08.15	Fen: valley mire, basic	Small specimens swept from base	RA	occasional

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche of vegetation.	Recorder	Abundance
<i>Valvata cristata</i> (Flat Valve Snail)	N424587	12.05.15	Fen: basin mire, basic	Small acid pool.	RA	1
<i>Valvata cristata</i> (Flat Valve Snail)	N42275911	16.06.15	Open water: small mesotrophic ponds	Swept, deep pool.	RA	1
<i>Valvata cristata</i> (Flat Valve Snail)	N42235917	16.06.15	Open water: small mesotrophic ponds	Deep acid pool.	RA	1
<i>Vertigo antivertigo</i> (a whorl snail)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	2
<i>Vertigo antivertigo</i> (a whorl snail)	N424587	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1
<i>Zonitoides nitidus</i> (a glass snail)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	several
<i>Zonitoides nitidus</i> (a glass snail)	N42235917	16.06.15	Open water: small mesotrophic ponds	Margins, deep pool.	RA	1
<i>Zonitoides nitidus</i> (a glass snail)	N42215922	16.06.15	Fen: valley mire, basic	In moss tussocks.	RA	several
<b>CHILOPODA</b>						
<i>Lithobius borealis</i> (a centipede)	N427585	17.06.15	Scrub: dense/continuous, neutral	Tree trunk wrapping.	AM	1
<b>DIPLOPODA</b>						
<i>Ommatoiulus sabulosus</i> (Striped Millipede)	N42615872	10.06.15	Fen: valley mire, basic	Under stacked conifer logs.	RA	1
<i>Ommatoiulus sabulosus</i> (Striped Millipede)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	1
<i>Ommatoiulus sabulosus</i> (Striped Millipede)	N423592	10.06 – 08.07.15	Mire: valley bog, open Sphagnum carpets	Moss pillows with Cladium.	RA	4
<i>Ommatoiulus sabulosus</i> (Striped Millipede)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Ommatoiulus sabulosus</i> (Striped Millipede)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1
<i>Ophiulus pilosus</i> (a julid snake millipede)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	6
<i>Ophiulus pilosus</i> (a julid snake millipede)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Ophiulus pilosus</i> (a julid snake millipede)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	8
<i>Ophiulus pilosus</i> (a julid snake millipede)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Polydesmus angustus</i> (a flat-back millipede)	N42615872	10.06.15	Fen: valley mire, basic	Under stacked conifer logs.	RA	1 pair
<i>Polydesmus angustus</i> (a flat-back millipede)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	7
<i>Polydesmus angustus</i> (a flat-back millipede)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Polydesmus angustus</i> (a flat-back millipede)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	3
<i>Polydesmus angustus</i> (a flat-back millipede)	N423592	10.06 – 08.07.15	Mire: valley bog, open Sphagnum carpets	Moss pillows with Cladium.	RA	2
<i>Polydesmus angustus</i> (a flat-back millipede)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	10
<i>Polydesmus angustus</i> (a flat-back millipede)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	2
<i>Proteroiulus fuscus</i> (Snake Millipede)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1
<i>Tachypodoiulus niger</i> (White-legged Snake Millipede)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	9
<i>Tachypodoiulus niger</i> (White-legged Snake Millipede)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	2
<i>Tachypodoiulus niger</i> (White-legged Snake Millipede)	N423592	10.06 – 08.07.15	Mire: valley bog, open Sphagnum carpets	Moss pillows with Cladium.	RA	8
<i>Tachypodoiulus niger</i> (White-legged Snake Millipede)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	18
<i>Tachypodoiulus niger</i> (White-legged Snake Millipede)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	6
<i>Tachypodoiulus niger</i> (White-legged Snake Millipede)	N42605890	10.06.15	Fen: valley mire, basic	Sweeping laneway.	RA	1
<b>ISOPODA</b>						
<i>Asellus aquaticus</i> (a water slater)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	frequent
<i>Asellus aquaticus</i> (a water slater)	N424587	12.05.15	Fen: basin mire, basic	Small acid pools.	RA	frequent
<i>Asellus aquaticus</i> (a water slater)	N42275911	16.06.15	Open water: small mesotrophic ponds	Swept, deep pool.	RA	frequent
<i>Asellus aquaticus</i> (a water slater)	N42055955	13.08.15	Fen: valley mire, basic	Small.	RA	frequent
<i>Asellus aquaticus</i> (a water slater)	N42105947	13.08.15	Fen: valley mire, basic	Swept from roots of vegetation.	RA	occasional
<i>Oniscus asellus</i> (a woodlouse)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky	RA	3

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
				wooded bog.		
<i>Oniscus asellus</i> (a woodlouse)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1
<i>Philoscia muscorum</i> (a woodlouse)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	12
<i>Philoscia muscorum</i> (a woodlouse)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	2
<i>Philoscia muscorum</i> (a woodlouse)	N423592	10.06 – 08.07.15	Mire: valley bog, open Sphagnum carpets	Moss pillows with Cladium.	RA	2
<i>Philoscia muscorum</i> (a woodlouse)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	9
<i>Trichoniscus pusillus</i> (a woodlouse)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	3
<i>Trichoniscus pusillus</i> (a woodlouse)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	2
<b>ARANEAE</b>						
<i>Agroeca proxima</i> (a running foliage spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Agyneta cauta</i> (a money spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Agyneta subtilis</i> (a money spider)	N427585	12.05.15	Scrub: dense/continuous, neutral	Sieved, deciduous litter.	AM	1
<i>Agyneta subtilis</i> (a money spider)	N427585	16.05.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	1
<i>Agyneta subtilis</i> (a money spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	1
<i>Agyneta subtilis</i> (a money spider)	N423592	10.06 – 08.07.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	2
<i>Alopecosa pulverulenta</i> (a wolf spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	2
<i>Antistea elegans</i> (a lesser cobweb spider)	N422591	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Antistea elegans</i> (a lesser cobweb spider)	N421594	18.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Aphileta misera</i> (a money spider)	N422591	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	3

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Aphileta misera</i> (a money spider)	N421594	18.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Araeoncus crassiceps</i> (a money spider)	N422591	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	7
<i>Araeoncus crassiceps</i> (a money spider)	N422593	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	2
<i>Araniella cucurbitina</i> (an orb-weaver spider)	N425588	16.05.15	Scrub: dense/continuous, neutral	Swept from shrub layer (/opisthographa).	AM	1
<i>Araniella cucurbitina</i> (an orb-weaver spider)	N424587	17.05.15	Grassland: marshy, lowland	Swept.	AM	1
<i>Argyroneta aquatica</i> (Water Spider)	N422591	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Baryphyma gowerense</i> (a money spider)	N422593	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Baryphyma gowerense</i> (a money spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Bathyphantes approximatus</i> (a money spider)	N422591	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	2
<i>Bathyphantes approximatus</i> (a money spider)	N421594	18.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Bathyphantes gracilis</i> (a money spider)	N422591	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Bathyphantes gracilis</i> (a money spider)	N422591	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Bathyphantes gracilis</i> (a money spider)	N422593	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Bathyphantes gracilis</i> (a money spider)	N423590	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Bathyphantes gracilis</i> (a money spider)	N424590	10.06 – 08.07.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Bathyphantes setiger</i> (a money spider)	N421594	18.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Carorita limnaea</i> (a money spider)	N422591	16.05.15	Mire: valley bog, mosaic	treading and sieving vegetation.	AM	1
<i>Carorita limnaea</i> (a money spider)	N422593	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	2
<i>Carorita limnaea</i> (a money spider)	N423590	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	3
<i>Carorita limnaea</i> (a money spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Carorita limnaea</i> (a money spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	1
<i>Centromerus arcanus</i> (a money spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	10
<i>Centromerus arcanus</i> (a money spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Centromerus arcanus</i> (a money spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	2
<i>Centromerus arcanus</i> (a money spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Centromerus dilutus</i> (a money spider)	N427585	16.05.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	1
<i>Ceratinella brevipes</i> (a money spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	13
<i>Ceratinella brevipes</i> (a money spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	2
<i>Ceratinella scabrosa</i> (a money spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	2
<i>Ceratinella scabrosa</i> (a money spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Ceratinella scabrosa</i> (a money spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	2
<i>Clubiona comta</i> (a foliage spider)	N425588	18.05.15	Scrub: dense/continuous, neutral	Bark wrappings.	AM	1

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Clubiona diversa</i> (a foliage spider)	N422593	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Clubiona phragmitis</i> (a foliage spider)	N421594	18.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Clubiona phragmitis</i> (a foliage spider)	N423592	10.06 – 08.07.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	1
<i>Clubiona reclusa</i> (a foliage spider)	N424587	17.05.15	Grassland: marshy, lowland	Swept.	AM	2
<i>Clubiona stagnatilis</i> (a foliage spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	1
<i>Dictyna arundinacea</i> (a mesh webbed spider)	N425588	16.05.15	Scrub: dense/continuous, neutral	Swept from heather.	AM	9
<i>Dictyna arundinacea</i> (a mesh webbed spider)	N423590	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	3
<i>Dicymbium nigrum</i> (a money spider)	N427585	16.05.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	1
<i>Diplocephalus picinus</i> (a money spider)	N427585	12.05.15	Scrub: dense/continuous, neutral	Sieved, deciduous litter.	AM	2
<i>Diplocephalus picinus</i> (a money spider)	N427585	16.05.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	2
<i>Dismodicus bifrons</i> (a money spider)	N424587	17.05.15	Grassland: marshy, lowland	Swept.	AM	1
<i>Dolomedes fimbriatus</i> (Raft Spider)	N42055955	13.08.15	Fen: valley mire, basic	Swept from shallow ground water.	RA	1
<i>Drassodes cupreus</i> (a ground spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Drepanotylus uncatius</i> (a money spider)	N422591	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Enoplognatha ovata</i> (a comb-footed spider)	N424587	17.05.15	Grassland: marshy, lowland	Swept.	AM	2
<i>Erigone atra</i> (a money spider)	N427585	16.05.15	Scrub: dense/continuous, neutral	Sieved from grass/moss; epigyne dissected.	AM	1
<i>Erigone atra</i> (a money spider)	N422593	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1



Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Erigone atra</i> (a money spider)	N424587	17.05.15	Grassland: marshy, lowland	Swept.	AM	1
<i>Ero cambridgei</i> (a pirate spider)	N423590	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Ero cambridgei</i> (a pirate spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Gnathonarium dentatum</i> (a money spider)	N424587	17.05.15	Grassland: marshy, lowland	Swept.	AM	3
<i>Gnathonarium dentatum</i> (a money spider)	N421594	18.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Gonatium rubens</i> (a money spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Gongyliidiellum vivum</i> (a money spider)	N427585	12.05.15	Scrub: dense/continuous, neutral	Sieved, deciduous litter.	AM	1
<i>Gongyliidiellum vivum</i> (a money spider)	N427585	16.05.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	4
<i>Gongyliidiellum vivum</i> (a money spider)	N422591	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Gongyliidiellum vivum</i> (a money spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	2
<i>Gongyliidiellum vivum</i> (a money spider)	N424590	10.06 – 08.07.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Haplodrassus signifer</i> (a ground spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Hypomma bituberculatum</i> (a money spider)	N425588	16.05.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	1
<i>Hypomma bituberculatum</i> (a money spider)	N421594	18.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Hypomma fulvum</i> (a money spider)	N421594	18.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Kaestneria pullata</i> (a money spider)	N422591	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	2
<i>Kaestneria pullata</i> (a money spider)	N423590	16.05.15	Mire: valley bog, mosaic	Treading nad sieving vegetation.	AM	2

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Larinioides cornutus</i> (an orb-weaver spider)	N424587	17.05.15	Grassland: marshy, lowland	Swept.	AM	1
<i>Larinioides cornutus</i> (an orb-weaver spider)	N421594	18.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Lepthyphantes leprosus</i> (a money spider)	N422591	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Leptorhoptrum robustum</i> (a money spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	1
<i>Lophomma punctatum</i> (a money spider)	N422591	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	7
<i>Lophomma punctatum</i> (a money spider)	N422593	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	3
<i>Lophomma punctatum</i> (a money spider)	N423590	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	2
<i>Maso sundevalli</i> (a money spider)	N425588	16.05.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	1
<i>Maso sundevalli</i> (a money spider)	N427585	16.05.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	3
<i>Maso sundevalli</i> (a money spider)	N424587	17.05.15	Grassland: marshy, lowland	Swept.	AM	3
<i>Maso sundevalli</i> (a money spider)	N425588	18.05.15	Scrub: dense/continuous, neutral	Bark wrappings.	AM	2
<i>Maso sundevalli</i> (a money spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	2
<i>Maso sundevalli</i> (a money spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Maso sundevalli</i> (a money spider)	N424590	10.06 – 08.07.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Maso sundevalli</i> (a money spider)	N423592	10.06 – 08.07.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	2
<i>Metellina mengei</i> (an orb-weaver spider)	N425588	16.05.15	Scrub: dense/continuous, neutral	Swept, shrub layer.	AM	11
<i>Metellina mengei</i> (an orb-weaver spider)	N427585	16.05.15	Scrub: dense/continuous, neutral	Swept from shrub layer.	AM	10
<i>Metellina mengei</i> (an orb-weaver spider)	N424587	17.05.15	Grassland: marshy, lowland	Swept.	AM	3
<i>Metellina merianae</i> (an orb-weaver spider)	N425588	18.05.15	Scrub: dense/continuous, neutral	Bark wrappings.	AM	1

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Metopobactrus prominulus</i> (a money spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	1
<i>Metopobactrus prominulus</i> (a money spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Microlinyphia pusilla</i> (a money spider)	N425588	16.05.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	1
<i>Microlinyphia pusilla</i> (a money spider)	N424587	17.05.15	Grassland: marshy, lowland	Swept.	AM	2
<i>Minyriolus pusillus</i> (a money spider)	N425588	16.05.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	1
<i>Misumena vatia</i> (a crab spider)	N427587	10.06.15	Scrub: dense/continuous, neutral	On flowers	RA	1
<i>Misumena vatia</i> (a crab spider)	N426588	08.07.15	Scrub: dense/continuous, neutral	On flowers	RA	1
<i>Monocephalus fuscipes</i> (a money spider)	N427585	16.05.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	1
<i>Monocephalus fuscipes</i> (a money spider)	N424587	17.05.15	Grassland: marshy, lowland	Swept.	AM	5
<i>Monocephalus fuscipes</i> (a money spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	3
<i>Nemastoma bimaculatum</i> (a harvestman)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	2
<i>Nemastoma bimaculatum</i> (a harvestman)	N424590	10.06 – 08.07.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Neon reticulatus</i> (a jumping spider)	N425588	16.05.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	1
<i>Neon reticulatus</i> (a jumping spider)	N422593	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	3
<i>Neon reticulatus</i> (a jumping spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Neon reticulatus</i> (a jumping spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	2
<i>Neon reticulatus</i> (a jumping spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	2
<i>Neon reticulatus</i> (a jumping spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Neon reticulatus</i> (a jumping spider)	N424590	10.06 – 08.07.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Neon reticulatus</i> (a jumping spider)	N423592	10.06 – 08.07.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	2
<i>Neriene peltata</i> (a money spider)	N427585	16.5.15	Scrub: dense/continuous, neutral	Swept from	AM	6

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
				shrub layer.		
<i>Neriene peltata</i> (a money spider)	N425588	18.05.15	Scrub: dense/continuous, neutral	Bark wrappings.	AM	1
<i>Nuctenea umbratica</i> (an orb-weaver spider)	N42965894	17.5.15	Mire: lowland raised bog, mosaic	Hand searching.	AM	1
<i>Nuctenea umbratica</i> (an orb-weaver spider)	N425588	18.05.15	Scrub: dense/continuous, neutral	Bark wrappings.	AM	1
<i>Oedothorax gibbosus</i> (a money spider)	N427585	16.5.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	3
<i>Oedothorax gibbosus</i> (a money spider)	N422591	16.5.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	2
<i>Oedothorax gibbosus</i> (a money spider)	N422593	16.5.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	4
<i>Oedothorax gibbosus</i> (a money spider)	N423590	16.5.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	8
<i>Oedothorax gibbosus</i> (a money spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	6
<i>Oedothorax gibbosus</i> (a money spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	37
<i>Oedothorax gibbosus</i> (a money spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	43
<i>Oedothorax gibbosus</i> (a money spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	3
<i>Oedothorax gibbosus</i> (a money spider)	N424590	10.06 – 08.07.15	Fen: valley mire, basic	Open moss tussocks.	RA	14
<i>Oedothorax gibbosus</i> (a money spider)	N423592	10.06 – 08.07.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	10
<i>Oedothorax gibbosus f. tuberosus</i> (a money spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	3
<i>Oedothorax gibbosus f. tuberosus</i> (a money spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	12
<i>Oedothorax gibbosus f. tuberosus</i> (a money spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	12
<i>Oedothorax gibbosus f. tuberosus</i> (a money spider)	N424590	10.06 – 08.07.15	Fen: valley mire, basic	Open moss tussocks.	RA	3
<i>Oedothorax gibbosus f. tuberosus</i> (a money spider)	N423592	10.06 – 08.07.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	2

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Oryphantes angulatus</i> (a money spider)	N421594	18.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Ozyptila trux</i> (a crab spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	2
<i>Ozyptila trux</i> (a crab spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	7
<i>Ozyptila trux</i> (a crab spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	2
<i>Ozyptila trux</i> (a crab spider)	N424590	10.06 – 08.07.15	Fen: valley mire, basic	Open moss tussocks.	RA	3
<i>Ozyptila trux</i> (a crab spider)	N423592	10.06 – 08.07.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	8
<i>Pachygnatha clercki</i> (a long-jawed spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Palliduphantes ericaeus</i> (a money spider)	N427585	16.05.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	1
<i>Palliduphantes ericaeus</i> (a money spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Palliduphantes ericaeus</i> (a money spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	1
<i>Palliduphantes ericaeus</i> (a money spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	4
<i>Palliduphantes ericaeus</i> (a money spider)	N423592	10.06 – 08.07.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	3
<i>Palliduphantes pallidus</i> (a money spider)	N425588	18.05.15	Scrub: dense/continuous, neutral	Bark wrappings.	AM	2
<i>Pardosa amentata</i> (a wolf spider)	N424590	17.5.15	Grassland: marshy, lowland	Swept.	AM	1
<i>Pardosa pullata</i> (a wolf spider)	N421594	18.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Pardosa pullata</i> (a wolf spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	31
<i>Pardosa pullata</i> (a wolf spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	13
<i>Pardosa pullata</i> (a wolf spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	33
<i>Pardosa pullata</i> (a wolf spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	47
<i>Pardosa pullata</i> (a wolf spider)	N423592	10.06 – 08.07.15	Fen: valley mire, basic	Moss pillows	RA	17

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
				with Cladium.		
<i>Pirata hygrophilus</i> (a wolf spider)	N427585	12.5.15	Scrub: dense/continuous, neutral	Sieved, deciduous litter.	AM	1
<i>Pirata hygrophilus</i> (a wolf spider)	N427585	16.5.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	4
<i>Pirata hygrophilus</i> (a wolf spider)	N422591	16.5.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	4
<i>Pirata hygrophilus</i> (a wolf spider)	N422593	16.5.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Pirata hygrophilus</i> (a wolf spider)	N423590	16.5.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Pirata hygrophilus</i> (a wolf spider)	N425588	18.05.15	Scrub: dense/continuous, neutral	Bark wrappings.	AM	1
<i>Pirata hygrophilus</i> (a wolf spider)	N421594	18.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Pirata hygrophilus</i> (a wolf spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky, wooded bog.	RA	23
<i>Pirata hygrophilus</i> (a wolf spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	21
<i>Pirata hygrophilus</i> (a wolf spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	20
<i>Pirata hygrophilus</i> (a wolf spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	9
<i>Pirata hygrophilus</i> (a wolf spider)	N424590	10.06 – 08.07.15	Fen: valley mire, basic	Open moss tussocks.	RA	19
<i>Pirata hygrophilus</i> (a wolf spider)	N423592	10.06 – 08.07.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	12
<i>Pirata piraticus</i> (a wolf spider)	N422591	16.5.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	4
<i>Pirata piraticus</i> (a wolf spider)	N423590	16.5.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	2
<i>Pirata piraticus</i> (a wolf spider)	N421594	18.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Pirata piraticus</i> (a wolf spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Pirata piraticus</i> (a wolf spider)	N424590	10.06 – 08.07.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Pirata piscatorius</i> (a wolf spider)	N421594	18.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Pirata piscatorius</i> (a wolf spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Pirata piscatorius</i> (a wolf spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	6
<i>Pirata piscatorius</i> (a wolf spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	1
<i>Pirata piscatorius</i> (a wolf spider)	N424590	10.06 – 08.07.15	Fen: valley mire, basic	Open moss tussocks.	RA	6
<i>Pirata tenuitarsis</i> (a wolf spider)	N421594	18.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Pirata tenuitarsis</i> (a wolf spider)	N422591	16.5.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	4
<i>Pirata tenuitarsis</i> (a wolf spider)	N422593	16.5.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Pirata tenuitarsis</i> (a wolf spider)	N423590	16.5.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Pirata tenuitarsis</i> (a wolf spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Pirata tenuitarsis</i> (a wolf spider)	N424590	10.06 – 08.07.15	Fen: valley mire, basic	Open moss tussocks.	RA	3
<i>Pocadicnemis juncea</i> (a money spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	3
<i>Pocadicnemis juncea</i> (a money spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Pocadicnemis juncea</i> (a money spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	14
<i>Pocadicnemis juncea</i> (a money spider)	N423592	10.06 – 08.07.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	3
<i>Pocadicnemis pumila</i> (a money spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss	RA	1

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
				tussocks.		
<i>Pocadicnemis pumila</i> (a money spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	25
<i>Pocadicnemis pumila</i> (a money spider)	N423592	10.06 – 08.07.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	1
<i>Porrhomma pygmaeum</i> (a money spider)	N425588	16.5.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	1
<i>Rilaena triangularis</i> (a harvestman)	N425588	16.5.15	Scrub: dense/continuous, neutral	Swept from shrub layer.	AM	1
<i>Robertus lividus</i> (a comb-footed spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Robertus lividus</i> (a comb-footed spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Robertus lividus</i> (a comb-footed spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	1
<i>Robertus lividus</i> (a comb-footed spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Robertus lividus</i> (a comb-footed spider)	N423592	10.06 – 08.07.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	1
<i>Salticus cingulatus</i> (a jumping spider)	N427585	12.5.15	Scrub: dense/continuous, neutral	Taken from wooden post.	AM	1
<i>Satilatlas brittteni</i> (a money spider)	N422593	16.5.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Silometopus elegans</i> (a money spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Silometopus elegans</i> (a money spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	27
<i>Silometopus elegans</i> (a money spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	8
<i>Silometopus elegans</i> (a money spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	3
<i>Silometopus elegans</i> (a money spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	2
<i>Silometopus elegans</i> (a money spider)	N424590	10.06 – 08.07.15	Fen: valley mire, basic	Open moss tussocks.	RA	31
<i>Silometopus elegans</i> (a money spider)	N423592	10.06 – 08.07.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	3
<i>Silometopus reussi</i> (a money spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	1



Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Sitticus caricis</i> (a jumping spider)	N422591	16.5.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Tallusia experta</i> (a money spider)	N422591	16.5.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Tallusia experta</i> (a money spider)	N422593	16.5.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Tallusia experta</i> (a money spider)	N423590	16.5.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Tallusia experta</i> (a money spider)	N421594	18.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Tallusia experta</i> (a money spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Tapinocyba pallens</i> (a money spider)	N427585	16.5.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	1
<i>Taranucnus setosus</i> (a money spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Taranucnus setosus</i> (a money spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	2
<i>Taranucnus setosus</i> (a money spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Tenuiphantes alacris</i> (a money spider)	N425588	18.05.15	Scrub: dense/continuous, neutral	Bark wrappings.	AM	1
<i>Tenuiphantes flavipes</i> (a money spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Tenuiphantes mengei</i> (a money spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	3
<i>Tenuiphantes mengei</i> (a money spider)	N423592	10.06 – 08.07.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	3
<i>Tenuiphantes tenuis</i> (a money spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	1
<i>Tetragnatha extensa</i> (a long-jawed spider)	N422591	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Tetragnatha extensa</i> (a long-jawed spider)	N422593	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	2

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Tetragnatha extensa</i> (a long-jawed spider)	N424590	17.05.15	Grassland: marshy, lowland	Swept.	AM	3
<i>Tetragnatha extensa</i> (a long-jawed spider)	N421594	18.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Tetragnatha obtusa</i> (a long-jawed spider)	N425588	16.05.15	Scrub: dense/continuous, neutral	Swept, shrub layer.	AM	3
<i>Tetragnatha obtusa</i> (a long-jawed spider)	N427585	16.05.15	Scrub: dense/continuous, neutral	Swept from shrub layer.	AM	4
<i>Tetragnatha obtusa</i> (a long-jawed spider)	N423590	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	2
<i>Theridion pallens</i> (a comb-footed spider)	N425588	16.05.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	1
<i>Theridion sisyphium</i> (a comb-footed spider)	N425588	16.05.15	Scrub: dense/continuous, neutral	Swept from shrub layer.	AM	1
<i>Trichopterna thorelli</i> (a money spider)	N422593	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Trichopterna thorelli</i> (a money spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Trochosa ruricola</i> (a wolf spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Trochosa spinipalpis</i> (a wolf spider)	N423592	12.05 – 10.06.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	1
<i>Trochosa terricola</i> (a wolf spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky, wooded bog.	RA	6
<i>Trochosa terricola</i> (a wolf spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	5
<i>Trochosa terricola</i> (a wolf spider)	N423592	10.06 – 08.07.15	Fen: valley mire, basic	Moss pillows with Cladium.	RA	1
<i>Walckenaeria acuminata</i> (a money spider)	N427585	12.05.15	Scrub: dense/continuous, neutral	Sieved, deciduous litter.	AM	1
<i>Walckenaeria acuminata</i> (a money spider)	N427585	16.05.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	2
<i>Walckenaeria atrotibialis</i> (a money spider)	N427585	16.05.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	1
<i>Walckenaeria atrotibialis</i> (a money spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Walckenaeria atrotibialis</i> (a money spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	3

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Walckenaeria atrotibialis</i> (a money spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	12
<i>Walckenaeria atrotibialis</i> (a money spider)	N424590	10.06 – 08.07.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Walckenaeria atrotibialis</i> (a money spider)	N423592	10.06 – 08.07.15	Fen: valley mire, basic	Moss pillows with <i>Cladium</i> .	RA	4
<i>Walckenaeria nudipalpis</i> (a money spider)	N425587	10.06 – 08.07.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Walckenaeria vigilax</i> (a money spider)	N427585	16.05.15	Scrub: dense/continuous, neutral	Sieved from grass/moss.	AM	1
<i>Xysticus cristatus</i> (a crab spider)	N425588	16.05.15	Scrub: dense/continuous, neutral	Swept from heather.	AM	1
<i>Xysticus ulmi</i> (a crab spider)	N422591	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Xysticus ulmi</i> (a crab spider)	N422593	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Xysticus ulmi</i> (a crab spider)	N423592	10.06 – 08.07.15	Fen: valley mire, basic	Moss pillows with <i>Cladium</i> .	RA	1
<i>Zora spinimana</i> (a ghost spider)	N425588	16.05.15	Scrub: dense/continuous, neutral	Swept, shrub layer.	AM	1
<i>Zora spinimana</i> (a ghost spider)	N422591	16.05.15	Mire: valley bog, mosaic	Treading and sieving vegetation.	AM	1
<i>Zora spinimana</i> (a ghost spider)	N425588	18.05.15	Scrub: dense/continuous, neutral	Bark wrappings	AM	1
<i>Zora spinimana</i> (a ghost spider)	N425587	12.05 – 10.06.15	Mire: lowland raised bog, mosaic	Tussocky wooded bog.	RA	1
<i>Zora spinimana</i> (a ghost spider)	N424590	12.05 – 10.06.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<i>Zora spinimana</i> (a ghost spider)	N424587	10.06 – 08.07.15	Fen: valley mire, basic	Open moss tussocks.	RA	1
<b>ODONATA</b>						
<i>Brachytron pratense</i> (Hairy dragonfly)	N42605881	04.06.15	Fen: valley mire, basic	Flying over fen.	BN	Present
<i>Coenagrion pulchellum</i> (Variable Damselfly)	N42605881	08.07.15	Fen: valley mire, basic	Flying through Equisetum by walkway.	RA	1
<i>Coenagrion pulchellum</i> (Variable Damselfly)	N423589	04.06.15	Fen: valley mire, basic	Flying over fen.	BN	Present

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Enallagma cyathigerum</i> (Common Blue Damselfly)	N42605881	08.07.15	Fen: valley mire, basic	Flying through Equisetum.	RA	several
<i>Enallagma cyathigerum</i> (Common Blue Damselfly)	N423592	10.06.15	Fen: valley mire, basic	On vegetation.	RA	1
<i>Libellula quadrimaculata</i> (Four-spotted Chaser)	N423592	10.06.15	Fen: valley mire, basic	Patrolling vegetation.	RA	several
<i>Libellula quadrimaculata</i> (Four-spotted Chaser)	N42275911	16.06.15	Open water: small mesotrophic ponds	Shallow margins of deep pool.	RA	several
<i>Libellula quadrimaculata</i> (Four-spotted Chaser)	N423589	04.06.15	Fen: valley mire, basic	Flying over fen	BN	Present
<i>Pyrrosoma nymphula</i> (Large Red Damselfly)	N423592	10.06.15	Fen: valley mire, basic	On vegetation.	RA	frequent
<i>Sympetrum striolatum</i> (Common Darter)	N42075952	13.08.15	Fen: valley mire, basic	Among tall fen vegetation.	RA	frequent
<b>DERMAPTERA</b>						
<i>Forficula auricularia</i> (Common earwig)	N42605887	16.5.15	Scrub: dense/continuous, neutral	Leaf litter.	AM	1
<b>HEMIPTERA</b>						
<i>Acalypta parvula</i> (a lacebug)	N423592	10.06 – 08.07.15	Mire: valley bog, open Sphagnum carpets	Moss pillows with Cladium.	RA	1
<i>Acalypta parvula</i> (a lacebug)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	1
<i>Acalypta parvula</i> (a lacebug)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Anthocoris nemoralis</i> (Flower bug)	N423589	04.06.15	Fen: valley mire, basic	Wood/scrub.	BN	Present
<i>Anthocoris nemorum</i> (Common flower bug)	N423589	04.06.15	Fen: valley mire, basic	Wood/scrub.	BN	Present
<i>Cymus glandicolor</i> (a stiltbug)	N42415907	08.07.15	Fen: valley mire, basic	Swept in tall vegetation.	RA	several
<i>Cymus glandicolor</i> (a stiltbug)	N425586	17.06.15	Grassland: marshy, lowland	Swept, marshy meadow.	AM	1
<i>Cymus glandicolor</i> (a stiltbug)	N421594	17.06.15	Fen: valley mire, basic	Sieving vegetation.	AM	1
<i>Cymus glandicolor</i> (a stiltbug)	N42215922	16.06.15	Fen: valley mire, basic	Moss tussock.	RA	several
<i>Cymus glandicolor</i> (a stiltbug)	N42215922	04.06.15	Fen: valley mire, basic	Fen part of site	BN	Present
<i>Dicyphus stachidis</i> (Plant bug)	N423589	04.06.15	Fen: valley mire, basic	Fen part of site	BN	Present
<i>Drymus brunneus</i> (a ground bug)	N42295920	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Drymus sylvaticus</i> (a ground bug)	N42605887	16.05.15	Fen Carr Woodland	Moss and leaf litter.	AM	1 pair

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Gerris lacustris</i> (Common pondskater)	N423589	04.06.15	Fen: valley mire, basic	Fen part of site	BN	Present
<i>Hallodapus rufescens</i> (a plantbug or grassbug)	N42215950	13.08.15	Fen: valley mire, basic	Swept from fen vegetation	RA	1
<i>Hebrus ruficeps</i> (Sphagnum bug)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1
<i>Hebrus ruficeps</i> (Sphagnum Bug)	N42335913	16.06.15	Fen: valley mire, basic	In moss.	RA	1
<i>Hebrus ruficeps</i> (Sphagnum Bug)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	4
<i>Hebrus ruficeps</i> (Sphagnum Bug)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	4
<i>Hebrus ruficeps</i> (Sphagnum Bug)	N423589	04.06.15	Mire: valley bog, mosaic	Mossy mire in flooded hollows.	BN	Present
<i>Hesperocorixa linnei</i> (a waterboatman)	N42235917	16.06.15	Open water: small mesotrophic ponds	Deep acid pool.	RA	frequent
<i>Hesperocorixa linnei</i> (a waterboatman)	N42105947	13.08.15	Fen: valley mire, basic	Swept from shallow water.	RA	3
<i>Hesperocorixa moesta</i> (a waterboatman)	N42045955	13.08.15	Fen: valley mire, basic	In small pond with bogbean.	RA	1
<i>Hesperocorixa moesta</i> (a waterboatman)	N42105947	13.08.15	Fen: valley mire, basic	Swept from shallow water.	RA	3
<i>Hydrometra stagnorum</i> (a water-measurer)	N422592	12.05.15	Fen: basin mire, basic	Sweeping fen vegetation.	RA	several
<i>Hydrometra stagnorum</i> (a water-measurer)	N423589	04.05.15	Fen: basin mire, basic	Mossy mire in flooded hollows..	BN	Present
<i>Leptopterna dolabrata</i> (a plantbug or grassbug)	N425586	17.06.15	Grassland: marshy, lowland	Swept, marshy meadow.	AM	3
<i>Lygus rugulipennis</i> (Tarnished plant bug)	N423589	04.06.15	Fen: valley mire, basic	Fen part of site.	BN	Present
<i>Microvelia reticulata</i> (A water cricket)	N423589	04.06.15	Fen: valley mire, basic	Pools.	BN	Present
<i>Miris striatus</i> (Fine Streaked Bugkin)	N42405909	08.07.15	Fen: valley mire, basic	Swept in dense vegetation.	RA	1
<i>Nepa cinerea</i> (Water Scorpion)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1
<i>Nepa cinerea</i> (Water Scorpion)	N42235917	16.06.15	Open water: small mesotrophic ponds	Deep acid pool.	RA	1
<i>Nepa cinerea</i> (Water Scorpion)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	1
<i>Nepa cinerea</i> (Water Scorpion)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	several

## Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Nepa cinerea</i> (Water Scorpion)	N42105947	13.08.15	Fen: valley mire, basic	Very small specimen.	RA	1
<i>Nepa cinerea</i> (Water Scorpion)	N425587	12.05 – 10.06.15	Fen: valley mire, basic	Pools.	BN	Present
<i>Nepa cinerea</i> (Water Scorpion)	N423589	04.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	1
<i>Notonecta glauca</i> (Common Water-boatman)	N42235917	16.06.15	Open water: small mesotrophic ponds	Deep acid pool.	RA	several
<i>Pachybrachius fracticollis</i> (a ground bug)	N42275911	16.06.15	Open water: small mesotrophic ponds	Shallow outflow of pool.	RA	frequent
<i>Pachybrachius fracticollis</i> (a ground bug)	N42525899	16.05.15	Fen: valley mire, basic	In moss.	AM	1
<i>Pachybrachius fracticollis</i> (a ground bug)	N42385904	16.05.15	Fen: valley mire, basic	Sweeping vegetation.	AM	1
<i>Pachybrachius fracticollis</i> (a ground bug)	N425586	17.06.15	Grassland: marshy, lowland	Swept, marshy meadow.	AM	1
<i>Pachybrachius fracticollis</i> (a ground bug)	N42365911	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Pachybrachius fracticollis</i> (a ground bug)	N423589	04.06.15	Fen: valley mire, basic	Swept fen part of site.	BN	Present
<i>Picromerus bidens</i> (a shield bug)	N425589	17.06.15	Heathland: wet dwarf shrub heath, lowland	Swept, wet meadow.	AM	1
<i>Polymerus palustris</i> (a plantbug or grassbug)	N42295920	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Sigara fossarum</i> (a waterboatman)	N42045955	13.08.15	Fen: valley mire, basic	Small pond with bogbean.	RA	1
<i>Stenodema calcaratum</i> (a plantbug or grassbug)	N42215922	16.06.15	Fen: valley mire, basic	Moss tussock.	RA	1
<i>Stenodema calcaratum</i> (a plantbug or grassbug)	N42405909	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Stenodema calcaratum</i> (a plantbug or grassbug)	N423589	04.06.15	Fen: valley mire, basic	Swept fen part of site.	BN	Present
<i>Stenodema holsatum</i> (a plantbug or grassbug)	N423589	04.06.15	Fen: valley mire, basic	Swept fen part of site.	BN	Present
<i>Stenodema laevigatum</i> (a plantbug or grassbug)	N423589	04.06.15	Fen: valley mire, basic	Swept fen part of site.	BN	Present
<i>Velia caprai</i> (Water Cricket)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Zicrona caerulea</i> (a shield bug)	N42335913	16.06.15	Fen: valley mire, basic	In moss.	RA	1
<i>Zicrona caerulea</i> (a shield bug)	N42295920	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Zicrona caerulea</i> (a shield bug)	N423589	04.06.15	Fen: valley mire, basic	Swept fen part of	BN	Present

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche site.	Recorder	Abundance
<b>AUCHENOR RHYNCHA</b>						
<i>Cixius similis</i> (a lacehopper)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Cixius similis</i> (a lacehopper)	N423589	04.06.15	Mire: valley bog, mosaic	Wood/scrub.	BN	Present
<b>LEPIDOPTERA (butterflies)</b>						
<i>Anthocharis cardamines</i> (Orange Tip)	N422591	16.05.15	Fen: valley mire, basic	Field observation.	AM	frequent
<i>Anthocharis cardamines</i> (Orange Tip)	N42605890	10.06.15	Fen: valley mire, basic	Wooded fen.	RA	frequent
<i>Aphantopus hyperantus</i> (Ringlet)	N42605881	08.07.15	Fen: valley mire, basic	Fen vegetation.	RA	frequent
<i>Maniola jurtina</i> (Meadow Brown)	N42605881	08.07.15	Fen: valley mire, basic	Fen vegetation.	RA	occasional
<i>Pieris brassicae</i> (Large White)	N42605890	10.06.15	Fen: valley mire, basic	Wooded fen.	RA	1
<i>Pieris napi</i> (Green-veined White)	N42605890	10.06.15	Fen: valley mire, basic	Wooded fen.	RA	occasional
<b>LEPIDOPTERA (moths)</b>						
<i>Abrostola trigeminal</i> (Dark Spectacle)	N42565900	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1
<i>Abrostola triplasia</i> (Spectacle)	N42565898	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1
<i>Acronicta rumicis</i> (Knotgrass)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Aethes cnicana</i> (a micro-moth)	N42565899	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1
<i>Aethes cnicana</i> (a micro-moth)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Aethes cnicana</i> (a micro-moth)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Agriphila straminella</i> (a pyralid moth)	N42565895	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	30+
<i>Agriphila straminella</i> (a pyralid moth)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	15
<i>Agriphila tristella</i> (a pyralid moth)	N42565895	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	3
<i>Agriphila tristella</i> (a pyralid moth)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Agrotis exclamationis</i> (Heart and Dart)	N42565895	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	23

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Agrotis exclamatoris</i> (Heart and Dart)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	10
<i>Alcis repandata</i> (Mottled Beauty)	N42565897	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1
<i>Alcis repandata</i> (Mottled Beauty)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	3
<i>Alcis repandata</i> (Mottled Beauty)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	7
<i>Ancylis geminana</i> (a tortrix moth)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Anthophila fabriciana</i> (Nettle-tap)	N425589	18.06.15	Scrub: dense/continuous, neutral	Field obs.	AM	frequent
<i>Apamea monoglypha</i> (Dark Arches)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	5
<i>Apamea monoglypha</i> (Dark Arches)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Apotomis semifasciana</i> (a tortrix moth)	N42565900	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	3
<i>Archips podana</i> (Large Fruit-tree Tortrix)	N42565899	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1
<i>Arctia caja</i> (Garden Tiger)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Autographa jota</i> (Plain Golden Y)	N42565895	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	3
<i>Autographa pulchrina</i> (Beautiful Golden Y)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	2
<i>Autographa pulchrina</i> (Beautiful Golden Y)	N42565898	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	2
<i>Autographa pulchrina</i> (Beautiful Golden Y)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	3
<i>Autographa pulchrina</i> (Beautiful Golden Y)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Axylia putris</i> (Flame)	N42565896	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	20
<i>Axylia putris</i> (Flame)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	20
<i>Biston betularia</i> (Peppered Moth)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	3
<i>Biston betularia</i> (Peppered Moth)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	2



## Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Cabera exanthemata</i> (Common Wave)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Cabera exanthemata</i> (Common Wave)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	4
<i>Cabera exanthemata</i> (Common Wave)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Cabera exanthemata</i> (Common Wave)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Calliteara pudibunda</i> (Pale Tussock)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Campaea margaritata</i> (Light Emerald)	N42565898	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1
<i>Campaea margaritata</i> (Light Emerald)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	3
<i>Campaea margaritata</i> (Light Emerald)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Catoptria margaritella</i> (Pearl-band Grass Veneer)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Chloroclystis rectangularata</i> (Green Pug)	N42565896	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	2
<i>Chloroclystis v-ata</i> (V-Pug)	N42565897	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1
<i>Chrysoteuchia culmella</i> (Garden Grass-veneer)	N42565895	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	10
<i>Chrysoteuchia culmella</i> (Garden Grass-veneer)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	3
<i>Colostygia pectinataria</i> (Green Carpet)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	2
<i>Cucullia umbratica</i> (Shark)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Deilephila elpenor</i> (Elephant Hawk-moth)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Diachrysia chrysitis</i> (Burnished Brass)	N42565897	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	4
<i>Diachrysia chrysitis</i> (Burnished Brass)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	2
<i>Diaphora mendica</i> (Muslin Moth)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	4
<i>Diarsia brunnea</i> (Purple Clay)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	3

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Diarsia mendica</i> (Ingrailed Clay)	N42595874	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	2
<i>Diarsia rubi</i> (Small Square-spot)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light tarp.	AM	1
<i>Diarsia rubi</i> (Small Square-spot)	N42595874	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	3
<i>Diarsia rubi</i> (Small Square-spot)	N42565900	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1
<i>Dicallomera fascelina</i> (Dark Tussock)	N422591	16.05.15	Fen: valley mire, basic	Field observation.	AM	1
<i>Dicallomera fascelina</i> (Dark Tussock)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1
<i>Drepana falcataria</i> (Pebble Hook-tip)	N42565896	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	2
<i>Ecliptopera silaceata</i> (Small Phoenix)	N425589	18.06.15	Scrub: dense/continuous, neutral	Field obs.	AM	1
<i>Ecliptopera silaceata</i> (Small Phoenix)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Eilema deplana</i> (Buff Footman)	N42565900	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	11
<i>Eilema deplana</i> (Buff Footman)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	14
<i>Eilema deplana</i> (Buff Footman)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	4
<i>Elachista argentella</i> (a micro-moth)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Eligmodonta ziczac</i> (Pebble Prominent)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Eligmodonta ziczac</i> (Pebble Prominent)	N42595874	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Eligmodonta ziczac</i> (Pebble Prominent)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	3
<i>Eligmodonta ziczac</i> (Pebble Prominent)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Endrosis sarcitrella</i> (White-shouldered House Moth)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	2
<i>Epirrhoe alternata</i> (Common Carpet)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	3
<i>Epirrhoe alternata</i> (Common Carpet)	N42565895	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Epirrhoe alternata</i> (Common Carpet)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	2
<i>Eucosma campoliliana</i> (a tortrix moth)	N42565897	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	3
<i>Eucosma cana</i> (a tortrix moth)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Eucosma cana</i> (a tortrix moth)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	3
<i>Eudonia angustea</i> (a pyralid moth)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Eudonia crataegella</i> (a pyralid moth)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	3
<i>Eudonia mercurella</i> (a pyralid moth)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	15
<i>Eudonia mercurella</i> (a pyralid moth)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	6
<i>Eulithis pyraliata</i> (Barred Straw)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Eulithis testata</i> (Chevron)	N42565900	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1
<i>Eupithecia absinthiata</i> (Wormwood Pug)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Eupithecia centaureata</i> (Lime-speck Pug)	N42565896	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	20
<i>Eupithecia tenuiata</i> (Slender Pug)	N42565899	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1
<i>Euplexia lucipara</i> (Small Angle Shades)	N42565899	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	8
<i>Euplexia lucipara</i> (Small Angle Shades)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Eurrhyncha hortulata</i> (Small Magpie)	N42565897	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	2
<i>Eurrhyncha hortulata</i> (Small Magpie)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Evergestis forficalis</i> (Garden Pebble)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	3
<i>Falcaria lacertinaria</i> (Scalloped Hook-tip)	N42565897	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1
<i>Falcaria lacertinaria</i> (Scalloped Hook-tip)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1

## Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Furcula furcula</i> (Sallow Kitten)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Gymnoscelis rufifasciata</i> (Double-striped Pug)	N42565897	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	2
<i>Gypsonoma dealbana</i> (a tortrix moth)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Hadena rivularis</i> (Campion)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	24
<i>Hadena rivularis</i> (Campion)	N42565898	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1
<i>Hedya ochroleucana</i> (a tortrix moth)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Hemithea aestivaria</i> (Common Emerald)	N42565895	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	4
<i>Hepialus fusconebulosa</i> (Map-winged Swift)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	2
<i>Herminea tarsipennalis</i> (Fan-foot)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	3
<i>Herminia grisealis</i> (Small Fan-foot)	N425589	18.06.15	Scrub: dense/continuous, neutral	Field obs.	AM	1
<i>Hydriomena furcata</i> (July Highflyer)	N42565897	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	8
<i>Hydriomena furcata</i> (July Highflyer)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	4
<i>Hypena crassalis</i> (Beautiful Snout)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Hypena proboscidalis</i> (Snout)	N42565900	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	3
<i>Idaea aversata</i> (Riband Wave)	N42565897	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	12
<i>Idaea aversata</i> (Riband Wave)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	6
<i>Idaea biselata</i> (Small Fan-footed Wave)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Idaea dimidiata</i> (Single-dotted Wave)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Lacanobia oleracea</i> (Bright-line Brown-eye)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	3
<i>Lacanobia oleracea</i> (Bright-line Brown-eye)	N42565896	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	7

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Lacanobia oleracea</i> (Bright-line Brown-eye)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Lampropteryx suffumata</i> (Water Carpet)	N422591	16.05.15	Fen: valley mire, basic	Field observation.	AM	1
<i>Laothoe populi</i> (Poplar Hawk-moth)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Laothoe populi</i> (Poplar Hawk-moth)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Lasiocampa quercus</i> (Oak Eggar)	N42565896	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	3
<i>Lomaspilis marginata</i> (Clouded Border)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	4
<i>Lomaspilis marginata</i> (Clouded Border)	N42595874	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	3
<i>Lomaspilis marginata</i> (Clouded Border)	N42565897	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	20
<i>Lomaspilis marginata</i> (Clouded Border)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	15
<i>Lomaspilis marginata</i> (Clouded Border)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	3
<i>Melanchra persicariae</i> (Dot Moth)	N42565897	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	2
<i>Mesapamea secalis</i> agg. (Common Rustic)	N42565897	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	3
<i>Mesapamea secalis</i> agg. (Common Rustic)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	4
<i>Mesapamea secalis</i> agg. (Common Rustic)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Mesoleuca albicillata</i> (Beautiful Carpet)	N42565897	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1
<i>Micropteryx calthella</i> (a micro-moth)	N422591	16.05.15	Fen: valley mire, basic	On Caltha.	AM	abundant
<i>Mythimna impura</i> (Smoky Wainscot)	N42565895	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	7
<i>Mythimna impura</i> (Smoky Wainscot)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	2
<i>Mythimna impura</i> (Smoky Wainscot)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	2
<i>Noctua pronuba</i> (Large Yellow Underwing)	N42565895	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	8

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Noctua pronuba</i> (Large Yellow Underwing)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	5
<i>Noctua pronuba</i> (Large Yellow Underwing)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	3
<i>Notodonta dromedarius</i> (Iron Prominent)	N42565896	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1
<i>Notodonta dromedarius</i> (Iron Prominent)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	2
<i>Ochropleura plecta</i> (Flame Shoulder)	N42565895	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	12
<i>Ochropleura plecta</i> (Flame Shoulder)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	15
<i>Olethreutes lacunana</i> (a tortrix moth)	N42595874	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Olethreutes lacunana</i> (a tortrix moth)	N425589	18.06.15	Scrub: dense/continuous, neutral	Field obs.	AM	1
<i>Olethreutes lacunana</i> (a tortrix moth)	N42565900	18.07.15	Scrub: dense/continuous, neutral	125w Mv light trap.	AM	6
<i>Oligia strigilis</i> (Marbled Minor)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Opisthograptis luteolata</i> (Brimstone Moth)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	4
<i>Opisthograptis luteolata</i> (Brimstone Moth)	N42565895	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	20
<i>Opisthograptis luteolata</i> (Brimstone Moth)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	4
<i>Orthonama vittata</i> (Oblique Carpet)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	2
<i>Orthonama vittata</i> (Oblique Carpet)	N42565897	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1
<i>Ourapteryx sambucaria</i> (Swallow-tailed Moth)	N42565895	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	2
<i>Pandemis cerasana</i> (Barred Fruit-tree Tortrix)	N42565900	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1
<i>Peribatodes rhomboidaria</i> (Willow Beauty)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Perizoma alchemillata</i> (Small Rivulet)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	2
<i>Phalera bucephala</i> (Buff-tip)	N42565897	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Pheosia tremula</i> (Swallow Prominent)	N42565897	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	2
<i>Pheosia tremula</i> (Swallow Prominent)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Piniphila bifasciata</i> (Pine marble)	N42595874	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Pterapherapteryx sexalata</i> (Small Seraphim)	N42565900	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	6
<i>Pterapherapteryx sexalata</i> (Small Seraphim)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	2
<i>Rheumaptera undulata</i> (Scallop Shell)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Rheumaptera undulata</i> (Scallop Shell)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Rivula sericealis</i> (Straw Dot)	N42565895	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	3
<i>Scoparia subfusca</i> (a pyralid moth)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	2
<i>Scopula immutata</i> (Lesser Cream Wave)	N42565900	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1
<i>Selenia dentaria</i> (Early Thorn)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Smerinthus ocellata</i> (Eyed Hawk-moth)	N42595874	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Spilonota ocellana</i> (Bud Moth)	N42565899	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	3
<i>Spilosoma lubricipeda</i> (White Ermine)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	9
<i>Spilosoma lubricipeda</i> (White Ermine)	N42565898	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	5
<i>Spilosoma lubricipeda</i> (White Ermine)	N42755853	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	2
<i>Spilosoma luteum</i> (Buff Ermine)	N42565897	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	5
<i>Teleiodes proximella</i> (a micro-moth)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	1
<i>Thera britannica</i> (Spruce Carpet)	N42565900	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1
<i>Thumatha senex</i> (Round-winged Muslin)	N42565895	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	30+

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Thumatha senex</i> (Round-winged Muslin)	N42595874	18.07.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	10
<i>Tinea semifulvoella</i> (a micro-moth)	N42565899	18.07.15	Scrub: dense/continuous, neutral	125w MV light trap.	AM	1
<i>Xanthorhoe montanata</i> (Silver-ground Carpet)	N42965894	17.06.15	Scrub: dense/continuous, neutral	Actinic light trap.	AM	7
<b>DIPTERA: RHAGIONIDAE</b>						
<i>Rhagio scolopacea</i> (a snipe fly)	N42525899	10.06.15	Fen: valley mire, basic	On tall vegetation near margins.	RA	several
<b>DIPTERA: TABANIDAE</b>						
<i>Haematopota pluvialis</i> (a horse fly)	N425588	18.07.15	Scrub: dense/continuous, neutral	Swept, bog wood.	AM	1
<i>Hybomitra bimaculata</i> (a horse fly)	N42265912	16.06.15	Fen: valley mire, basic	Swept from deep moss among Equisetum, fen.	RA	1
<b>DIPTERA: STRATIOMYIDAE</b>						
<i>Microchrysa cyaneiventris</i> (a soldier fly)	N425588	18.07.15	Scrub: dense/continuous, neutral	Swept, bog wood.	AM	1
<i>Nemotelus pantherinus</i> (a soldier fly)	N42415907	08.07.15	Fen: valley mire, basic	Swept in tall vegetation.	RA	1
<i>Oplodontha viridula</i> (a soldier fly)	N42415907	08.07.15	Fen: valley mire, basic	Swept in dense vegetation.	RA	1
<i>Oplodontha viridula</i> (a soldier fly)	N425588	18.07.15	Scrub: dense/continuous, neutral	Swept, bog wood.	AM	1
<i>Oplodontha viridula</i> (a soldier fly)	N42105947	13.08.15	Fen: valley mire, basic	Swept off Angelica.	RA	several
<b>DIPTERA: SYRPHIDAE</b>						
<i>Cheilosia albitarsis</i> (a hoverfly)	N425588	18.07.15	Scrub: dense/continuous, neutral	Swept, bog wood.	AM	1
<i>Cheilosia albitarsis</i> (a hoverfly)	N427585	16.05.15	Scrub: dense/continuous, neutral	Swept, dry wood.	AM	1
<i>Chrysogaster solstitialis</i> (a hoverfly)	N42405909	08.07.15	Fen: valley mire, basic	Swept in dense vegetation.	RA	2
<i>Eristalis arbustorum</i> (a hoverfly)	N42065955	13.08.15	Fen: valley mire, basic	On Angelica.	RA	1
<i>Eristalis pertinax</i> (a hoverfly)	N425588	18.07.15	Scrub: dense/continuous, neutral	Swept, bog wood.	AM	several
<i>Eristalis pertinax</i> (a hoverfly)	N42605881	08.07.15	Fen: valley mire, basic	Flowers by	RA	frequent



Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
				walkway.		
<i>Helophilus pendulus</i> (a hoverfly)	N427585	16.05.15	Scrub: dense/continuous, neutral	Swept, dry wood.	AM	1
<i>Leucozона lucorum</i> (a hoverfly)	N427585	16.05.15	Scrub: dense/continuous, neutral	Swept, dry wood.	AM	2
<i>Leucozона lucorum</i> (a hoverfly)	N42605881	08.07.15	Fen: valley mire, basic	Fen vegetation by walkway.	RA	2
<i>Melanostoma scalare</i> (a hoverfly)	N425588	18.07.15	Scrub: dense/continuous, neutral	Swept, bog wood.	AM	1
<i>Neoscia meticulosa</i> (a hoverfly)	N427585	16.05.15	Scrub: dense/continuous, neutral	Swept, dry wood.	AM	1
<i>Neoscia tenur</i> (a hoverfly)	N42405909	08.07.15	Fen: valley mire, basic	Swept in dense vegetation.	RA	1 pair
<i>Parhelophilus consimilis</i> (a hoverfly)	N42605881	08.07.15	Fen: valley mire, basic	Fen vegetation by walkway.	RA	several
<i>Parhelophilus consimilis</i> (a hoverfly)	N42605880	13.08.15	Fen: valley mire, basic	Fen vegetation by walkway.	RA	several
<i>Platycheirus albimanus</i> (a hoverfly)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1
<i>Pyrophaena granditarsa</i> (a hoverfly)	N42045955	13.08.15	Fen: valley mire, basic	Around umbels in fen.	RA	frequent
<i>Pyrophaena granditarsa</i> (a hoverfly)	N42075952	13.08.15	Fen: valley mire, basic	Among tall vegetation.	RA	occasional
<i>Rhingia campestris</i> (a hoverfly)	N42695879	16.06.15	Boundaries, intact hedge, species-rich	At brambles, hedgerow.	RA	several
<i>Rhingia campestris</i> (a hoverfly)	N425588	18.07.15	Scrub: dense/continuous, neutral	Swept, bog wood.	AM	1
<i>Sericomyia silentis</i> (a hoverfly)	N425588	18.07.15	Scrub: dense/continuous, neutral	Swept, bog wood.	AM	1
<i>Syrphus ribesii</i> (a hoverfly)	N42045955	13.08.15	Fen: valley mire, basic	Around Angelica.	RA	several
<i>Syrphus torvus</i> (a hoverfly)	N427585	16.05.15	Scrub: dense/continuous, neutral	Swept, dry wood.	AM	1
<b>SYMPHYTA</b>						
<i>Arge pagana</i> (a sawfly)	N42625900	16.06.15	Cultivated farmland, mainly grass and hedge boundaries.	At brambles, field.	RA	1
<i>Athalia circularis</i> (a sawfly)	N42415907	08.07.15	Fen: valley mire, basic	Swept in tall vegetation.	RA	1
<b>ACULEATA</b>						

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Bombus lucorum</i> (White-tailed Bumble Bee)	N428586	10.06.15	Scrub: dense/continuous, acidic	Vegetation by path.	RA	1
<i>Bombus pascuorum</i> (Common Carder Bee)	N428586	10.06.15	Scrub: dense/continuous, acidic	Vegetation by path.	RA	several
<i>Bombus terrestris</i> (Buff-tailed Bumble Bee)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1
<i>Formica lemani</i> (an ant)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	Present
<i>Formica lemani</i> (an ant)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	Present
<i>Formica lemani</i> (an ant)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	Present
<i>Myrmica rubra</i> (Red Ant)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	Present
<i>Myrmica ruginodis</i> (an ant)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	Present
<i>Myrmica ruginodis</i> (an ant)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	Present
<i>Myrmica ruginodis</i> (an ant)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	Present
<i>Myrmica ruginodis</i> (an ant)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	Present
<i>Myrmica ruginodis</i> (an ant)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	Present
<i>Myrmica ruginodis</i> (an ant)	N423592	10.06 – 08.07.15	Mire: valley bog, open Sphagnum carpets	Moss pillows with Cladium.	RA	Present
<b>DERMAPTERA</b>						
<i>Forficula auricularia</i> (Common Earwig)	N42605887	16.05.15	Fen Carr Woodland	Leaf litter.	AM	1
<b>COLEOPTERA</b>						
<i>Acalyptus carpini</i> (a weevil)	N42295920	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Agabus affinis</i> (a water beetle)	N42315909	16.06.15	Fen: valley mire, basic	Swept in shallow fen.	RA	1
<i>Agabus affinis</i> (a water beetle)	N42235917	16.06.15	Open water: small mesotrophic ponds	Deep acid pool.	RA	several
<i>Agabus affinis</i> (a water beetle)	N42045955	13.08.15	Fen: valley mire, basic	Small pond with bogbean.	RA	1
<i>Agabus affinis</i> (a water beetle)	N423589	12.05.15	Fen: valley mire, basic	Swept, mossy mire with	BN	Present

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
				flooded hollows.		
<i>Agabus bipustulatus</i> (a water beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1 pair
<i>Agabus bipustulatus</i> (a water beetle)	N423589	12.05.15	Fen: valley mire, basic	Swept, mossy mire with flooded hollows.	BN	Present
<i>Agabus unguicularis</i> (a water beetle)	N42065955	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	3
<i>Agabus unguicularis</i> (a water beetle)	N42105947	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Agabus unguicularis</i> (a water beetle)	N423589	04.06.15	Fen: valley mire, basic	Swept, mossy mire with flooded hollows.	BN	Present
<i>Agonum fuliginosum</i> (a ground beetle)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1
<i>Agonum fuliginosum</i> (a ground beetle)	N42605887	16.05.15	Fen Carr Woodland	Leaf litter.	AM	2
<i>Agonum fuliginosum</i> (a ground beetle)	N42525899	16.05.15	Fen: valley mire, basic	In moss.	AM	1
<i>Agonum fuliginosum</i> (a ground beetle)	N421594	17.06.15	Fen: valley mire, basic	Sieving vegetation.	AM	1
<i>Agonum muelleri</i> (a ground beetle)	N42385904	16.05.15	Fen: valley mire, basic	Sweeping vegetation.	AM	1
<i>Agonum muelleri</i> (a ground beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	1
<i>Agonum thoreyi</i> (a ground beetle)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1
<i>Agonum thoreyi</i> (a ground beetle)	N424587	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	2
<i>Agonum thoreyi</i> (a ground beetle)	N42525899	16.05.15	Fen: valley mire, basic	In moss.	AM	3
<i>Agonum thoreyi</i> (a ground beetle)	N42385904	16.05.15	Fen: valley mire, basic	Sweeping vegetation.	AM	1
<i>Agonum thoreyi</i> (a ground beetle)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Aleochara lanuginosa</i> (a rove beetle)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with <i>Cladium</i> .	RA	1
<i>Alophus triguttatus</i> (a weevil)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with <i>Cladium</i> .	RA	1
<i>Altica longicollis</i> (a leaf beetle)	N42235933	16.05.15	Fen: valley mire, basic	Sweeping	AM	2

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
				vegetation.		
<i>Altica longicollis</i> (a leaf beetle)	N42385907	16.05.15	Fen: valley mire, basic	Sweeping vegetation.	AM	1
<i>Altica longicollis</i> (a leaf beetle)	N426589	17.06.15	Scrub: dense/continuous, neutral	Tree trunk wrapping	AM	4
<i>Altica longicollis</i> (a leaf beetle)	N425586	17.06.15	Grassland: marshy, lowland	Swept, marshy meadow	AM	1
<i>Amara plebeja</i> (a ground beetle)	N42605887	16.05.15	Fen Carr Woodland	Leaf litter, bog wood.	AM	1
<i>Amischa analis</i> (a rove beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	2
<i>Anacaena globulus</i> (a scavenger water beetle)	N42605887	16.05.15	Fen Carr Woodland	In leaf litter.	AM	3
<i>Anacaena globulus</i> (a scavenger water beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	Present
<i>Anacaena globulus</i> (a scavenger water beetle)	N423589	12.05.15	Fen: valley mire, basic	Open moss tussocks and pools	BN	Present
<i>Anacaena globulus</i> (a scavenger water beetle)	N423589	04.06.15	Fen: valley mire, basic	Open moss tussocks and pools	BN	Present
<i>Anacaena limbata</i> (a scavenger water beetle)	N422592	12.05.15	Fen: valley mire, basic	Open moss tussocks and pools	RA	several
<i>Anacaena lutescens</i> (a scavenger water beetle)	N423589	04.06.15	Fen: valley mire, basic	Open moss tussocks and pools	BN	Present
<i>Anaspis regimbarti</i> (a tumbling flower beetle)	N427585	17.06.15	Scrub: dense/continuous, neutral	Tree trunk wrapping.	AM	1
<i>Anotylus rugosus</i> (a rove beetle)	N42575894	10.06.15	Fen: valley mire, basic	Sweeping along boardwalk.	RA	1
<i>Anotylus rugosus</i> (a rove beetle)	N42055955	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Anthobium unicolor</i> (a rove beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	1
<i>Asemum striatum</i> (a longhorn beetle)	N423589	04.06.15	Fen: valley mire, basic	On pine stem, wooded area	BN	1
<i>Atheta graninicola</i> (a rove beetle)	N42365911	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	2
<i>Atheta graninicola</i> (a rove beetle)	N421594	17.06.15	Fen: valley mire, basic	Sieving	AM	1

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
				vegetation.		
<i>Bagous lutosus</i> (a weevil)	N42385904	16.05.15	Fen: valley mire, basic	sweeping vegetation.	AM	13
<i>Bagous lutosus</i> (a weevil)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	3
<i>Bagous lutosus</i> (a weevil)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	2
<i>Bagous lutosus</i> (a weevil)	N423592	10.06 – 08.07.15	Mire: valley bog, open Sphagnum carpets	Moss pillows with Cladium.	RA	5
<i>Bagous lutosus</i> (a weevil)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	11
<i>Barypeithes araneiformis</i> (Spider weevil)	N42605887	16.05.15	Fen Carr Woodland	In moss etc.	AM	1
<i>Barypeithes araneiformis</i> (Spider weevil)	N427585	17.06.15	Scrub: dense/continuous, neutral	Tree trunk wrapping.	AM	1
<i>Bolitobius cingulatus</i> (a rove beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	1
<i>Brachygluta fossulata</i> (a short-winged mould beetle)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Brachygluta haematica</i> (a short-winged mould beetle)	N42615872	10.6.15	Scrub: dense/continuous, acidic	Under bark of conifer log.	RA	1
<i>Brachygluta haematica</i> (a short-winged mould beetle)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Bradycellus ruficollis</i> (a ground beetle)	N42575880	16.05.15	Scrub: dense/continuous, acidic	In moss, heather.	AM	1
<i>Bryaxis bulbifer</i> (a short-winged mould beetle)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Byturus tomentosus</i> (Raspberry Beetle)	N42605887	16.05.15	Fen Carr Woodland	Swept.	AM	1
<i>Cartodere bifasciatus</i> (a mould beetle)	N42605890	10.06.15	Fen: valley mire, basic	Sweeping along boardwalk.	RA	1
<i>Cartodere nodifer</i> (a mould beetle)	N423592	10.06 – 08.07.15	Mire: valley bog, open Sphagnum carpets	Moss pillows with Cladium.	RA	1
<i>Cercyon analis</i> (a scavenger water beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	1
<i>Cercyon analis</i> (a scavenger water beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1
<i>Chalcoides aurea</i> (Willow Flea Beetle)	N42605887	16.05.15	Fen Carr Woodland	Beaten off willow.	AM	1
<i>Chalcoides aurea</i> (Willow Flea Beetle)	N42605890	10.06.15	Fen: valley mire, basic	Goat willow.	RA	2
<i>Chalcoides aurea</i> (Willow Flea Beetle)	N425586	17.06.15	Grassland: marshy, lowland	Swept, marshy	AM	2

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
				meadow.		
<i>Chalcoides fulvicornis</i> (a leaf beetle)	N425586	17.06.15	Grassland: marshy, lowland	Swept, marshy meadow.	AM	1
<i>Chilocorus bipustulatus</i> (a ladybird)	N42575880	16.05.15	Scrub: dense/continuous, acidic	Swept off Calluna.	AM	1
<i>Chrysolina polita</i> (Knotgrass Leaf Beetle)	N421594	17.06.15	Fen: valley mire, basic	Sieving vegetation.	AM	2
<i>Cidnorhinus quadrimaculatus</i> (Small Nettle Weevil)	N42605887	16.05.15	Fen Carr Woodland	Swept off nettle.	AM	1
<i>Coccidula rufa</i> (a ladybird)	N425586	17.06.15	Grassland: marshy, lowland	Swept, marshy meadow.	AM	1
<i>Coelostoma orbiculare</i> (a scavenger water beetle)	N423592	10.06 – 08.07.15	Mire: valley bog, open Sphagnum carpets	Moss pillows with Cladium.	RA	1
<i>Coelostoma orbiculare</i> (a scavenger water beetle)	N423589	12.05.15	Fen: valley mire, basic	Mossy mire in flooded hollows.	BN	Present
<i>Corticicara gibbosa</i> (a mould beetle)	N423592	10.06 – 08.07.15	Mire: valley bog, open Sphagnum carpets	Moss pillows with Cladium.	RA	1
<i>Cryptopleurum minutum</i> (a scavenger water beetle)	N425586	17.06.15	Grassland: marshy, lowland	Swept, marshy meadow.	AM	1
<i>Curculio salicivorus</i> (Willow Gall Weevil)	N42605887	16.05.15	Fen Carr Woodland	Beaten off willow.	AM	1
<i>Cyphon coarctatus</i> (a marsh beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	3
<i>Cyphon coarctatus</i> (a marsh beetle)	N427585	17.06.15	Scrub: dense/continuous, neutral	Tree trunk wrapping.	AM	4
<i>Cyphon coarctatus</i> (a marsh beetle)	N425586	17.06.15	Grassland: marshy, lowland	Swept, marshy meadow.	AM	2
<i>Cyphon hilaris</i> (a marsh beetle)	N424587	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1
<i>Cyphon hilaris</i> (a marsh beetle)	N42605887	16.05.15	Fen Carr Woodland	In moss.	AM	1
<i>Cyphon hilaris</i> (a marsh beetle)	N42575880	16.05.15	Scrub: dense/continuous, acidic	Swept.	AM	1
<i>Cyphon padi</i> (a marsh beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	1
<i>Cyphon padi</i> (a marsh beetle)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	1
<i>Cyphon padi</i> (a marsh beetle)	N426589	17.06.15	Scrub: dense/continuous, neutral	Tree trunk wrapping.	AM	1
<i>Cyphon padi</i> (a marsh beetle)	N427585	17.06.15	Scrub: dense/continuous, neutral	Tree trunk wrapping.	AM	1

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Cyphon punctipennis</i> (a marsh beetle)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Cyphon variabilis</i> (a marsh beetle)	N42385904	16.05.15	Fen: valley mire, basic	Sweeping vegetation.	AM	1
<i>Cyphon variabilis</i> (a marsh beetle)	N42605890	10.06.15	Fen: valley mire, basic	Sweeping along boardwalk.	RA	1
<i>Cyphon variabilis</i> (a marsh beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	2
<i>Cyphon variabilis</i> (a marsh beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	4
<i>Cyphon variabilis</i> (a marsh beetle)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Cyphon variabilis</i> (a marsh beetle)	N427585	17.06.15	Scrub: dense/continuous, neutral	Tree trunk wrapping.	AM	1
<i>Cyphon variabilis</i> (a marsh beetle)	N421594	17.06.15	Fen: valley mire, basic	Sieving vegetation.	AM	several
<i>Cytilus sericeus</i> (a pill beetle)	N42275911	16.06.15	Open water: small mesotrophic ponds	Shallow outflow of pool.	RA	7
<i>Cytilus sericeus</i> (a pill beetle)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	2
<i>Cytilus sericeus</i> (a pill beetle)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	2
<i>Cytilus sericeus</i> (a pill beetle)	N423590	17.06.15	Fen: valley mire, basic	Swept, mossy fen.	AM	3
<i>Dalopius marginatus</i> (a click beetle)	N42605887	16.05.15	Fen Carr Woodland	Leaf litter, bog wood.	AM	1
<i>Dalopius marginatus</i> (a click beetle)	N42575880	16.05.15	Scrub: dense/continuous, acidic	Swept off willow.	AM	1
<i>Dalopius marginatus</i> (a click beetle)	N425586	17.06.15	Grassland: marshy, lowland	Swept, marshy meadow.	AM	1
<i>Dinaraea linearis</i> (a rove beetle)	N42615872	10.06.15	Scrub: dense/continuous, acidic	Under bark of conifer log.	RA	1
<i>Dromius quadrimaculatus</i> (a ground beetle)	N427585	17.06.15	Scrub: dense/continuous, neutral	Tree trunk wrapping.	AM	1
<i>Dromius quadrinotatus</i> (a ground beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	15
<i>Drusilla canaliculata</i> (a rove beetle)	N425587	10.06 – 08.07.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	1
<i>Drusilla canaliculata</i> (a rove beetle)	N423592	10.06 – 08.07.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	28

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Drusilla canaliculata</i> (a rove beetle)	N423592	10.06 – 08.07.15	Mire: valley bog, open Sphagnum carpets	Moss pillows with Cladium.	RA	55
<i>Drusilla canaliculata</i> (a rove beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1
<i>Drusilla canaliculata</i> (a rove beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	12
<i>Drusilla canaliculata</i> (a rove beetle)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Dryocoetinus villosus</i> (a bark or ambrosia beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1
<i>Dytiscus semisulcatus</i> (a water beetle)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1
<i>Enochrus coarctatus</i> (a scavenger water beetle)	N424587	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1
<i>Enochrus coarctatus</i> (a scavenger water beetle)	N42235917	16.06.15	Open water: small mesotrophic ponds	Deep acid pool.	RA	1
<i>Enochrus coarctatus</i> (a scavenger water beetle)	N423589	12.05.15	Fen: valley mire, basic	Mossy mire in flooded hollows.	BN	Present
<i>Enochrus ochropterus</i> (a scavenger water beetle)	N42235917	16.06.15	Open water: small mesotrophic ponds	Deep acid pool.	RA	1
<i>Enochrus ochropterus</i> (a scavenger water beetle)	N423590	17.06.15	Fen: valley mire, basic	Swept, mossy fen.	AM	1
<i>Erichsonius cinerascens</i> (a rove beetle)	N42605890	10.06.15	Fen: valley mire, basic	Sweeping along boardwalk.	RA	2
<i>Euplectus</i> sp. indet. (A rove beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1
<i>Eutrichapion ervi</i> (a seed weevil)	N425586	17.06.15	Grassland: marshy, lowland	Swept, marshy meadow.	AM	1
<i>Eutrichapion viciae</i> (a seed weevil)	N425586	17.06.15	Grassland: marshy, lowland	Swept, marshy meadow.	AM	1
<i>Fagniezia impressa</i> (a short-winged mould beetle)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Galerucella lineola</i> (Brown Willow Beetle)	N42575880	16.05.15	Scrub: dense/continuous, acidic	General sweeping.	AM	frequent
<i>Galerucella lineola</i> (Brown Willow Beetle)	N42635884	10.06.15	Scrub: dense/continuous, acidic	Beaten off goat willow.	RA	several
<i>Galerucella lineola</i> (Brown Willow Beetle)	N42575894	10.06.15	Fen: valley mire, basic	On goat willow.	RA	1
<i>Galerucella lineola</i> (Brown Willow Beetle)	N42335913	16.06.15	Fen: valley mire, basic	In moss.	RA	1
<i>Galerucella lineola</i> (Brown Willow Beetle)	N425586	17.06.15	Grassland: marshy, lowland	Swept, marshy meadow.	AM	several



Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Galerucella pusilla</i> (a leaf beetle)	N423592	10.06.15	Fen: valley mire, basic	On meadowsweet leaves.	RA	1
<i>Galerucella pusilla</i> (a leaf beetle)	N425586	17.06.15	Grassland: marshy, lowland	Swept, marshy meadow.	AM	1
<i>Galerucella tenella</i> (a leaf beetle)	N421594	17.06.15	Fen: valley mire, basic	Sieving vegetation.	AM	2
<i>Graptodytes granularis</i> (a water beetle)	N422592	12.05.15	Fen: basin mire, basic	Treading fen egetation.	RA	1
<i>Graptodytes granularis</i> (a water beetle)	N42105947	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Graptodytes granularis</i> (a water beetle)	N423589	12.05.15	Fen: valley mire, basic	Mossy mire with flooded hollows.	BN	Present
<i>Gymnetron beccabungae</i> (a weevil)	N421594	17.06.15	Fen: valley mire, basic	Sieving vegetation.	AM	1
<i>Gymnusa brevicollis</i> (a rove beetle)	N42235933	16.05.15	Fen: valley mire, basic	Sweeping vegetation.	AM	1
<i>Gymnusa brevicollis</i> (a rove beetle)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	1
<i>Helophorus brevipalpis</i> (a scavenger water beetle)	N42055955	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Helophorus grandis</i> (a scavenger water beetle)	N42235917	16.06.15	Open water: small mesotrophic ponds	Deep acid pool.	RA	several
<i>Hydroporus angustatus</i> (a water beetle)	N42145942	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Hydroporus angustatus</i> (a water beetle)	N423589	04.06.15	Fen: valley mire, basic	Mossy mire with flooded hollows.	BN	present
<i>Hydroporus erythrocephalus</i> (a water beetle)	N424587	12.05.15	Fen: basin mire, basic	Small acid pools.	RA	1
<i>Hydroporus erythrocephalus</i> (a water beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	2
<i>Hydroporus erythrocephalus</i> (a water beetle)	N423589	12.05.15	Fen: valley mire, basic	Mossy mire with flooded hollows.	BN	present
<i>Hydroporus glabriusculus</i> (a water beetle)	N424587	12.05.15	Fen: basin mire, basic	Swept, eget acid pools.	RA	1
<i>Hydroporus glabriusculus</i> (a water beetle)	N42055955	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1 pair
<i>Hydroporus glabriusculus</i> (a water beetle)	N42405909	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Hydroporus glabriusculus</i> (a water beetle)	N423589	12.05.15	Fen: valley mire, basic	Mossy mire with flooded hollows.	BN	present
<i>Hydroporus memnonius</i> (a water beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1
<i>Hydroporus memnonius</i> (a water beetle)	N423589	12.05.15	Fen: valley mire, basic	Mossy mire with flooded hollows.	BN	present
<i>Hydroporus nigrita</i> (a water beetle)	N42525899	16.05.15	Fen: valley mire, basic	Swept in shallow pools.	AM	several
<i>Hydroporus nigrita</i> (a water beetle)	N42145942	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	several
<i>Hydroporus obscurus</i> (a water beetle)	N42145942	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Hydroporus palustris</i> (a water beetle)	N42065955	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Hydroporus scalesianus</i> (a water beetle)	N423589	12.05.15	Fen: valley mire, basic	Mossy mire with flooded hollows.	BN	present
<i>Hydroporus striola</i> (a water beetle)	N423589	12.05.15	Fen: valley mire, basic	Mossy mire with flooded hollows.	BN	present
<i>Hydroporus tristis</i> (a water beetle)	N42415907	08.07.15	Fen: valley mire, basic	Swept in wet moss.	RA	2
<i>Hydroporus tristis</i> (a water beetle)	N42145942	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	2
<i>Hydroporus umbrosus</i> (a water beetle)	N424587	12.05.15	Fen: basin mire, basic	Small egetation.	RA	1
<i>Hydroporus umbrosus</i> (a water beetle)	N42065955	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Hydrothassa marginella</i> (a leaf beetle)	N42525899	16.05.15	Fen: valley mire, basic	In moss.	AM	1
<i>Hydrothassa marginella</i> (a leaf beetle)	N427585	17.06.15	Scrub: dense/continuous, neutral	Tree trunk wrapping.	AM	frequent
<i>Hygronoma dimidiata</i> (a rove beetle)	N42345903	08.07.15	Fen: valley mire, basic	Swept in wet moss.	RA	1
<i>Hygrotus inaequalis</i> (a water beetle)	N42275911	16.06.15	Open water: small mesotrophic ponds	Swept, deep pool.	RA	1
<i>Hypera arator</i> (a weevil)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Ilybius aenescens</i> (a water beetle)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Ilybius guttiger</i> (a water beetle)	N42065955	13.08.15	Fen: valley mire, basic	Swept from fen	RA	1

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Ilybius guttiger</i> (a water beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	vegetation. Tussocky wooded bog.	RA	2
<i>Ilybius guttiger</i> (a water beetle)	N423589	04.06.15	Fen: valley mire, basic	Mossy mire with flooded hollows.	BN	present
<i>Ilybius montanus</i> (a water beetle)	N42525899	16.05.15	Fen: valley mire, basic	Swept in shallow pools.	AM	2
<i>Ilybius quadriguttatus</i> (a water beetle)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1
<i>Ilybius quadriguttatus</i> (a water beetle)	N42235917	16.06.15	Open water: small mesotrophic ponds	Deep acid pool.	RA	1
<i>Ilybius quadriguttatus</i> (a water beetle)	N42065955	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Ilybius quadriguttatus</i> (a water beetle)	N42105947	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Ilybius quadriguttatus</i> (a water beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	1
<i>Ischnopterapion virens</i> (a seed weevil)	N42575894	10.06.15	Fen: valley mire, basic	Sweeping along boardwalk.	RA	1
<i>Kateretes rufilabris</i> (a pollen or sap beetle)	N425586	17.06.15	Grassland: marshy, lowland	Swept, marshy meadow.	AM	1
<i>Laccornis oblongus</i> (a water beetle)	N423589	12.05.15	Fen: valley mire, basic	Mossy mire with flooded hollows.	BN	present
<i>Lathrobium brunnipes</i> (a rove beetle)	N42575880	16.05.15	Scrub: dense/continuous, acidic	General sweeping.	AM	1
<i>Lathrobium brunnipes</i> (a rove beetle)	N42235933	16.05.15	Fen: valley mire, basic	Sweeping vegetation.	AM	3
<i>Lathrobium geminum</i> (a rove beetle)	N42605887	16.05.15	Fen Carr Woodland	Leaf litter.	AM	4
<i>Lathrobium terminatum</i> (a rove beetle)	N424587	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1
<i>Lathrobium terminatum</i> (a rove beetle)	N42525899	16.05.15	Fen: valley mire, basic	In moss.	AM	1
<i>Lathrobium terminatum</i> (a rove beetle)	N42235917	16.06.15	Open water: small mesotrophic ponds	Outflow of pool.	RA	2
<i>Lathrobium terminatum</i> (a rove beetle)	N42215922	16.06.15	Fen: valley mire, basic	Moss tussock.	RA	1
<i>Lesteva heeri</i> (a rove beetle)	N42385904	16.05.15	Fen: valley mire, basic	Sweeping vegetation.	AM	1
<i>Lesteva heeri</i> (a rove beetle)	N42235933	16.05.15	Fen: valley mire, basic	Sweeping.	AM	1
<i>Liopteris haemorrhoidalis</i> (a water beetle)	N422592	12.05.15	Fen: basin mire, basic	Treading fen	RA	1

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
				vegetation.		
<i>Liopterus haemorrhoidalis</i> (a water beetle)	N424587	12.05.15	Fen: basin mire, basic	Small acid pools.	RA	1
<i>Liopterus haemorrhoidalis</i> (a water beetle)	N42525899	16.05.15	Fen: valley mire, basic	Swept in shallow pools.	AM	2
<i>Liopterus haemorrhoidalis</i> (a water beetle)	N42235917	16.06.15	Open water: small mesotrophic ponds	Deep acid pool.	RA	1
<i>Liopterus haemorrhoidalis</i> (a water beetle)	N423589	12.05.15	Fen: valley mire, basic	Mossy mire in flooded hollows.	BN	Present
<i>Lochmaea suturalis</i> (Heather Beetle)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	2
<i>Lochmaea suturalis</i> (Heather Beetle)	N42575880	16.05.15	Scrub: dense/continuous, acidic	Swept off Calluna.	AM	1
<i>Lochmaea suturalis</i> (Heather Beetle)	N421594	17.06.15	Fen: valley mire, basic	Sieving vegetation.	AM	1
<i>Malachius bipustulatus</i> (Malachite beetle)	N42705875	10.06.15	Fen: valley mire, basic	Wooded path to walkway.	RA	1
<i>Malachius bipustulatus</i> (Malachite beetle)	N423589	04.06.15	Fen: valley mire, basic	Fen part of site.	BN	1
<i>Megasternum obscurum</i> (a scavenger water beetle)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	1
<i>Meligethes aeneus</i> (Common Pollen Beetle)	N42605887	16.05.15	Fen Carr Woodland	General sweeping.	AM	1
<i>Micrelus ericae</i> (Heather weevil)	N423589	04.06.15	Mire: valley bog, mosaic	Mossy mire with flooded hollows.	BN	Present
<i>Microcara testacea</i> (a marsh beetle)	N42575894	10.06.15	Fen: valley mire, basic	Sweeping along platform.	RA	1
<i>Mniusa incrassata</i> (a rove beetle)	N42605887	16.05.15	Fen Carr Woodland	Under bark, dead wood.	AM	1
<i>Mniusa incrassata</i> (a rove beetle)	N42235933	16.05.15	Fen: valley mire, basic	Sweeping vegetation.	AM	3
<i>Mocyta orbata</i> (a rove beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	1
<i>Mocyta orbata</i> (a rove beetle)	N423592	10.06 – 08.07.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	1
<i>Neuraphes elongatulus</i> (a small antlike beetle)	N423592	10.06 – 08.07.15	Mire: valley bog, open Sphagnum carpets	Moss pillows with Cladium.	RA	1
<i>Neuraphes elongatulus</i> (a small antlike beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	several
<i>Noterus crassicornis</i> (The Smaller Noterus)	N42275911	16.06.15	Open water: small mesotrophic ponds	Swept, pool	RA	2

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
				margins.		
<i>Noterus crassicornis</i> (The Smaller Noterus)	N42105947	13.08.15	Fen: valley mire, basic	Swept from roots of vegetation.	RA	1
<i>Notiophilus biguttatus</i> (a ground beetle)	N425589	17.06.15	Fen: valley mire, basic	Swept, wooded fen.	AM	1
<i>Ochtheophilum fracticorne</i> (a rove beetle)	N42525899	16.05.15	Fen: valley mire, basic	In moss.	AM	1
<i>Ochtheophilum fracticorne</i> (a rove beetle)	N42385904	16.05.15	Fen: valley mire, basic	Sweeping vegetation.	AM	1
<i>Ochtheophilum fracticorne</i> (a rove beetle)	N423590	17.06.15	Fen: valley mire, basic	Swept, mossy fen.	AM	3
<i>Ocyusa picina</i> (a rove beetle)	N42605890	10.06.15	Fen: valley mire, basic	Sweeping Equisetum, boardwalk.	RA	2
<i>Ocyusa picina</i> (a rove beetle)	N42055955	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	3
<i>Ocyusa picina</i> (a rove beetle)	N421594	17.06.15	Fen: valley mire, basic	Sieving vegetation.	AM	1
<i>Othius punctulatus</i> (a rove beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	2
<i>Otiorhynchus singularis</i> (Raspberry Weevil)	N427585	17.06.15	Scrub: dense/continuous, neutral	Tree trunk wrapping.	AM	1
<i>Oulema obscura</i> (a leaf beetle)	N42605887	16.05.15	Fen Carr Woodland	Swept.	AM	1
<i>Oxytelus laqueatus</i> (a rove beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	abundant
<i>Paederus riparius</i> (a rove beetle)	N422592	12.05.15	Fen: basin mire, basic	Treading swamp vegetation.	RA	frequent
<i>Paederus riparius</i> (a rove beetle)	N424587	12.05.15	Fen: basin mire, basic	Small acid pool margins.	RA	1
<i>Paederus riparius</i> (a rove beetle)	N42525899	16.05.15	Fen: valley mire, basic	In moss.	AM	9
<i>Paederus riparius</i> (a rove beetle)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	2
<i>Paederus riparius</i> (a rove beetle)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	27
<i>Paederus riparius</i> (a rove beetle)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	several
<i>Phaedon armoraciae</i> (Mustard Beetle)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Phaedon armoraciae</i> (Mustard Beetle)	N42575880	16.05.15	Scrub: dense/continuous, acidic	Swept.	AM	1
<i>Phaedon armoraciae</i> (Mustard Beetle)	N42385904	16.05.15	Fen: valley mire, basic	Sweeping vegetation.	AM	1
<i>Phaedon armoraciae</i> (Mustard Beetle)	N42605890	10.06.15	Fen: valley mire, basic	Sweeping along boardwalk.	RA	3
<i>Phaedon cochleariae</i> (Mustard Beetle)	N42385904	16.05.15	Fen: valley mire, basic	Sweeping vegetation.	AM	1
<i>Phaedon cochleariae</i> (Mustard Beetle)	N42605890	10.06.15	Fen: valley mire, basic	Sweeping along boardwalk.	RA	1
<i>Philonthus carbonarius</i> (a rove beetle)	N42235917	16.06.15	Fen: valley mire, basic	Outflow of pool.	RA	1
<i>Philonthus carbonarius</i> (a rove beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	1
<i>Philonthus fumarius</i> (a rove beetle)	N42525899	16.05.15	Fen: valley mire, basic	In moss.	AM	1
<i>Philonthus laminatus</i> (a rove beetle)	N42295920	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	7
<i>Philonthus nigrita</i> (a rove beetle)	N424587	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1 pair
<i>Philonthus nigrita</i> (a rove beetle)	N42525899	16.05.15	Fen: valley mire, basic	In moss.	AM	1
<i>Philonthus nigrita</i> (a rove beetle)	N42385904	16.05.15	Fen: valley mire, basic	Sweeping vegetation.	AM	1 pair
<i>Philonthus nigrita</i> (a rove beetle)	N42235933	16.05.15	Fen: valley mire, basic	Sweeping vegetation.	AM	1
<i>Phyllotreta flexuosa</i> (a leaf beetle)	N42605890	10.06.15	Fen: valley mire, basic	Sweeping along boardwalk.	RA	1
<i>Phyllotreta flexuosa</i> (a leaf beetle)	N42575894	10.06.15	Fen: valley mire, basic	Sweeping along boardwalk.	RA	1
<i>Plateumaris discolor</i> (a leaf beetle)	N422593	16.06.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Plateumaris sericea</i> (a leaf beetle)	N42575880	16.05.15	Scrub: dense/continuous, acidic	General sweeping.	AM	1
<i>Polydrusus pterygomalis</i> (a weevil)	N42695879	16.06.15	Boundaries, intact hedge, species-rich	Beaten off hazel, hedgerow.	RA	1
<i>Poophagus sisymbrii</i> (a weevil)	N42575894	10.06.15	Fen: valley mire, basic	Sweeping along boardwalk.	RA	frequent
<i>Poophagus sisymbrii</i> (a weevil)	N42605890	10.06.15	Fen: valley mire, basic	Sweeping crucifers.	RA	1
<i>Poophagus sisymbrii</i> (a weevil)	N423589	04.06.15	Fen: valley mire, basic	Wooded fen drains	BN	present

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Porhydrus lineatus</i> (a water beetle)	N42235917	16.06.15	Open water: small mesotrophic ponds	Deep acid pool.	RA	1
<i>Prasocuris junci</i> (a leaf beetle)	N423589	04.06.15	Fen: valley mire, basic	Mossy mire with flooded hollows.	BN	present
<i>Prasocuris phellandrii</i> (a leaf beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	1
<i>Prasocuris phellandrii</i> (a leaf beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	occasional
<i>Propylea quattuordecimpunctata</i> (14-spot Ladybird)	N42635884	10.06.15	Scrub: dense/continuous, acidic	Beaten off birch.	RA	1
<i>Pselaphus heisei</i> (a short-winged mould beetle)	N42605887	16.05.15	Fen Carr Woodland	In moss.	AM	1
<i>Pselaphus heisei</i> (a short-winged mould beetle)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Pselaphus heisei</i> (a short-winged mould beetle)	N423592	10.06 – 08.07.15	Mire: valley bog, open Sphagnum carpets	Moss pillows with Cladium.	RA	1
<i>Pselaphus heisei</i> (a short-winged mould beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	5
<i>Pterostichus aterrimus</i> (a ground beetle)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	5
<i>Pterostichus diligens</i> (a ground beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	2
<i>Pterostichus diligens</i> (a ground beetle)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	6
<i>Pterostichus diligens</i> (a ground beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1
<i>Pterostichus diligens</i> (a ground beetle)	N423590	17.06.15	Fen: valley mire, basic	Swept, mossy fen.	AM	2
<i>Pterostichus gracilis</i> (a ground beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	1
<i>Pterostichus gracilis</i> (a ground beetle)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	3
<i>Pterostichus gracilis</i> (a ground beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	2
<i>Pterostichus rhaeticus</i> (a ground beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	3
<i>Pterostichus rhaeticus</i> (a ground beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1
<i>Pterostichus strenuus</i> (a ground beetle)	N42525899	16.05.15	Fen: valley mire, basic	In moss.	AM	1
<i>Pterostichus strenuus</i> (a ground beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	1

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Quedius curtipennis</i> (a rove beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	1
<i>Quedius curtipennis</i> (a rove beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1
<i>Quedius fuliginosus</i> (a rove beetle)	N42525899	16.05.15	Fen: valley mire, basic	In moss.	AM	6
<i>Quedius fuliginosus</i> (a rove beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	1 pair
<i>Quedius fuliginosus</i> (a rove beetle)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1 pair
<i>Quedius fuliginosus</i> (a rove beetle)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with <i>Cladium</i> .	RA	1
<i>Quedius fuliginosus</i> (a rove beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1
<i>Reichenbachia juncorum</i> (a short-winged mould beetle)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Rhagium bifasciatum</i> (a longhorn beetle)	N42425905	10.06.15	Fen: valley mire, basic	Landed on me.	RA	1
<i>Rhagonycha lignosa</i> (a soldier beetle)	N425588	17.06.15	Fen: valley mire, basic	Swept, wooded fen.	AM	1
<i>Rhantus grapii</i> (a water beetle)	N42105947	13.08.15	Fen: valley mire, basic	Teneral specimen.	RA	1
<i>Rhantus grapii</i> (a water beetle)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	2
<i>Rhantus suturalis</i> (a water beetle)	N423589	04.06.15	Fen: valley mire, basic	Mossy mire with flooded hollows.	BN	present
<i>Rhizophagus dispar</i> (a narrow bark beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky wooded bog.	RA	1
<i>Rhynchites germanicus</i> (Strawberry Rhynchites)	N42605887	16.05.15	Fen Carr Woodland	Beating birch.	AM	2
<i>Scirtes orbicularis</i> (a marsh beetle)	N42065955	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Silpha atrata</i> (Black Snail Beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	1
<i>Sitona lineatus</i> (Pea and Bean Weevil)	N42605887	16.05.15	Fen Carr Woodland	Swept off willow.	AM	1
<i>Sitona lineatus</i> (Pea and Bean Weevil)	N425586	17.06.15	Grassland: marshy, lowland	Swept, marshy meadow.	AM	1
<i>Staphylinus erythropterus</i> (a rove beetle)	N42425905	10.06.15	Fen: valley mire, basic	Walking on bog moss.	RA	5
<i>Staphylinus erythropterus</i> (a rove beetle)	N425587	12.05 – 10.06.15	Parkland/scattered trees: mixed	Tussocky	RA	13



Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
				wooded bog.		
<i>Staphylinus erythropterus</i> (a rove beetle)	N423590	12.05 – 10.06.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	324
<i>Staphylinus erythropterus</i> (a rove beetle)	N423592	12.05 – 10.06.15	Mire: valley bog, mosaic	Moss pillows with Cladium.	RA	112
<i>Staphylinus erythropterus</i> (a rove beetle)	N423592	10.06 – 08.07.15	Mire: valley bog, open Sphagnum carpets	Moss pillows with Cladium.	RA	3
<i>Staphylinus erythropterus</i> (a rove beetle)	N425587	10.06 – 08.07.15	Mire: valley bog, mosaic	Tussocky wooded bog.	RA	4
<i>Staphylinus erythropterus</i> (a rove beetle)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	1
<i>Stenichnus collaris</i> (a small antlike beetle)	N42605887	16.05.15	Fen Carr Woodland	In moss.	AM	1
<i>Stenus brunniipes</i> (a rove beetle)	N42055955	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	several
<i>Stenus cicindeloides</i> (a rove beetle)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	4
<i>Stenus cicindeloides</i> (a rove beetle)	N424587	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1
<i>Stenus cicindeloides</i> (a rove beetle)	N42335913	16.06.15	Fen: valley mire, basic	In moss.	RA	1
<i>Stenus fulvicornis</i> (a rove beetle)	N42365911	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Stenus fuscipes</i> (a rove beetle)	N424590	10.06 – 08.07.15	Mire: valley bog, mosaic	Open moss tussocks.	RA	3
<i>Stenus glabellus</i> (a rove beetle)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1
<i>Stenus glabellus</i> (a rove beetle)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1
<i>Stenus glabellus</i> (a rove beetle)	N42235933	16.05.15	Fen: valley mire, basic	Sweeping vegetation.	AM	1
<i>Stenus glabellus</i> (a rove beetle)	N42365911	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Stenus impressus</i> (a rove beetle)	N42605887	16.05.15	Fen Carr Woodland	Leaf litter/moss.	AM	1
<i>Stenus impressus</i> (a rove beetle)	N42365911	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Stenus impressus</i> (a rove beetle)	N427585	17.06.15	Scrub: dense/continuous, neutral	Tree trunk wrapping.	AM	2
<i>Stenus junco</i> (a rove beetle)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Stenus latifrons</i> (a rove beetle)	N42525899	16.05.15	Fen: valley mire, basic	In moss.	AM	3
<i>Stenus latifrons</i> (a rove beetle)	N42385904	16.05.15	Fen: valley mire, basic	Sweeping vegetation.	AM	1
<i>Stenus latifrons</i> (a rove beetle)	N42235933	16.05.15	Fen: valley mire, basic	Sweeping.	AM	4
<i>Stenus latifrons</i> (a rove beetle)	N42235917	16.06.15	Fen: valley mire, basic	Outflow of pool.	RA	1
<i>Stenus latifrons</i> (a rove beetle)	N42215922	16.06.15	Fen: valley mire, basic	Moss tussock.	RA	1
<i>Stenus latifrons</i> (a rove beetle)	N42335913	16.06.15	Fen: valley mire, basic	In moss.	RA	1
<i>Stenus latifrons</i> (a rove beetle)	N42055955	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Stenus latifrons</i> (a rove beetle)	N42065955	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	2
<i>Stenus latifrons</i> (a rove beetle)	N42365911	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	5
<i>Stenus latifrons</i> (a rove beetle)	N421594	17.06.15	Fen: valley mire, basic	Swept, open fen.	AM	3
<i>Stenus nitens</i> (a rove beetle)	N424587	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1
<i>Stenus nitens</i> (a rove beetle)	N421594	17.06.15	Fen: valley mire, basic	Swept, open fen.	AM	7
<i>Stenus nitidiusculus</i> (a rove beetle)	N424587	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1 pair
<i>Stenus nitidiusculus</i> (a rove beetle)	N42525899	16.05.15	Fen: valley mire, basic	In moss.	AM	1
<i>Stenus nitidiusculus</i> (a rove beetle)	N42235933	16.05.15	Fen: valley mire, basic	Sweeping vegetation.	AM	1 pair
<i>Stenus nitidiusculus</i> (a rove beetle)	N42235917	16.06.15	Fen: valley mire, basic	Outflow of pool.	RA	2
<i>Stenus nitidiusculus</i> (a rove beetle)	N42055955	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1 pair
<i>Stenus nitidiusculus</i> (a rove beetle)	N42365911	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Stenus palustris</i> (a rove beetle)	N422592	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1
<i>Stenus palustris</i> (a rove beetle)	N42525899	16.05.15	Fen: valley mire, basic	In moss.	AM	1
<i>Stenus palustris</i> (a rove beetle)	N42215922	16.06.15	Fen: valley mire, basic	Moss tussock.	RA	1
<i>Stenus palustris</i> (a rove beetle)	N42065955	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	3
<i>Stenus palustris</i> (a rove beetle)	N42295920	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1

Appendix 2 (cont)

Species Name (Common Name)	Grid Ref	Date	Habitat type	Comment/niche	Recorder	Abundance
<i>Stenus similis</i> (a rove beetle)	N42525899	16.05.15	Fen: valley mire, basic	In moss.	AM	1
<i>Stenus tarsalis</i> (a rove beetle)	N42235933	16.05.15	Fen: valley mire, basic	Sweeping vegetation.	AM	1
<i>Stenus tarsalis</i> (a rove beetle)	N42605890	10.06.15	Fen: valley mire, basic	Sweeping along boardwalk.	RA	1
<i>Suphrodytes dorsalis</i> (a water beetle)	N42105947	13.08.15	Fen: valley mire, basic	Swept from fen vegetation.	RA	1
<i>Tachyporus pusillus</i> (a rove beetle)	N42605887	16.05.15	Fen Carr Woodland	In moss.	AM	1
<i>Tachyporus pusillus</i> (a rove beetle)	N427585	17.06.15	Scrub: dense/continuous, neutral	Tree trunk wrapping.	AM	1
<i>Zyras collaris</i> (a rove beetle)	N422592	12.05.15	Fen: basin mire, basic	Treading fen egetation.	RA	1
<i>Zyras collaris</i> (a rove beetle)	N424587	12.05.15	Fen: basin mire, basic	Treading fen vegetation.	RA	1