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# The status and distribution of the ground beetle *Leistus montanus* in 2017 at its historic sites in Wales

National Museums Liverpool

NRW Evidence Report No. 249

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## Contents

1. Crynodeb Gweithredol .....	1
2. Executive Summary .....	1
3. Introduction.....	2
4. Methods.....	3
5. Results .....	4
5.1. Cadair Idris.....	4
5.2. Y Lliwedd, Snowdon .....	6
5.3. Eglwyseg Rocks.....	9
5.4. Carnedd y Ddelw.....	11
5.5. Other invertebrate records.....	11
6. Discussion .....	11
7. Conclusion.....	12
8. Acknowledgements.....	12
9. References .....	13
10. Appendix 1. Invertebrates recorded during the 2017 survey .....	14
11. Appendix 2: Data Archive Appendix.....	21

## List of Figures

Figure 1. Distribution of <i>Leistus montanus</i> in the UK .....	2
Figure 2. <i>Leistus montanus</i> adult on Y Lliwedd, 10 <sup>th</sup> August 2017 .....	4
Figure 3. <i>Leistus montanus</i> collection locality on Cadair Idris, 29 <sup>th</sup> June 2017.....	5
Figure 4. Location of two specimens of <i>Leistus montanus</i> found on Cadair Idris .....	5
Figure 5. Distribution of <i>Leistus montanus</i> on Cadair Idris.....	6
Figure 6. <i>Leistus montanus</i> collection locality on Y Lliwedd, 30 <sup>th</sup> June 2017.. .....	7
Figure 7. <i>Leistus montanus</i> field record locality on Y Lliwedd, 10 <sup>th</sup> August 2017 .....	7
Figure 8. <i>Leistus montanus</i> collection locality on Y Lliwedd, 10 <sup>th</sup> August 2017 .....	8
Figure 9. Location of the three specimens of <i>Leistus montanus</i> found on Y Lliwedd .....	8
Figure 10. Distribution of <i>Leistus montanus</i> on Y Lliwedd.....	9
Figure 11. Scree slopes at Eglwyseg Rocks, Llangollen, 19 <sup>th</sup> May 2017.....	10
Figure 12. Limestone scree at Eglwyseg Rocks and location of <i>Leistus spinibarbis</i> .....	10
Figure 13. Carnedd y Ddelw.....	11

## List of Tables

Table 1: Welsh records of <i>Leistus montanus</i> .....	2
Table 2: Records of <i>Leistus montanus</i> in 2017 .....	4

## 1. Crynodeb Gweithredol

A hithau ar un adeg yn cael ei chofnodi'n rheolaidd yn ardaloedd mynyddig yr Alban ac Ardal y Llynnoedd, mae cofnodion diweddar o'r chwilen ddaear *Leistus montanus*, sydd mewn perygl yn ôl yr Undeb Rhyngwladol dros Gadwraeth Natur, ac yn gysylltiedig â sgri yn yr ucheldiroedd, bellach yn cael eu cyfyngu i Gopaon Langdale yn 2008 a Skiddaw yn 2016 – y ddau le yn Cumbria. Yng Nghymru, cafodd ei chofnodi'n hanesyddol ar Gadair Idris yn 1829 ac yn 1968, ar y Lliwedd ar yr Wyddfa yn 1965 ac 1968, ac ar Garnedd y Ddelw yn y Carneddau yn 1971. Credwyd mai yn 2007 roedd yr unig gofnod diweddar, ar Greigiau Eglwyseg.

Nod arolwg 2017 oedd pennu statws a dosbarthiad cyfredol *Leistus montanus* yng Nghymru trwy ymweld â phob lleoliad hysbys a chwilio o dan gerrig ar lethrau sgri. Treuliodd pobl gyfanswm o 96 awr rhwng mis Mai a mis Hydref, gan ddarganfod pum chwilen aeddfed a oedd yn cynnwys dwy ar Gadair Idris a thair ar y Lliwedd. Cofnodwyd un *Leistus spinibarbis* aeddfed sengl ar Greigiau Eglwyseg, gan sbarduno archwiliad o'r sbesimen enghreifftiol o 2007, y dangoswyd ei fod yn *L. spinibarbis* hefyd. Ni chafwyd unrhyw chwilog ar Garnedd y Ddelw, lle mae'r cynefin i'w weld yn anaddas, gydag ychydig yn unig neu ddim sgri, gan awgrymu y gallai cofnod 1971 fod yn anghywir hefyd. Felly, yn ôl pob golwg, cyfyngir *L. montanus* yng Nghymru i Gadair Idris a'r Lliwedd, y ddau le yn cynnal gwelyau sgri helaeth, er y byddai angen cynnal arolygon ar safleoedd eraill sydd â chynefin addas er mwyn cadarnhau hyn.

## 2. Executive Summary

Once regularly recorded in the montane areas of Scotland and the Lake District, recent records of the IUCN Endangered ground beetle *Leistus montanus*, a species associated with high altitude scree, are confined to the Langdale Pikes in 2008 and Skiddaw in 2016, both in Cumbria. In Wales, it was historically recorded on Cadair Idris in 1829 and 1968, from Y Lliwedd on Snowdon (Yr Wyddfa) in 1965 and 1968, and from Carnedd y Ddelw on the Carneddau in 1971. The only recent record was thought to be from Eglwyseg Rocks in 2007.

The aim of the 2017 survey was to determine the current status and distribution of *Leistus montanus* in Wales by visiting all known locations and searching under stones on scree slopes. A total of 96 person hours between May and October located five adult beetles including two on Cadair Idris and three from Y Lliwedd. A single adult of *Leistus spinibarbis* was recorded on Eglwyseg Rocks, prompting an examination of the voucher specimen from 2007 which also proved to be *L. spinibarbis*. No beetles were found at Carnedd y Ddelw where the habitat appears unsuitable, with little or no scree, suggesting that the 1971 record may also be erroneous. *L. montanus* therefore appears to be restricted in Wales to Cadair Idris and Y Lliwedd, both of which support extensive scree beds, although surveys of other sites with suitable habitat would be needed to confirm this.

### 3. Introduction

Historically, the IUCN Endangered ground beetle *Leistus montanus* was regularly recorded in montane areas of Scotland and the Lake District (Telfer, 2016; Welch, 1995). In Wales, it was recorded on Cadair Idris in 1829 (Curtis, 1830) and 1968, from Y Lliwedd on Snowdon (Yr Wyddfa) in 1965 and 1968 (Goodier, 1968; Skidmore & Johnson, 1969), and from Carnedd y Ddelw on the Carneddau in 1971.

The 1965 Snowdon record was of four adults in pitfall traps near the summit of Y Lliwedd at 2,900ft in August (Goodier, 1968). Since 1980, Telfer (2016) reported just two British records, one from the Langdale Pikes in Cumbria in 2008 and one from Eglwyseg Rocks (SJ223472) in Denbighshire in April 2007, where a single adult was found under a stone at the edge of limestone scree. It has since been recorded from Skiddaw in Cumbria in 2016 (Hewitt, 2017). Welsh records are summarised in Table 1 and its UK distribution is mapped in Figure 1.

Table 1. Welsh records of *Leistus montanus*.

Site	Grid Reference	Date	Recorder	Abundance
Carnedd y Ddelw	SH708706	07.8.1971	L. Davies	1 adult
Cadair Idris	SH71	1829	J. Curtis	
Cadair Idris	SH7113	1968	Rawdon Goodier	
Y Lliwedd	SH622533	26.8.1965	Rawdon Goodier	4 adults
Y Lliwedd	SH622533	07.5.1966	Rawdon Goodier	1 adult
Eglwyseg Rocks	SJ223472	27.4.2007	Merfyn Rogers	1 adult

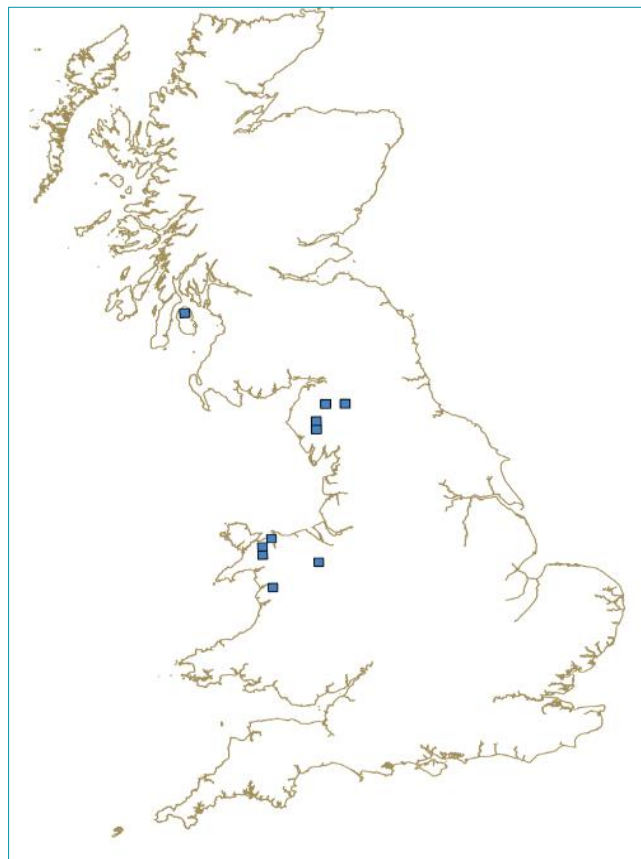


Figure 1. Distribution of *Leistus montanus* in the UK.

As its name suggests, *L. montanus* is an upland species occurring in freely-draining habitats such as scree slopes and shingle banks where it feeds on springtails (Collembola). There are records from low altitudes in Scotland (Welch, 1995) but it is not clear if these are a result of mis-identification of the closely-related *L. spinibarbis* (Telfer, 2016), which has added to confusion over its distribution (Farkac & Fassanti, 1999). Careful microscopic examination is needed to separate these species using the Royal Entomological Society Handbook (Luff, 2007), the more recent *Beetles of Britain & Ireland* (Duff, 2012) or the on-line identification guide to *Leistus* species (Walters, 2010).

The aim of the 2017 survey was to determine the current status and distribution of *Leistus montanus* in Wales by visiting all known locations and searching for beetles under stones on scree slopes.

## 4. Methods

Seven site visits were made between May and October 2017, involving 96 person hours of search:

- 19.05.2017 **Eglwyseg Rocks**: (GH, MH, TH, SJ, DP) = 30 person hours (fine, dry).
- 29.06.2017 **Cadair Idris**: (R I-D, RG, MH, TH, SJ) = 15 person hours (overcast with fine rain).
- 30.06.2017 **Y Lliwedd**: (RG, TH, SJ) 8 person hours (windy with light rain)
- 10.08.2017 **Y Lliwedd**: (TH, MH, HJ, SJ) = 18 person hours (overcast then fine and dry).
- 11.08.2017 **Carnedd y Ddelw**: (TH, SJ) = 3 person hours (extremely windy with intermittent rain).
- 05.10.2017 **Carnedd y Ddelw**: (CF, RG, TH, LH, MH, SJ) = 11 person hours (very windy with rain showers).
- 06.10.2017 **Eglwyseg Rocks**: (CF, GH, TH, SJ) = 11 person hours (cloudy in morning then fine and dry).

Survey work was undertaken by the following people: **CF** Chris Felton (National Museums Liverpool associate); **RG** Richard Gallon (North Wales Spider Recorder/Cofnod Local Records Centre); **GH** Gary Hedges (NML); **LH** Liz Howe (NRW); **MH** Mike Howe (NRW); **TH** Tony Hunter (NML); **RI-D** Rhodri Irranca-Davies (NRW); **HR** Hywel Roberts (NRW); **SJ** Steve Judd (NML); **DP** Dafydd Parry (NRW); **PW** Paul Williams (NRW).

All of the 2017 survey work was performed during daylight hours, with the main search method simply involving turning over stones on scree slopes to find adult beetles. Vacuum sampling was also attempted on Carnedd y Ddelw.

As well as searching for *L. montanus*, other invertebrate species encountered were recorded by those involved with the fieldwork (see Appendix 1). In most cases, voucher specimens were determined by the recorders credited in the Appendix but some were



identified by Carl Clee (aculeate Hymenoptera), Don Stenhouse (*Leistus* specimens), Richard Loxton (Coleoptera including carabids).

## 5. Results

Five adults of *Leistus montanus* were recorded during the 2017 survey, with two found on Cadair Idris and three on Y Lliwedd (Table 2). Three specimens were retained as vouchers to allow critical determination to species. All records were of adults found on the underside of stones on or near the surface of scree slopes.

Table 2. Records of *Leistus montanus* in 2017.

Site	Grid reference	Altitude	Date	Number
Cadair Idris	SH71151363	c.645 m	29.06.2017	1 adult
Cadair Idris	SH71241359	c.645 m	29.06.2017	1 adult
Y Lliwedd	SH61995344	742 m	30.06.2017	1 adult
Y Lliwedd	SH6199753471	744 m	10.08.2017	1 adult
Y Lliwedd	SH6205353433	771m	10.08.2017	1 adult



Figure 2. *Leistus montanus* adult on Y Lliwedd, 10<sup>th</sup> August 2017. © Tony Hunter

### 5.1. Cadair Idris

Two *L. montanus* adults were recorded on a single visit on 29<sup>th</sup> June 2017, in wet and overcast weather, in 15 hours of search. Both were under stones on a scree slope on the west side of the mountain, close to the site of previous records (Figures 3 to 5), and were recorded in relatively quick succession. A voucher specimen collected was a female.

Cadair Idris supports more than 140ha of siliceous scree, mostly on the high, north-facing slopes (Figure 4). The current survey only looked at a very small proportion of the resource, primarily within the vicinity of historic records for *L. montanus*. It is likely that the beetle is widespread across the main scree beds, but this would take considerable effort to prove if search efforts were restricted to stone-turning.





Figure 3. *Leistus montanus* collection locality on Cadair Idris, 29<sup>th</sup> June 2017.

**Cadair Idris scree and location of 2017 records**

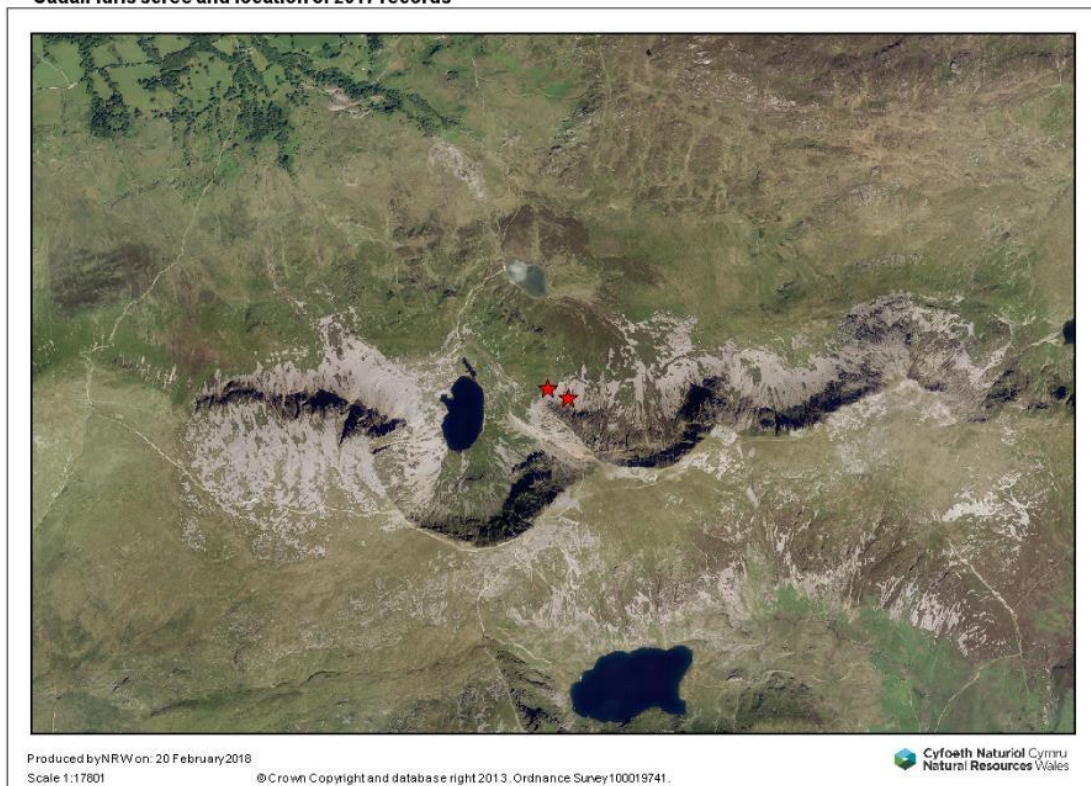


Figure 4. Location of the two specimens of *Leistus montanus* found on Cadair Idris on 29<sup>th</sup> June 2017, and showing the extent of scree habitat available on the mountain.

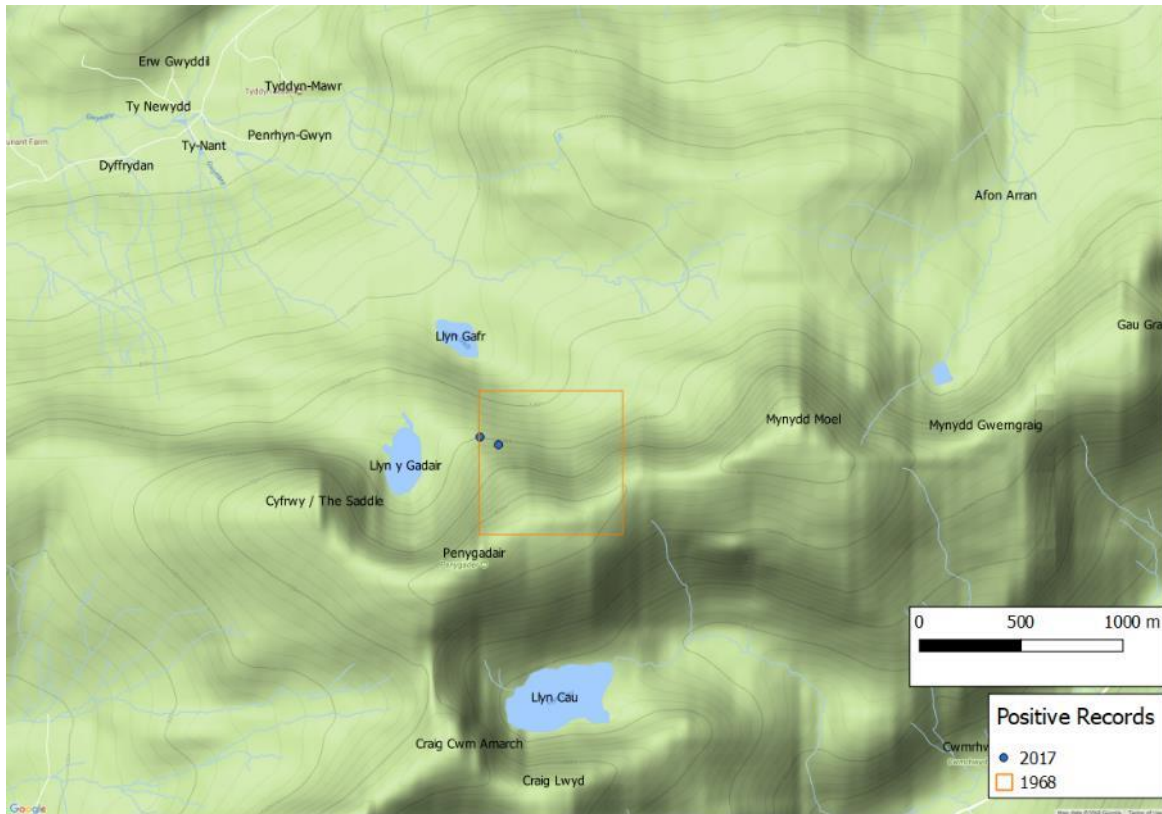


Figure 5. Distribution of *Leistus montanus* on Cadair Idris.

## 5.2. Y Lliwedd, Snowdon

Three *L. montanus* adults were found under stones on a south-west facing scree slope on Y Lliwedd (Figures 6 to 8 & 10), including a single female on 30<sup>th</sup> June 2017 in light rain, and two beetles on 10<sup>th</sup> August 2017 in dry, sunny weather (one male was retained as a voucher for critical examination). Although 26 person hours were expended, two of the three beetles were recorded in a relatively short period of time, perhaps indicating that the population here is also fairly large. Y Lliwedd is part of Eryri SAC which supports more 1180ha of siliceous scree, whilst the south-western slopes of Y Lliwedd support in excess of 17ha (Figure 9). It is likely that the beetle is widespread across the main Y Lliwedd scree beds, but again this would take considerable effort to prove if search efforts were restricted to stone-turning alone.





Figure 6. *Leistus montanus* collection locality on Y Lliwedd, 30<sup>th</sup> June 2017.



Figure 7. *Leistus montanus* field record locality on Y Lliwedd, 10<sup>th</sup> August 2017.

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Figure 8. *Leistus montanus* collection locality on Y Lliwedd, 10<sup>th</sup> August 2017.

Y Lliwedd scree and location of 2017 records

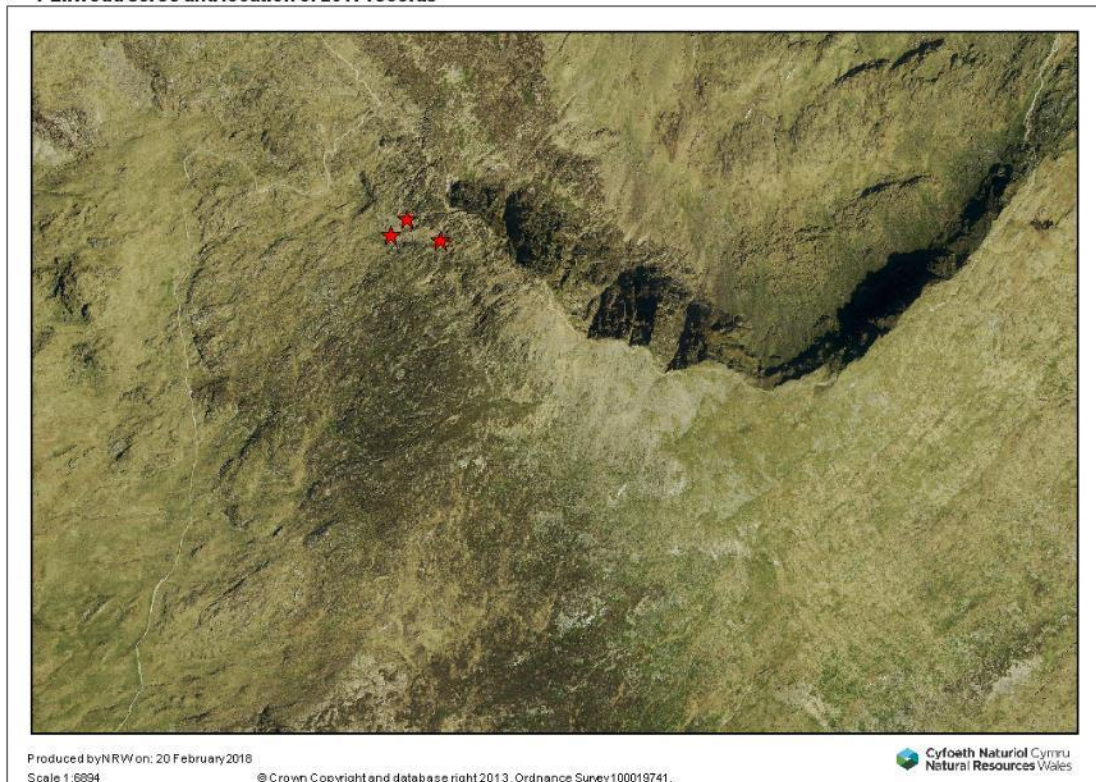


Figure 9. Location of the three specimens of *Leistus montanus* found on Y Lliwedd on 30<sup>th</sup> June and 10<sup>th</sup> August 2017, and showing the extent of scree on site.  
[www.naturalresourceswales.gov.uk](http://www.naturalresourceswales.gov.uk)



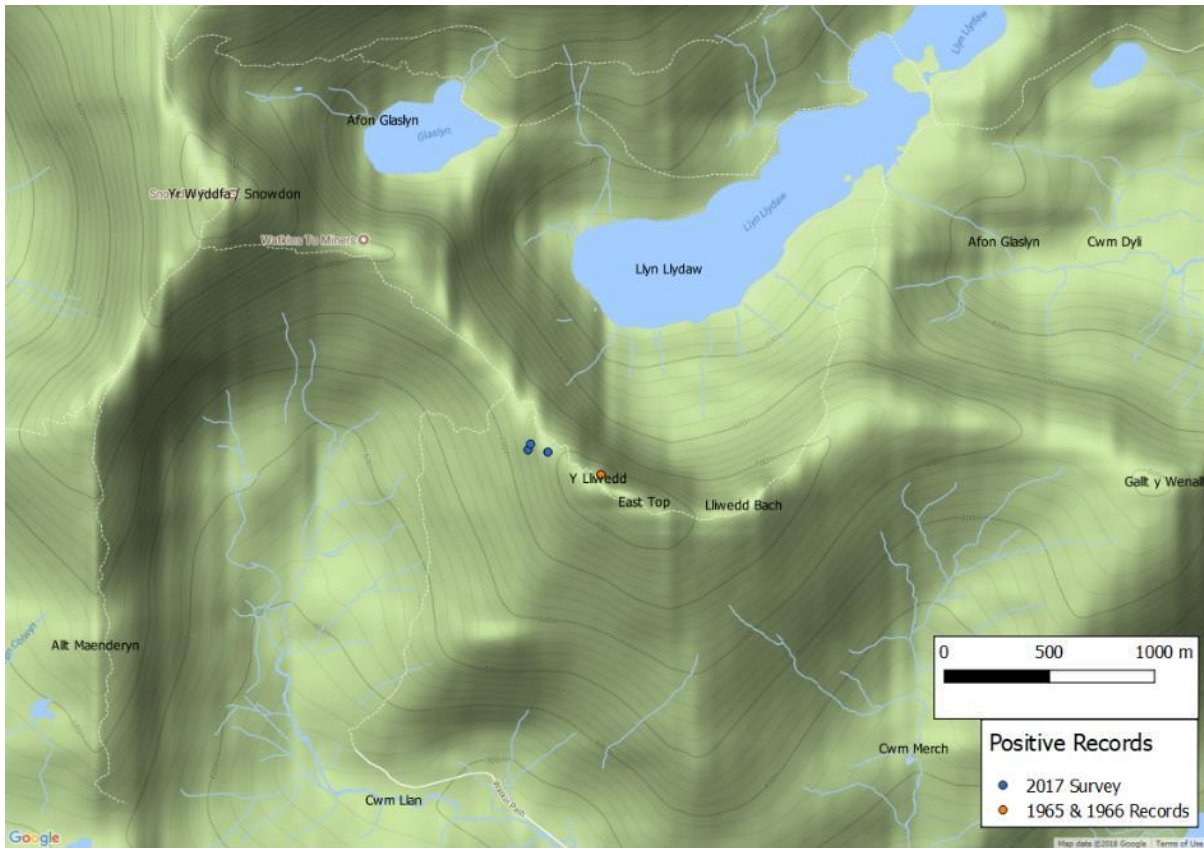


Figure 10. Distribution of *Leistus montanus* on Y Lliwedd.

### 5.3. Eglwyseg Rocks

No *L. montanus* were recorded from the site during the current survey, although a single adult of *L. spinibarbis* was recorded on 19<sup>th</sup> May 2017 (see Appendix 1). This prompted an examination of the voucher collected in 2007 (see Telfer, 2016) and this also proved to be *L. spinibarbis*. Whilst there is plentiful limestone scree at this site (Figures 11 & 12), it is at much lower altitudes than the sites where *L. montanus* was recorded in 2017, and it is thought unlikely that *L. montanus* occurs here.

The search in May 2017 did record several adults of the snail-killing fly *Ectinocera borealis*, known from just two other Welsh localities and not recorded in Wales since 1997.



Figure 11. Scree slopes at Eglwyseg Rocks, Llangollen, 19<sup>th</sup> May 2017.



Figure 12. Limestone scree at Eglwyseg Rocks and the location of *Leistus spinibarbis* on 19<sup>th</sup> May 2017.



#### 5.4. Carnedd y Ddelw

No *L. montanus* were recorded here in 2017. This site is at a much lower altitude than the occupied sites on Cadair Idris and Y Lliwedd and, although there are some stones and a large cairn near the summit, no scree slope was found and most of the area is dominated by upland grasses, rushes and sedges (Figure 13). Ideally, the identification of the 1971 specimen referred to in the literature should be checked to ensure it has not been confused with *L. spinibarbis*.



Figure 13. Carnedd y Ddelw.

#### 5.5. Other invertebrate records

In total, the current survey recorded 121 species of invertebrates, including the rare snail-killing fly *Ectinocera borealis* on Eglwyseg Rocks and a larva of Juniper Carpet *Thera juniperata* on the abundant juniper *Juniperus communis* on the higher slopes of Y Lliwedd (see Appendix 1).

## 6. Discussion

The 2017 survey successfully relocated *Leistus montanus* on Cadair Idris and Y Lliwedd where it had not been recorded since 1968 and 1966 respectively. Whilst the number of individuals found was small (two on Cadair Idris and three on Y Lliwedd), both sites support extensive areas of scree and it is likely that strong populations of the beetle occur throughout the scree beds. The search technique of daytime stone-turning employed during the survey is unlikely to find large numbers of adults and other

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techniques such as pitfall trapping may have to be deployed if estimates of abundance are required. Pitfall trapping may also provide the best method for determining the distribution of the beetle on both sites, although it should be noted that excavating pitfalls in scree beds would be extremely challenging.

Confirmation that the specimen recorded from Eglwyseg Rocks in 2007 as *L. montanus* is actually *L. spinibarbis*, means that there are no substantiated records of *L. montanus* from this site. This is perhaps unsurprising as although Eglwyseg Rocks does support extensive limestone scree beds, these are at much lower altitude (less than 400m) than the other sites where the beetle was recorded.

Given the lack of suitable scree beds at Carnedd y Ddelw, it seems likely that the record of *L. montanus* in 1972 is also an error but this can only be confirmed by examination of a voucher specimen. For the moment, Carnedd y Ddelw will not be considered as a site for *L. montanus*.

## 7. Conclusion

*Leistus montanus* still occurs on Cadair Idris and Y Lliwedd, both of which support extensive areas of montane scree. A record of the beetle from Eglwyseg Rocks is erroneous and the lack of suitable habitat at Carnedd y Ddelw suggest that the 1972 record is also likely to be a mis-identification.

Further work is required to determine population abundances and extent of distribution on Cadair Idris and Y Lliwedd, and this may require the use of techniques such as pitfall trapping. Wider searches of high altitude scree beds in Eryri may locate additional populations.

*L. montanus* is not thought to occur at Eglwyseg Rocks but the current survey did record significant invertebrate interest associated with limestone scree beds, in particular the presence of the snail-killing fly *Ectinocera borealis*, and further invertebrate recording at this site should be considered.

## 8. Acknowledgements

Thanks are due to: Dr Mike Howe of Natural Resources Wales for commissioning the survey and assisting with the report, and his colleagues, Liz Howe, Daffyd Parry, Hywel Roberts, Paul Williams, and Rhodri Irranca-Davies for providing site information and survey assistance; Mr Richard Gallon who provided survey assistance, images, and invertebrate records for the report; Bryan Formstone and Merfyn Rogers for making a *Leistus* specimen collected at Eglwyseg available for critical examination; Chris Felton who provided identification and survey assistance; Gary Hedges who provided identification, survey assistance and maps for the report; Steve Judd who provided transport and survey assistance.

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## 10. Appendix 1. Invertebrates recorded during the 2017 survey

Date collected	Sex	Locality	Grid Ref	Recorder
<b>Araneae: Ageleniidae: <i>Malthonica silvestris</i> (L. Koch, 1872)</b>				
19.05.2017	Female	Eglwyseg: Scree	SJ 231 473	Chris Felton
06.10.2017	Unsexed	Eglwyseg: Scree	SJ 223 471	Chris Felton
<b>Araneae: Ageleniidae: <i>Textrix denticulata</i> (Olivier, 1789)</b>				
19.05.2017	Both	Eglwyseg: Scree	SJ 222 470	Tony Hunter
30.06.2017	Female	Y-Lliwedd: Scree	SH62215314	Richard Gallon
11.08.2017	Female	Carnedd y Ddelw: Under rock	SH70557083	Tony Hunter
06.10.2017	Unsexed	Eglwyseg: Scree	SJ 223 471	Chris Felton
<b>Araneae: Amaurobiidae: <i>Coelotes atropos</i> (Walckenaer, 1830)</b>				
19.05.2017	Female	Eglwyseg: Scree	SJ 222 470	Tony Hunter
05.10.2017	Female	Carnedd y Ddelw: Under rock	SH70737055	Richard Gallon
30.06.2017	Female	Y-Lliwedd: Scree	SH61985344	Richard Gallon
<b>Araneae: Gnaphosidae: <i>Drassodes cupreus</i> (Blackwall, 1834)</b>				
19.05.2017	Male	Eglwyseg: Scree	SJ 222 470	Steve Judd
11.08.2017	Female	Carnedd y Ddelw: Under rock	SH70557083	Tony Hunter
<b>Araneae: Gnaphosidae: <i>Zelotes apricorum</i> (L. Koch, 1876)</b>				
30.06.2017	Female	Y-Lliwedd: Scree	SH62215314	Richard Gallon
30.06.2017	Female	Y-Lliwedd: Scree	SH61905353	Richard Gallon
06.10.2017	Male	Eglwyseg: Scree	SJ 223 471	Chris Felton
<b>Araneae: Dictynidae: <i>Cryphoeca silvicola</i> (C.L. Koch, 1834)</b>				
29.06.2017	Female	Cadair Idris: Scree	SH71241359	Richard Gallon
05.10.2017	Female	Carnedd y Ddelw: Under rock	SH70737055	Richard Gallon
05.10.2017	Both	Garnedd Uchaf: Under stone	SH71011352	Richard Gallon
<b>Araneae: Hahnidae: <i>Hahnia montana</i> (Blackwall, 1841)</b>				
19.05.2017	Female	Eglwyseg: Scree	SJ 231 473	Chris Felton
29.06.2017	Female	Cadair Idris: Scree	SH71221363	Richard Gallon
30.06.2017	Female	Y-Lliwedd: Scree	SH62215314	Richard Gallon
30.06.2017	Male	Y-Lliwedd: Scree	SH61985344	Richard Gallon
30.06.2017	Female	Y-Lliwedd: Scree	SH61905353	Richard Gallon
<b>Araneae: Linyphiidae: <i>Bolyphantes luteolus</i> (Blackwall, 1833)</b>				
05.10.2017	Female	Carnedd Fach: Under rock	SH 6586 6259	Tony Hunter
<b>Araneae: Linyphiidae: <i>Centromerita bicolor</i> (Blackwall, 1833)</b>				
05.10.2017	Both	Garnedd Uchaf: Under stone	SH68856694	Richard Gallon
05.10.2017	Both	Garnedd Uchaf: G Vac	SH69176733	Richard Gallon
<b>Araneae: Linyphiidae: <i>Centromerita concinna</i> (Thorell, 1875)</b>				
19.05.2017	Female	Eglwyseg: Scree	SJ 231 473	Chris Felton
06.10.2017	Female	Eglwyseg: Scree	SJ 220 457	Tony Hunter
05.10.2017	Both	Garnedd Uchaf: G Vac	SH69176733	Richard Gallon
05.10.2017	Both	Garnedd Uchaf: Under stone	SH68856694	Richard Gallon
<b>Araneae: Linyphiidae: <i>Centromerus arcanus</i> (O.P.-Cambridge, 1873)</b>				
05.10.2017	Both	Garnedd Uchaf: Under stone	SH68856694	Richard Gallon
<b>Araneae: Linyphiidae: <i>Centromerus dilutus</i> (O.P.-Cambridge, 1875)</b>				
05.10.2017	Female	Garnedd Uchaf: Under stone	SH68856694	Richard Gallon
<b>Araneae: Linyphiidae: <i>Centromerus prudens</i> (O.P.-Cambridge, 1873)</b>				
05.10.2017	Male	Carnedd y Ddelw: Under rock	SH70737055	Richard Gallon
05.10.2017	Female	Garnedd Uchaf: Under stone	SH68856694	Richard Gallon
<b>Araneae:Linyphiidae: <i>Dicymbium tibiale</i> (Blackwall, 1836)</b>				
05.10.2017	Female	Garnedd Uchaf: G Vac	SH69176733	Richard Gallon
05.10.2017	Both	Garnedd Uchaf: G Vac	SH68856694	Richard Gallon
<b>Araneae:Linyphiidae: <i>Diplocephalus cristatus</i> (Blackwall, 1833)</b>				

29.06.2017	Female	Cadair Idris: Scree	SH71241359	Richard Gallon
<b>Araneae: Linyphiidae: <i>Erigone arctica</i> (White, 1852)</b>				
19.05.2017	Male	Eglwyseg: Scree	SJ 222 470	Steve Judd
<b>Araneae: Linyphiidae: <i>Gonatium rubens</i> (Blackwall, 1833)</b>				
05.10.2017	Female	Garnedd Uchaf: G Vac	SH68856694	Richard Gallon
<b>Araneae: Linyphiidae: <i>Linyphia triangularis</i> (Clerck, 1757)</b>				
19.05.2017	Female	Eglwyseg: Herbs by path	SJ22714758	Tony Hunter
<b>Araneae: Linyphiidae: <i>Meioneta gulosa</i> (L. Koch, 1869)</b>				
05.10.2017	Female	Garnedd Uchaf: Under stone	SH68856694	Richard Gallon
<b>Araneae: Linyphiidae: <i>Meioneta rurestris</i> (C.L. Koch, 1836)</b>				
05.10.2017	Female	Garnedd Uchaf: G Vac	SH68856694	Richard Gallon
<b>Araneae: Linyphiidae: <i>Micrargus herbigradus</i> (Blackwall, 1854)</b>				
19.05.2017	Female	Eglwyseg: Scree	SJ 231 473	Chris Felton
29.06.2017	Female	Cadair Idris: Scree	SH71011352	Richard Gallon
30.06.2017	Female	Y-Lliwedd: Scree	SH61985344	Richard Gallon
<b>Araneae: Linyphiidae: <i>Microneta viaria</i> (Blackwall, 1841)</b>				
06.10.2017	Male	Eglwyseg: Scree	SJ 223 471	Chris Felton
<b>Araneae: Linyphiidae: <i>Monocephalus castaneipes</i> (Simon, 1884)</b>				
05.10.2017	Both	Garnedd Uchaf: Under stone	SH68856694	Richard Gallon
<b>Araneae: Linyphiidae: <i>Neriene peltata</i> (Wider, 1834)</b>				
19.05.2017	Male	Eglwyseg: Scree	SJ 231 473	Chris Felton
<b>Araneae: Linyphiidae: <i>Obscuriphantes obscurus</i> (Blackwall, 1841)</b>				
19.05.2017	Male	Eglwyseg: Scree	SJ 222 470	Tony Hunter
<b>Araneae: Linyphiidae: <i>Oedothorax fuscus</i> (Blackwall, 1834)</b>				
24.05.2017	Female	Y-Lliwedd	SH 630 532	Tony Hunter
<b>Araneae: Linyphiidae: <i>Palliduphantes ericaeus</i> (Blackwall, 1853)</b>				
29.06.2017	Female	Cadair Idris: Scree	SH71241359	Richard Gallon
29.06.2017	Female	Cadair Idris: Scree	SH71221363	Richard Gallon
30.06.2017	Female	Y-Lliwedd: Scree	SH61985344	Richard Gallon
30.06.2017	Female	Y-Lliwedd: Scree	SH61905353	Richard Gallon
<b>Araneae: Linyphiidae: <i>Parapelecopsis nemoralis</i> (Blackwall, 1841)</b>				
05.10.2017	Both	Carnedd y Ddelw: Under rock	SH70737055	Richard Gallon
<b>Araneae: Linyphiidae: <i>Pholcomma gibbum</i> (Westring, 1851)</b>				
05.10.2017	Male	Carnedd y Ddelw: Under rock	SH70737055	Richard Gallon
<b>Araneae: Linyphiidae: <i>Pocadicnemis pumila</i> (Blackwall, 1841)</b>				
30.06.2017	Female	Y-Lliwedd: Scree	SH61905353	Richard Gallon
<b>Araneae: Linyphiidae: <i>Poecilometes variegata</i> (Blackwall, 1841)</b>				
30.06.2017	Female	Y-Lliwedd: Scree	SH61905353	Richard Gallon
11.08.2017	Female	Carnedd y Ddelw: Under rock	SH 7055 7083	Tony Hunter
<b>Araneae: Linyphiidae: <i>Porrhomma montanum</i> Jackson, 1913</b>				
30.06.2017	Male	Y-Lliwedd: Scree	SH61905353	Richard Gallon
<b>Araneae: Linyphiidae: <i>Saaristoa abnormis</i> (Blackwall, 1841)</b>				
10.08.2017	Female	Y-Lliwedd: Scree	Not localised	Tony Hunter
29.06.2017	Female	Cadair Idris: Scree	SH71011352	Richard Gallon
30.06.2017	Both	Y-Lliwedd: Scree	SH61905353	Richard Gallon
05.10.2017	Female	Garnedd Uchaf: Under stone	SH68856694	Richard Gallon
<b>Araneae: Linyphiidae: <i>Semljicola faustus</i> (O.P.-Cambridge, 1900)</b>				
05.10.2017	Female	Garnedd Uchaf: G Vac	SH69176733	Richard Gallon
<b>Araneae: Linyphiidae: <i>Silometopus ambiguus</i> (O.P.-Cambridge, 1905)</b>				
10.08.2017	Female	Y-Lliwedd: Scree	Not localised	Tony Hunter
<b>Araneae: Linyphiidae: <i>Tenuiphantes tenebricola</i> (Wider, 1834)</b>				
19.05.2017	Male	Eglwyseg: Scree	SJ 222 470	Tony Hunter

06.10.2017	Female	Eglwyseg: Scree	SJ 220 457	Tony Hunter
<b>Araneae: Linyphiidae: <i>Tenuiphantes tenuis</i> (Blackwall, 1852)</b>				
19.05.2017	Female	Eglwyseg: Scree	SJ 231 473	Chris Felton
11.08.2017	Female	Foel Liwyd: Under rock	SH71737184	Tony Hunter
05.10.2017	Male	Garnedd Uchaf: Under stone	SH68856694	Richard Gallon
<b>Araneae: Linyphiidae: <i>Tenuiphantes zimmermanni</i> (Bertkau, 1890)</b>				
10.08.2017	Both	Y-Lliwedd: Scree	Not localised	Tony Hunter
29.06.2017	Female	Cadair Idris: Scree	SH71221363	Richard Gallon
30.06.2017	Male	Y-Lliwedd: Scree	SH62215314	Richard Gallon
30.06.2017	Male	Y-Lliwedd: Scree	SH61985344	Richard Gallon
30.06.2017	Female	Y-Lliwedd: Scree	SH61905353	Richard Gallon
05.10.2017	Female	Garnedd Uchaf: Under stone	SH68856694	Richard Gallon
05.10.2017	Male	Garnedd Uchaf: G Vac	SH69176733	Richard Gallon
05.10.2017	Female	Garnedd Uchaf: G Vac	SH68856694	Richard Gallon
<b>Araneae: Linyphiidae: <i>Tiso vagans</i> (Blackwall, 1834)</b>				
05.10.2017	Male	Garnedd Uchaf: G Vac	SH68856694	Richard Gallon
<b>Araneae: Lycosidae: <i>Pardosa agrestis</i> (Westring, 1861)</b>				
19.05.2017	Female	Eglwyseg: Scree	SJ 222 470	Tony Hunter
<b>Araneae: Lycosidae: <i>Pardosa pullata</i> (Clerck, 1757)</b>				
19.05.2017	Female	Eglwyseg: Scree	SJ 231 473	Chris Felton
<b>Araneae: Lycosidae: <i>Trochosa terricola</i> Thorell, 1856</b>				
30.06.2017	Female	Eglwyseg: Quarry	SJ 2244 4409	Steve Judd
30.06.2017	Female	Y-Lliwedd: Scree	SH61905353	Richard Gallon
<b>Araneae: Oonopidae: <i>Oonops pulcher</i> Templeton, 1835</b>				
06.10.2017	Unsexed	Eglwyseg: Scree	SJ 223 471	Chris Felton
<b>Araneae: Salticidae: <i>Neon reticulatus</i> (Blackwall, 1853)</b>				
19.05.2017	Female	Eglwyseg: Scree	SJ 222 470	Tony Hunter
<b>Araneae: Salticidae: <i>Neon robustus</i> Lohmander, 1945</b>				
19.05.2017	Female	Eglwyseg: Scree	SJ 222 470	Tony Hunter
19.05.2017	Male	Eglwyseg: Scree	SJ 227 472	Chris Felton
29.06.2017	Female	Cadair Idris: Scree	SH71241359	Richard Gallon
29.06.2017	Female	Cadair Idris: Scree	SH71011352	Richard Gallon
30.06.2017	Both	Y-Lliwedd: Scree	SH62215314	Richard Gallon
30.06.2017	Female	Y-Lliwedd: Scree	SH61985344	Richard Gallon
30.06.2017	Female	Y-Lliwedd: Scree	SH61905353	Richard Gallon
05.10.2017	Both	Garnedd y Ddelw: Under rock	SH70737055	Richard Gallon
<b>Araneae: Salticidae: <i>Pseudeuophrys erratica</i> (Walckenaer, 1826)</b>				
19.05.2017	Both	Eglwyseg: Scree	SJ 222 470	Tony Hunter
<b>Araneae: Salticidae: <i>Salticus scenicus</i> (Clerck, 1757)</b>				
19.05.2017	Unsexed	Eglwyseg Rocks	SJ 223 472	Mike Howe
<b>Araneae: Segestridae: <i>Segestria senoculata</i> (Linnaeus, 1758)</b>				
11.08.2017	Female	Foel Liwyd: Under rock	SH71737184	Tony Hunter
<b>Araneae: Theridiidae: <i>Paidiscura pallens</i> (Blackwall, 1834)</b>				
19.05.2017	Female	Worlds End	SJ23334791	Tony Hunter
<b>Araneae: Theridiidae: <i>Robertus lividus</i> (Blackwall, 1836)</b>				
29.06.2017	Female	Cadair Idris: Scree	SH71221363	Richard Gallon
30.06.2017	Female	Y-Lliwedd: Scree	SH61905353	Richard Gallon
05.10.2017	Male	Garnedd Uchaf: Under stone	SH68856694	Richard Gallon
<b>Araneae: Theridiidae: <i>Theonoe minutissima</i> (O.P.-Cambridge, 1879)</b>				
30.06.2017	Female	Y-Lliwedd: Scree	SH61985344	Richard Gallon
<b>Araneae: Thomisidae: <i>Ozyptila atomaria</i> (Panzer, 1801)</b>				
19.05.2017	Both	Eglwyseg: Scree	SJ 222 470	Tony Hunter
<b>Araneae: Thomisidae: <i>Xysticus erraticus</i> (Blackwall, 1834)</b>				
19.05.2017	Male	Eglwyseg: Herbs by path	SJ22714758	Tony Hunter



**Archaeognatha: Machilidae: *Dilta* sp.**

06.10.2017	Unsexed	Eglwyseg: Scree	SJ 223 471	Chris Felton
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**Chilopoda: Geophilidae: *Geophilus flavus* (De Geer, 1778)**

06.10.2017	Unsexed	Eglwyseg: Scree	SJ 223 471	Chris Felton
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**Chilopoda: Geophilidae: *Geophilus easoni* Arthur et al., 2001**

19.05.2017	Unsexed	Eglwyseg: Scree	SJ 222 470	Tony Hunter
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29.06.2017	Unsexed	Cadair Idris: Scree	SH71011352	Richard Gallon
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**Chilopoda: Geophilidae: *Geophilus insculptus* Attems, 1895**

06.10.2017	Male	Eglwyseg: Scree	SJ 223 471	Chris Felton
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**Chilopoda: Lithobiidae: *Lithobius borealis* Meinert, 1868**

06.10.2017	Unsexed	Eglwyseg: Scree	SJ2211645578	Tony Hunter
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**Chilopoda: Lithobiidae: *Lithobius calcaratus* C.L. Koch, 1844**

07.04.2017	Female	Eglwyseg: Scree	Not localised	Tony Hunter
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11.08.2017	Female	Carnedd y Ddelw: Under rock	SH70557083	Tony Hunter
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**Chilopoda: Lithobiidae: *Lithobius crassipes* L. Koch, 1862**

06.10.2017	Male	Eglwyseg: Scree	SJ 223 471	Chris Felton
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**Chilopoda: Lithobiidae: *Lithobius forficatus* (Linnaeus, 1758)**

19.05.2017	Unsexed	Eglwyseg Rocks	SJ 223 472	Mike Howe
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06.10.2017	Female	Eglwyseg: Scree	SJ 223 471	Chris Felton
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**Chilopoda: Lithobiidae: *Lithobius variegatus* Leach, 1813**

19.05.2017	Unsexed	Eglwyseg: Scree	SJ 222 470	Tony Hunter
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29.06.2017	Female	Cadair Idris: Scree	SH71011352	Richard Gallon
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06.10.2017	Unsexed	Eglwyseg: Scree	SJ 223 471	Chris Felton
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**Coleoptera: Carabiidae: *Abax parallelepipedus* (Piller & Mitt., 1783)**

19.05.2017	Unsexed	Eglwyseg: Scree	SJ 222 470	Steve Judd
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19.05.2017	Unsexed	Eglwyseg Rocks	SJ 223 472	Mike Howe
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**Coleoptera: Carabiidae: *Badister (Badister) bullatus* (Schrank, 1798)**

06.10.2017	Male	Eglwyseg: Scree	SJ 220 457	Tony Hunter
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**Coleoptera: Carabiidae: *Carabus (Eucarabus) arvensis* Herbst, 1784**

30.06.2017	Unsexed	Watkin path	SH 6225 5138	Tony Hunter
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**Coleoptera: Carabiidae: *Harpalus (Harpalus) affinis* (Schrank, 1781)**

30.06.2017	Unsexed	Eglwyseg: Quarry	SJ 2244 4409	Steve Judd
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**Coleoptera: Carabiidae: *Harpalus (Harpalus) latus* (Linnaeus, 1758)**

19.05.2017	Unsexed	Eglwyseg: Scree	Not localised	Tony Hunter
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**Coleoptera: Carabiidae: *Leistus montanus* Stephens, 1828**

29.06.2017	Female	Cadair Idris: Scree	SH71151363	Rhodri Irranca-Davies
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29.06.2017	Unsexed	Cadair Idris: Scree	SH71241359	Tony Hunter
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30.06.2017	Female	Y-Lliwedd: Scree	SH61995344	Richard Gallon
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10.08.2017	Unsexed	Y-Lliwedd: Scree	SH62005346	Tony Hunter
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10.08.2017	Male	Y-Lliwedd: Scree	SH62065343	Steve Judd
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**Coleoptera: Carabiidae: *Leistus spinibarbis* (Fabricius, 1775)**

19.05.2017	Unsexed	Eglwyseg: Scree	SJ 220 457	Gary Hedges
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**Coleoptera: Carabiidae: *Nebria salina* Fairmaire & Laboulbène, 1854**

19.05.2017	Unsexed	Eglwyseg Rocks	SJ 223 472	Mike Howe
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**Coleoptera: Carabiidae: *Notiophilus biguttatus* (Fabricius, 1779)**

10.08.2017	Unsexed	Y-Lliwedd	SH 621 533	Mike Howe
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**Coleoptera: Carabiidae: *Notiophilus germinyi* Fauvel, 1863**

10.08.2017	Unsexed	Y-Lliwedd	SH 621 533	Mike Howe
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**Coleoptera: Carabiidae: *Olisthopus rotundatus* (Paykull, 1790)**

30.06.2017	Unsexed	Y-Lliwedd: Scree	SH61985344	Richard Gallon
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30.06.2017	Unsexed	Y-Lliwedd: Scree	SH619 534	Tony Hunter
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10.08.2017	Unsexed	Y-Lliwedd	SH 621 533	Mike Howe
<b>Coleoptera: Carabiidae: <i>Pterostichus aethiops</i> (Panzer, 1796)</b>				
29.06.2017	Unsexed	Cadair Idris	SH71221363	Mike Howe
10.08.2017	Unsexed	Y-Lliwedd	SH 621 533	Mike Howe
<b>Coleoptera: Carabiidae: <i>Pterostichus madidus</i> (Fabricius, 1775)</b>				
10.08.2017	Unsexed	Y-Lliwedd: Scree	SH62005346	Tony Hunter
10.08.2017	Male	Y-Lliwedd: Scree	SH62065343	Steve Judd
10.08.2017	Unsexed	Y-Lliwedd	SH 621 533	Mike Howe
<b>Coleoptera: Carabiidae: <i>Trechus obtusus</i> Erichson, 1837</b>				
10.08.2017	Unsexed	Y-Lliwedd	SH 621 533	Mike Howe
<b>Coleoptera: Elateridae: <i>Agriotes obscurus</i> (Linnaeus, 1758)</b>				
19.05.2017	Unsexed	Eglwyseg Rocks	SJ 223 472	Mike Howe
<b>Coleoptera: Elateridae: <i>Selatosomus aeneus</i> (Linnaeus, 1758)</b>				
19.05.2017	Unsexed	Eglwyseg Rocks	SJ 223 472	Mike Howe
<b>Coleoptera: Silphidae: <i>Silpha atrata</i> Linnaeus, 1758</b>				
19.05.2017	Unsexed	Eglwyseg Rocks	SJ 223 472	Mike Howe
06.10.2017	Male	Eglwyseg: Scree	SJ22116 45578	Tony Hunter
<b>Coleoptera: Staphylinidae: <i>Ocypus olens</i> (Müller, O.F., 1764)</b>				
19.05.2017	Unsexed	Eglwyseg Rocks	SJ 223 472	Mike Howe
30.06.2017	Female	Eglwyseg: Quarry	SJ 2244 4409	Steve Judd
<b>Coleoptera: Staphylinidae: <i>Tasgius melanarius</i> (Heer, 1839)</b>				
19.05.2017	Female	Eglwyseg: Scree	SJ 222 470	Tony Hunter
<b>Diplopoda: Craspedosomatidae: <i>Nanogona polydesmoides</i> (Leach)</b>				
06.10.2017	Unsexed	Eglwyseg: Scree	SJ 223 471	Chris Felton
<b>Diplopoda: Glomeridae: <i>Chordeuma proximum</i> Ribaut, 1913</b>				
06.10.2017	Unsexed	Eglwyseg: Scree	SJ 223 471	Chris Felton
<b>Diplopoda: Glomeridae: <i>Glomeris marginata</i> (Villers, 1789)</b>				
06.10.2017	Unsexed	Eglwyseg: Scree	SJ2211645578	Tony Hunter
06.10.2017	Unsexed	Eglwyseg: Scree	SJ 223 471	Chris Felton
<b>Diplopoda: Julidae: <i>Ophiulus pilosus</i> (Newport, 1842)</b>				
19.05.2017	Both	Eglwyseg: Scree	SJ 231 473	Chris Felton
06.10.2017	Female	Eglwyseg: Scree	SJ 223 471	Chris Felton
<b>Diplopoda: Julidae: <i>Proteroiulus fuscus</i> (Am Stein, 1857)</b>				
19.05.2017	Unsexed	Eglwyseg: Scree	SJ 231 473	Chris Felton
<b>Diplopoda: Julidae: <i>Tachypodoiulus niger</i> (Leach, 1814)</b>				
19.05.2017	Unsexed	Eglwyseg Rocks	SJ 223 472	Mike Howe
<b>Diptera: Limoniidae: <i>Pseudolimnophila lucorum</i> (Meigen, 1818)</b>				
29.06.2017	Male	Cadair Idris	SH71221363	Mike Howe
<b>Diptera: Sciomyzidae: <i>Ectinocera borealis</i> Zetterstedt, [1838]</b>				
19.05.2017	Female	Eglwyseg Rocks	SJ 223 472	Mike Howe
19.05.2017	Female	Eglwyseg: Scree	SJ 222 470	Tony Hunter
<b>Hemiptera: Lygaeidae: <i>Drymus brunneus</i> (Sahlberg, 1848)</b>				
19.05.2017	Female	Eglwyseg: Scree	SJ 231 473	Chris Felton
<b>Hymenoptera: Apidae: <i>Bombus monticola</i> Smith, 1849</b>				
19.05.2017	Unsexed	Eglwyseg Rocks	SJ 223 472	Mike Howe
29.06.2017	Unsexed	Cadair Idris	SH 708 151	Mike Howe
10.08.2017	Unsexed	Y-Lliwedd	SH 621 533	Mike Howe
<b>Hymenoptera: Apidae: <i>Bombus lucorum</i> (Linnaeus, 1761)</b>				
10.08.2017	Unsexed	Y-Lliwedd	SH 621 533	Mike Howe
<b>Hymenoptera: Apidae: <i>Nomada fabriciana</i> (Linnaeus, 1767)</b>				
19.05.2017	Male	Eglwyseg: Scree	Not localised	Tony Hunter
<b>Hymenoptera: Formicidae: <i>Myrmica rubra</i> (Linnaeus, 1758)</b>				



22.07.2017	Male	Y-Lliwedd: Juncus	Not localised	Tony Hunter
<b>Hymenoptera: Halictidae: <i>Lasioglossum calceatum</i> (Scopoli, 1763)</b>				
19.05.2017	Female	Eglwyseg: Scree	SJ 231 473	Chris Felton
<b>Hymenoptera: Ichneumonidae: <i>Ichneumon bucculentus</i> Wesm., 1845</b>				
05.10.2017	Female	Carnedd y Ddelw: Under rock	SH7057083	Chris Felton
05.10.2017	Female	Carnedd y Ddelw: Under rock	SH70557083	Steve Judd
<b>Hymenoptera: Ichneumonidae: <i>Ophion obscuratus</i> Fabricius, 1798</b>				
05.10.2017	Male	Yr Ole Wen: Under rock	SH650609	Gary Hedges
<b>Hymenoptera: Ichneumonidae: <i>Sussaba cognata</i> (Holmgren, 1858)</b>				
22.07.2017	Male	Y-Lliwedd: Juncus	Not localised	Tony Hunter
<b>Hymenoptera: Ichneumonidae: <i>Tymmophorus obscuripes</i> (Holm., 1858)</b>				
22.07.2017	Male	Y-Lliwedd: Juncus	Not localised	Tony Hunter
<b>Hymenoptera: Vespidae: <i>Ancistrocerus scoticus</i> (Curtis, 1826)</b>				
11.08.2017	Female	Foel Liwyd: Under rock	SH71737184	Tony Hunter
<b>Isopoda: Armadillidiidae: <i>Armadillidium vulgare</i> (Latreille, 1804)</b>				
06.10.2017	Unsexed	Eglwyseg: Scree	SJ 223 471	Chris Felton
<b>Isopoda: Porcellionidae: <i>Oniscus asellus</i> Linnaeus, 1758</b>				
06.10.2017	Unsexed	Eglwyseg: Scree	SJ 223 471	Chris Felton
<b>Isopoda: Porcellionidae: <i>Porcellio spinicornis</i> Say, 1818</b>				
06.10.2017	Unsexed	Eglwyseg: Scree	SJ 223 471	Chris Felton
<b>Lepidoptera: Geometridae: <i>Colostygia pectinataria</i> (Knoch, 1781)</b>				
30.06.2017	Unsexed	Y-Lliwedd: Scree	SH61995344	Tony Hunter
<b>Lepidoptera: Geometridae: <i>Entephria caesiata</i> ([Denis &amp; Schiff.], 1775)</b>				
30.06.2017	Unsexed	Y-Lliwedd: Scree	SH61995344	Tony Hunter
<b>Lepidoptera: Geometridae: <i>Eulithis populata</i> (Linnaeus, 1758)</b>				
10.08.2017	Unsexed	Y-Lliwedd: Scree	SH62005346	Tony Hunter
<b>Lepidoptera: Geometridae: <i>Thera juniperata</i> (Linnaeus, 1758)</b>				
10.08.2017	Unsexed	Y-Lliwedd	SH 621 533	Mike Howe
<b>Lepidoptera: Nymphalidae: <i>Coenonympha pamphilus</i> (Linnaeus, 1758)</b>				
29.06.2017	Female	Cadair Idris: Scree	SH71011352	Richard Gallon
<b>Lepidoptera: Nymphalidae: <i>Aglais io</i> (Linnaeus, 1758)</b>				
10.08.2017	Unsexed	Y-Lliwedd	SH 621 533	Mike Howe
<b>Mollusca: Pulmonata: <i>Lauria cylindracea</i> (Da Costa, 1778)</b>				
19.05.2017	N/A	Eglwyseg: Scree	SJ 231 473	Chris Felton
19.05.2017	Unsexed	Eglwyseg Rocks	SJ 223 472	Mike Howe
06.10.2017	N/A	Eglwyseg: Scree	SJ 223 471	Chris Felton
<b>Mollusca: Punctidae: <i>Punctum pygmaeum</i> (Draparnaud, 1801)</b>				
19.05.2017	N/A	Eglwyseg: Scree	SJ 231 473	Chris Felton
<b>Mollusca: Pyramidulidae: <i>Pyramidula pusilla</i> (Vallot, 1801)</b>				
19.05.2017	N/A	Eglwyseg: Scree	SJ 231 473	Chris Felton
06.10.2017	N/A	Eglwyseg: Scree	SJ 223 471	Chris Felton
<b>Mollusca: Pristilomatidae: <i>Vitrea contracta</i> (Westerlund, 1871)</b>				
19.05.2017	N/A	Eglwyseg: Scree	SJ 231 473	Chris Felton
06.10.2017	N/A	Eglwyseg: Scree	SJ 223 471	Chris Felton
<b>Opiliones: Nemastomatidae: <i>Mitostoma chrysomelas</i> (Hermann, 1804)</b>				
29.06.2017	Male	Cadair Idris: Scree	SH71221363	Richard Gallon
30.06.2017	Female	Y-Lliwedd: Scree	SH62215314	Richard Gallon
30.06.2017	Female	Y-Lliwedd: Scree	SH61905353	Richard Gallon
<b>Opiliones: Nemastomatidae: <i>Nemastoma bimaculatum</i> (Fab., 1775)</b>				
30.06.2017	Female	Y-Lliwedd: Scree	SH61985344	Richard Gallon
30.06.2017	Female	Y-Lliwedd: Scree	SH61905353	Richard Gallon
05.10.2017	Male	Carnedd y Ddelw: Under rock	SH70737055	Richard Gallon

05.10.2017	Female	Garnedd Uchaf: G Vac	SH68856694	Richard Gallon
<b>Opiliones: Phalangiidae: <i>Leiobunum blackwalli</i> Meade, 1861</b>				
06.10.2017	Female	Eglwyseg: Scree	SJ 223 471	Chris Felton
<b>Opiliones: Phalangiidae: <i>Megabunus diadema</i> (Fabricius, 1779)</b>				
29.06.2017	Female	Cadair Idris: Scree	SH71221363	Richard Gallon
29.06.2017	Unsexed	Cadair Idris	SH71221363	Mike Howe
30.06.2017	Female	Y-Lliwedd: Scree	SH62215314	Richard Gallon
<b>Opiliones: Phalangiidae: <i>Mitopus morio</i> (Fabricius, 1779)</b>				
29.06.2017	Female	Cadair Idris: Scree	SH71011352	Richard Gallon
30.06.2017	Female	Y-Lliwedd: Scree	SH61905353	Richard Gallon
<b>Opiliones: Phalangiidae: <i>Nelima gothica</i> Lohmander, 1945</b>				
06.10.2017	Unsexed	Eglwyseg: Scree	SJ 223 471	Chris Felton
<b>Opiliones: Phalangiidae: <i>Opilio canestrinii</i> (Thorell, 1876)</b>				
06.10.2017	Female	Eglwyseg: Scree	SJ 223 471	Chris Felton
<b>Pseudoscorpiones:Neobisidae:<i>Neobisium carcinoides</i>(Herman, 1804)</b>				
05.10.2017	Unsexed	Garnedd Uchaf: Under stone	SH68856694	Richard Gallon
06.10.2017	Unsexed	Eglwyseg: Scree	SJ2211645572	Tony Hunter

## 11. Appendix 2: Data Archive Appendix

The data archive contains:

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

[B] Species records, which are held on the NRW Recorder 6 database.

Metadata for this project is publicly accessible through Natural Resources Wales' Library Catalogue <http://libcat.naturalresources.wales> or <http://catllyfr.cyfoethnaturiol.cymru> by searching 'Dataset Titles'. The metadata is held as record no 121298.



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