

Surveying for the Bog Pseudoscorpion *Microbisium brevifemoratum* on the raised bog at Cors Fochno (Dyfi SSSI)

NRW Evidence Report No. 678

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Microbisium brevifemoratum

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Crynodeb gweithredol

Cynhaliodd y prosiect hwn arolwg yng Nghors Fochno ym mis Hydref/Tachwedd 2022, gan ddefnyddio samplu gwactod safonol, ar gyfer y Ffug-sgorpion y Gors *Microbisium brevifemorum* prin iawn (Ellingsen, 1903). Cynhaliwyd cyfanswm o chwe deg dau o funudau o samplu dan wactod yn ystod yr arolwg ar 17 pwynt samplu. Darganfuwyd cyfanswm o bum sbesimen o *M. brevifemorum* mewn dau bwynt samplu yn ystod yr arolwg. Mae un oedolyn yn SN63849084 (29 Hydref 2022) yn cynrychioli lleoliad newydd, gyda phedwar oedolyn arall yn SN64029087 (22 Tachwedd 2022) yn agos iawn at y man lle darganfuwyd y rhywogaeth yn 2021. Hyd yn hyn, mae holl gofnodion Cors Fochno o *M. brevifemorum* wedi dod o ran dde-ddwyreiniol y gors mewn ardaloedd o hen doriadau mawn gwlyb. Cafodd yr holl sbesimenau a ddarganfuwyd yn ystod yr arolwg hwn eu hwfro o ardaloedd â thwmpathau ynys datblygedig o *Sphagnum* spp. (gan gynnwys *Sphagnum papillosum*) yn sefyll o fewn lawntiau *Sphagnum* dirlawn ar lawr hen doriadau mawn. Mae'r microgynefin twmpath ynys hwn yn gyson â chanfyddiadau blaenorol ym Mhrydain o'r rhywogaeth hon gan yr awdur a hefyd adroddiadau am ei hecoleg yn Nenmarc.

Mae'r pum sbesimen *M. brevifemorum* a gofnodwyd yn ystod yr arolwg cyfredol hwn bron yn dyblu'r nifer hysbys o sbesimenau ym Mhrydain a ganfuwyd i 11.

Argymhellir gwneud *Microbisium brevifemorum* yn nodwedd gymhwyso o SoDdGA Dyfi fel yr unig gymdogaeth yng Nghymru ac un o dair yn unig yn y DU.

Roedd canlyniadau arwyddocaol eraill yn cynnwys:

- Dau gofnod pellach o'r pry copyn IUCN Cenedlaethol Brin, Mewn Perygl, *Lasaeola prona* (Menge, 1868) sydd hefyd yn nodwedd gymhwyso o SoDdGA Dyfi;
- Dau gofnod o'r pry copyn IUCN Cenedlaethol Brin, Mewn Perygl *Linyphiidae lepidus* Casemir, 1961 sy'n newydd i Gors Fochno ac yn cynrychioli dim ond yr 17eg lleoliad ym Mhrydain a'r 7fed safle yng Nghymru ar gyfer y rhywogaeth hon. Mae'n debyg y dylai fod yn nodwedd gymhwyso o SoDdGA Dyfi;
- *Satlatlas britteni* (Jackson, 1913) a *Theridiosoma gemmosum* (L. Koch, 1877) (Pryfaid cop sy'n Brin yn Genedlaethol) ill dau yn newydd i Gors Fochno;
- Gwnaed 25 o gofnodion o saith rhywogaeth pry cop sy'n Brin yn Genedlaethol yn ystod yr arolwg hwn.

Executive summary

This project surveyed Cors Fochno in October/November 2022, using standardised vacuum sampling, for the very rare Bog Pseudoscorpion *Microbisium brevifemoratum* (Ellingsen, 1903). A total of sixty-two minutes of vacuum sampling was undertaken during the survey at 17 sample points. In total, five specimens of *M. brevifemoratum* were found at two sample points during the survey. A single adult at SN63849084 (29th October 2022) represents a new location, with a further four adults found at SN64029087 (22nd November 2022) very near to where the species was found in 2021. To date, all Cors Fochno records of *M. brevifemoratum* have come from the southeast section of the bog in areas of old, wet peat cuttings. The specimens found during this survey were all vacuumed from areas with well-developed island-hummocks of *Sphagnum* spp. (including *Sphagnum papillosum*) standing within saturated *Sphagnum* lawns on the floor of old peat cuttings. This island-hummock microhabitat is consistent with previous British finds of this species by the author and also reports of its Danish ecology.

The five *M. brevifemoratum* specimens recorded during this current survey almost doubles the known number of British specimens found to 11.

It is recommended that *Microbisium brevifemoratum* is made a qualifying feature of Dyfi SSSI as the only Welsh locality and one of only three in the UK.

Other significant results included:

- Two further records of the IUCN Endangered, Nationally Rare spider *Lasaeola prona* (Menge, 1868) which is also a qualifying feature of the Dyfi SSSI;
- Two records of the IUCN Endangered, Nationally Rare Linyphiidae spider *Maro lepidus* Casemir, 1961 which is new to Cors Fochno and represents only the 17th British location and 7th Welsh site for this species. It should probably be a qualifying feature of Dyfi SSSI;
- *Satlatlas britteni* (Jackson, 1913) and *Theridiosoma gemmosum* (L. Koch, 1877) (Nationally Scarce spiders) both new to Cors Fochno;
- 25 records of seven Nationally Scarce spider species were made during this survey.

1. Introduction

The Bog Pseudoscorpion *Microbisium brevifemoratum* (Ellingsen, 1903) is one of Britain's rarest pseudoscorpions. In Britain it is known only from three high quality bogs; Chartley Moss, Bettisfield Moss (Shropshire part) and Cors Fochno which is its only Welsh site. The first UK specimen was found by Steve Judd during a Liverpool Museum survey at Chartley Moss (SK0228) amongst *Sphagnum* on 29th July 1994. Two adults and an immature were found by me at Bettisfield Moss (English section) on 8th October 2017 during a vacuum sampling survey (Gallon, 2018a&b).

Mike Bailey pitfalled the first Cors Fochno specimen from a *Sphagnum* pool area at SN636908 in August 2005. The second Cors Fochno specimen was vacuum sampled by me on the 1st September 2021 at SN64019087 (Gallon, 2022). Prior to this current survey, only six specimens of *M. brevifemoratum* have been found in Britain on four occasions (Table 1).

Table 1. Previous British records of *Microbisium brevifemoratum*.

Site	Grid reference	Abundance	Method	Date	Recorder
Chartley Moss	SK0228	1 adult		29 July 1994	Steve Judd
Cors Fochno	SN636908	1 adult	Pitfall trap	August 2005	Mike Bailey
Bettisfield Moss	SJ48063523	2 adult, 1 immature	G-vac	8 October 2017	Richard Gallon
Cors Fochno	SN64019087	1 adult	G-vac	1 September 2021	Richard Gallon

The Pseudoscorpions of the World website notes that *M. brevifemoratum* has been recorded from Austria, Azerbaijan, Belgium, China, Denmark, Estonia, Finland, Germany, Latvia, Nepal, Norway, Pakistan, Poland, Russia, Sweden and Switzerland (Harvey, 2013). There is also a specimen from Canada on the BOLD DNA barcode website.

This current survey aimed to gauge the frequency and distribution of *M. brevifemoratum* at Cors Fochno, focusing on habitats supporting its favoured microhabitat, as described by Lissner (2019) and Gallon (2018a&b, 2022).

2. Methods

This survey was conducted on 29th & 30th October and 22nd November 2022 on Cors Fochno within the Dyfi SSSI. The survey primarily focused on the old wet peat cuttings in the southeast of the bog, but some exploratory sampling was also conducted on the central uncut raised bog in areas exhibiting hummock/hollow topography.

Aerial imagery and recommendations from the NRW site manager Justin Lyons were used to target areas thought to represent the most suitable habitat for *Microbisium brevifemoratum*. Sample points were preferentially chosen where small island-hummocks of *Sphagnum*, *Erica tetralix* and/or *Calluna* were sitting within pools of saturated *Sphagnum* lawn. This microhabitat is consistent with previous finds of *M. brevifemoratum* made by the author at Cors Fochno and Bettisfield Moss (Gallon 2018a&b, 2022) and also Danish records of this species (Lissner, 2019).

Timed vacuum sampling using a petrol vacuum sampler (Stihl SH56C), as described in Gallon (2022), was the main survey method employed. A total of 62 minutes of vacuum sampling was undertaken during the survey at 17 sample points (Figure 1, Figures 6 to 22). The resulting sieved vacuum samples were examined with x2 magnification glasses to find *Microbisium* specimens and spiders (Figure 2).

A clump of *Sphagnum* was sieved over a tray in the field at SN63809102 (Figures 3 & 13). Two samples of *Sphagnum* from SN63989088 (Sample Point 3) and SN64029087 (Sample Point 13) were subjected to Tullgren Funnel extraction in the lab (Figures 4 & 5). Here, *Sphagnum* moss was placed on a wire mesh grid within a large plastic funnel and subjected to a 25W incandescent light bulb from above. This method slowly dries out the moss and any hidden invertebrates are driven downwards, falling through the funnel and into a sample pot of preserving alcohol. As Tullgren Funnels are widely used for surveying pseudoscorpions from leaf litter, straw and moss, it was felt this would be worth trying during this survey.

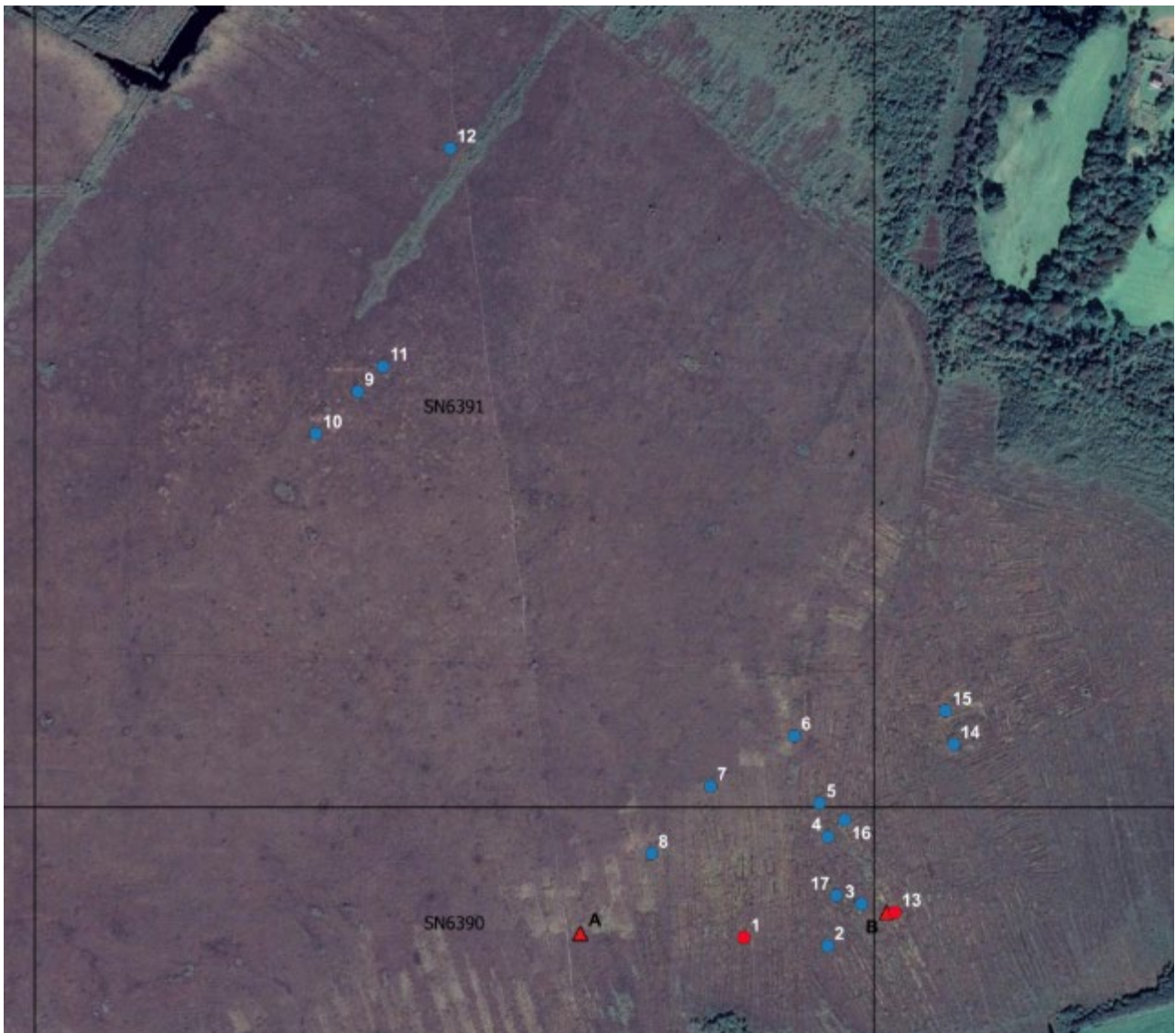


Figure 1. Sample Points on Cors Fochno (1 km grid). *Microbisium brevifemoratum* present: red triangles previous records; red circles 2022 records from this survey.



Figure 2. Searching for *Microbisium brevifemorum* specimens amongst sieved vacuum sample using x2 inspection glasses, Cors Fochno.



Figure 3. *Sphagnum* sieving for *Microbisium brevifemorum*, Cors Fochno.



Figure 4. Tullgren Funnel extraction of *Sphagnum* dwelling invertebrates.

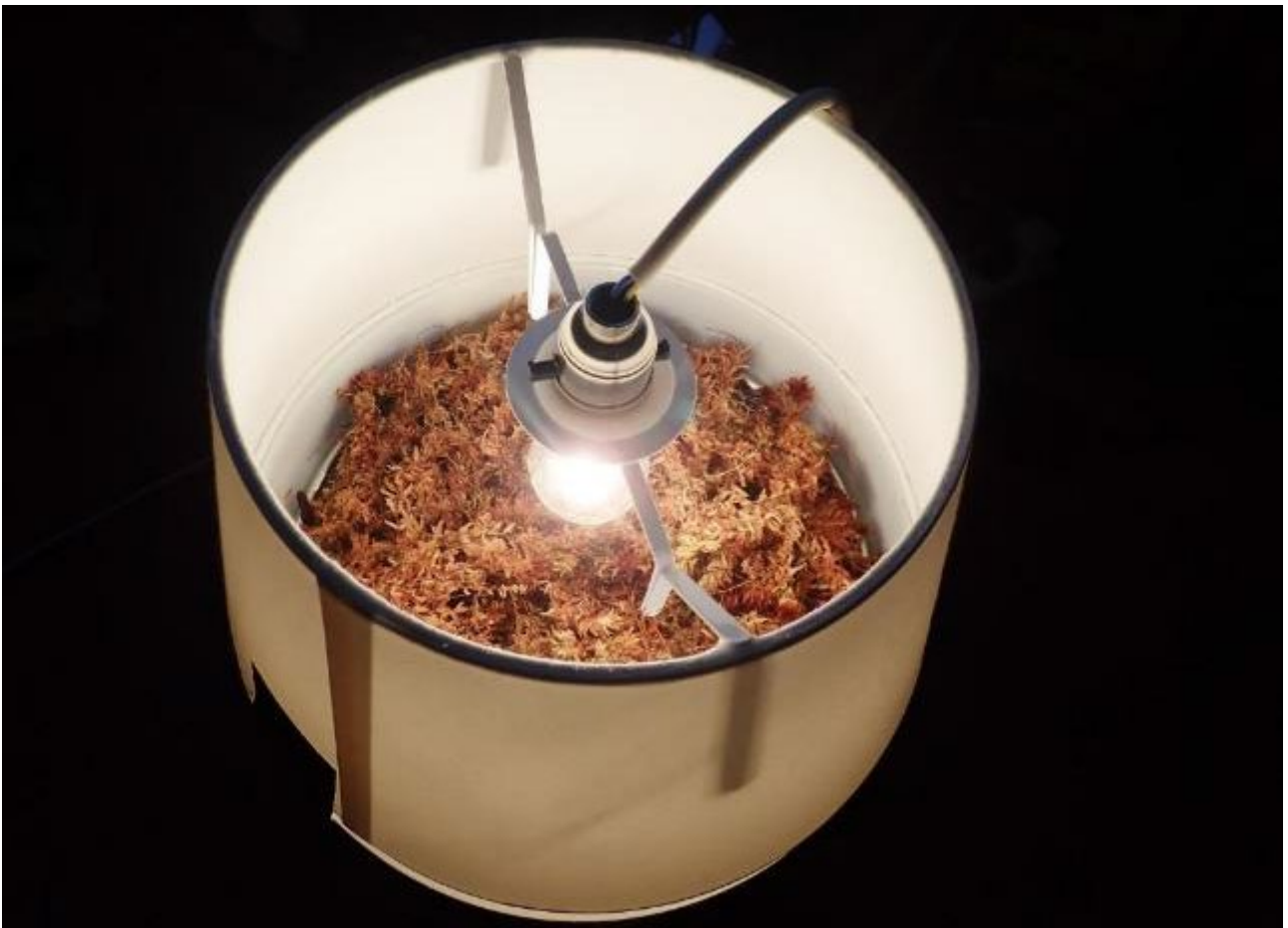


Figure 5. Tullgren Funnel extraction showing incandescent lightbulb dehydrating *Sphagnum* over mesh-screened funnel.



Figure 6. Cors Fochno sample point 1, SN63849084, 29/10/2022. *Microbisium brevifemoratum* and *Lasaeola prona* present.



Figure 7. Cors Fochno sample point 2, SN63949083, 29/10/2022. *Lasaeola prona* present.



Figure 8. Cors Fochno sample point 3, SN63989088, 29/10/2022. *Maro lepidus* present.



Figure 9. Cors Fochno sample point 4, SN63949096, 29/10/2022.



Figure 10. Cors Fochno sample point 6, SN63909108, 29/10/2022. *Maro lepidus* present.



Figure 11. Cors Fochno sample point 7, SN63809102, 29/10/2022.



Figure 12. Cors Fochno sample point 8, SN63739094, 29/10/2022.



Figure 13. Cors Fochno *Sphagnum* sieving site, SN63719091, 29/10/2022.



Figure 14. Cors Fochno sample point 9, SN63389149, 30/10/2022.



Figure 15. Cors Fochno sample point 10, SN63339144, 30/10/2022.



Figure 16. Cors Fochno sample point 11, SN63419152, 30/10/2022.



Figure 17. Cors Fochno sample point 12, SN63499178, 22/11/2022.



Figure 18. Cors Fochno sample point 13, SN64029087, 22/11/2022. *Microbisium brevifemoratum* present.



Figure 19. Cors Fochno sample point 14, SN64099107, 22/11/2022.



Figure 20. Cors Fochno sample point 15, SN64089111, 22/11/2022.



Figure 21. Cors Fochno sample point 16, SN63969098, 22/11/2022.



Figure 22. Cors Fochno sample point 17, SN63959089, 22/11/2022.

3. Results

3.1. *Microbisium brevifemoratum* (Ellingsen, 1903)

In total five adult *Microbisium brevifemoratum* were found during this survey at two locations (Table 2). The first specimen was found on 29th October at sample point 1 (Figure 6 & 23) and was vacuumed from island-hummocks of *Sphagnum papillosum* within a lawn of *Sphagnum pulchrum* and *S. cuspidatum* in the base of an old peat cutting. The sample tray was scrutinised by three observers for several minutes before the specimen was found. This highlights the need for careful and systematic tray inspection when looking for this species, since it can remain immobile when clinging to *Sphagnum* fragments or when trapped in surface water droplets on the tray.

The second location (sample point 13) (Figure 18) produced four adult *M. brevifemoratum* in eight minutes of vacuum sampling on 22nd November (Figure 24 to 26). The specimens here were also vacuumed from island-hummocks of *Sphagnum* spp. within saturated *Sphagnum* lawn at the base of an old peat cutting. This was the same location where a single *M. brevifemoratum* was found in September 2021 (Gallon, 2022).

No Pseudoscorpions were recovered from *Sphagnum* sieving nor Tullgren Funnel extractions.

Table 2. Cors Fochno records of *Microbisium brevifemoratum* in 2022.

Site	Grid reference	Abundance	Method	Date	Recorder
Cors Fochno	SN63849084	1 adult	G-vac (2 minutes)	29 October 2022	Richard Gallon
Cors Fochno	SN64029087	4 adult	G-vac (8 minutes)	22 November 2022	Richard Gallon



Figure 23. *Microbisium brevifemoratum* (left) with Springtail, SN63849084, 29/10/2022, Cors Fochno, sample point 1.



Figure 24. *Microbisium brevifemoratum* immobilised in water drop on sample tray, SN64029087, 22/11/2022, Cors Fochno, sample point 13.



Figure 25. *Microbisium brevifemoratum* immobilised in water drop on sample tray showing size (arrowed), SN64029087, 22/11/2022, Cors Fochno.

To date all four Cors Fochno *Microbisium brevifemoratum* records have come from the area of old peat cuttings in the southeast of the bog (Figure 1). They seem to favour the very wettest cuttings where small, isolated island-hummocks of *Sphagnum*/*Erica*/*Calluna* sit within saturated lawns of *Sphagnum*. This habitat is consistent with where the species was found at Bettisfield Moss in 2017, and also with Danish records. In Denmark, Lissner (2019) notes it is found by sieving *Sphagnum magellanicum* (= *Sphagnum medium*), a moss which occupies areas intermediate between the top of the hummocks and the wet parts of the hollows.

Despite specifically targeting 17 apparently suitable sampling points during this survey, *M. brevifemoratum* was only found at two of these locations. It is thus likely to occur at low densities. However, the most productive site (sample point 13) also appears to represent the best example of 'Sphagnum island-hummocks within saturated Sphagnum lawn' habitat encountered during this survey. The island-hummocks here are well-developed, but not overly shaded by plant growth, characteristics shared by its Bettisfield Moss site. This may well point to the species favouring a rare combination of sun-exposed isolated *Sphagnum* islands surrounded by saturated *Sphagnum* lawn. Many of the other negative-record sample points investigated during this survey had islands which were more vegetated, and thus shadier than at sample point 13. In time, larger areas of suitable *Microbisium brevifemoratum* microhabitat will develop at Cors Fochno, thanks to previous hydrological management and low-profile bunding undertaken by the New LIFE for Welsh Raised Bogs project.

Prior to this survey only six *Microbisium brevifemorum* specimens had been recorded from three sites in Britain - 2 from Cors Fochno, 3 from Bettisfield Moss and 1 from Chartley Moss. The five specimens recorded during this current survey almost doubles the known number of British specimens found to 11. Its restricted and highly localised British distribution underlines the reason why this species should be considered a Qualifying Feature of the Dyfi SSSI.



Figure 26. *Microbisium brevifemorum*, dorsal view. Cors Fochno, SN64029087. Scale 1 mm.

3.2. Identification of *Microbisium brevifemorum*

So far no other pseudoscorpion species, apart from *Microbisium brevifemorum*, have been recorded from the open bog habitats at Cors Fochno. However, Adrian Fowles recorded *Neobisium carcinoides* at Gwynfryn Carr woodland on margins of the bog at SN64029087 on 27th January 1990. *Neobisium carcinoides* is a very common pseudoscorpion species occurring in many habitats. It can be found in woodland leaf litter, under rocks on mountain summits and in *Polytrichum* clumps in acid wetlands. Although *N. carcinoides* has not been found on the open raised bog or the old peat cuttings at Cors Fochno yet, care should be taken identifying future finds of *Microbisium* on the bog, since the two species are superficially similar and need microscopic examination to identify them.

Microbisium brevifemorum differs from *Neobisium carcinoides* in having proportionally more robust squat pincers (Figures 27 & 28). The number of trichobothria on the movable finger of the pincers also differs - 3 in *M. brevifemorum*, 4 in *N. carcinoides*. *Microbisium*

brevifemoratum has a strongly pointed, distinct epitome on the front carapace margin. The pedipalp tibia of *M. brevifemoratum* is strongly and abruptly swollen distally, but in *N. carcinoides* this segment widens more smoothly. *Microbisium brevifemoratum* is also paler and smaller than *N. carcinoides*, but care is needed to exclude pale freshly moulted or juvenile *N. carcinoides*.



Figure 27. *Neobisium carcinoides* (top) comparison with *Microbisium brevifemoratum* (bottom), dorsal view. Scale 1 mm.



Figure 28. *Neobisium carcinoides* (bottom) comparison with *Microbisium brevifemorum* (top), lateral view. Scale 1 mm.



Figure 29. *Neobisium carcinoides*, dorsal view. Foxtor Mires SX61177056. Scale 1 mm.

3.3. Nationally Rare, Endangered spiders

***Lasaeola prona* (Menge, 1868)**

Two immature female specimens of the Endangered and Nationally Rare theridiid spider *Lasaeola prona* were found during this survey on 29th October 2022 (Figure 30). One specimen from sample point 1 (SN63849084, Figure 6) and the other from sample point 2 (SN63949083, Figure 7).

These records are in keeping with the distribution recorded during a previous survey for this species at Cors Fochno (Gallon, 2022; Howe, 2021). In Britain, this species is typically associated with hot, dry, coastal grasslands, and its wetland habitat at Cors Fochno is somewhat atypical. It is a qualifying feature on Dyfi SSSI.

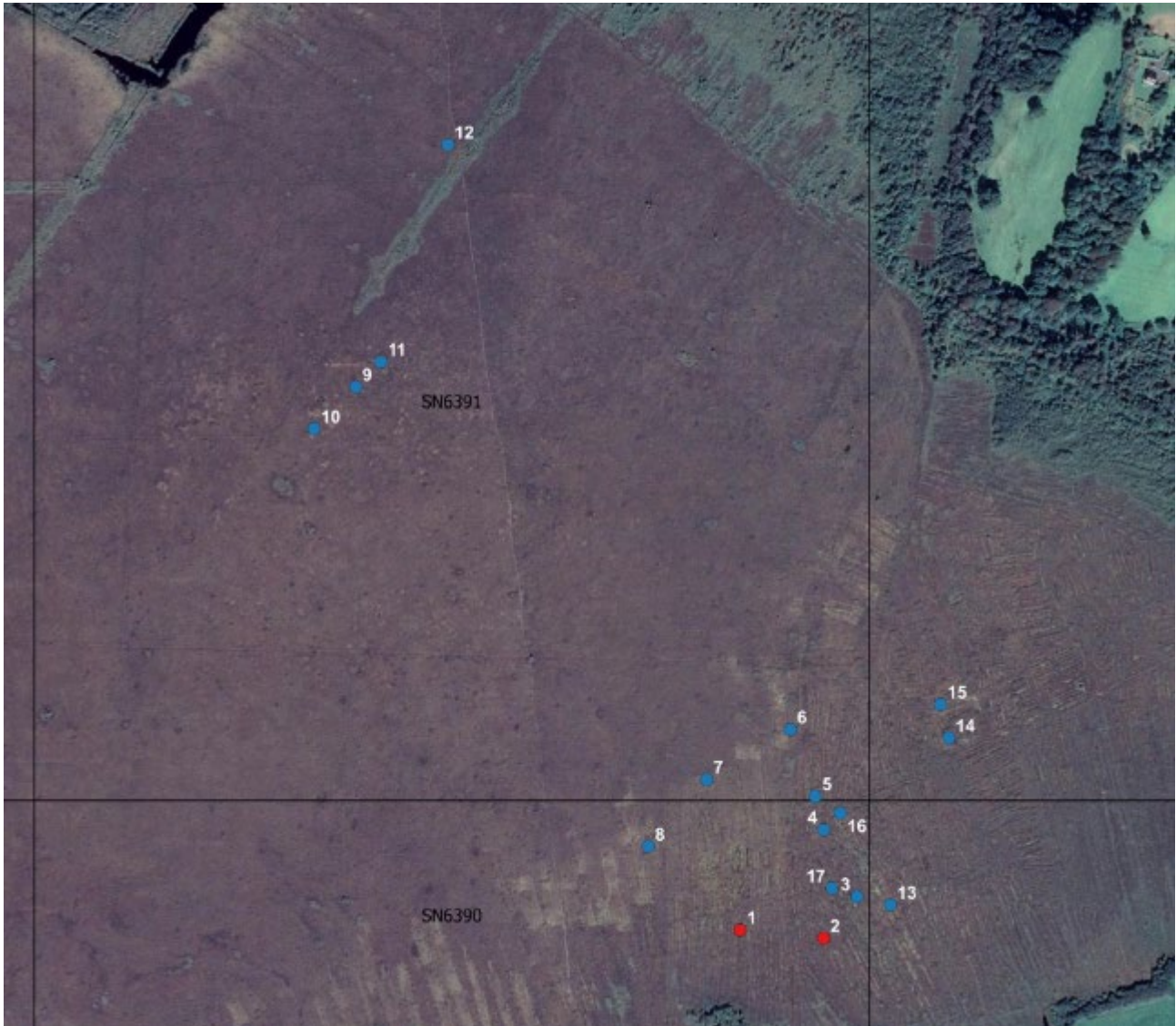


Figure 30. *Lasaeola prona* locations Cors Fochno (red circles present).

***Maro lepidus* Casemir, 1961**

Two adult males of the Endangered and Nationally Rare linyphiid spider *Maro lepidus* were found during this survey on 29th October 2022. One specimen was found at sample point 3 (SN63989088, Figure 8) and the other at sample point 6 (SN63909108, Figure 10) (Figure 31). These are the first records of this species for Cors Fochno.

Maro lepidus is typically an upland species associated with *Sphagnum* flushes, so it is interesting to discover it here at sea-level. However, both Cors Fochno sample points had extensive areas of *Sphagnum* growth associated with deep water, so had cool, high-humidity characteristics similar to its more usual upland habitat.

In Britain, *Maro lepidus* is only known from four Scottish, six English and six previous Welsh sites (Howe, 2020). It is currently a qualifying feature on Cors Caron SSSI and Migneint-Arenig-Ddualt SSSI. Given its rarity both in the UK and Wales, it should probably be a qualifying feature on Dyfi SSSI.

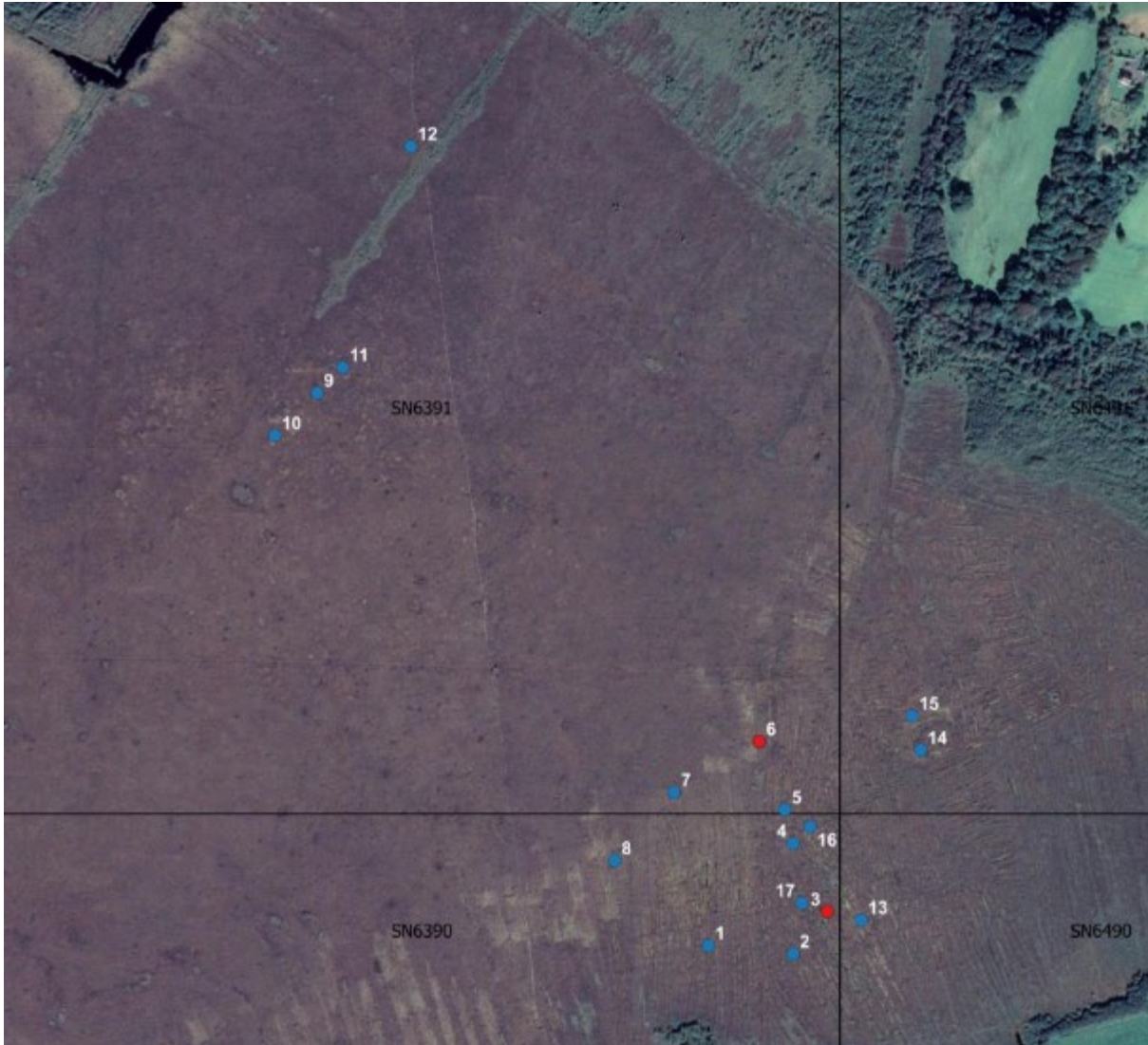


Figure 31. *Maro lepidus* locations Cors Fochno (red circles present).



Figure 32. *Maro lepidus* adult male, dorsal view. Cors Fochno, SN63909108. Scale 1mm.



Figure 33. *Maro lepidus* adult male, ventral view. Cors Fochno, SN63909108. Scale 1mm.

3.4. Nationally Scarce spiders

During this survey seven Nationally Scarce spider species were recorded.

Hypsosinga albovittata (Westring, 1851) is well-known from Cors Fochno having been recorded there since 1986. Eleven records of this small orb-web spider were made during the survey: Sample Point (SP) 1 (1iM, SN63849084, 29/10/2022); SP2 (1i, SN63949083, 29/10/2022); SP3 (1iM, SN63989088, 29/10/2022); SP4 (1iM 1iF, SN63949096, 29/10/2022); SP5 (1iM 1iF, SN63939100, 29/10/2022); SP9 (1iM 1iF, SN63389149, 30/10/2022); SP10 (3iF, SN63339144, 30/10/2022); SP11 (1iM 2iF, SN63419152, 30/10/2022); SP12 (1iM 1iF, SN63499178, 22/11/2022); SP13 (1iM 4iF, SN64029087, 22/11/2022); SP15 (1iF, SN64089111, 22/11/2022).

Satilatlas britteni (Jackson, 1913) has not previously been recorded from Cors Fochno. During this survey, two immature females were vacuumed from two sample points: SP1 (1iF, SN63849084, 29/10/2022); SP15 (1iF, SN64089111, 22/11/2022).

Walckenaeria alticeps (Denis, 1952) is a species indicative of raised bogs and other good quality bogs and fens. Two specimens were found at two sample points at Cors Fochno: SP6 (1M, SN63909108, 29/10/2022); SP13 (1F, SN64029087, 22/11/2022).

Scotina gracilipes (Blackwall, 1859) is strongly associated with heather and was found at five sample points on Cors Fochno: SP6 (1i, SN63909108, 29/10/2022); SP9 (1F, SN63389149, 30/10/2022); SP10 (1i, SN63339144, 30/10/2022); SP12 (1i, SN63499178, 22/11/2022); SP13 (2F, SN64029087, 22/11/2022).

Marpissa nivoyi (Lucas, 1846) is typically a sand dune species although in western Britain it also occupies lowland coastal raised bogs. It is well-known from Cors Fochno and two immatures were found at two sample points during this survey: SP4 (1i, SN63949096, 29/10/2022); SP6 (1i, SN63909108, 29/10/2022).

Euryopis flavomaculata (C. L. Koch, 1836) is known from Cors Fochno and two immatures were found at two sample points during this survey: SP4 (1i, SN63949096, 29/10/2022); SP16 (1iM, SN63969098, 22/11/2022).

Theridiosoma gemmosum (L. Koch, 1877) has not previously been recorded from Cors Fochno. During this survey an immature female was vacuumed at SP10 (1iF, SN63339144, 30/10/2022).

4. Discussion

The Bog Pseudoscorpion *Microbisium brevifemorum* was recorded at two of 17 sampling points in October to November 2022 using a standardised vacuum sampling methodology. In total, five specimens were found including four adults at SN64029087 on 22nd November 2022 - very near to where the species was found in 2021 (Gallon, 2022) - and a single adult at SN63849084 on 29th October 2022, representing a new location. To date, all of *M. brevifemorum* on Cors Fochno have come from the southeast section of the bog in areas of old, wet peat cuttings. The specimens found during this survey were all vacuumed from areas with well-developed island-hummocks of *Sphagnum* spp. (including *Sphagnum papillosum*) standing within saturated *Sphagnum* lawns on the floor of old peat cuttings. This island-hummock microhabitat is consistent with previous British finds of this species by the author (Gallon, 2018a&b) and also reports of its Danish ecology (Lissner, 2019).

The five *M. brevifemorum* specimens recorded during this current survey almost doubles the known number of British specimens found to 11.

It is recommended that *Microbisium brevifemorum* is made a qualifying feature of Dyfi SSSI as the only Welsh locality and one of only three in the UK.

During the survey, two further records of the Endangered spider *Lasaeola prona* were made. This spider is a qualifying feature of Dyfi SSSI (Gallon, 2022; Howe, 2021). The Endangered money spider *Maro lepidus* was also recorded, a 1st record for Cors Fochno. This represents only the 17th British location and 7th Welsh site for this species. It is currently a qualifying feature of Cors Caron SSSI and Migneint-Arenig-Ddualt SSSI (Howe, 2020) and should probably be a qualifying feature of Dyfi SSSI on the basis of the current survey.

The Nationally Scarce spiders *Satlatlas britteni* and *Theridiosoma gemmosum* were both found for the first time on Cors Fochno, along with five other Nationally Scarce species.

5. Acknowledgements

Special thanks are extended to Justin Lyons (NRW Senior Officer - Land Management [Mid North]) for arranging site access and for suggesting suitable areas of the bog to survey. Justin and Katy Peat also kindly helped with survey work during the October survey dates. Justin also identified some of the *Sphagnum* spp. associated with *Microbisium* habitats. Mike Howe and Adrian Fowles provided useful background information.

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Appendix 1. Records of spiders, pseudoscorpions and centipedes during the 2022 survey.

The abundance qualifiers within tables are M (male), F (female) and i (immature).

Table 3. 29/10/2022, SN63849084, Cors Fochno, Raised bog. Old cutting with islands, G-vac (2 minutes), sample point 1 records.

Group	Family	Species	GB National Rarity Status	IUCN Status	Abundance
Araneae	Araneidae	<i>Hypsosinga albobittata</i>	NS	-	1iM
Araneae	Linyphiidae	<i>Satlatlas britteni</i>	NS	-	1iF
Araneae	Linyphiidae	<i>Savignia frontata</i>	-	-	1M
Araneae	Linyphiidae	<i>Stemonyphantes lineatus</i>	-	-	1M
Araneae	Theridiidae	<i>Lasaeola prona</i>	NR	EN	1iF
Pseudoscorpiones	Neobisiidae	<i>Microbisium brevifemuratum</i>	-	-	1 adult

Table 4. 29/10/2022, SN63949083, Cors Fochno, Raised bog. Old cutting with islands, G-vac (2 minutes), sample point 2 records.

Group	Family	Species	GB National Rarity Status	IUCN Status	Abundance
Araneae	Araneidae	<i>Hypsosinga albobittata</i>	NS	-	1i
Araneae	Araneidae	<i>Hypsosinga pygmaea</i>	-	-	1iF
Araneae	Linyphiidae	<i>Tenuiphantes menzei</i>	-	-	1F
Araneae	Linyphiidae	<i>Tenuiphantes tenuis</i>	-	-	1M
Araneae	Salticidae	<i>Neon reticulatus</i>	-	-	1iM
Araneae	Theridiidae	<i>Lasaeola prona</i>	NR	EN	1iF

Table 5. 29/10/2022, SN63989088, Cors Fochno, Raised bog. Wet old cutting with *Sphagnum* islands, G-vac (6 minutes), sample point 3 records.

Group	Family	Species	GB National Rarity Status	IUCN Status	Abundance
Araneae	Araneidae	<i>Hypsosinga albobittata</i>	NS	-	1iM
Araneae	Linyphiidae	<i>Centromerita concinna</i>	-	-	1F
Araneae	Linyphiidae	<i>Maro lepidus</i>	NR	EN	1M
Araneae	Philodromidae	<i>Thanatus striatus</i>	-	-	1i
Araneae	Salticidae	<i>Euophrys frontalis</i>	-	-	1iF
Araneae	Salticidae	<i>Neon reticulatus</i>	-	-	1iM
Araneae	Theridiidae	<i>Theonoe minutissima</i>	-	-	1F
Chilopoda	Lithobiidae	<i>Lithobius calcaratus</i>	-	-	1M

Table 6. 29/10/2022, SN63949096, Cors Fochno, Raised bog. Cutting, G-vac (4 minutes), sample point 4 records.

Group	Family	Species	GB National Rarity Status	IUCN Status	Abundance
Araneae	Araneidae	<i>Hypsosinga albobittata</i>	NS	-	1iM 1iF
Araneae	Linyphiidae	<i>Aphileta misera</i>	-	-	1F
Araneae	Linyphiidae	<i>Centromerita concinna</i>	-	-	1M
Araneae	Linyphiidae	<i>Erigone dentipalpis</i>	-	-	1F
Araneae	Linyphiidae	<i>Gongylidiellum vivum</i>	-	-	1M
Araneae	Linyphiidae	<i>Palliduphantes ericaeus</i>	-	-	1M
Araneae	Salticidae	<i>Marpissa nivoyi</i>	NS	-	1i
Araneae	Salticidae	<i>Neon reticulatus</i>	-	-	1iM
Araneae	Theridiidae	<i>Episinus angulatus</i>	-	-	1iM
Araneae	Theridiidae	<i>Euryopis flavomaculata</i>	NS	-	1i

Table 7. 29/10/2022, SN63939100, Cors Fochno, Raised bog. Cutting with Heather islands, G-vac (2 minutes), sample point 5 records.

Group	Family	Species	GB National Rarity Status	IUCN Status	Abundance
Araneae	Araneidae	<i>Hypsosinga albovittata</i>	NS	-	1iM 1iF
Araneae	Linyphiidae	<i>Ceratinella brevis</i>	-	-	1F
Araneae	Philodromidae	<i>Thanatus striatus</i>	-	-	2i

Table 8. 29/10/2022, SN63909108, Cors Fochno, Raised bog. Plastic bunded area, G-vac (4 minutes), sample point 6 records.

Group	Family	Species	GB National Rarity Status	IUCN Status	Abundance
Araneae	Linyphiidae	<i>Maro lepidus</i>	NR	EN	1M
Araneae	Linyphiidae	<i>Walckenaeria alticeps</i>	NS	-	1M
Araneae	Liocranidae	<i>Scotina gracilipes</i>	NS	-	1i
Araneae	Salticidae	<i>Marpissa nivoyi</i>	NS	-	1i
Araneae	Salticidae	<i>Neon reticulatus</i>	-	-	1iM
Araneae	Thomisidae	<i>Ozyptila trux</i>	-	-	1F

Table 9. 29/10/2022, SN63809102, Cors Fochno, Raised bog. Cutting with *R. alba* and Heather, G-vac (2 minutes), sample point 7 records.

Group	Family	Species	GB National Rarity Status	IUCN Status	Abundance
Araneae	Linyphiidae	<i>Aphileta misera</i>	-	-	1M
Araneae	Linyphiidae	<i>Centromerus arcanus</i>	-	-	1F
Araneae	Philodromidae	<i>Thanatus striatus</i>	-	-	1iF
Araneae	Salticidae	<i>Neon reticulatus</i>	-	-	2iM
Araneae	Theridiidae	<i>Episinus angulatus</i>	-	-	1iF
Araneae	Theridiidae	<i>Robertus arundineti</i>	-	-	1F

Table 10. 29/10/2022, SN63739094, Cors Fochno, Raised bog. Cutting with *R. alba* and Heather islands. Plastic bund, G-vac (2 minutes), sample point 8 records.

Group	Family	Species	GB National Rarity Status	IUCN Status	Abundance
Araneae	Linyphiidae	<i>Aphileta misera</i>	-	-	1M
Araneae	Linyphiidae	<i>Tenuiphantes tenuis</i>	-	-	1F

Table 11. 30/10/2022, SN63389149, Cors Fochno, Raised bog. Patterned mire with hard *Sphagnum*, G-vac (4 minutes), sample point 9 records.

Group	Family	Species	GB National Rarity Status	IUCN Status	Abundance
Araneae	Araneidae	<i>Hypsosinga albovittata</i>	NS	-	1iM 1iF
Araneae	Linyphiidae	<i>Bathypantes gracilis</i>	-	-	1M
Araneae	Linyphiidae	<i>Centromerita concinna</i>	-	-	1F
Araneae	Liocranidae	<i>Scotina gracilipes</i>	NS	-	1F
Araneae	Salticidae	<i>Neon reticulatus</i>	-	-	1i
Araneae	Araneidae	<i>Hypsosinga albovittata</i>	NS	-	1iM 1iF
Araneae	Linyphiidae	<i>Bathypantes gracilis</i>	-	-	1M
Araneae	Linyphiidae	<i>Centromerita concinna</i>	-	-	1F
Araneae	Liocranidae	<i>Scotina gracilipes</i>	NS	-	1F
Araneae	Salticidae	<i>Neon reticulatus</i>	-	-	1i

Table 12. 30/10/2022, SN63339144, Cors Fochno, Raised bog. Small *Sphagnum pulchrum* hummocks, G-vac (4 minutes), sample point 10 records.

Group	Family	Species	GB National Rarity Status	IUCN Status	Abundance
Araneae	Araneidae	<i>Hypsosinga albobittata</i>	NS	-	3iF
Araneae	Hahniidae	<i>Iberina montana</i>	-	-	1F
Araneae	Linyphiidae	<i>Centromerus arcanus</i>	-	-	1M
Araneae	Linyphiidae	<i>Erigone atra</i>	-	-	1M
Araneae	Linyphiidae	<i>Tenuiphantes menzei</i>	-	-	1M
Araneae	Linyphiidae	<i>Tenuiphantes tenuis</i>	-	-	3M 1F
Araneae	Liocranidae	<i>Scotina gracilipes</i>	NS	-	1i
Araneae	Salticidae	<i>Neon reticulatus</i>	-	-	1iM 1iF
Araneae	Theridiidae	<i>Robertus arundineti</i>	--	-	1M
Araneae	Theridiosomatidae	<i>Theridiosoma gemmosum</i>	NS	-	1iF

Table 13. 30/10/2022, SN63419152, Cors Fochno, Raised bog. *Sphagnum pulchrum* lawn with red *Sphagnum* islands, G-vac (4 minutes), sample point 11 records.

Group	Family	Species	GB National Rarity Status	IUCN Status	Abundance
Araneae	Araneidae	<i>Hypsosinga albobittata</i>	NS	-	1iM 2iF
Araneae	Linyphiidae	<i>Erigone atra</i>	-	-	1M
Araneae	Linyphiidae	<i>Gongyliidiellum vivum</i>	-	-	1F
Araneae	Linyphiidae	<i>Tenuiphantes tenuis</i>	-	-	1F

Table 14. 22/11/2022, SN63499178, Cors Fochno, Raised bog. Heather, *Erica* and *Narthecium*, G-vac (4 minutes), sample point 12 records.

Group	Family	Species	GB National Rarity Status	IUCN Status	Abundance
Araneae	Araneidae	<i>Hypsosinga albobittata</i>	NS	-	1iM 1iF
Araneae	Linyphiidae	<i>Erigone atra</i>	-	-	1F
Araneae	Linyphiidae	<i>Pocadicnemis pumila</i>	-	-	1F
Araneae	Linyphiidae	<i>Tenuiphantes menzei</i>	-	-	1M 1F
Araneae	Linyphiidae	<i>Tenuiphantes tenuis</i>	-	-	1F
Araneae	Liocranidae	<i>Scotina gracilipes</i>	NS	-	1i
Araneae	Lycosidae	<i>Pardosa nigriceps</i>	-	-	1iF
Araneae	Theridiidae	<i>Episinus angulatus</i>	-	-	1i

Table 15. 22/11/2022, SN64029087, Cors Fochno, Raised bog. Old cutting. Islands in saturated *Sphagnum* lawn, G-vac (8 minutes), sample point 13 records.

Group	Family	Species	GB National Rarity Status	IUCN Status	Abundance
Araneae	Araneidae	<i>Hypsosinga albobittata</i>	NS	-	1iM 4iF
Araneae	Araneidae	<i>Hypsosinga pygmaea</i>	-	-	1iF
Araneae	Linyphiidae	<i>Agyneta rurestris</i>	-	-	1M
Araneae	Linyphiidae	<i>Bathypantes gracilis</i>	-	-	1M
Araneae	Linyphiidae	<i>Centromerita concinna</i>	-	-	1M
Araneae	Linyphiidae	<i>Ceratinella brevis</i>	-	-	1M
Araneae	Linyphiidae	<i>Erigone atra</i>	-	-	4M 1F
Araneae	Linyphiidae	<i>Tenuiphantes tenuis</i>	-	-	1F
Araneae	Linyphiidae	<i>Walckenaeria alticeps</i>	NS	-	1F
Araneae	Liocranidae	<i>Scotina gracilipes</i>	NS	-	2F
Araneae	Salticidae	<i>Neon reticulatus</i>	-	-	1i
Pseudoscorpiones	Neobisiidae	<i>Microbisium brevifemuratum</i>	-	-	4 adults

Table 16. 22/11/2022, SN64099107, Cors Fochno, Raised bog. Old cutting. Islands in saturated *Sphagnum* lawn, G-vac (4 minutes), sample point 14 records.

Group	Family	Species	GB National Rarity Status	IUCN Status	Abundance
Araneae	Araneidae	<i>Hypsosinga pygmaea</i>	-	-	1iF
Araneae	Linyphiidae	<i>Bathypantes gracilis</i>	-	-	1M
Araneae	Linyphiidae	<i>Ceratinella brevipes</i>	-	-	1F
Araneae	Linyphiidae	<i>Erigone atra</i>	-	-	1M
Araneae	Linyphiidae	<i>Erigone dentipalpis</i>	-	-	1M
Araneae	Tetragnathidae	<i>Pachygnatha degeeri</i>	-	-	1F

Table 17. 22/11/2022, SN64089111, Cors Fochno, Raised bog. Old cutting. Islands behind plastic bund, G-vac (4 minutes), sample point 15 records.

Group	Family	Species	GB National Rarity Status	IUCN Status	Abundance
Araneae	Araneidae	<i>Agelenatea redii</i>	-	-	1i
Araneae	Araneidae	<i>Hypsosinga albobittata</i>	NS	-	1iF
Araneae	Linyphiidae	<i>Bathypantes gracilis</i>	-	-	1M 1F
Araneae	Linyphiidae	<i>Erigone dentipalpis</i>	-	-	1F
Araneae	Linyphiidae	<i>Satlatlas britteni</i>	NS	-	1iF
Araneae	Salticidae	<i>Neon reticulatus</i>	-	-	1i

Table 18. 22/11/2022, SN63969098, Cors Fochno, Raised bog cutting. Saturated *Sphagnum* and *R. alba* lawn with Heather and *Erica* islands, G-vac (4 minutes), sample point 16 records.

Group	Family	Species	GB National Rarity Status	IUCN Status	Abundance
Araneae	Araneidae	<i>Hypsosinga pygmaea</i>	-	-	1iF
Araneae	Linyphiidae	<i>Erigone atra</i>	-	-	1F
Araneae	Linyphiidae	<i>Erigone dentipalpis</i>	-	-	1F
Araneae	Theridiidae	<i>Episinus angulatus</i>	-	-	1i
Araneae	Theridiidae	<i>Euryopsis flavomaculata</i>	NS	-	1iM
Araneae	Theridiidae	<i>Pholcomma gibbum</i>	-	-	1F

Table 19. 22/11/2022, SN63959089, Cors Fochno, Raised bog cutting. Saturated *Sphagnum pulchrum* lawn with *Erica* islands, G-vac (2 minutes), sample point 17 records.

Group	Family	Species	GB National Rarity Status	IUCN Status	Abundance
Araneae	Linyphiidae	<i>Ceratinella brevis</i>	-	-	1F
Araneae	Linyphiidae	<i>Tenuiphantes menzei</i>	-	-	1F

Data Archive Appendix

The data archive contains:

[A] The final report in Microsoft Word and Adobe PDF formats.

~~[B] A full set of maps produced in JPEG format.~~

~~[C] A series of GIS layers on which the maps in the report are based with a series of word documents detailing the data processing and structure of the GIS layers.~~

~~[D] A set of raster files in ESRI and ASCII grid formats.~~

~~[E] A database named [name] in Microsoft Access 2000 format with metadata described in a Microsoft Word document [name.doc].~~

~~[F] A full set of images produced in [jpg/tiff] format.~~

[G] Species records held in Welsh Invertebrate Database (WID).

Metadata for this project is publicly accessible through Natural Resources Wales' Library Catalogue <https://libcat.naturalresources.wales> (English Version) and <https://catllyfr.cyfoethnaturiol.cymru> (Welsh Version) by searching 'Dataset Titles'. The metadata is held as record no 125474.

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