A Survey for the Foaming Fern-borer Sawfly *Blasticotoma filiceti* on Cors Graianog SSSI in August 2025.

NRW Evidence Report No. 949

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Blasticotoma filiceti larval foam ball, Cors Graianog SSSI, August 2025

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Cynhaliwyd arolwg o'r llifbryf *Blasticotoma filiceti* sy'n brin yn genedlaethol ar SoDdGA Cors Graianog ym mis Awst 2025. Gwyddom yn sicr bod y llifbryf hwn i'w gael ar dri safle yn unig yng Nghymru – Cors Graianog, Chwarel Arenig a Thrawscoed – gyda'r boblogaeth ar Gors Graianog yn nodwedd gymhwysol yn y SoDdGA. Cafodd y pryf ei ganfod yma am y tro cyntaf ym 1997, a chafwyd y cofnod diweddaraf yn 2017. Comisiynwyd yr arolwg i benderfynu ei fod yn dal yn bresennol ac i roi cyngor ar waith rheoli prysgwydd arfaethedig a wneir fel rhan o brosiect Corsydd Crynedig LIFE Cyfoeth Naturiol Cymru.

Gan ganolbwyntio ar ardal Cors Graianog y gwyddom sy'n cynnal *B. filiceti*, cynhaliwyd yr arolwg cyfredol yn bennaf dros bedwar diwrnod yn olynol o 8 i 11 Awst a chofnodwyd pedair pêl o ewyn larfa ar dri phlanhigyn Rhedyn Mair *Athyrium filix-femina*, ei blanhigyn lletya dewisol. Roedd pellter mawr o 43.5m, 66m a 90m rhwng planhigion a oedd wedi'u meddiannu, ac fe'u canfuwyd mewn cynefin agored a oedd yn cael ei ddominyddu gan *Molinia* i'r dwyrain o ardal yr arolwg ar ymyl gwern helyg. Roedd Rhedynen Mair ei hun yn doreithiog ar draws ardal yr arolwg, yn enwedig ar ymylon gwern helyg ac ar hyd waliau cerrig a ffensys ar gyrion y gwlyptir. Ni fu'n bosibl i'r arolygwr ganfod presenoldeb larfâu drwy ddefnyddio afliwiad rachisau rhedyn a marwolaeth y pinwlâu cyfagos fel techneg arolygu.

Mae'n bosibl bod y cyfnod hirfaith o dywydd poeth a sych yn ystod haf 2025 wedi effeithio ar yr arolwg, a'r ffaith fod straen sychder ar y rhedyn yn effeithio ar faint o secretiad larfa a oedd yn cael ei gynhyrchu gan arwain at lai o beli ewyn larfâu.

Mae'n annhebygol y bydd gwaith clirio prysgwydd arfaethedig a dulliau rheoli eraill ar Gors Graianog yn ystod hydref a gaeaf 2025-26 yn effeithio ar *B. filiceti* mewn unrhyw ffordd sylweddol ond dylid osgoi niweidio clystyrau o Redyn Mair gymaint ag y bo'n ymarferol bosibl. Dylai peiriannau trwm osgoi'r ardaloedd cyfagos y canfuwyd eu bod yn cynnal y larfa yn 2025, a dylai unrhyw waith clirio prysgwydd yma gael ei wneud ag offer llaw. Dylid gofalu peidio â tharfu ar y swbstrad o amgylch prif glystyrau o Redyn Mair gan mai dyma lle bydd chwilera yn digwydd. Dylai gwaith rheoli osgoi tynnu rhisomau/gwreiddiau'r Rhedynen Mair a gor-gywasgu ardaloedd sy'n cynnal y planhigyn.

Dylid cynnal arolwg dilynol ar gyfer *B. filiceti* ar ôl cwblhau'r gwaith o reoli prysgwydd er mwyn cadarnhau presenoldeb parhaus ar Gors Graianog.

Executive Summary

A survey for the Nationally Scarce Foaming Fern-borer *Blasticotoma filiceti* on Cors Graianog SSSI was undertaken in August 2025. This sawfly is known with certainty from just three sites in Wales – Cors Graianog, Arenig Quarry and Trawscoed – with the population on Cors Graianog being a qualifying feature of the SSSI. It was first found here in 1997, with the most recent record being in 2017. The survey was commissioned to determine continued presence and to provide advice to planned scrub management works being undertaken as part of Natural Resources Wales' LIFEQuake project.

Focussing on the area of Cors Graianog known to support *B. filiceti*, the current survey was mostly conducted over four consecutive days from 8th to 11th August and recorded four larval foam balls on three plants of Lady Fern *Athyrium filix-femina*, its preferred host plant. Occupied plants were widely separated from one another by distances of 43.5m, 66m and 90m, and were found in open *Molinia*-dominated habitat to the east of the survey area on the edge of willow carr. Lady Fern itself was abundant across the survey area, particularly on the edges of willow carr and along stone walls and fences at the edge of the wetland. The surveyor was unable to detect the presence of larvae using the discolouration of fern rachises and death of adjacent pinnules as a survey technique.

The prolonged hot and dry weather during summer 2025 may have impacted upon the survey, with water-stressed ferns affecting the amount of larval secretion produced resulting in less larval foam balls.

Planned scrub clearance and other management on Cors Graianog in autumn and winter 2025-26 is unlikely to affect *B. filiceti* in any significant way but should avoid damaging stands of Lady Fern as much as is practicable. Heavy machinery should avoid the immediate areas found to support the larvae in 2025, with any scrub clearance here undertaken by hand tools. Care should be taken not to disturb the substrate around major stands of Lady Fern as this is where pupation will be taking place. Management works should avoid both removing Lady Fern rhizomes/roots and overly compacting areas supporting the plant.

A follow-up survey for *B. filiceti* upon completion of scrub management should be undertaken to confirm continued presence on Cors Graianog.

1. Introduction

1.1. Status & Ecology of *Blasticotoma filiceti*

The Nationally Scarce Foaming Fern-borer *Blasticotoma filiceti* Klug, 1834 is a sawfly (Hymenoptera, Symphyta) belonging to the small family Blasticotomidae. It has a wide global distribution and is known from Belgium (Verheyde *et al*., 2018), the Netherlands, Germany, Sweden, Finland, Russia and Japan (Benson, 1951), with a single site in the Republic of Ireland (Bowdry, 2008). In the UK, it was first recorded from London in 1870 (Newman, 1870), and subsequently found at RHS Wisley in Surrey in 1905 (Benson, 1951) but has not been seen here since 1982. Early reports in the UK were primarily associated with ornamental gardens, including Wisley, Kew Gardens and Sizergh Castle in Cumbria (Quinlan & Gauld, 1981; Wright, 1990). However, Benson (1953) noted the first occurrence at a natural site - Goldstitch Moss in Staffordshire, which has since been destroyed by development (Knight, 2009).

Figure 1. European distribution of Foaming Fern-borer *Blasticotoma filiceti.* From: Global Biodiversity Information Facility (GBIF) website.

Only females have been recorded, at least in the Western Palaearctic (Schedl, 1974), and *B. filiceti* is suspected to reproduce parthenogenetically (Liston, 2007). Females are small, approximately 8mm long, and black with yellowish legs and infuscated wings (Figure 2). The forewing stigma is semicircular, and cell 1m is domed outwards apically. Antennae are similar to those in the family Argidae but with a very small additional segment at the tip. Additional images of *B. filiceti* are available on Steven Falk's Flickr website at: https://www.flickr.com/photos/63075200@N07/albums/72157712376562792/

Females are on the wing from May to July (UK Sawflies website), reportedly flying in heavy rain (Key, 1998). They oviposit into the rachises of ferns, favouring Lady Fern *Athyrium filix-femina* but also recorded as using Buckler-ferns *Dryopteris* spp., Ostrich Fern *Matteuccia struthiopteris*, Shield-ferns *Polystichum* spp. and Bracken *Pteridium aquilinum*

(Lindqvist, 1966; Schedl, 1974; Shcherbakov, 2006). The larva develops in a short cell within the rachis, typically about 1.5 times as long as the length of the larva and with an absolute maximal length of 20mm and no wider than the larva, feeding on phloem sap (Liston, 2007; UK Sawflies website). Multiple larvae can develop in the same rachis and are separated by a thin wall of plant tissue. As the larva feeds, it can produce a foamy 'froth ball' excretion that sticks to the outside of the rachis, and this is the best visible indicator of its presence (Liston, 2007; UK Sawflies website). However, a search in a woodland in Germany by Liston (2007) found that only two out of forty-eight mines containing larvae had these foam balls and he postulated that larval development can be completed successfully without producing such secretions. The absence of foam balls may be in part due to their removal by ants in a trophobiotic relationship (Liston, 2007; Novgoradova & Biryukova, 2011; Shcherbakov, 2006) but dry summer conditions which reduce water availability to the hostplant may also affect the amount of larval secretion produced (Liston, 2007).

Discolouration or blackening of the rachis around the mine, as well as the death of a small portion of the pinnule adjacent to the cell, are also indicators of larval presence (Liston, 2007). Once development is completed, the larva leaves its mine very slowly, with 1-2 abdominal segments appearing first and their emergence being repeated up to several times, avoiding contact with anything outside the rachis. The emerged larva eventually drops onto the ground litter and burrows into the substrate to pupate (Novgoradova & Biryukova, 2011). Images of larvae can be found in Novgoradova & Biryukova (2011) and Liston (2007).

Figure 2. *Blasticotoma filiceti* adult © Guy Knight.

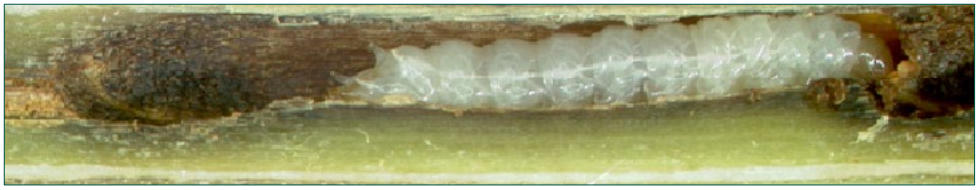

Figure 3. *Blasticotoma filiceti* larva within its cell © Liston (2007).

1.2. *Blasticotoma filiceti* in Wales

B. filiceti was first recorded in Wales when a female was captured on Cors Graianog SSSI in June 1997 (Key, 1998), providing a second natural site for the UK. Subsequent searches at the site found foam balls and larval damage on Lady Fern (Knight, 2009; Knight & Howe, 2007) but a wider search of sites close to Cors Graianog - Cors Gyfelog, Coed Tanybryn and verges along minor roads in the area - failed to locate additional

populations (Knight, 2009). Foam balls were found at a second locality at Trawscoed in August 2016 by Andrew Graham and a third locality was found on the roadside below Arenig Quarry in August 2017 by Mike Howe (Howe, 2022) (Table 1). There is an unconfirmed record from Coed-ty-llwyd near Lisvane in Cardiff in 1982.

Table 1. Welsh records of *Blasticotoma filiceti*.

Site	VC	GR	Date	Abundance	Comment
Coed-ty-llwyd	41	ST188823	07/07/1982		Requires confirmation
Arenig Quarry	48	SH829391	23/08/2017	1 larva	
Trawscoed	48	SH84673232	27/08/2016	3 larvae	
Trawscoed	48	SH84673232	22/07/2018		
Cors Graianog	49	SH4945	15/06/1997	1 adult	
Cors Graianog	49	SH495453	19/08/2005	14 larvae	
Cors Graianog	49	SH495453	04/08/2006	1 larva	
Cors Graianog	49	SH495453	01/05/2007	1 adult	
Cors Graianog	49	SH495453	15/08/2017	2 larvae	

Figure 4. Welsh distribution of *Blasticotoma filiceti*.

The population of *B. filiceti* is a qualifying feature of Cors Graianog SSSI. It is restricted to an area of fen with relatively scattered scrub (Figure 5), seemingly avoiding more open fen and dense carr.

Figure 5. Aerial image of Cors Graianog SSSI, with the area occupied by *Blasticotoma filiceti* outlined in green.

1.3. Cors Graianog SSSI

Cors Graianog (SH497454) is a SSSI and part of Corsydd Eifionydd / Eifionydd Fens SAC. Covering 35.8ha, the site features a range of mire habitats including nutrient-rich and nutrient-poor fen, quaking rafts and acidic bog. A total of 3ha of mature wet woodland (willow carr) is a complementary feature. In addition to *B. filiceti*, Intermediate Bladderwort *Utricularia intermedia* is a notified feature of the SSSI.

The site was once common land with communal grazing and shared maintenance, including ditch clearance, coppicing of the willow and clearance of scrub. Peat cutting was also carried out on the site. The site is now largely unmanaged, with small parts around the periphery grazed by ponies or cattle. The area occupied by B*. filiceti* is not managed with any livestock (Countryside Council for Wales, 2008).

1.4. 2025 Survey

Scrub removal is planned to take place within the area occupied by *B. filiceti* in autumn to winter 2025 as part of the LIFEQuake project to restore quaking bog habitat throughout Wales. As a consequence, a survey was commissioned by Natural Resources Wales to

assess the current status of the sawfly and Lady Fern prior to management works with this core area and to advise on management to minimise any impact.

2. Methods

A brief initial visit was made to Cors Graianog on the 26th of May 2025, when adult females are on the wing. The weather on this day was characterised by heavy rain. Lady Fern plants and the surrounding vegetation were swept with an insect sweep net.

Figure 6. Sweeping Lady Fern during heavy rain on 26th May 2025.

The core part of the survey for *B. filiceti* was conducted from 8th to 11th August 2025, as recommended by Knight (2007). Surveys focused on finding larval foam balls by gently prizing apart plants of Lady Fern and inspecting rachises. As the survey area is relatively small, the surveyor was confident that the majority of accessible Lady Fern stands were inspected. When a foam ball was found, a Grid Reference was taken and the fern was marked with a flag marker. The blackening of the rachis was also looked for. However, the surveyor's limited experience with the species rendered this method inconclusive for determining larval presence, as fern discolouration is a common natural occurrence. Ferns and the surrounding vegetation were also swept with a net to look for females although the survey period fell outside the flight period.

The site was revisited on 22nd and 23rd August 2025 to test whether applying ditch water to ferns using watering cans might stimulate foam ball production. These tests focused on ferns where larvae had previously been detected. Less thorough, wider searches were also made. Further visits were made on the 8th and 15th of September to assess the habitat and take photographs for the report.

3. Results

No adults were found on 26th of May 2025. Visits by Guy Knight on 7th and 16th May 2025 also failed to locate adults (Guy Knight, pers. comm.).

The weather for the entirety of the core August survey period (8th to 11th) was very warm (18°C to 20°C at midday) and dry, with very little rainfall for the entirety of late July and early August 2025. A total of four larval foam balls was found on three Lady Fern plants, with two being found on separate frond rachises belonging to the same plant (Table 2; Figures 9 to 12). A Lady Fern rachis was also found that had the characteristic discolouration and death of the pinule without a foam ball (Figure 13). As expected, no females were found during the survey. The three Lady Fern plants on which the foam balls were found were well separated from one another (distances of 43.5m, 66m and 90m) and occurred in open areas dominated by Purple Moor-grass *Molinia caerulea*, although fairly close to the willow carr to the east of the survey area (Figures 6 & 7). The foam balls stayed stuck to the rachis for the entirety of the core survey period but could not be relocated during the later visit. They appeared to have been produced prior to the survey period, and no further production occurred during the site visits.

No sawfly-ant interactions were observed during the survey.

The attempt to stimulate larval foam ball production by applying water with watering cans did not succeed.

Lady Fern is abundant across the survey area, particularly on the edges of the willow carr and the edges of the site against the fence and stone walls. The ferns started to naturally brown and die off in early September visits, which made detection of the larvae at later dates very difficult.

Table 2. Date and Grid Reference for larval foam balls found during the 2025 survey. See Appendix 1 for habitat photographs.

Record	Date	Grid Reference	Habitat	Distance
1	08/08/2025	SH4952145329	Open area dominated by *Molinia caerulea* and *Erica tetralix.*	From 2: 66m From 3 & 4: 90m
2	08/08/2025	SH4958645342	An opening within the willow carr with *Molinia caerulea* and *Succisa pratensis.*	From 1: 66m From 3 & 4: 43.5m
3 & 4	11/08/2025	SH4959345385	Open *Myrica gale* and *Molinia caerulea* dominated area.	From 1: 90m From 2: 43.5m

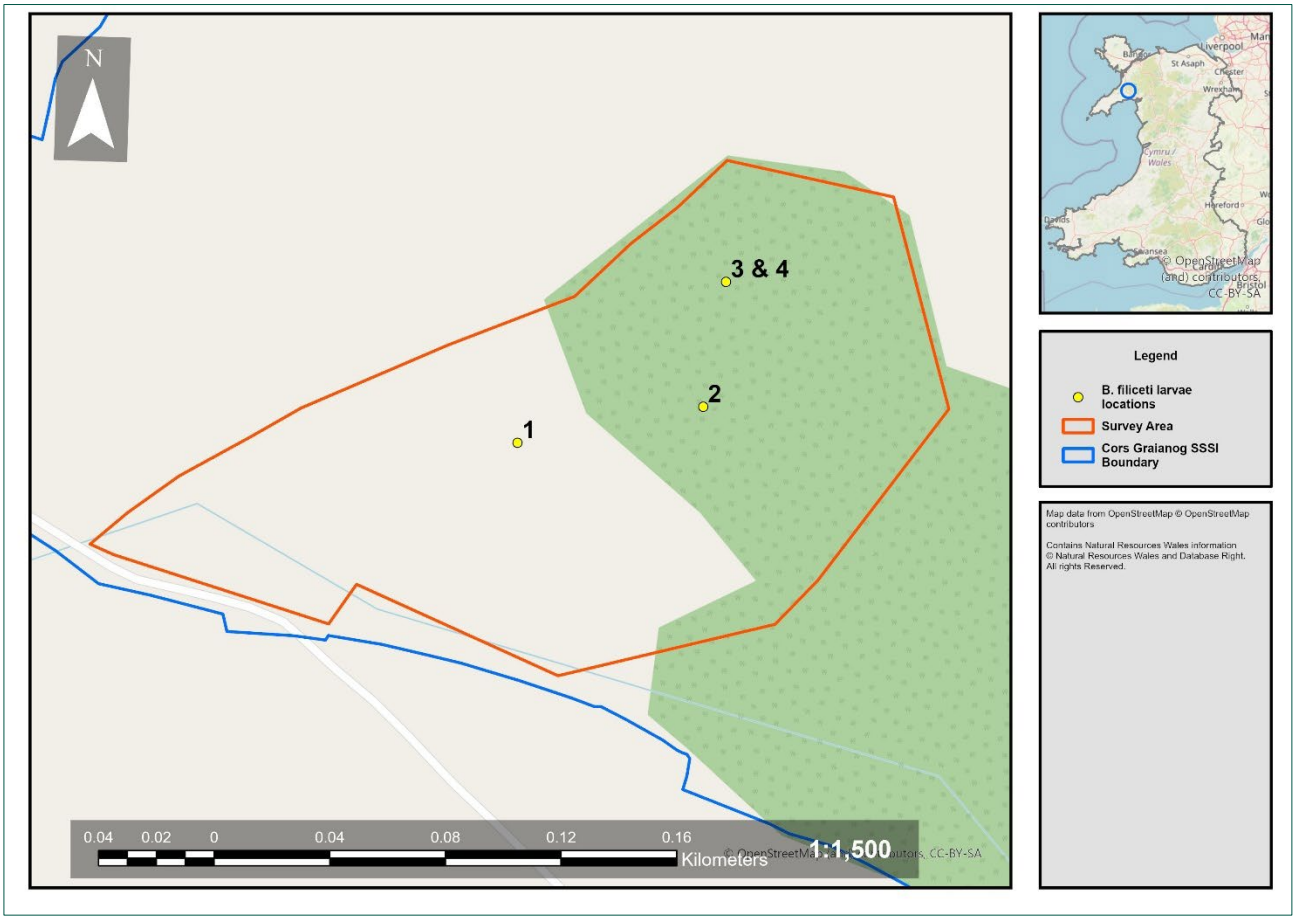

Figure 7. The location of *Blasticotoma filiceti* larval foam balls found in August 2025 within the survey area on Cors Graianog SSSI.

Figure 8. Aerial image of the survey area on Cors Graianog showing the locations of *Blasticotoma filiceti* larval foam balls found in August 2025 (shown as red x).

Figure 9. First larval foam ball found on 8th August 2025. Note the darkening of the rachis and death of the lower pinnules.

Figure 10. Second larval foam ball found on 8th August 2025. Note the darkening of the rachis and death of the lower pinnules.


Figures 11 & 12. Third (left) and fourth (right) larval foam balls found on separate frond rachises of the same Lady Fern plant. Note the darkening of the rachis and death of the lower pinnules.

Figure 13. Lady Fern rachis showing the signs of larval presence, discolouration and death of the pinule but without a foam ball.

4. Conclusions

This survey confirms that *B. filiceti* is still present on Cors Graianog SSSI. Due to limited experience with the species, surveyor confidence was low when determining the presence of larvae based upon discolouration of the rachis or the death of the adjacent pinnules alone, without the presence of foam balls. As the majority of larvae may not produce these secretions during their development (Liston, 2007), the number of larvae at Cors Graianog is likely to greatly exceed the four found. The results, therefore, do not necessarily reflect the true distribution of the sawfly within the survey area.

The fronds of Lady Fern plants hosting the larvae appeared to die off earlier than other fronds of the same plant, and all the fronds with larval foam balls had the characteristic discolouration of the rachis and death of the lower adjacent pinnules.

North Wales experienced prolonged dry weather during summer 2025, with a drought declared towards the end of the summer. As a consequence, many wetlands experienced very low water levels and desiccation. Whilst the survey area on Cors Graianog did remain wet, it is very likely that Lady Fern plants would have been water-stressed and, as a result, sawfly larvae may not have been producing foam balls. The attempt to stimulate larval foam ball production by applying water with watering cans did not succeed, perhaps because the fern fronds were no longer transpiring or because water application was undertaken over too short a period to stimulate secretions. It is a technique worth persevering if drought conditions apply in future years.

Larval foam ball surveys may benefit from starting earlier in the summer when it is not as dry and hot as August 2025, and well before the larval development results in the death of the fern frond.

Planned scrub clearance and other management on Cors Graianog in autumn and winter 2025-26 is unlikely to affect *B. filiceti* in any significant way but **should avoid damaging any stands of Lady Fern as much as is practicable. Heavy machinery should avoid the immediate areas found to support the larvae in 2025, with any scrub clearance here undertaken by hand tools.** Care should be taken not to disturb the substrate around any major stands of Lady Fern as this is where pupation will be taking place. Management works should avoid both removing Lady Fern rhizomes/roots and overly compacting areas supporting the plant.

A follow-up survey for *B. filiceti* upon completion of scrub management should be undertaken to confirm continued presence on Cors Graianog.

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Appendix 1. Images Showing the Position of Larval Foam Balls and the Immediate Habitat Surroundings.

Habitat for 1st larval foam ball record (SH4952145329).

Habitat for 2nd larval fom ball record (SH4958645342).

Habitat for 3rd & 4th larval foam ball records (SH4959345385).

Appendix 2. Other Species Recorded During The Survey.

Species	Order	Common Name	GR	Date	Abundance
Nicrophorus vespilloides	Coleoptera	Sexton Beetle	SH4959245353	23.08.2025	1 adult
Chrysotoxum bicinctum	Diptera	a hoverfly	SH4959245353	23.08.2025	
Dasysyrphus tricinctus	Diptera	a hoverfly	SH4959245353	23.08.2025	
Eristalis intricarius	Diptera	a hoverfly	SH4959245353	23.08.2025	
Pedicia rivosa	Diptera	a cranefly	SH4953145342	22.08.2025	4 adults
Prosena siberita	Diptera	Sabre-tongued Parasite Fly	SH4958745364	10.08.2025	2 adults
Pyrophaena granditarsa	Diptera	a hoverfly	SH4959245353	23.08.2025	
Sericomyia superbiens	Diptera	a hoverfly	SH4959245353	23.08.2025	1 adult
Tachina grossa	Diptera	Yellow-faced Fly	SH4961345373	12.05.2025	1 adult
Abia nitens	Hymenoptera	Scabious Clubhorn	SH4954645334	26.05.2025	1 adult
Athalia scutellaria	Hymenoptera	Skullcap Tigress	SH4959945337	12.08.2025	1 larva
Bombus pascuorum	Hymenoptera	Common Carder Bee	SH4959245353	23.08.2025	
Aglais io	Lepidoptera	Peacock	SH4959245353	23.08.2025	
Amblyptilia acanthadactyla	Lepidoptera	Beautiful Plume Moth	SH4958045365	10.08.2025	1 adult
Apamea monoglypha	Lepidoptera	Dark Arches	SH4953145342	22.08.2025	1 adult
Autographa gamma	Lepidoptera	Silver Y	SH4959945360	11.08.2025	1 adult
Colostygia pectinataria	Lepidoptera	Green Carpet	SH4953145342	22.08.2025	1 adult
Denticucullus pygmina	Lepidoptera	Small Wainscot	SH4953145342	22.08.2025	3 adults
Ecliptopera silaceata	Lepidoptera	Small Phoenix	SH4953145342	22.08.2025	2 adults
Ennomos alniaria	Lepidoptera	Canary-shouldered Thorn	SH4953145342	22.08.2025	3 adults
Eulithis testata	Lepidoptera	The Chevron	SH4953145342	22.08.2025	1 adult
Gandaritis pyraliata	Lepidoptera	Barred Straw	SH4953145342	22.08.2025	1 adult
Luperina testacea	Lepidoptera	Flounced Rustic	SH4953145342	22.08.2025	1 adult

Macrothylacia rubi	Lepidoptera	Fox Moth	SH4956145353	15.09.2025	1 larva
Mythimna pallens	Lepidoptera	Common Wainscot	SH4953145342	22.08.2025	1 adult
Noctua janthe	Lepidoptera	Lesser Broad-bordered Yellow Underwing	SH4953145342	22.08.2025	
Noctua pronuba	Lepidoptera	Large Yellow Underwing	SH4953145342	22.08.2025	3 adults
Ochropleura plecta	Lepidoptera	Flame Shoulder	SH4953145342	22.08.2025	12 adults
Opisthograptis luteolata	Lepidoptera	Brimstone	SH4953145342	22.08.2025	1 adult
Pheosia gnoma	Lepidoptera	Lesser Swallow Prominent	SH4953145342	22.08.2025	1 adult
Pheosia tremula	Lepidoptera	Swallow Prominent	SH4953145342	22.08.2025	1 adult
Phlogophora meticulosa	Lepidoptera	Angle Shades	SH4953145342	22.08.2025	1 adult
Prochoreutis inflatella	Lepidoptera	Skullcap Skeletoniser	SH4960945354	11.08.2025	1 adult
Vanessa atalanta	Lepidoptera	Red Admiral	SH4959245353	23.08.2025	
Xestia castanea	Lepidoptera	Neglected Rustic	SH4953145342	22.08.2025	1 adult
Sympetrum danae	Odonata	Black Darter	SH4952045332	23.08.2025	several adults
Vipera berus		Adder	SH4945945288	10.08.2025	1

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 are held in the 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. NRW_DS161395.