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# The status of the caddis *Adicella filicornis* in Wales in 2016

ID Wallace & B Wallace

NRW Evidence Report No. 200

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## 1. Crynodeb Gweithredol

Yn 2016 canfu arolwg o'r pryf pric mewn perygl, *Adicella filicornis* (Trichoptera) enghreifftiau chwilerol ym mhob un o'r pedwar safle yng Nghymru, gyda chofnodion modern ac un oedolyn. Ymddengys fod poblogaethau yng Nghoed Dol-gôch, Coedwig Halton, Coedwig Prisk a Choedwig Wilderness yn fach, a bod y cynefin a ddefnyddir gan y pryf pric – sef afonydd sefydlog bach iawn ar lethrau eithaf serth yn agos i'w tarddiad o darddellau dŵr daear – hefyd yn lleoledig iawn ac yn hynod o fregus. Dim ond Coed Dol-goch sy'n cynnal ardal gynefin resymol, ac mae nifer o fannau wedi'u meddiannu. Nid oes yr un o'r safleoedd yn derbyn unrhyw warchodaeth statudol, er bod Coedwig Prisk yn eiddo i Ymddiriedolaeth Bywyd Gwyllt Gwent, ac mae Coed Dol-gôch yn goetir cymunedol. Dylid rhoi ystyriaeth i ddynodi un, os nad pob un o'r safleoedd, yn Safle o Ddiddordeb Gwyddonol Arbennig ar sail *A. filicornis*. Mae Coedwig Prisk a Choedwig Wilderness hefyd yn cynnal unig boblogaethau pryf y teilwr prin yng Nghymru, *Ellipteroides alboscuteellatus*, rhywogaeth sy'n gysylltiedig â thryddiferiadau sy'n dyddodi twffa. Mae angen cynnal arolygon pellach o *A. filicornis* ym mhob un o'r pedwar safle lle y ceir enghreifftiau ohonynt, er mwyn pennu eu statws a'u dosbarthiad ac i nodi bygythiadau i'w cynefin.

## 2. Executive Summary

A survey for the Endangered caddis *Adicella filicornis* (Trichoptera) in 2016 found pupal cases at all four Welsh sites with modern records, and a single adult. Populations at Coed Dol-gôch, Halton Wood, Prisk Wood and Wilderness Wood appear to be small and the habitat used by the caddis - very small permanent streams on quite steep slopes close to their origin from groundwater springs - is also highly localised and very fragile. Only Coed Dol-gôch supports a reasonable area of habitat with several stations being occupied. None of the sites has any statutory protection, although Prisk Wood is owned by the Gwent Wildlife Trust and Coed Dol-gôch is a community woodland. Consideration should be given to notifying one, if not all, sites as SSSI for *A. filicornis*. Prisk Wood and Wilderness Wood also support the only Welsh populations of the rare cranefly *Ellipteroides alboscuteellatus*, a species associated with tufa-depositing seepages. Further surveys for *A. filicornis* at all four occupied sites are required to determine its status and distribution and to identify threats to its habitat.

### 3. Introduction

The eminent Scottish caddis worker Kenneth J Morton added this species to the British list in 1884 (Morton, 1884). That it continued to be one of his favourite species can be seen in this introduction to a paper in 1904 “*The insect itself is one of the most interesting little things imaginable, and to have watched it fluttering about in the warm sunlit glades that it loves is to have seen one of the most delicate and charming pictures of insect life: the interest being enhanced when one knows where it has come from, and how it has spent its earlier life*” (Morton, 1904).

#### 3.1 Background information

The caddis *Adicella filicornis* (Pictet, 1834) is an Endangered species in the UK (Wallace, 2016), with records from only eight widely-separated and isolated localities of which five are in Wales. It had been given the status of RDB3 by Wallace (1991). Post-1980 records are restricted to a short stretch of south Devon cliffs and four sites in Wales. Larvae have been found in very small permanent streams on quite steep slopes close to their origin from groundwater springs. Some sites have very hard water and deposit travertine, but others are not so calcareous although the surrounding vegetation suggests they are not base-deficient. A notable feature of all sites is instability; the sites are often amongst trees that have fallen due to the ground slumping.

In Wales, *A. filicornis* was recorded from Talybont-on-Usk (VC42; SO12) from 1927 to 1929, with more recent records from Wilderness Wood (VC50; SJ333533) in 1995, Halton Wood (VC50; SJ301408) from 1981 to 1988, Coed Dol-gôch (VC48; SH653042) from 1982 to 1995 and Prisk Wood (VC35; SO531091) in 2005. Populations are vulnerable to site loss or damage. At Wilderness Wood, the stream complex had been impacted by footpath maintenance and short visits in 2005 and 2011 failed to re-find the species. At Halton Wood tree-felling opened up the habitat to brambles and other rank vegetation and the caddis was not seen in visits to the site in 1991 and 1997 (Ian Wallace, pers. obs.).

The larvae probably take only a year for the life cycle as a range of sizes has not been found. This contrasts with the beraeid species *Beraea maurus* (Curtis) and *Ernodes articularis* (Pictet) which often occur with *A. filicornis* and exhibit a considerable larval size range throughout the year. The larvae are thought to be detritivores or to feed on living plant material. Adults are on the wing from mid-June to mid-July.

#### 3.2 Objectives

The objective of the 2016 survey was to determine the current status of *A. filicornis* at the four Welsh sites with recent records. At the recommendation of the NRW Project Manager, a visit was also made to Cwm Taf Fechan Woodlands (VC41; SO043095) which support tufa-forming seepages under a broad-leaved woodland canopy.

## 4. Methods

Sites were visited between May and July 2016 to search for larvae, pupal cases and adults. An additional visit was made to Coed Dol-gôch on 25.3.2017 to search for larvae. The Welsh sites for this species are near the sources of very small spring streams under deciduous trees, with an unstable bottom of coarse sand, stones and a few clumps of moss. Roots of marginal vegetation, including trees, may be present. As it would be easy to damage such sites by vigorous searching, sites were sampled from the margins wherever possible, rather than standing in the water course. Only a few stones, clumps of moss or plants of *Chrysosplenium oppositifolium* were removed for examination and these were carefully replaced. Once the species was located, we moved to another station. Neighbouring vegetation was swept for resting adults.

The species is most conveniently recorded as pupal cases. These persist for at least a year after emergence of the adult and, for a while, can be found attached to stones and moss or, after they have become detached, under stones or plants; Morton (1886) gives a description of the micro-habitat where he found pupal cases – attached to the underside of saturated moss in a trickle of water. The plan was to put back any cases containing pupae, but the adult had emerged from all that were encountered. It is not possible to decide on the age of most old pupal cases but if the anterior closing membrane was still attached it was concluded that such cases were recently vacated. The membrane hinges back to allow the adult to escape, but may remain attached to the case for a short time after emergence, but very weakly. With experience, old pupal cases of *A. filicornis* can be identified in the field using a hand lens. They superficially resemble those of beraeids, which are present in significant numbers at all *A. filicornis* sites. However, the construction of the case of *A. filicornis* includes a layer of silk over the top of the sand grains which gives the case a shiny appearance and the individual sand grains cannot be easily distinguished, except where the outer layer has been abraded. This contrasts with the case of beraeids which lacks the outer layer of silk, and thus has a rougher appearance and where individual sand grains are more conspicuous. The posterior end of the larval case of beraeids terminates in a conical projection. This contrasts with the posterior end of the case of *A. filicornis* which is straight (Figures 1 to 3). Difficult examples can be collected for examination under a microscope; the cast larval exuviae remain in the case after the pupa has left and can be extracted and identified (see Wallace *et al.*, 2003).



Figure 1: Old pupal case of *A. filicornis*.





Figure 2: Posterior part of pupal cases of *A. filicornis*, (left) and *Beraea maurus* (centre and right).

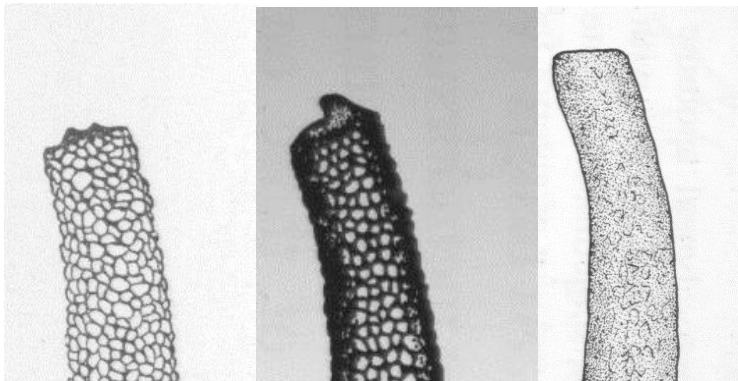


Figure 3: Posterior end of pupal cases. From left to right *B. pullata* (from Wesenburg-Lund, 1943), *Ernodes articularis* (from Wiberg-Larsen, 1979) and *A. filicornis* (from Wallace *et al.*, 2003).

Many cased caddis living in flowing water attach their larval cases to larger objects in the water before sealing them for pupation, to avoid being carried off by the current. *A. filicornis* attaches its case to mosses and stones. This habit makes the pupal cases relatively easy to find. The visit in March 2017 was to try to locate larvae. Mosses, *Chryso splenium*, roots of trees and *Oenanthe crocata*, aggregations of dead leaves and loose shale from the stream bed were searched manually, with a small net and by 'panning' in a small tray.

Britain's two *Adicella* species are the only caddis adults with long antennae (family Leptoceridae) that are likely to be encountered around spring streams. They can be identified using Barnard & Ross (2012).

All grid references were obtained using a Garmin *etrex 10*.

## 5. Results

In summer 2016, *A. filicornis* was recorded at all four Welsh sites with recent records, in low numbers and as old pupal cases (Table 1). A single female was found at Coed Dol-gôch (Figure 17). Many old cases and a few larvae were found in a survey of the Coed Dol-gôch site on 25<sup>th</sup> March 2017. The species was not found at Cwm Taf Fechan Woodlands (see Appendix 1).

Table 1: Records of *Adicella filicornis* from Welsh sites in summer 2016 and spring 2017.

Site	Grid Reference	Date	Abundance	Recorders
Wilderness Wood	SJ3331553396	17.5.2016	2 old pupal cases	I.D. & B. Wallace
Wilderness Wood	SJ3319453358	17.5.2016	1 recently vacated pupal case	I.D. & B. Wallace
Halton Wood	SJ3010340902	27.6.2016	2 old pupal cases	I.D. & B. Wallace
Halton Wood	SJ3010740902	27.6.2016	1 old pupal case	I.D. & B. Wallace
Coed Dol-gôch	SH6515804280	5.7.2016	1 old pupal case	I.D. & B. Wallace
Coed Dol-gôch	SH6516604279	5.7.2016	1 female	I.D. & B. Wallace
Coed Dol-gôch	SH6537204229	5.7.2016	2 old pupal case	I.D. & B. Wallace
Coed Dol-gôch	SH6547204201	5.7.2016	1 old pupal case	I.D. & B. Wallace
Coed Dol-gôch	SH6547704199	5.7.2016	1 old pupal case	I.D. & B. Wallace
Coed Dol-gôch	SH6547804199	5.7.2016	1 old pupal case	I.D. & B. Wallace
Coed Dol-gôch	SH652042 (centre)	25.3.2017	29 old pupal cases, 5 empty final instar larval cases, 1 pre-pupa, 5 final instar larvae	I.D., B. & M.C. Wallace
Prisk Wood	SO5316509059	7.7.2016	1 recently vacated pupal case	I.D. & B. Wallace

### Wilderness Wood

Wilderness Wood was visited on 17<sup>th</sup> May 2016 and three old pupal cases were found at two different stations.

#### Station 1 SJ3331553396

Two old pupal cases were found under a moss-covered stick in a small stream (Figure 4). Stones, sand and moss were also present. The water flow was much slower than at other *A. filicornis* sites.

#### Station 2 SJ3319453358

One recently vacated pupal case was taken from a spring stream that had very clean water, a clean sand bottom and moss-covered stones (Figures 5 & 6). The water was shallow but flowed quickly. There are many springs in this wood and most deposit travertine but this site, from which *A. filicornis* was also recorded in 1995, does not.

The Wilderness Wood streams have a good range of other caddis, including three specialists of travertine, *Ernodes articularis*, *Plectrocnemia brevis* and *Tinodes unicolor* (Table 2), the first two being Nationally Scarce. *Agapetus fuscipes*, *Adicella reducta* (Figure 7), *Beraea maurus*, *Crunoecia irrorata*, *Micropterna sequax* and *Wormaldia occipitalis* were also noted. Larval cases made by the travertine specialist crane fly *Thaumasoptera calceata* were also observed.





Figure 4: Station 1 at Wilderness Wood, SJ3331553396, showing the stick (arrowed) under which the old pupal cases were found.



Figure 5: Station 2 at Wilderness Wood, SJ3319453358, showing the clumps of moss in the water course.





Figure 6: Station 2 at Wilderness Wood in more detail.



Figure 7: A mating pair of *Adicella reducta* at Wilderness Wood. Another delightful caddis, associated as a larva with submerged plant roots in clean water. Pupal cases were found amongst alder roots.

### Halton Wood

Halton Wood was visited during the afternoon of 27<sup>th</sup> June 2016 (Figure 9). Three old pupal cases were found at two stations on one spring stream complex at SJ3010340902 (Figures 8 & 10; two specimens) and SJ3010740902 (Figure 11; one specimen). The site was highly calcareous and deposited travertine. However, the bottom had no hard concretion and contrasted in that way with a neighbouring,



superficially similar, site at SJ3011240905 where *A. filicornis* was not found. Another six sites in the wood were investigated but were either silty, too slow-flowing, or had a consolidated bottom (Figure 12) and yielded no *A. filicornis*. *Beraea maurus* and *Crunoecia irrorata* were found with *A. filicornis*. Other sites in the wood had those two, *Agapetus fuscipes*, *Micropterna sequax*, *Plectrocnemia brevis*, *Tinodes unicolor* and *Wormaldia occipitalis* (Table 2).

*A. filicornis* was recorded from only one locality in Halton Wood in 1981 and 1988. GPS was not available at that time so it is uncertain if it was exactly the same site as the two 2016 stations but if not, it was very close by.



Figure 8: Environs of Station 1 in Halton Wood (SJ3010740902).



Figure 9: Sampling one of the Halton Wood stations.





Figure 10: Detail of part of Station 1 in Halton Wood showing tree roots and moss where old pupal cases were found.



Figure 11: Part of Station 2 in Halton Wood where the flow is concentrated. An old pupal case was attached to the moss.



Figure 12: A Halton Wood stream at SJ2921340877 which has a hard consolidated bottom and *A. filicornis* was not found there.

### Coed Dol-gôch

Coed Dol-gôch is a community-owned woodland in a steep gorge whose south side has an area of springs and seepages marked by land slippage, fallen trees and a subsiding old board walk. It was visited during the afternoon of 5<sup>th</sup> July 2016. *A. filicornis* was found at six stations (six old pupal cases and one adult female). All stations lay along the old board walk. The boardwalk is closed to the public because of its dilapidated condition but it gives access to the spring complexes and minimises damage to this fragile area. It was thanks to the board walk that the species was first found here in 1982.

The trees at the *A. filicornis* stations were ash, alder and sycamore. Moss was a feature of all stations and alder tree roots at four of the six. *Chrysosplenium* was abundant (Figures 14 to 16). The presence of *Ancylus* water snails suggests the stations are not deficient in calcium. Very little silt was produced when the bottom was disturbed, unlike similar sites on the north slope of the gorge, where *A. filicornis* was not found.

On the visit in March 2017, while the trees were still bare of leaves, it could be seen that apparently-suitable habitat ran all the way down the slope to the Nant Dol-gôch (Figure 22). Old pupal cases were very common amongst debris and among *Chrysosplenium* and moss both above the board walk (Station 2; Figures 14 to 16) and just below (Station 7; Figures 20 & 21). Final instar larvae were found at stations 2, 3 and 6. Packets of decaying tree leaves were common but *A. filicornis* was not found amongst them.

### Station 1 SH6515804280

A small shallow stream near its source (Figure 13). One old pupal case of *A. filicornis* was found amongst moss on a rock in July 2016 but nothing was found in March



2017. The bottom of the stream was very unstable and on a steep slope. It did not flow in a runnel.

Station 2 SH6516604279 (centre)

An unstable steep bank covered in *Chrysosplenium* and some moss which generally had water from a stream flowing through it (Figures 14 to 16). The area was very unstable. A female (Figure 17) was swept from a fern. The female's breeding site is not known as no pupal cases were found amongst the small rocks below the plants in July 2016 but in March 2017 it was a productive area for larvae and old pupal cases.

Station 3 SH6537204229

A steep sided very narrow runnel with alder roots and moss at the edge (Figure 18). One old pupal case was found amongst the alder roots and another amongst the moss in July 2016 and 2 larvae were collected there in March 2017. The area surrounding the runnel was not unstable.

Station 4 SH6547204201

Another steep-sided runnel with alder roots and moss. A rather battered empty pupal case, probably over a year old, was found under a stone in July 2016. The surrounding area was not unstable.

Station 5 SH6547704199 & Station 6 SH6547804199

Two adjacent steep-sided but wider runnels with flat unstable bottoms (Figure 19). Alder roots and moss grew at the edges and an old pupal case was found in each, close to the edge.

Station 7 SH65162 04271 (centre)

An extensive area dominated by *Chrysosplenium* where the streams from sites 1 to 3 pass through and in places spread out. It is steep, wet and very unstable (Figures 20 & 21). Only sampled in March 2017, when old pupal cases and two final instar larvae were found.



Figure 13: Coed Dol-gôch Station 1 - a small shallow stream at SH6515804280.





Figure 14: Coed Dol-gôch Station 2 - an unstable bank with *Chrysosplenium* at SH6516604279, above the remains of the board-walk. Photographed in July 2016.



Figure 15: Station 2, the same location as Figure 14 but photographed in March 2017. A large tree had fallen over the path in the intervening 8 months.





Figure 16: Searching among *Chrysosplenium* and roots of *Oenanthe crocata* at the eastern end of station 2. A pre-pupa, larva and old pupal cases were found here on 25 March 2017.



Figure 17: Female *Adicella filicornis* collected at Coed Dol-gôch Station 2, SH6516604279 in July 2016.



Figure 18: Coed Dol-gôch Station 3 - steep narrow runnel at SH6537204229 where two old pupal cases were found in July 2016 and two final instar larvae in March 2017.





Figure 19: Coed Dol-gôch Station 5 - a wider runnel at SH6547704199 where one old pupal case was found in July 2016.





Figure 20: Sampling at Coed Dol-gôch below the board walk in station 7. Final instar larvae and old pupal cases were found here in March 2017.



Figure 21: Looking up towards station 2 from station 7 at Coed Dol-gôch in March 2017.





Figure 22: Apparently suitable habitat for *A. filicornis* extends down to the Nant Dolgôch. March 2017.

### Prisk Wood

Prisk Wood was visited on 7<sup>th</sup> July 2016 and one old pupal case was found in a spring stream at SO5316509059 (Figures 23 & 24). A discussion with Dr Peter Kirby revealed that it was the same site where he had made the original record in 2004. The 2016 specimen was found under a moss-covered stone in very shallow water. The site did not deposit calcium carbonate. There are several small streams nearby but only this one and an immediate neighbour have an obvious source. Others gradually increase in volume downstream apparently fed by groundwater. Some of these were followed upstream as far as the impenetrable bramble allowed, but unsuccessfully for *A. filicornis*. All the streams, including that with *A. filicornis*, had good populations of another caddis, *Tinodes maclachlani* (Figure 24). This is the only *A. filicornis* site where this widespread species has been found.

Other caddis recorded from various small streams at Prisk Wood, near the *A. filicornis* site, were *Agapetus fuscipes*, *Beraea maurus*, *Crunoecia irrorata*, *Diplectrona felix*, *Micropterna sequax*, *Plectrocnemia conspersa*, *Plectrocnemia geniculata* and *Silo pallipes* (Table 2).





Figure 23: The Prisk Wood site at SO5316509059 showing the stone (arrowed) whose underside is featured in the photograph below.

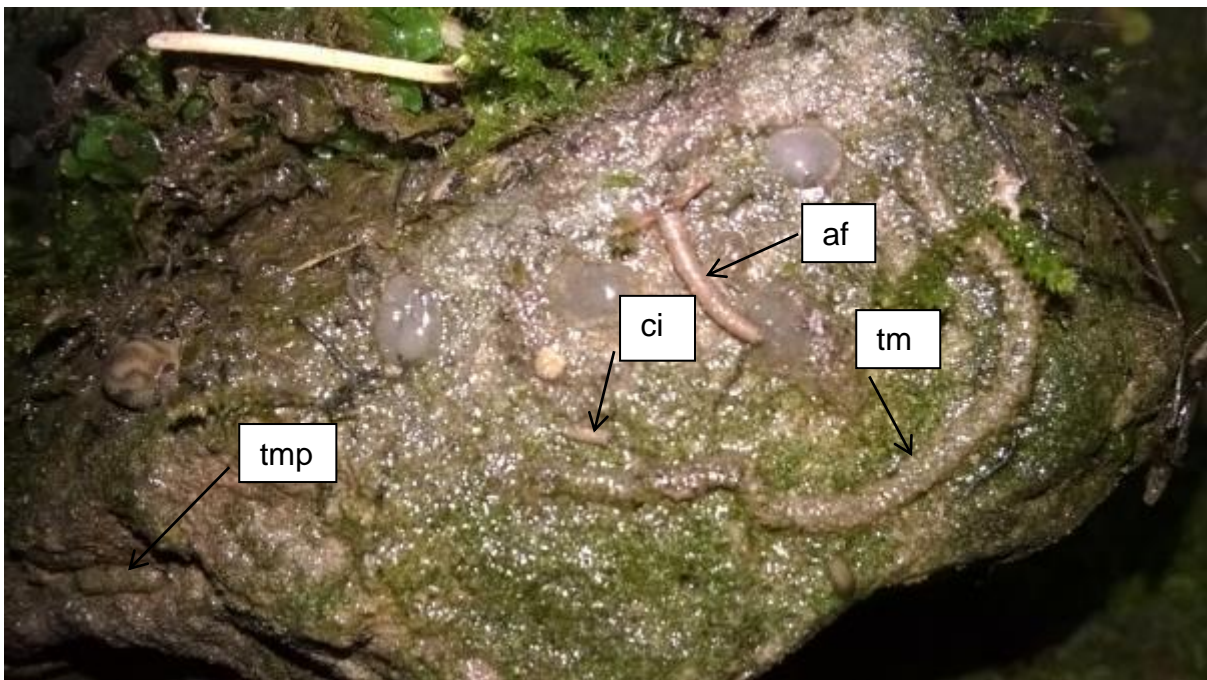


Figure 24: Recently vacated pupal case of *A. filicornis* from Prisk Wood (arrowed 'af'). Also showing a larval gallery of *Tinodes maclachlani* (arrowed 'tm'), a pupal shelter of *T. maclachlani* (arrowed 'tmp') and a larval case of *Crunoecia irrorata* (arrowed 'ci').



Figure 25: Another stone from the same stream at Prisk Wood showing old pupal cases of *Beraea maurus* (arrowed 'bm'). And also the webbing of a snare net of a *Plectrocnemia* larva (arrowed 'p').

#### Observations on oviposition and the egg mass of *A. filicornis*

The female collected at Coed Dol-gôch laid an egg mass. This did not develop but it enabled information on egg laying and the egg mass, hitherto unknown, to be recorded. The captive female produced the egg mass a few hours after capture in the afternoon of 5<sup>th</sup> July and held it in an un-expanded form between two lobes at the tip of the abdomen. She was offered damp moss on which to lay but continued to hold the egg mass during 6<sup>th</sup> July; a small amount of free water was added to the tube in the evening of 6<sup>th</sup> July and, on 7<sup>th</sup> July, she was noticed to have deposited the egg mass on the wet side of the tube where it had expanded into a small jelly blob of 5.5mm in diameter containing about 80 green eggs which were dispersed throughout the jelly. The female died on 8<sup>th</sup> July.

Table 2: Other species of caddis (and a crane fly *Thaumastoptera calceata*) recorded at *A. filicornis* sites in 2016.

Species	Site	Grid Reference	Date	Abundance
<i>Ernodes articularis</i>	Wilderness Wood	SJ331533	17.5.2016	sev larvae
<i>Plectrocnemia brevis</i>	Wilderness Wood	SJ331533	17.5.2016	sev larvae
<i>Tinodes unicolor</i>	Wilderness Wood	SJ331533	17.5.2016	sev larvae
<i>Agapetus fuscipes</i>	Wilderness Wood	SJ331533	17.5.2016	sev larvae
<i>Adicella reducta</i>	Wilderness Wood	SJ331533	17.5.2016	sev adults + larvae
<i>Beraea maurus</i>	Wilderness Wood	SJ331533	17.5.2016	sev larvae
<i>Crunoecia irrorata</i>	Wilderness Wood	SJ331533	17.5.2016	sev larvae
<i>Micropterna sequax</i>	Wilderness Wood	SJ331533	17.5.2016	sev larvae
<i>Wormaldia occipitalis</i>	Wilderness Wood	SJ331533	17.5.2016	sev adults + larvae



<i>Thaumasoptera calceata</i>	Wilderness Wood	SJ331533	17.5.2016	sev cases
<i>Beraea maurus</i>	Halton Wood	SJ301409	27.6.2016	sev larvae
<i>Crunoecia irrorata</i>	Halton Wood	SJ301409	27.6.2016	sev larvae
<i>Agapetus fuscipes</i>	Halton Wood	SJ301409	27.6.2016	sev larvae
<i>Micropterna sequax</i>	Halton Wood	SJ301409	27.6.2016	1 larva
<i>Plectrocnemia brevis</i>	Halton Wood	SJ301409	27.6.2016	sev larvae
<i>Tinodes unicolor</i>	Halton Wood	SJ301409	27.6.2016	sev larvae
<i>Wormaldia occipitalis</i>	Halton Wood	SJ301409	27.6.2016	sev adults + larvae
<i>Beraea maurus</i>	Coed Dol-gôch	SH651042	5.7.2016	sev adults
<i>Crunoecia irrorata</i>	Coed Dol-gôch	SH651042	5.7.2016	sev adults
<i>Wormaldia occipitalis</i>	Coed Dol-gôch	SH651042	5.7.2016	sev adults
<i>Diplectrona felix</i>	Coed Dol-gôch	SH6547704199	5.7.2016	sev larva
<i>Philopotamus montanus</i>	Coed Dol-gôch	SH6547704199	5.7.2016	1 dead adult
<i>Agapetus fuscipes</i>	Prisk Wood	SO531090	7.7.2016	sev larvae
<i>Beraea maurus</i>	Prisk Wood	SO531090	7.7.2016	sev larvae
<i>Crunoecia irrorata</i>	Prisk Wood	SO531090	7.7.2016	sev larvae
<i>Diplectrona felix</i>	Prisk Wood	SO531090	7.7.2016	sev larvae
<i>Micropterna sequax</i>	Prisk Wood	SO531090	7.7.2016	sev larvae
<i>Plectrocnemia conspersa</i>	Prisk Wood	SO531090	7.7.2016	sev larvae
<i>Plectrocnemia geniculata</i>	Prisk Wood	SO531090	7.7.2016	1 larva
<i>Silo pallipes</i>	Prisk Wood	SO531090	7.7.2016	1 pupal case

## 6. Discussion

The re-discovery of *A. filicornis* at all of its modern Welsh sites is reassuring. However, none of the four sites has any statutory protection although Prisk Wood is owned by the Gwent Wildlife Trust and abuts Graig Wood SSSI, and Coed Dol-gôch is a community woodland. The populations at all four sites appear to be small and the habitat used by the caddis is also highly localised and very fragile. Only Coed Dol-gôch supports a reasonable area of habitat with several stations being occupied. It is possible that the caddis is more widespread in Wilderness Wood and this site is deserving of further searches.

The association of the species with unconsolidated sand and silt-free water was a very useful observation for future survey work - if the site deposits travertine then the sand is consolidated as small calcium carbonate spheroids.

The presence of *A. filicornis* at four sites might suggest a revision of its status from Endangered to Vulnerable but the small size of the populations and the highly localised nature of the associated habitat and its fragility indicates that this may be premature. It would also require an assessment of its status at English and Scottish localities.

## 7. Conclusions & Recommendations

The caddis *A. filicornis* still occurs on four widely separated sites in Wales where it is associated with small areas of suitable and fragile habitat. Only Coed Dol-gôch

supports a reasonable amount of habitat. Consideration should be given to notify one if not all of the sites as SSSI, given the status of the caddis and the fragility of the habitat – at present none of the sites is afforded statutory protection. This could involve extending the existing SSSI boundary at Graig Wood to encompass Prisk Wood. Prisk Wood also supports the RDB crane fly *Ellipteroides alboscuteatus* which is associated with travertine deposits, and was recorded here at one of its two Welsh localities in 1994. Wilderness Wood is the other locality for this crane fly and it has been recorded in good numbers from 2007 to 2016 (Mike Howe, NRW pers. comm.).

Further survey work is needed at all four occupied sites to determine the distribution of *A. filicornis*, most particularly at Coed Dol-gôch and Wilderness Wood. Surveys at Nantylbelan Wood, on the opposite side of the Dee to Halton Wood, and the lower parts of Prisk Wood, adjacent to the old railway line, may reveal additional populations as both have several areas of springs.

## 8. Acknowledgements

We are grateful to Mike Howe for commissioning this work. Emma Broad of Wrexham Unitary Authority facilitated access to the Wilderness Wood site; David Evans of Oxley Ltd. gave permission for us to survey at Halton Wood; Arwel Pierce of Dolgoch Community advised us about sampling at Coed Dol-gôch; Robert Bacon of Natural Resources Wales facilitated access to Prisk Wood; Nick Sharp, also of Natural Resources Wales, obtained permission for us to undertake the survey at Cwm Taf Fechan Woodlands.

## 9. References

Barnard, P. & Ross, E. 2012. The adult Trichoptera (caddisflies). *Handbooks for the Identification of British Insects* **1 (17)**. Royal Entomological Society & Field Studies Council.

Morton, K.J. 1884. *Adicella filicornis*, Pict; an addition to the British Trichoptera. *Entomologist's Monthly Magazine* **21**: 91.

Morton, K.J. 1886. Notes on some spring-frequenting Trichoptera. *Entomologist's Monthly Magazine* **23**: 146-150.

Morton, K.J. 1904. The preparatory stages of *Adicella filicornis*, Pictet. *Entomologist's Monthly Magazine*. (Series 2) **15**: 82-84.

Wallace, I.D. 1991. A review of the Trichoptera of Great Britain. Research and Survey in Nature Conservation No. **32**. Nature Conservancy Council, Peterborough.

Wallace, I.D. 2016. A review of the status of caddis flies (Trichoptera) of Great Britain - Species Status No. **27**. Natural England Commissioned Reports No. 191, Natural England.

Wallace, I.D., Wallace, B. & Philipson, G.N. 2003. Keys to the case-bearing caddis larvae of Britain and Ireland. Scientific Publications of the Freshwater Biological Association **61**: 259pp.

Wesenberg-Lund, C. 1943. Biologie der süßwasserinsekten. *Gyldendalske Boghandel*. Copenhagen & Verlag Springer, Berlin 682 pp.

Wiberg-Larsen, P. 1979. Revised key to larvae of Beraeidae in NW Europe (Trichoptera). *Entomologica Scandinavica* **10**: 112-118.

## 10. Appendix 1. A survey of the caddis of flushes and springs in the Cwm Taf Fechan Woodlands.

### Background

Cwm Taf Fechan Woodlands SSSI was visited on 6<sup>th</sup> July 2016 on the recommendation of the NRW Project Manager as the site supports numerous tufa-forming springs and seepages under a woodland canopy. We started at the south east corner of the reserve, walked along the south side, crossed the Taf Fechan by the footbridge and returned along the north bank. The area east of the minor road is not within the reserve but we looked at flushes on the north bank from the railway viaduct to the footbridge at SO0502 1020. The Taf Fechan was not investigated but in the past few years Environment Agency Wales/NRW have recorded 21 species of caddis from the river just above the reserve at SO0452 0980 or at its southern tip at SO0370 0764.

Other recent caddis records in the NRW Welsh Invertebrate Database (WID) for the SSSI are of adults of *Agapetus fuscipes*, *Beraea maurus*, *Crunoecia irrorata*, *Ernodes articularis* and *Lepidostoma hirtum* (taken by Andy Godfrey and Peter Skidmore on 29<sup>th</sup> July 2007 at SO04380952). *L. hirtum* probably came from the Taf Fechan as Environment Agency/NRW biologists have recorded larvae from the river nearby. All species except *L. hirtum* were found during the current survey.

Grid references were obtained using a Garmin *etrex 10*.

### Results

Whilst *Adicella filicornis* was not found, two Nationally Scarce caddis, *Ernodes articularis* and *Plectrocnemia brevis*, both restricted to tufa-depositing flushes and tiny streams, were recorded (Table 3). *Tinodes maclachlani* / *assimilis* is a widespread taxon of non-depositing streams but qualifies for the status of Nationally Scarce, perhaps because it is under-recorded due to the paucity of surveys of very small streams and wet rock faces. The other caddis are common, widespread species.

Table 3: Caddis species recorded from Cwm Taf Fechan Woodlands SSSI in July 2016.

Species	Grid Reference	Date	Abundance
<i>Beraea maurus</i>	SO0440409630	6.7.2016	1 old pupal case
<i>Plectrocnemia brevis</i>	SO0440409630	6.7.2016	1 old pupal shelter
<i>Beraea maurus</i>	SO0441409643	6.7.2016	1 female
<i>Plectrocnemia conspersa</i>	SO0437309458	6.7.2016	1 larva
<i>Micropterna sequax</i>	SO0437309458	6.7.2016	1 old larval case
<i>Beraea maurus</i>	SO0437309458	6.7.2016	sev adults & empty pupal case
<i>Agapetus fuscipes</i>	SO0437309458	6.7.2016	sev old pupal cases
<i>Plectrocnemia brevis</i>	SO0374408509	6.7.2016	sev pupae
<i>Plectrocnemia geniculata</i>	SO0346808412	6.7.2016	1 larva
<i>Agapetus fuscipes</i>	SO0346808412	6.7.2016	sev larvae + pupae
<i>Silo pallipes</i>	SO0346808412	6.7.2016	1 pupa
<i>Tinodes maclachlani/assimilis</i>	SO0346808412	6.7.2016	1 old pupal shelter

<i>Psychomyia pusilla</i>	SO0346808412	6.7.2016	1 male
<i>Beraea maurus</i>	SO0398308871	6.7.2016	sev adults
<i>Rhyacophila dorsalis</i>	SO0402309151	6.7.2016	1 larva
<i>Plectrocnemia conspersa</i>	SO0402309151	6.7.2016	1 pupa
<i>Glossosoma conformis</i>	SO0402309151	6.7.2016	1 larva
<i>Agapetus fuscipes</i>	SO0402309151	6.7.2016	sev old pupal cases
<i>Silo pallipes</i>	SO0402309151	6.7.2016	1 larva
<i>Apatania muliebris</i>	SO0402309151	6.7.2016	1 larva
<i>Agapetus fuscipes</i>	SO0412709231	6.7.2016	sev larvae + pupae
<i>Plectrocnemia brevis</i>	SO0457810021	6.7.2016	sev pupae
<i>Plectrocnemia geniculata</i>	SO0457810021	6.7.2016	1 larva
<i>Agapetus fuscipes</i>	SO0457810021	6.7.2016	sev larvae + pupae
<i>Crunoecia irrorata</i>	SO0457810021	6.7.2016	1 larva
<i>Rhyacophila dorsalis</i>	SO0486010249	6.7.2016	sev larvae + pupae
<i>Plectrocnemia conspersa</i>	SO0486010249	6.7.2016	1 larva
<i>Diplectronea felix</i>	SO0486010249	6.7.2016	1 larva
<i>Tinodes unicolor</i>	SO0486010249	6.7.2016	1 pupa
<i>Agapetus fuscipes</i>	SO0486010249	6.7.2016	sev larvae + pupae
<i>Chaetopteryx villosa</i>	SO0486010249	6.7.2016	1 larva

A description of sampled sites and their associated caddis fauna is given below.

- Depositing spring stream in open field at SO04404 09630

*Beraea maurus* old pupal case

*Plectrocnemia brevis* old pupal shelter

- Spring stream in open area at SO04414 09643

*Beraea maurus* female

*Plectrocnemia* sp. immature larva

- Ooze at SO04368 09489

No caddis found

- Major landslip and associated streamlets at SO04373 09458 and SO04372 09442

*Plectrocnemia conspersa* larva

*Micropterna sequax* old larval case

*Beraea maurus* old pupal case and adults

*Agapetus fuscipes* old pupal cases





Figure 26: The major landslide in Cwm Taf Fechan Woodlands at SO043094.

- Streamlet at SO04366 09434

No caddis found

- Area of comparatively slow-flowing depositing stream fed by a faster stream above, sampled at SO03744 08509 and SO03739 08504

*Plectrocnemia brevis* pupae and pupal shelters

- Small streams that were not obviously calcareous at SO03468 08412 and SO03460 08406.

*Plectrocnemia geniculata* larva

*Agapetus fuscipes* larvae and pupae

*Silo pallipes* pupa

*Tinodes maclachlani* / *assimilis* old pupal shelter

(*Psychomyia pusilla* male, probably a vagrant from the Taf Fechan as the Environment Agency have recorded larvae in the river nearby)

- Several small streamlets between SO03983 08871 and SO03949 09068

*Beraea maurus* adults and eggs

- Comparatively large non-calcareous stream at SO04023 09151

*Rhyacophila dorsalis* larva

*Rhyacophila* probably *obliterata* larva

*Hydropsyche* sp. immature larva

*Plectrocnemia conspersa* pupa

*Glossosoma conformis* larva

*Hydroptila* sp. larva

*Agapetus fuscipes* old pupal cases

*Silo pallipes* larva

*Apatania muliebris* larva

- Several non-depositing small streamlets flowing across overgrown fields and vegetated by *Apium nodiflorum* and *Nasturtium* species between SO04127 09231 and SO04312 09425  
*Agapetus fuscipes* larvae and pupae
- To the east of the reserve. A series of heavily depositing flushes that ran from the steep side under a boardwalk with examples examined at SO04578 10021 and SO04610 10038

*Plectrocnemia brevis* pupae

*Plectrocnemia geniculata* larva

*Agapetus fuscipes* larvae and pupae

*Crunoecia irrorata* larva

- To the east of the reserve. Comparatively large depositing streams. The deposits were spectacular, resembling frozen cascades. However, the deposit had cemented in the stones and no caddis were found; caddis were recorded below the 'cascades'. Streams examined at SO04860 10249, SO04902 10247 and SO04998 10247

*Rhyacophila dorsalis* larvae and pupae

*Plectrocnemia conspersa* larva

*Diplectronea felix* larva

*Tinodes unicolor* pupa

*Agapetus fuscipes* larvae and pupae

*Chaetopteryx villosa* larva



Figure 27: Part of a cascade in the stream at SO049102 in Cwm Taf Fechan Woodlands.

- To the east of the reserve. Adult caddis swept between SO04578 10021 and SO04998 10247, all of which probably bred from the adjoining small streams and flushes

*Wormaldia occipitalis* males and females

*Beraea maurus* female

*Ernodes articularis* female

*Crunoecia irrorata* female



## 11. 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. 118342.



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