



Male *Sibirionor lae* from Holcroft Moss © Richard Gallon

Cheshire & Lancashire lowland bog spider surveys 2018

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Summary

This report summarises a series of casual surveys of 11 lowland bogs in Cheshire and Lancashire over the summer and early autumn of 2018. The primary survey method was vacuum sampling – a technique capable of sampling a large proportion of the spider species present in habitats with limited vertical stratification (e.g. bogs).

- Over 200 ‘site first’ species were recorded across the 11 sites.
- 11 of those site firsts were either Nationally Rare or Nationally Scarce and 12 of them were Amber Listed spiders.
- The jumping spider *Heliophanus dampfi* was recorded at Holcroft Moss – making it the first confirmed site for this spider in England (and confirming previously unverified records of the species made by Alan Scott on the site in 2000).
- The jumping spider *Sibianor larae* was recorded at Holcroft Moss – the first confirmed record of this species for the UK.
- Spider surveys on Cheshire and Lancashire lowland bogs, detecting bog indicator species, have the potential to predict overall site quality for invertebrates.
- It would be feasible to establish a regular survey protocol based on vacuum sampling to document the recovery of lowland bogs under restoration in Cheshire and Lancashire.
- Holcroft Moss is a nationally important site for spiders and has the potential to be a source for recolonization of nearby bogs such as Risley Moss and Cadishead/Little Woolden Moss.
- The Carbon Landscape Project has the potential to make this a reality.

Separate site accounts are included in the body of the report.

Introduction

The North West of England was once home to vast expanses of lowland raised bog. It is estimated that the extent of UK lowland raised bog with a largely undisturbed surface diminished by 94% between the start of the 19th century and the early 21st century (BRIG, 2008). The bogs of Cheshire and Lancashire have not escaped these privations.

Many of the remaining fragments of lowland raised bog in Cheshire and Lancashire have been acquired and/or are managed for nature conservation by organisations such as the wildlife trusts and local councils. Some of these sites were so modified, usually by commercial peat extraction, that radical habitat restoration is being undertaken to salvage and restore their wildlife interest.

Biological recording on these sites has the potential to play a role in documenting their recovery and determining their conservation status. There is an increasing recognition that invertebrates could play a useful role in this respect (Scott, Oxford and Selden, 2006; Brigić *et al.*, 2017). Scott, Oxford and Selden (2006) argued that spiders, in particular, have potential to be used as indicators of lowland raised bog condition because:

- they are predators liable to integrate the biotic and abiotic influences affecting lower trophic levels;
- most species can be effectively sampled on bogs where there is little vertical habitat stratification; and
- there is a recognisable assemblage of bog spiders species, several of which are endangered.

They identified 71 “*spider indicator species for peat bogs in western Britain*” and a further 48 species considered “*appropriate for peat bogs in western Britain*”. The bog indicator species are defined as

“not necessarily stenotopic for bogs (tyrphobionts) but are unlikely to occur in drier habitats” and the bog appropriate species as those which although not indicators are *“regularly encountered and can be shown to complete their lifecycles in the habitat”*. The authors showed that *“the number of spider bog indicator species is [...] a surrogate for the conservation value of the total invertebrate fauna of bogs in the study area”*. Although this statement pertains to numbers of bog indicator species collected using a strict pitfall sampling protocol, it points to the usefulness of all spider records made on bogs, even those collected outside this strict protocol.

In the surveys described here, spiders were sampled on several Cheshire and Lancashire bogs over the summer of 2018. Most of the sampling was carried out by Rich Burkmar, frequently accompanied by Richard Gallon and occasionally by others (as indicated in the individual site accounts). This report does not present the detailed records of spiders collected – these can be obtained in a spreadsheet, on request, from the author – but presents, for each site, the new species recorded in 2018, noting:

- whether they are bog indicators;
- whether they are a ‘first’ for the site, vice county or country; and
- their national rarity and IUCN conservation status (after Harvey *et al.*, 2017).

Also included, for each site, is a list of all spiders previously recorded that are either bog indicators or have a national rarity or IUCN conservation status (after Harvey *et al.*, 2017). In almost all cases these lists were derived exclusively from the database of the national Spider Recording Scheme (SRS) run under the auspices of the British Arachnological Society. The only exception was for Holcroft Moss where records made by Alan Scott, held in the database of Cheshire Record LERC, were found not to be held in the SRS database. These important records were added to those of the SRS to derive the list of previously recorded species.

Most of the sampling was carried out by means of a vacuum sampler comprising a petrol driven garden vacuum modified with a net over the air intake pipe to retain the spiders. Both Richard Burkmar and Richard Gallon used Stihl SH56C garden vacs. At most sites a sweeping, beating and hand searching was also deployed. Vacuum samplers are readily deployed in bog habitats where there is little vertical stratification of the vegetation and are very effective at sampling a large proportion of the spider species present.

Site accounts

Table 1 indicates which sites were visited in 2018 and, for each of them, the total number of spider species recorded at the site, the number of new species recorded in 2018, the numbers of nationally scarce/rare species, the number of species of conservation concern, the number of bog indicators, and the number of other bog appropriate species. Also included in the table is an indication of how many years at least one spider record has been made for the site which gives some indication of the degree to which the site has been recorded.

Table 1. Lowland bogs visited during this survey in 2018 with summaries of the numbers of all spider species recorded at each site. Numbers in normal type include species from both this survey and all previous surveys. Numbers in parentheses refer only to species recorded in this survey.

Site	Species	Nationally rare/scarce ¹	Conservation concern ²	Bog indicators ³	Bog appropriate ⁴	Years recorded ⁵
Winmarleigh Moss	100 (14)	5 (1)	5 (1)	12 (5)	33 (3)	14
Red Moss	73 (7)	2 (2)	3 (2)	19 (2)	27 (1)	7
Highfield Moss	118 (19)	3 (0)	3 (0)	21 (5)	28 (4)	3
Little Woolden Moss	19 (19)	0 (0)	0 (0)	8 (8)	6 (6)	1
Cadishead Moss	45 (28)	1 (1)	1 (1)	14 (11)	15 (9)	2
Holcroft Moss	125 (30)	9 (1)	9 (1)	22 (6)	34 (5)	5
Risley Moss	91 (27)	5 (4)	5 (4)	14 (10)	22 (9)	8
Danes Moss	37 (36)	1 (1)	1 (1)	9 (9)	14 (14)	2
Little Budworth Common	147 (20)	8 (1)	11 (2)	24 (3)	37 (1)	11
Abbot's Moss	175 (1)	21 (0)	22 (0)	27 (0)	37 (0)	13
Blakemere complex	183 (2)	20 (0)	22 (0)	37 (1)	37 (0)	39

¹ Nationally Rare and Nationally Scarce species considered together (after Harvey *et al.*, 2017).

² Species of conservation concern are those which are given an IUCN status of 'Vulnerable' or 'Near Threatened' or which were 'Amber Listed' by Harvey *et al.*, (2017), which they define as species which "do not come close enough to qualifying for an IUCN category to be considered Near Threatened, but have the potential to qualify for Near Threatened in the future if their decline is not understood and/or ameliorated".

³ Species listed as "spider indicator species for peat bogs in western Britain" by Scott, Oxford and Selden, (2006).

⁴ Species not considered as indicators but listed as "appropriate for peat bogs in western Britain" by Scott, Oxford and Selden, (2006).

⁵ Number of years for which at least one species of spider is recorded for the site.

The figures in Table 1 cannot be used to compare sites because of the huge difference in surveying effort at each of them over all years and in 2018. The surveys in 2018 were not systematic and are better characterised as 'casual' and opportunistic in nature. The time spent on each site ranged from an hour or so (e.g. Abbot's Moss) to several days (e.g. Holcroft Moss). Nevertheless, the table does show that the recording in 2018 was very successful in terms of the number of new species added to site lists with 203 'site firsts' over all 11 sites. 11 of these site firsts were also either Nationally Rare or Nationally Scarce and 12 of them were Amber Listed spiders.

A number of significant mossland sites were not visited in 2018 due to lack of opportunity and/or time. Previous records for these sites are listed in Table 2.

Table 2. Significant Cheshire/Lancashire lowland bogs not visited during this survey in 2018 with summaries of the numbers of all spider species recorded at each site.

Site	Species	Nationally rare/scarce ¹	Conservation concern ²	Bog indicators ³	Bog appropriate ⁴	Years recorded ⁵
Wybunbury Moss	163	16	17	32	38	15
Astley Moss	160	5	5	21	39	17
Twelve Yards Road	9	0	0	3	4	1
Heysham Moss	105	0	1	14	27	9

¹ Nationally Rare and Nationally Scarce species considered together (after Harvey *et al.*, 2017).

² Species of conservation concern are those which are given an IUCN status of 'Vulnerable' or 'Near Threatened' or which were 'Amber Listed' by Harvey *et al.*, (2017), which they define as species which "do not come close enough to qualifying for an IUCN category to be considered Near Threatened, but have the potential to qualify for Near Threatened in the future if their decline is not understood and/or ameliorated".

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⁴ Species not considered as indicators but listed as "appropriate for peat bogs in western Britain" by Scott, Oxford and Selden, (2006).

⁵ Number of years for which at least one species of spider is recorded for the site.

Detailed accounts of the recording carried out on each site in 2018 and the spiders recorded there can be found in the following sections.

Winmarleigh Moss

I spent around five hours on Winmarleigh Moss on 1st August 2018, vacuuming low bog vegetation at six sampling points and beating Bog Myrtle (*Myrica gale*) at another. Conditions were so extraordinarily dry that it was possible to walk across (usually) wet *Sphagnum* hollows without even wetting my wellingtons. Despite this, the sampling yielded some interesting spiders including 14 species not recorded at Winmarleigh Moss before (see Table 3), bringing the total recorded for the site to 100. Five of the newly recorded species are considered bog indicators and one, the money spider *Taranucnus setosus*, is both Nationally Scarce and Amber listed. There are now four species of spider recorded at Winmarleigh Moss which are both Nationally Scarce and Amber listed. The total of bog indicator species for the site stands at 12 (Table 4) with a further 33 bog appropriate species (Table 1).

Winmarleigh Moss is a vast site including large areas of bog in excellent condition. Even though the site has been recorded reasonably well over the years, there is no doubt that further discoveries are there to be made.

Table 3. Species recorded in 2018 which had not been recorded at Winmarleigh Moss before.

Scientific name	Common name	Bog indicator	First	Conservation status
<i>Ero cambridgei</i>	A pirate spider		site	
<i>Ceratinella brevis</i>	A money spider		site	
<i>Oedothorax fuscus</i>	A money spider		site	
<i>Lophomma punctatum</i>	A money spider	yes	site	
<i>Aphileta misera</i>	A money spider	yes	site	
<i>Meioneta rurestris</i>	A money spider		site	
<i>Meioneta beata</i>	A money spider		site	
<i>Saaristoa abnormis</i>	A money spider		site	
<i>Kaestneria pullata</i>	A money spider	yes	site	
<i>Floronia bucculenta</i>	A money spider		site	
<i>Taranucnus setosus</i>	A money spider	yes	VC60	Nationally Scarce & Amber List
<i>Palliduphantes ericaeus</i>	A money spider		site	
<i>Antistea elegans</i>	A Lesser Cobweb spider	yes	site	
<i>Neon reticulatus</i>	A jumping spider		site	

Table 4. Spiders recorded at Winmarleigh Moss prior to 2018 which have either an IUCN conservation status, national rarity or which are regarded as indicators of bog.

Scientific name	Common name	Bog indicator	Conservation status
<i>Euryopis flavomaculata</i>	A comb footed spider		Nationally Scarce & Amber List
<i>Ceratinella brevipes</i>	A money spider	yes	
<i>Walckenaeria dysderoides</i>	A money spider		Nationally Scarce & Amber List
<i>Walckenaeria vigilax</i>	A money spider	yes	
<i>Gnathonarium dentatum</i>	A money spider	yes	
<i>Hypselistes jacksoni</i>	A money spider	yes	Nationally Scarce & Amber List
<i>Pirata piraticus</i>	An otter spider	yes	

<i>Pirata hygrophilus</i>	An otter spider	yes	
<i>Pirata uliginosus</i>	An otter spider	yes	
<i>Scotina gracilipes</i>	Running foliage spider		Nationally Scarce

Red Moss

I spent about three hours on Red Moss on 2nd September 2018, vacuuming bog and fen vegetation at five sampling points. Seven new species were recorded on the site (Table 5), bringing the total recorded at Red Moss to 73 species. Two of the new species recorded are Nationally Scarce and one of those is Amber Listed. The two new species are also bog indicators bringing the total number of bog indicators recorded at Red Moss to 19 (see Table 6 for bog indicators previously recorded). A further 27 bog appropriate species have also been recorded at the site (Table 1).



Figure 1. Recorded for the first time at Red Moss this year is the common Four-spotted Orbweb spider, *Araneus quadratus*. Females, like the one pictures, are reputed to be amongst the heaviest UK spiders when gravid.

Red Moss is responding well to bog restoration work being carried out by the Lancashire Wildlife Trust and it is likely that as the habitat continues to improve, more species will be added to this growing list.

Table 5. Species recorded in 2018 which had not been recorded at Red Moss before.

Scientific name	Common name	Bog indicator	First	Conservation status
<i>Neottiura bimaculata</i>	A comb footed spider		site	
<i>Gonatium rubens</i>	A money spider		site	
<i>Hypselistes jacksoni</i>	A money spider	yes	site	Nationally Scarce & Amber List
<i>Tapinopa longidens</i>	A money spider		site	
<i>Allomengea vidua</i>	A money spider	yes	site	Nationally Scarce
<i>Araneus quadratus</i>	Four-spotted Orbweb spider		site	
<i>Hypsosinga pygmaea</i>	An orb web spider		site	

Table 6. Spiders recorded at Red Moss prior to 2018 which have either an IUCN conservation status, national rarity or which are regarded as indicators of bog.

Scientific name	Common name	Bog indicator	Conservation status
<i>Theonoe minutissima</i>	A comb footed spider	yes	
<i>Ceratinella brevipes</i>	A money spider	yes	
<i>Walckenaeria vigilax</i>	A money spider	yes	
<i>Gnathonarium dentatum</i>	A money spider	yes	
<i>Hypomma bituberculatum</i>	A money spider	yes	
<i>Silometopus elegans</i>	A money spider	yes	
<i>Lophomma punctatum</i>	A money spider	yes	
<i>Diplocephalus permixtus</i>	A money spider	yes	

<i>Drepanotylus uncatus</i>	A money spider	yes	Amber List
<i>Aphileta misera</i>	A money spider	yes	
<i>Bathyphantes approximatus</i>	A money spider	yes	
<i>Kaestneria pullata</i>	A money spider	yes	
<i>Pirata piraticus</i>	An otter spider	yes	
<i>Pirata uliginosus</i>	An otter spider	yes	
<i>Argyroneta aquatica</i>	Water spider	yes	
<i>Antistea elegans</i>	A Lesser Cobweb spider	yes	
<i>Clubiona phragmitis</i>	A sac spider	yes	

Highfield Moss

Richard Gallon and I visited Highfield Moss on 22nd September 2018, spending about five hours there. I vacuumed at five locations on the bog and beat vegetation at two locations on the margins. Richard Gallon vacuumed at five locations on the bog and collected from vegetation at several locations. The survey added an impressive 19 species to the site list, including five new bog indicator species. One species of money spider, *Meioneta beata*, was new for the vice county of South Lancashire. This brings the total number of species recorded at Highfield Moss to 118 species, including 21 bog indicators and a further 28 bog appropriate species (see Table 7, Table 8 and Table 1).

Given that prior to 2018 the site had only been surveyed for spiders in 2007 and 2008 the number of species and bog indicator species at Highfield Moss is impressive. Further recording will, no doubt, reveal more species.

Table 7. Species recorded in 2018 which had not been recorded at Highfield Moss before.

Scientific name	Common name	Bog indicator	First	Conservation status
<i>Ero cambridgei</i>	A pirate spider		site	
<i>Theridion pictum</i>	A comb footed spider		site	
<i>Enoplognatha latimana</i>	Scarce Candy-striped spider		site	
<i>Theonoe minutissima</i>	A comb footed spider	yes	site	
<i>Gnathonarium dentatum</i>	A money spider	yes	site	
<i>Metopobactrus prominulus</i>	A money spider		site	
<i>Peponocranium ludicrum</i>	A money spider		site	
<i>Micrargus herbigradus sens. str.</i>	A money spider		site	
<i>Diplocephalus cristatus</i>	A money spider		site	
<i>Diplocephalus permixtus</i>	A money spider	yes	site	
<i>Meioneta rurestris</i>	A money spider		site	
<i>Meioneta beata</i>	A money spider		VC59	
<i>Centromerus sylvaticus</i>	A money spider		site	
<i>Centromerita bicolor</i>	A money spider		site	
<i>Saaristoa abnormis</i>	A money spider		site	
<i>Bathyphantes approximatus</i>	A money spider	yes	site	
<i>Pachygnatha degeeri</i>	A long-jawed Orbweb spider		site	
<i>Hahnia nava</i>	A Lesser Cobweb spider		site	
<i>Clubiona stagnatilis</i>	A sac spider	yes	site	

Table 8. Spiders recorded at Highfield Moss prior to 2018 which have either an IUCN conservation status, national rarity or which are regarded as indicators of bog.

Scientific name	Common name	Bog indicator	Conservation status
<i>Ceratinella brevipes</i>	A money spider	yes	
<i>Hypomma bituberculatum</i>	A money spider	yes	
<i>Hypselistes jacksoni</i>	A money spider	yes	Nationally Scarce & Amber List
<i>Silometopus elegans</i>	A money spider	yes	
<i>Lophomma punctatum</i>	A money spider	yes	
<i>Aphileta misera</i>	A money spider	yes	
<i>Porrhomma pygmaeum</i>	A money spider	yes	
<i>Tallusia experta</i>	A money spider	yes	
<i>Kaestneria pullata</i>	A money spider	yes	
<i>Taranucnus setosus</i>	A money spider	yes	Nationally Scarce & Amber List
<i>Pirata piraticus</i>	An otter spider	yes	
<i>Pirata uliginosus</i>	An otter spider	yes	
<i>Pirata latitans</i>	An otter spider	yes	
<i>Antistea elegans</i>	A Lesser Cobweb spider	yes	
<i>Hahnia pusilla</i>	A Lesser Cobweb spider	yes	Nationally Scarce
<i>Clubiona phragmitis</i>	A sac spider	yes	

Little Woolden Moss

Little Woolden Moss is a vast area of peat previously milled on an industrial scale. Until recently, there was barely a scrap of vegetation over the entire 100 hectares, but since peat extraction stopped and the Lancashire Wildlife Trust took over management of the site, rewetting, natural colonisation and planting has led to large areas of vegetation, particularly Cotton Grass (*Eriophorum angustifolium*) becoming established. I visited the site on two occasions, on 25th May and 9th September 2018, and on each day I vacuumed vegetation at a single location spending around one hour on the site each time. The results were surprising for such a ‘new’ and recently colonised site with 19 species being recorded, including 8 bog indicators (Table 9). One species, the large money spider *Linyphia impigra*, has only be recorded once before in the vice country of South Lancashire. As well as this surprising number of species, the abundance of the spiders, particularly in May, was noticeable, which could help explain why the site has already become important for breeding waders.

The attractively marked wolf spider *Arctosa perita* is a particularly notable feature of the site. This spider is typically associated with sandy sites (especially dunes) but is also known from gravelly sites and post-industrial habitats with friable substrate into which they make burrows with an entrance covered by a retractable silken ‘hatch’. As far as I can establish, there are *no* records of an association with peat habitats, but I first recorded this spider on peat at the adjoining Cadishead Moss in 2009 where it occurred in friable oxidising peat.



Figure 2. Typically marked *Arctosa perita* from the Sefton Coast (left) and Cadishead Moss (right) both taken in 2009.

In 2018 *Arctosa perita* turned up at Little Woolden Moss in the same habitat – bare oxidising peat. Volunteers carrying out peat excavation work for rewetting recorded them on the margins of the bog, running over the peat when their burrows were disturbed. I also recorded one on open bare peat away from the margin in September.

Arctosa perita is well-known for its variable colouration with populations in different locations being cryptically coloured against the substrate in which they make their homes. Those from Little Woolden are much darker than *Arctosa perita* recorded elsewhere, making them well camouflaged against the dark peat.

Ironically *Arctosa perita* at peatland sites can probably be regarded as an indicator of *degraded* habitat since it is the friable, dry oxidising peat that is probably responsible for their presence. As the peat is rewetted the spider is likely to find it less to its liking and gradually disappear. So whilst this is an interesting example of post-industrial adaptation by a species (perhaps with parallels to that of the Peppered Moth, *Biston betularia*) we should not worry about trying to preserve this species on our peatland sites and could, arguably, regard its future disappearance as a milestone in the restoration of the bog!

Table 9. Species recorded in 2018 which had not been recorded at Little Woolden Moss before.

Scientific name	Common name	Bog indicator	First	Conservation status
<i>Ero cambridgei</i>	A pirate spider		site	
<i>Neottiura bimaculata</i>	A comb footed spider		site	
<i>Gnathonarium dentatum</i>	A money spider	yes	site	
<i>Hypomma bituberculatum</i>	A money spider	yes	site	
<i>Oedothorax gibbosus</i>	A money spider		site	
<i>Gongylidiellum vivum</i>	A money spider		site	
<i>Erigone atra</i>	A money spider		site	
<i>Aphileta misera</i>	A money spider	yes	site	
<i>Bathyphantes gracilis</i>	A money spider		site	
<i>Kaestneria pullata</i>	A money spider	yes	site	
<i>Tenuiphantes tenuis</i>	A money spider		site	
<i>Nerienne clathrata</i>	A money spider		site	
<i>Microlinyphia impigra</i>	A money spider	yes	site	
<i>Tetragnatha extensa</i>	Common stretch spider		site	
<i>Arctosa perita</i>	A wolf spider		site	
<i>Pirata piraticus</i>	An otter spider	yes	site	
<i>Antistea elegans</i>	A Lesser Cobweb spider	yes	site	
<i>Clubiona reclusa</i>	A sac spider		site	
<i>Clubiona phragmitis</i>	A sac spider	yes	site	

Cadishead Moss

I visited Cadishead Moss for about an hour on 25th May, vacuuming at a single location and again for about three hours on 9th September 2018, vacuuming at three more locations. The sampling added 28 new species to the site list, bringing the site total to 45 (Table 1, Table 10 and Table 11). The site had only been recorded once before, almost ten years ago in 2009 when I visited shortly after it was acquired by the Lancashire Wildlife Trust.

One of the newly recorded species was the attractively marked comb-footed spider *Euryopis flavomaculata* which is Nationally Scarce and Amber Listed. Another comb-footed spider, *Robertus arundineti*, has never before been recorded in the vice county of South Lancashire.

One of the most interesting finds was a single juvenile specimen of the tiny jumping spider *Talavera aequipes*. Before 2018, this spider had only been recorded once in the combined counties of Cheshire and Lancashire by Jenifer Newton at Heysham Nature Reserve in 2005 (vice county of West Lancashire). But during the surveys described in this report it was found on three more sites: Cadishead Moss, Holcroft Moss (in the vice county of South Lancashire) and Abbot’s Moss (in the vice county of Cheshire). The spider has a mainly southern distribution in the UK, seemingly preferring “warm, open, sunny habitats with bare surfaces” (Askins, no date). Interestingly at all three sites where it was found this year, the locations tended to be in the heathier, drier areas. However in all three there was some exposed areas of peat which, although dry, would likely be wet in more typical summer. At Cadishead Moss, the specimen of *Talavera aequipes* was found in the heathy strip separating the main part of Cadishead Moss from Little Woolden Moss.

The number of bog indicator species, at 14, is high for such a sparsely recorded site (especially if considered as a proportion of the site total of 45) comparing very favourably with Winmarleigh and Risley, for example, both of which have been recorded to a greater extent (Table 1). A further 15 bog appropriate species have been recorded on the site. All the indications are that Cadishead Moss is rapidly developing a significant and important bog spider community.

The proximity of Cadishead Moss – directly adjacent to the much bigger Little Woolden Moss – makes its bog spider community even more valuable since it will act as a source from which Little Woolden Moss can be rapidly re-colonised as its restoration continues.

Table 10. Species recorded in 2018 which had not been recorded at Cadishead Moss before.

Scientific name	Common name	Bog indicator	First	Conservation status
<i>Ero cambridgei</i>	A pirate spider		site	
<i>Ero furcata</i>	A pirate spider		site	
<i>Euryopis flavomaculata</i>	A comb footed spider		site	Nationally Scarce & Amber List
<i>Robertus arundineti</i>	A comb footed spider	yes	VC59	
<i>Walckenaeria unicornis</i>	A money spider		site	
<i>Gnathonarium dentatum</i>	A money spider	yes	site	
<i>Hypomma bituberculatum</i>	A money spider	yes	site	
<i>Gonatium rubens</i>	A money spider		site	
<i>Oedothorax gibbosus</i>	A money spider		site	
<i>Cnephalocotes obscurus</i>	A money spider		site	
<i>Lophomma punctatum</i>	A money spider	yes	site	
<i>Diplocephalus permixtus</i>	A money spider	yes	site	
<i>Prinerigone vagans</i>	A money spider		site	
<i>Aphileta misera</i>	A money spider	yes	site	
<i>Porrhomma pygmaeum</i>	A money spider	yes	site	
<i>Bathyphantes approximatus</i>	A money spider	yes	site	
<i>Tenuiphantes tenuis</i>	A money spider		site	
<i>Palliduphantes ericaeus</i>	A money spider		site	
<i>Tetragnatha extensa</i>	Common stretch spider		site	
<i>Araneus quadratus</i>	Four-spotted Orbweb spider		site	

<i>Larinioides cornutus</i>	An orb web spider		site	
<i>Hypsosinga pygmaea</i>	An orb web spider		site	
<i>Pirata latitans</i>	An otter spider	yes	site	
<i>Pisaura mirabilis</i>	Nursery web spider		site	
<i>Antistea elegans</i>	A Lesser Cobweb spider	yes	site	
<i>Clubiona phragmitis</i>	A sac spider	yes	site	
<i>Tibellus maritimus</i>	A running crab spider		site	
<i>Talavera aequipes</i>	A jumping spider		VC59	

Table 11. Spiders recorded at Cadishead Moss prior to 2018 which have either an IUCN conservation status, national rarity or which are regarded as indicators of bog.

Scientific name	Common name	Bog indicator	Conservation status
<i>Kaestneria pullata</i>	A money spider	yes	
<i>Pirata piraticus</i>	An otter spider	yes	
<i>Pirata uliginosus</i>	An otter spider	yes	

Holcroft Moss

I visited Holcroft Moss on June 14th and again with Richard Gallon on July 28th and September 15th. On June 14th I vacuumed at six locations and swept at two locations. On July 28th we vacuumed at eight locations and swept and beat at two or three more. On September 15th we vacuumed at seven locations and swept and beat at another two.

This relatively intensive sampling at Holcroft in 2018 added 30 species to the site list, bringing it to 125 (Table 12). Surveys prior to 2018 had yielded a significant list of eight Nationally Scarce species, six of which are also Amber listed (see Table 13).

The reason for the intensive sampling of the site in 2018 was that the first visit on June 14th turned up a number of remarkable species including the Nationally Rare and IUCN Vulnerable jumping spider *Heliophanus dampfi*, which was not previously confirmed for England (but see below) and another jumping spider, later identified as *Sibianor larae*, which was not previously known from Britain.



Figure 3. *Heliophanus dampfi* juvenile male from Holcroft Moss. Photograph copyright of Richard Gallon.

In fact, Cheshire Record, the Local Environmental Record Centre for Cheshire, had records of *H. dampfi* from Holcroft made in 2000 by Alan Scott, but they were unable to verify the records because Alan died and the whereabouts of his specimens is unknown, so the spider was not regarded as having been recorded at Holcroft Moss. The re-discovery of *H. dampfi* is sufficient evidence to verify Alan's original records and they will be added to the database of the national Spider Recording Scheme.

Sibianor larae is new to Britain and was therefore not considered by Harvey et al., (2017) in their review of the scarce and threatened spiders of Britain and consequently not assigned to a IUCN category in that analysis. Currently Holcroft Moss is the only confirmed site at which the species is extant in Britain and its national rarity status would be Nationally Rare. *S. larae* was only recognised as a distinct species from *S. aurocinctus* in 2000 by the arachnologist and taxonomist Dmitri Logunov who works at Manchester Museum (Logunov, 2000). He confirmed our discovery of *S. larae* at Holcroft and also re-examined a specimen collected at nearby Kirkby Moss in 1924 by the famous arachnologist W. Falconer and held in Liverpool Museum which also turned out to be *S. larae*. Sadly, Kirkby Moss has been lost to development. It is possible that some other records of supposed *S. aurocinctus* made in the north of England (e.g. at Thorn and Hatfield mosses) and Scotland may turn out to be *S. larae*. This ongoing story will be covered in more detail in the bulletin of the British Arachnological Society (Burkmar and Gallon, in prep.).



Figure 4. *Sibianor larae* juvenile from Holcroft Moss. Note the 'red knees' of the first pair of legs which separate *S. larae* from the related *S. aurocinctus*. Image copyright of Richard Gallon.

Aside from the two jumping spiders mentioned above, our 2018 sampling also added three species not recorded in the vice county of South Lancashire before; the comb-footed spider *Achaearanea simulans*, the very attractive Humped Orbweb spider *Gibbaranea gibbosa* and the jumping spider *Talavera aequipes* (see also the section on Cadishead Moss for more information on *T. aequipes*). We added six bog indicator species, bringing the total for the site to a very respectable 22 with a further 34 bog appropriate species (Table 1 and Table 12).

Table 12. Species recorded in 2018 which had not been recorded at Holcroft Moss before.

Scientific name	Common name	Bog indicator	First	Conservation status
<i>Ero furcata</i>	A pirate spider		site	
<i>Achaearanea simulans</i>	A comb footed spider		VC59	
<i>Phylloneta impressa</i>	A comb footed spider		site	
<i>Theridion pictum</i>	A comb footed spider		site	
<i>Enoplognatha latimana</i>	Scarce Candy-striped spider		site	
<i>Robertus lividus</i>	A comb footed spider		site	
<i>Ceratinella brevipes</i>	A money spider	yes	site	
<i>Walckenaeria antica</i>	A money spider		site	
<i>Gnathonarium dentatum</i>	A money spider	yes	site	
<i>Hypomma bituberculatum</i>	A money spider	yes	site	
<i>Pocadicnemis pumila sens. str.</i>	A money spider		site	
<i>Pelecopis parallela</i>	A money spider		site	
<i>Cnephalocotes obscurus</i>	A money spider		site	
<i>Lophomma punctatum</i>	A money spider	yes	site	
<i>Micrargus herbigradus sens. str.</i>	A money spider		site	

<i>Erigone dentipalpis</i>	A money spider		site	
<i>Meioneta rurestris</i>	A money spider		site	
<i>Tapinopa longidens</i>	A money spider		site	
<i>Tenuiphantes flavipes</i>	A money spider		site	
<i>Linyphia triangularis</i>	Common Sheetweb spider		site	
<i>Neriere montana</i>	A money spider		site	
<i>Tetragnatha montana</i>	A stretch spider		site	
<i>Tetragnatha nigrita</i>	A stretch spider		site	
<i>Gibbaranea gibbosa</i>	Humped Orbweb spider		VC59	
<i>Agalenatea redii</i>	An orb web spider		site	
<i>Zygiella atrica</i>	A missing-sector Orbweb spider		site	
<i>Trochosa ruricola</i>	A wolf spider		site	
<i>Pirata latitans</i>	An otter spider	yes	site	
<i>Heliophanus dampfi</i>	A sun jumping spider	yes	England	Nationally Rare & IUCN Vulnerable
<i>Talavera aequipes</i>	A jumping spider		VC59	
<i>Sibianor larae</i>	A jumping spider	(see text)	Britain	(see text)

Table 13. Spiders recorded at Holcroft Moss prior to 2018 which have either an IUCN conservation status, national rarity or which are regarded as indicators of bog.

Scientific name	Common name	Bog indicator	Conservation status	
<i>Euryopis flavomaculata</i>	A comb footed spider		Nationally Scarce & Amber List	
<i>Robertus arundineti</i>	A comb footed spider	yes		
<i>Walckenaeria alticeps</i>	A money spider		Nationally Scarce	
<i>Walckenaeria dysderoides</i>	A money spider		Nationally Scarce & Amber List	
<i>Walckenaeria vigilax</i>	A money spider	yes		
<i>Silometopus elegans</i>	A money spider	yes		
<i>Gongylidiellum latebricola</i>	A money spider		Nationally Scarce & Amber List	
<i>Diplocephalus permixtus</i>	A money spider	yes		
<i>Aphileta misera</i>	A money spider	yes		
<i>Porrhomma pygmaeum</i>	A money spider	yes		
<i>Agyneta cauta</i>	A money spider	yes	Nationally Scarce & Amber List	
<i>Maro minutus</i>	A money spider	yes	Nationally Scarce	
<i>Centromerus dilutus</i>	A money spider	yes		
<i>Tallusia experta</i>	A money spider	yes		
<i>Sintula corniger</i>	A money spider	yes	Nationally Scarce & Amber List	
<i>Kaestneria pullata</i>	A money spider	yes		
<i>Taranucnus setosus</i>	A money spider	yes	Nationally Scarce & Amber List	
<i>Pirata piraticus</i>	An otter spider	yes		
<i>Pirata uliginosus</i>	An otter spider	yes		
<i>Antistea elegans</i>	A Lesser Cobweb spider	yes		

Risley Moss

I visited Risley Moss for four hours on 23rd September, vacuuming from four locations and sweeping/beating from another. Despite being reasonably well recorded in the past (with records from six previous years) the sampling added an impressive 27 new species to the site list, bringing the site total to 91 (Table 1, Table 14 and Table 15). The sampling added four new Nationally Scarce species to the one previously known: the comb-footed spider *Euryopis flavomaculata* and the money spiders *Hypselistes jacksoni*, *Bathyphantes setiger* and *Taranucnus setosus*. *Bathyphantes setiger*, in particular, is a nice find, being previously unrecorded from the vice county of South Lancashire. The nearest recorded sites for this species are the bogs of Delamere Forest. The survey added ten new bog indicator species, bringing the total for the site to 14 with a further 22 bog appropriate species (Table 1, Table 14 and Table 15).

The good number of species added to the site list by this survey may be an indication of the success of restoration and rewetting work undertaken at Risley Moss in recent years. Apart from some limited recording in 2013, other previous records are all from 1996 or before, dating from a time when the bog was in much less favourable condition.

Table 14. Species recorded in 2018 which had not been recorded at Risley Moss before.

Scientific name	Common name	Bog indicator	First	Conservation status
<i>Ero cambridgei</i>	A pirate spider		site	
<i>Euryopis flavomaculata</i>	A comb footed spider		site	Nationally Scarce & Amber List
<i>Theridion pictum</i>	A comb footed spider		site	
<i>Platnickina tinctoria</i>	A comb footed spider		site	
<i>Ceratinella brevis</i>	A money spider		site	
<i>Gonatium rubens</i>	A money spider		site	
<i>Hypselistes jacksoni</i>	A money spider	yes	site	Nationally Scarce & Amber List
<i>Oedothorax retusus</i>	A money spider		site	
<i>Silometopus elegans</i>	A money spider	yes	site	
<i>Gongyliidiellum vivum</i>	A money spider		site	
<i>Savignia frontata</i>	A money spider		site	
<i>Aphileta misera</i>	A money spider	yes	site	
<i>Meioneta rurestris</i>	A money spider		site	
<i>Tallusia experta</i>	A money spider	yes	site	
<i>Bathyphantes gracilis</i>	A money spider		site	
<i>Bathyphantes setiger</i>	A money spider	yes	VC59	Nationally Scarce & Amber List
<i>Kaestneria pullata</i>	A money spider	yes	site	
<i>Taranucnus setosus</i>	A money spider	yes	site	Nationally Scarce & Amber List
<i>Tenuiphantes mengei</i>	A money spider		site	
<i>Hypsosinga pygmaea</i>	An orb web spider		site	
<i>Pirata uliginosus</i>	An otter spider	yes	site	
<i>Antistea elegans</i>	A Lesser Cobweb spider	yes	site	
<i>Clubiona stagnatilis</i>	A sac spider	yes	site	
<i>Clubiona diversa</i>	A sac spider		site	
<i>Tibellus oblongus</i>	A running crab spider		site	
<i>Ozyptila trux</i>	A crab spider		site	
<i>Neon reticulatus</i>	A jumping spider		site	

Table 15. Spiders recorded at Risley Moss prior to 2018 which have either an IUCN conservation status, national rarity or which are regarded as indicators of bog.

Scientific name	Common name	Bog indicator	Conservation status
<i>Moebelia penicillata</i>	A money spider		Nationally Scarce & Amber List
<i>Hypomma bituberculatum</i>	A money spider	yes	
<i>Bathyphantes approximatus</i>	A money spider	yes	
<i>Pirata piraticus</i>	An otter spider	yes	
<i>Pirata hygrophilus</i>	An otter spider	yes	

Danes Moss

I spent about six hours on Danes Moss on 20th July, as part of a field visit organised by Gary Hedges of the Tanyptera Project, vacuuming at five locations, sweeping at four and beating at another. Only a single previous record existed for this site in the SRS database – the sac spider *Clubiona diversa*. Coming at the end of a remarkably long hot dry summer, Danes Moss was exceptionally dry and in poor condition for a survey of bog spiders. 36 new species were recorded bringing the total list for the site to 37 species. Nine of the new species are bog indicators and one, the money spider *Hypselistes jacksoni*, is Nationally Scarce and Amber Listed. A further 14 species are considered bog appropriate. There is no doubt in my mind that the number of species recorded was affected by the conditions and that further surveys at Danes Moss will considerably increase the list of spiders recorded there.

Table 16. Species recorded in 2018 which had not been recorded at Danes Moss before.

Scientific name	Common name	Bog indicator	First	Conservation status
<i>Phylloneta sisypbia</i>	A comb footed spider		site	
<i>Phylloneta impressa</i>	A comb footed spider		site	
<i>Enoplognatha ovata sens. str.</i>	Common Candy-striped spider		site	
<i>Theonoe minutissima</i>	A comb footed spider	yes	site	
<i>Dicymbium nigrum</i>	A money spider		site	
<i>Dismodicus bifrons</i>	A money spider		site	
<i>Maso sundevalli</i>	A money spider		site	
<i>Hypselistes jacksoni</i>	A money spider	yes	site	Nationally Scarce & Amber List
<i>Oedothorax gibbosus</i>	A money spider		site	
<i>Cnephalocotes obscurus</i>	A money spider		site	
<i>Lophomma punctatum</i>	A money spider	yes	site	
<i>Erigone atra</i>	A money spider		site	
<i>Aphileta misera</i>	A money spider	yes	site	
<i>Bathyphantes gracilis</i>	A money spider		site	
<i>Kaestneria pullata</i>	A money spider	yes	site	
<i>Linyphia triangularis</i>	Common Sheetweb spider		site	
<i>Pachygnatha clercki</i>	A long-jawed Orbweb spider		site	
<i>Araneus quadratus</i>	Four-spotted Orbweb spider		site	
<i>Larinioides cornutus</i>	An orb web spider		site	
<i>Zygiella atrica</i>	A missing-sector Orbweb spider		site	

<i>Pardosa pullata</i>	A wolf spider		site	
<i>Pardosa amentata</i>	A wolf spider		site	
<i>Pardosa nigriceps</i>	A wolf spider		site	
<i>Trochosa terricola</i>	A wolf spider		site	
<i>Pirata piraticus</i>	An otter spider	yes	site	
<i>Pirata hygrophilus</i>	An otter spider	yes	site	
<i>Pirata uliginosus</i>	An otter spider	yes	site	
<i>Antistea elegans</i>	A Lesser Cobweb spider	yes	site	
<i>Dictyna arundinacea</i>	A Meshweb spider		site	
<i>Clubiona reclusa</i>	A sac spider		site	
<i>Clubiona lutescens</i>	A sac spider		site	
<i>Zora spinimana</i>	A ghost spider		site	
<i>Tibellus maritimus</i>	A running crab spider		site	
<i>Xysticus cristatus</i>	A crab spider		site	
<i>Ozyptila trux</i>	A crab spider		site	
<i>Neon reticulatus</i>	A jumping spider		site	

Little Budworth Common

Richard Gallon and I visited Little Budworth Common on 18th May 2018, together with other recorders, as part of a field visit organised by Gary Hedges of the Tanyptera Project. We spent about five hours there and I vacuumed at four locations on the bog and swept or beat heathy vegetation at four locations. Richard Gallon vacuumed at five locations on the bog and swept, beat or sieved at four locations. Tony Hunter also recorded a number of spiders by hand searching, beating and sweeping at a number of locations.

Little Budworth Common is a well-studied site but, nevertheless, the new survey added 23 species to the site list, bringing the total to 150 species. Of these new species, the money spider *Erigonella ignobilis*, is Nationally Scarce and the very handsome wolf spider, *Alopecosa barbipes*, is Amber Listed. These new finds bring the total number of Nationally Scarce species at Little Budworth Common to seven, four of which are also Amber Listed. A further three are Amber Listed. The Nationally Rare and IUCN Near Threatened jumping spider *Sitticus floricola* also occurs on the site and was the subject of a study by Richard Gallon in 2017 (Gallon, 2018). Three new bog indicators were added to the list, bringing the total to 24 with a further 37 bog appropriate species recorded (see Table 17, Table 18 and Table 1).

The high number of species recorded at Little Budworth reflects both the quality and diversity of habitat found there with excellent examples of both heathland and bog.

Table 17. Species recorded in 2018 which had not been recorded at Little Budworth Common before.

Scientific name	Common name	Bog indicator	First	Conservation status
<i>Theridion mystaceum</i>	A comb footed spider		site	
<i>Simitidion simile</i>	A comb footed spider		site	
<i>Paidiscura pallens</i>	A comb footed spider		site	
<i>Enoplognatha thoracica</i>	A comb footed spider		site	
<i>Theonoe minutissima</i>	A comb footed spider	yes	site	
<i>Walckenaeria vigilax</i>	A money spider	yes	site	

<i>Entelecara acuminata</i>	A money spider		site	
<i>Hylyphantes graminicola</i>	A money spider		site	
<i>Dismodicus bifrons</i>	A money spider		site	
<i>Minyriolus pusillus</i>	A money spider		site	
<i>Erigonella ignobilis</i>	A money spider	yes	site	Nationally Scarce
<i>Diplocephalus picinus</i>	A money spider		site	
<i>Meioneta saxatilis sens. str.</i>	A money spider		site	
<i>Tenuiphantes tenebricola</i>	A money spider		site	
<i>Tetragnatha pinicola</i>	A stretch spider		site	
<i>Araneus sturmi</i>	An orb web spider		site	
<i>Agalenatea redii</i>	An orb web spider		site	
<i>Cyclosa conica</i>	Trash line spider		site	
<i>Alopecosa barbipes</i>	A wolf spider		site	Amber List
<i>Clubiona lutescens</i>	A sac spider		site	
<i>Philodromus aureolus</i>	A running crab spider		site	
<i>Philodromus cespitum</i>	A running crab spider		site	
<i>Tibellus oblongus</i>	A running crab spider		site	

Table 18. Spiders recorded at Little Budworth Common prior to 2018 which have either an IUCN conservation status, national rarity or which are regarded as indicators of bog.

Scientific name	Common name	Bog indicator	Conservation status
<i>Euryopis flavomaculata</i>	A comb footed spider		Nationally Scarce & Amber List
<i>Ceratinella brevipes</i>	A money spider	yes	
<i>Hypomma bituberculatum</i>	A money spider	yes	
<i>Hypselistes jacksoni</i>	A money spider	yes	Nationally Scarce & Amber List
<i>Silometopus elegans</i>	A money spider	yes	
<i>Lophomma punctatum</i>	A money spider	yes	
<i>Diplocephalus permixtus</i>	A money spider	yes	
<i>Araeoncus humilis</i>	A money spider		Amber List
<i>Drepanotylus uncatus</i>	A money spider	yes	Amber List
<i>Aphileta misera</i>	A money spider	yes	
<i>Porrhomma pygmaeum</i>	A money spider	yes	
<i>Centromerus dilutus</i>	A money spider	yes	
<i>Tallusia experta</i>	A money spider	yes	
<i>Bathyphantes approximatus</i>	A money spider	yes	
<i>Bathyphantes setiger</i>	A money spider	yes	Nationally Scarce & Amber List
<i>Kaestneria pullata</i>	A money spider	yes	
<i>Palliduphantes insignis</i>	A money spider		Nationally Scarce
<i>Pirata piraticus</i>	An otter spider	yes	
<i>Pirata tenuitarsis</i>	An otter spider	yes	Nationally Scarce
<i>Pirata hygrophilus</i>	An otter spider	yes	
<i>Pirata latitans</i>	An otter spider	yes	
<i>Pirata piscatorius</i>	An otter spider	yes	Nationally Scarce & Amber List
<i>Argyroneta aquatica</i>	Water spider	yes	

<i>Sitticus floricola</i>	A jumping spider	yes	Nationally Rare & IUCN Near Threatened
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Abbot's Moss

I visited Abbot's Moss on 2nd July as part of a tour around some of the Delamere bogs. I spent about one hour at Abbot's Moss vacuuming within a single location. I was not able to spend long at this amazing site and it is so well-studied that I only managed to add one more species to the site list, the jumping spider *Talavera aequipes*, which was also a first for the vice county of Cheshire (Table 19). (See the account for Cadishead Moss for more information on this spider.)

I only sampled from the northern end of Abbot's Moss – the part also known as Shemmy Moss – but the records in Table 20 include records recorded both here and in the southern end of Abbot's Moss (the part known as South Moss). Abbot's Moss is an extremely rich site with 19 Nationally Scarce species recorded, as well as the Nationally Rare jumping spider *Sitticus floricola* (IUCN Near Threatened) and Nationally Rare money spider *Glyphesis cottonae* (IUCN Vulnerable). 13 species recorded on the bog are Amber Listed. 27 bog indicators have been recorded from the site and a further 37 bog appropriate species (Table 1 and Table 20).

Table 19. Species recorded in 2018 which had not been recorded at Abbot's Moss before.

Scientific name	Common name	Bog indicator	First	Conservation status
<i>Talavera aequipes</i>	A jumping spider		VC58	

Table 20. Spiders recorded at Abbot's Moss prior to 2018 which have either an IUCN conservation status, national rarity or which are regarded as indicators of bog.

Scientific name	Common name	Bog indicator	Conservation status
<i>Euryopis flavomaculata</i>	A comb footed spider		Nationally Scarce & Amber List
<i>Robertus neglectus</i>	A comb footed spider		Nationally Scarce & Amber List
<i>Theonoe minutissima</i>	A comb footed spider	yes	
<i>Ceratinella brevipes</i>	A money spider	yes	
<i>Walckenaeria nodosa</i>	A money spider	yes	Nationally Scarce & Amber List
<i>Walckenaeria dysderoides</i>	A money spider		Nationally Scarce & Amber List
<i>Walckenaeria furcillata</i>	A money spider		Nationally Scarce & Amber List
<i>Walckenaeria vigilax</i>	A money spider	yes	
<i>Hypomma bituberculatum</i>	A money spider	yes	
<i>Hypselistes jacksoni</i>	A money spider	yes	Nationally Scarce & Amber List
<i>Satilatlas britteni</i>	A money spider	yes	Nationally Scarce
<i>Monocephalus castaneipes</i>	A money spider		Nationally Scarce
<i>Lophomma punctatum</i>	A money spider	yes	
<i>Glyphesis cottonae</i>	A money spider	yes	Nationally Rare & IUCN Vulnerable
<i>Diplocephalus permixtus</i>	A money spider	yes	
<i>Aphileta misera</i>	A money spider	yes	
<i>Porrhomma pygmaeum</i>	A money spider	yes	
<i>Porrhomma convexum</i>	A money spider		Nationally Scarce & Amber List
<i>Agyneta subtilis</i>	A money spider		Amber List
<i>Agyneta olivacea</i>	A money spider		Nationally Scarce

<i>Centromerus dilutus</i>	A money spider	yes	
<i>Tallusia experta</i>	A money spider	yes	
<i>Bathyphantes approximatus</i>	A money spider	yes	
<i>Kaestneria pullata</i>	A money spider	yes	
<i>Taranucnus setosus</i>	A money spider	yes	Nationally Scarce & Amber List
<i>Trochosa spinipalpis</i>	A wolf spider	yes	Nationally Scarce & Amber List
<i>Pirata piraticus</i>	An otter spider	yes	
<i>Pirata tenuitarsis</i>	An otter spider	yes	Nationally Scarce
<i>Pirata hygrophilus</i>	An otter spider	yes	
<i>Pirata latitans</i>	An otter spider	yes	
<i>Pirata piscatorius</i>	An otter spider	yes	Nationally Scarce & Amber List
<i>Scotina gracilipes</i>	Running foliage spider		Nationally Scarce
<i>Clubiona stagnatilis</i>	A sac spider	yes	
<i>Clubiona norvegica</i>	A sac spider	yes	Nationally Scarce & Amber List
<i>Clubiona phragmitis</i>	A sac spider	yes	
<i>Gnaphosa leporina</i>	A ground spider		Nationally Scarce
<i>Philodromus histrio</i>	A running crab spider		Nationally Scarce
<i>Xysticus sabulosus</i>	A crab spider		Nationally Scarce & Amber List
<i>Sitticus floricola</i>	A jumping spider	yes	Nationally Rare & IUCN Near Threatened

Blakemere complex

I visited several sites in the area of Blakemere on 2nd July as part of a tour around some of the Delamere bogs. I vacuumed a couple of locations at Black Lake and swept another and the same at Hatchmere. At Blakemere itself I vacuumed a single location. These are all so close together and their boundaries so poorly defined that it was not feasible to extract separate site lists from the current records to contrast with those made during this visit. Instead I have considered all these sites together as the 'Blakemere complex'. (Note that Abbot's Moss is sufficiently differentiated to be considered separately.)

Like nearby Abbot's Moss, the sites around Blakemere are so well surveyed that I was able to add little to the site list except the stretch spider *Tetragnatha obtusa* and the money spider *Silometopus elegans*, which is a bog indicator (Table 21). The existing site list for this area comprises a remarkable 18 Nationally Scarce species recorded, as well as the Nationally Rare jumping spider *Sitticus floricola* (IUCN Near Threatened) and Nationally Rare money spider *Glyphesis cottonae* (IUCN Vulnerable) – the same two Nationally Rare species recorded at Abbot's Moss. 11 species recorded on the Blakemere complex are Amber Listed. An excellent total of 37 bog indicators have been recorded from the Blakemere complex and a further 37 bog appropriate species (Table 1 and Table 22).

Table 21. Species recorded in 2018 which had not been recorded on the Blakemere complex before.

Scientific name	Common name	Bog indicator	First	Conservation status
<i>Silometopus elegans</i>	A money spider	yes	site	
<i>Tetragnatha obtusa</i>	A stretch spider		site	

Table 22. Spiders recorded on the Blakemere complex prior to 2018 which have either an IUCN conservation status, national rarity or which are regarded as indicators of bog.

Scientific name	Common name	Bog indicator	Conservation status
<i>Euryopis flavomaculata</i>	A comb footed spider		Nationally Scarce & Amber List
<i>Robertus arundineti</i>	A comb footed spider	yes	
<i>Theonoe minutissima</i>	A comb footed spider	yes	
<i>Ceratinella brevipes</i>	A money spider	yes	
<i>Walckenaeria nodosa</i>	A money spider	yes	Nationally Scarce & Amber List
<i>Walckenaeria vigilax</i>	A money spider	yes	
<i>Moebelia penicillata</i>	A money spider		Nationally Scarce & Amber List
<i>Gnathonarium dentatum</i>	A money spider	yes	
<i>Tmeticus affinis</i>	A money spider	yes	Nationally Scarce
<i>Hypomma bituberculatum</i>	A money spider	yes	
<i>Hypselistes jacksoni</i>	A money spider	yes	Nationally Scarce & Amber List
<i>Microctenonyx subitaneus</i>	A money spider		Nationally Scarce
<i>Satilatlas britteni</i>	A money spider	yes	Nationally Scarce
<i>Lophomma punctatum</i>	A money spider	yes	
<i>Gongyliidium latebricola</i>	A money spider		Nationally Scarce & Amber List
<i>Glyphesis cottonae</i>	A money spider	yes	Nationally Rare & IUCN Vulnerable
<i>Erigonella ignobilis</i>	A money spider	yes	Nationally Scarce
<i>Diplocephalus permixtus</i>	A money spider	yes	
<i>Aphileta misera</i>	A money spider	yes	
<i>Porrhomma pygmaeum</i>	A money spider	yes	
<i>Porrhomma montanum</i>	A money spider		Nationally Scarce
<i>Agyneta subtilis</i>	A money spider		Amber List
<i>Centromerus dilutus</i>	A money spider	yes	
<i>Tallusia experta</i>	A money spider	yes	
<i>Sintula corniger</i>	A money spider	yes	Nationally Scarce & Amber List
<i>Saaristoa firma</i>	A money spider		Nationally Scarce
<i>Bathyphantes approximatus</i>	A money spider	yes	
<i>Bathyphantes setiger</i>	A money spider	yes	Nationally Scarce & Amber List
<i>Kaestneria pullata</i>	A money spider	yes	
<i>Taranucnus setosus</i>	A money spider	yes	Nationally Scarce & Amber List
<i>Microlinyphia impigra</i>	A money spider	yes	
<i>Alopecosa barbipes</i>	A wolf spider		Amber List
<i>Arctosa leopardus</i>	A wolf spider	yes	
<i>Pirata piraticus</i>	An otter spider	yes	
<i>Pirata tenuitarsis</i>	An otter spider	yes	Nationally Scarce
<i>Pirata hygrophilus</i>	An otter spider	yes	
<i>Pirata latitans</i>	An otter spider	yes	
<i>Pirata piscatorius</i>	An otter spider	yes	Nationally Scarce & Amber List
<i>Argyroneta aquatica</i>	Water spider	yes	
<i>Antistea elegans</i>	A Lesser Cobweb spider	yes	
<i>Hahnia pusilla</i>	A Lesser Cobweb spider	yes	Nationally Scarce

<i>Clubiona stagnatilis</i>	A sac spider	yes	
<i>Clubiona phragmitis</i>	A sac spider	yes	
<i>Gnaphosa leporina</i>	A ground spider		Nationally Scarce
<i>Sitticus floricola</i>	A jumping spider	yes	Nationally Rare & IUCN Near Threatened

Discussion

The surveys described in this report were not part of a systematic effort but are best characterised as casual surveys undertaken by expert amateurs. Nevertheless, the surveys produced very useful and interesting records, including the first confirmed English records of the jumping spider *Heliophanus dampfi* and the first confirmed UK records for the jumping spider *Sibianor larae* (both at Holcroft Moss). The surveys produced new site records at every one of the 11 sites surveyed – a total of 203 new site records.

From a study carried out on North West lowland bogs, Scott, Oxford and Selden (2006) noted the potential of spider surveys in assessing the site quality of lowland bogs, finding that the number of bog indicator species was significantly correlated with the Red Data Book and notable species in other invertebrate taxa and stating that “*spider indicator species are an acceptable surrogate for the conservation value of the total invertebrate mesofauna*”. The authors devised and recommended a repeatable ‘short-survey’ protocol that involves setting 40 pitfall traps on a site and emptying them weekly, typically for around 6 to 8 weeks (depending on a number of stopping rules). In reality, even a short-survey protocol like this can prove too expensive in time and/or money for conservation organisations relying on volunteers to deploy.

Vacuum sampling of the type deployed in the surveys described in this report may provide the basis of an alternative sampling strategy which, whilst not producing the same sort of quantifiable data as the protocol described by Scott, Oxford and Selden, (2006), could nevertheless provide useful information on the quality/condition of a site, especially if used in conjunction with the ‘bog indicator’ lists of Scott, Oxford and Selden, (2006). It would not be difficult to add more rigour to vacuum sampling surveys by introducing some standardisation to the number of sampling points, time spent running the sampler and frequency of visits made to sites etc. The following features could form the basis of a repeatable and relatively inexpensive spider survey protocol for North West lowland bogs that could realistically be resourced by site owners such as the Wildlife Trusts and local councils with the aid of expert volunteers:

- sample lowland bog sites at least once every five years;
- carry out subsequent visits to a site at different times of year, normally between April and September;
- on each visit choose sampling points representative of the different microhabitats on the site;
- choose at least five sampling points for each visit, but more for large sites;
- at each sampling point, standardise the number and length of vacuum samples, e.g. three vacuum samples of 90 seconds each;
- use different sampling points in subsequent years in order to cover as much of the site as possible; and
- supplement the vacuum sampling with other methods as appropriate for the microhabitat, e.g. hand searching, beating and sweeping.

The kind of survey described above could be undertaken in a day for most sites and therefore a suite of 20 sites could completely covered by sampling around four sites per year – a number which could realistically be resourced by committed volunteers.

Scott, Oxford and Selden, (2006) found that most bog species are active as adults in the months of May and June, suggesting that this is the best time of year for a single survey, but surveying only at this time of year will never yield a complete picture for a site, so an effort should be made survey over a range of dates over the years.

Several of the sites surveyed in 2018, including Risley Moss, Holcroft Moss, Cadishead Moss and Little Woolden Moss, are part of a geographically tight group (also including Astley and Bedford Mosses which were not surveyed this year). Figure 5 illustrates that these sites are part of peatland bodies which historically would have been part of a single ecological unit. Their proximity to each other is such that there is still the potential for spider species from one site to naturally colonise their neighbours. We are already witnessing this where the colonisation of the formerly bare Little Woolden Moss is probably being greatly accelerated by its close proximity to Cadishead Moss.



Figure 5. The extent of lowland peatlands between Greater Manchester and Liverpool, indicating the original extent of lowland raised bogs and the current extent of the habitat. (Extent of peatlands derived from data supplied by the British Geological Survey.)

Could the amazing survival of *Heliophanus dampfi*, *Sibianor laeae* and others at Holcroft Moss offer the potential for recolonization of nearby Risley Moss and Cadishead/Little Woolden Moss, either naturally or perhaps by planned reintroductions in the future? Projects like the *Carbon Landscape*, which treat these sites as integral parts of a greater whole, could help us realise this. Holcroft Moss is currently the jewel in this crown and should be protected at all costs, not only for its own intrinsic interest, but because of its potential as a biodiversity source for the rest of the carbon landscape.

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References

- Askins, M. (no date) *Summary for Talavera aequipes (Araneae), Spider and Harvestman Recording Scheme website*. Available at: <http://srs.britishspiders.org.uk/portal.php/p/Summary/s/Talavera+aequipes/u/26/x/7aaca5cb> (Accessed: 14 January 2019).
- BRIG (2008) *UK Biodiversity Action Plan; Priority Habitat Descriptions: Lowland Raised Bog, JNCC Research Report*. Available at: http://www.jncc.gov.uk/page-5155%0Ahttp://www.jncc.gov.uk/page-5155%0Ahttp://jncc.defra.gov.uk/_ukbap/UKBAP_BAPHabitats-49-SeagrassBeds.doc.
- Brigić, A. *et al.* (2017) 'Spatial distribution of insect indicator taxa as a basis for peat bog conservation planning', *Ecological Indicators*, 80(May), pp. 344–353. doi: 10.1016/j.ecolind.2017.05.007.
- Burkmar, R. J. and Gallon, R (2019) '*Sibianor larae* Logunov, 2001 a Salticidae new to Britain, with notes on *Heliophanus dampfi* Schenkel, 1923 and other spiders from Holcroft Moss SSSI', in preparation for the newsletter of the British Arachnological Society.
- Gallon, R. C. (2018) *The status and distribution of the jumping spider Sitticus floricola in Northwest England and Wales*.
- Harvey, P. *et al.* (2017) *A review of the scarce and threatened spiders (Araneae) of Great Britain: Species Status No . 22*.
- Logunov, D. V. (2000) 'A redefinition of the genera *Bianor* Peckham & Peckham, 1885 and *Harmochirus* Simon, 1885, with the establishment of a new genus *Sibianor* gen.n. (Aranei: Salticidae)', *Arthropoda Selecta*, 9(4), pp. 221–286. doi: 10.1002/mame.201200034.
- Scott, A. G., Oxford, G. S. and Selden, P. A. (2006) 'Epigeic spiders as ecological indicators of conservation value for peat bogs', *Biological Conservation*, 127(4), pp. 420–428. doi: 10.1016/j.biocon.2005.09.001.