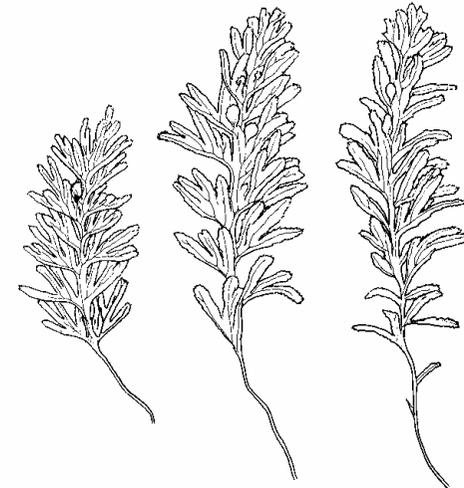

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(L to R) Filmy-ferns: Tunbridge; hybrid; Wilson's (see page 17)

(Jeremy Roberts)

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From the Editor

Unusually, this issue contains an extended Editorial (see p. 1), which all CNHS members are encouraged to read and think about. From this it will be apparent that the Society is hoping to change the name of this journal to more truly reflect its scope and contents. If this goes ahead, it will apply from the first issue of 2013, so that the next issue, Vol 20 (2), will be the last in the current series. Whatever, we fully intend to maintain and expand the scope and quality of this journal, which has developed steadily since it first appeared in 1993.

David Clarke

Society News & Notices

Bioblitz's

CNHS members are getting involved in two comprehensive wildlife recording projects during 2012. These will be at Watchtree NR, Great Orton on 16th/17th June, and at Geltsdale on 7th July. Experts in the Society will lead surveys of birds, mammals, insects, wildflowers, etc, and there will be displays and demonstrations at the Watchtree event - where CBDC will be collating and presenting the records as they come in. **For details of how to get involved in either event, please contact** Stephen Hewitt at Tullie House Museum (01228-618736; steveh@carlisle.gov.uk).

Museum News

High Fell – the Cumbria landscape story: 31 March – 1 July 2012

Special Exhibitions Gallery, Tullie House Museum

An exhibition linking to Cumbria Wildlife Trust's High Fell project, capturing local people's memories of the Lakeland landscape since 1950. Included are recollections provided by local naturalists, including members of this Society, who have witnessed the impact of these changes on the wildlife of our county.

Online recording facility launched

You can now enter your own wildlife sightings online and send them in to Cumbria Biodiversity Data Centre (CBDC) at Tullie House Museum. If you have internet access this could be an easy way for you to submit your records of Cumbrian wildlife. Contact Teresa Frost at manager@cbdc.org.uk for more information.

As is made clear in the 'Information for Authors' section on the inside back cover, the scope of our journal is countywide both in content and, so far as possible, in its contributors. The title '*The Carlisle Naturalist*' does not, however, convey this, and indeed may give the impression to some that it is centred on the Carlisle area. For similar reasons, it may not attract as wide a range of contributors, or readers, as we would all like. There are therefore compelling reasons for a more 'inclusive' title, reflecting more accurately the geographical coverage. Discussion of possible alternatives took place at the February 2012 Council meeting, and at the AGM which followed. There was general agreement about the justification for change. The choice of a name proved more challenging. For reasons expanded on below, '*The Lakeland Naturalist*' has been suggested. Most Council members, including the Editor, were happy to accept this. Such reservations as have been expressed centre around the near equivalence of *Lakeland* and *Lake District* in everyday speech. The main alternative word, *Cumbria*, of course relates primarily to a modern political unit, which may be less permanent, and is certainly less evocative.

Many are perhaps not aware that use of *Lakeland* in a natural history context has a respectable pedigree. It begins with H. A. Macpherson, who in 1892 entitled his monumental work '*A Vertebrate Fauna of Lakeland*' by which he meant the then counties of Cumberland, Westmorland and Lancashire North of the Sands. CNHS adopted the use of *Lakeland* with five of the seven volumes of occasional *Transactions* which bore titles (the exceptions being '*Lake Counties*' (with vol. 10) and '*Cumbria*' (with vol. 12). Derek Ratcliffe, arguably the area's greatest naturalist, used the single word '*Lakeland*' as the title for his 2002 book in the *New Naturalist* series about Cumbria as a whole. In it he wrote 'To most people, Lakeland and the Lake District are probably just alternative names for the same area of north-west England ...' Doubtless, the book's publishers were not unaware of the marketing value of such a choice, and this is a factor we too would do well to consider.

If we are going to make the change, it would make much sense to begin with the first issue of 2013, coincidentally the 120th anniversary year of the Society. It would also nicely round off our 'First Series' at volume 20. The connection between these earlier volumes with the new title would always be indicated. (Allen Armsby is currently engaged with producing a comprehensive index to Vols 1-20, which will be made available online.)

A decision is required by the time of the autumn issue and, hopefully, the summer Council meeting will resolve the matter. Any members having particular views are encouraged to contact a Council member as soon as possible.

Editor

Recent Reports

These notes are compiled from members' records from October 2011 to March 2012. Non-credited records are mine although not necessarily mine alone. As usual, most records over this period were birds.

However, there was a surprising number of late insect sightings, beginning with a **Scarce Umber** moth at Lattrigg on November 19th (DI). Although the date is not unusual and the species is not very scarce, it is usually only reported at lights by moth-trappers. **Red Admirals** were seen in Carlisle on November 1st (JS) and on the coast on November 2nd (DI). A **Small Tortoiseshell** and a **Comma** were at Cumwhitton on November 7th (DC) and **Peacocks** were noted at Lattrigg on November 9th (DI), and much later at Caldbeck on November 21st (PG).

Other winter sightings included a late (or early?) **Hedgehog** feeding in a Stanwix garden on December 8th & 31st (JS) – and one dead on the road at Bassenthwaite on 1st January 2012 (SH); 5 **Red Squirrels** at a feeding station in Carlisle Cemetery on October 30th (DH); an **Otter** at Siddick Pond on December 13th (KM). There were several, less-welcome, reports of **Grey Squirrels** in various places.

On November 9th JR discovered an unusual fungus, *Schizophyllum commune*, growing out of bales of hay and straw at Aglionby Grange. Both he and I can only recall seeing it once before in Cumbria (October 1999 in Greystoke Forest). Equally scarce, **Striated Earthstar** fungi were reported to DC see note on page 5. The fungus *Cordyceps ophioglossoides*, growing parasitically on the subterranean truffle-like *Elaphomyces granulatus*, was found under larch on the south flank of Skiddaw on March 1st (SH). (The *Elaphomyces* species was identified by Paul Nichol on spore characters).

Early, or perhaps premature, stirrings of the 2012 season were from insect hibernators: **Small Tortoiseshells** at Anthorn on January 9th (DI), and at Penrith on January 23rd (RA), and a **Peacock** at Broadwath on February 15th (R&CS). **Frog spawn** was reported on February 22nd at Cumwhitton (DC) and on 28th at Denton Holme, Carlisle (RH).

Birds

Late records of summer visitors are represented by a **Wheatear** near Melmerby on October 8th and **Swallows** and **Sand Martins** at Grune Point on October 16th (all JH). Overwintering **Blackcaps** were reported at Anthorn on November 12th (A&MA); Hayton on January 12th (JH) and Denton Holme (a pair) on January 19th (RH). There was a late **Greenshank** at Anthorn on November 12th (A&MA),

the **Great White Egret** remained over the winter at Campfield and there were **Little Egrets** at Calvo Marsh on November 3rd (FM) and 2 at Carr Beds on February 28th (RH). Up to 4 **Bitterns** were reported at Siddick Pond and several observers saw at least one there over the winter period (the 4 were reported to KM on December 15th). A **Gannet** flying over Carlisle Sands Centre on November 27th was very unusual (PW).

The usual flocks of **Whooper Swans** frequented various lowland sites. Notable amongst these were 289 near Silloth and 105 at Newton Arlosh on October 25th (DH). A female **Smew** stayed briefly at Talkin Tarn on December 31st but in February a male was present from 11th to 21st, sometimes accompanied by a female. Also at Talkin Tarn, **Goldeneye** numbers were much higher than in recent years with at least 31 on February 29th – the most since March 1994! By contrast, **Goosander** numbers were well down, often absent and never more than 20. Staying at Talkin Tarn for the moment, there was an early **Brambling** on October 4th but very few sightings afterwards. A **Raven** was unusual there on December 31st and was seen two days later at Brampton Station.

Hen Harriers were reported from the Solway lowlands at Finglandrigg (FM), Bowness Common (RH), both in November, and at Drumburgh Moss on 3 occasions between late October and mid december (MC). Other non-passerines of note were 20 **Grey Partridge** at Corby Hill on December 12th (R&CS), a **Green Woodpecker** at Dalston on November 13th (DH) – the first he has recorded there for over 30 years – and **Little Owls** at Sandwith on October 13th (MC) and Whitrigg on December 9th (A&MA).

A very good record at Watchtree on December 4th was a female **Black Redstart** (SG). A pair of the now scarce **Stonechat** was at Mawbray on November 21st (DI). Some interesting garden observations from AA at Heads Nook included 8 **Reed Buntings** and 7 **Yellowhammers** from February 5th to 7th, with a nearby 9 **Bullfinches** on February 22nd. Not far away at Broadwath, an amazing 70 or so **Siskins** were on garden bird feeders in January, but by late February, approximately double that number had been caught and ringed! (RS). A **Starling** roost at Haverlands near Finglandrigg on January 22nd was estimated at 25,000 (FM) and the fortunate JH found 30 **Snow Buntings** on Helvellyn on January 13th.

And finally, the period was marked in the Solway area by unusual numbers of two species of grey geese rarely seen here. Up to c. 50 **Tundra Bean Geese** (plate 1) were in the area from late November 2011 (TR and others); **European White-fronted Geese** (plate 2) were more widely reported, with numbers sometimes exceeding 100 – e.g. at least 130 at Wedholme Flow on 8th January 2012 (FM,

DH and others).

A few spring migrants were reported in the last days before going to press. DC heard a **Chiffchaff** near Broadwath on March 19th. **Wheatears** were noted at Small Water, Haweswater on March 26th (MR) and at Birkside Gill, Dunmail Raise on 28th (DC). The period from 22 March until the end of the month saw some exceptionally warm and sunny weather, bringing many plants into early flower and spring-emerging insects onto the wing: a **Holly Blue** butterfly was seen in the Tullie House gardens on March 25th (SH)!

Recorders

Anne & Mike Abbs (A&MA); Allen Armsby (AA); Roger Atkins (RA); David Clarke (DC); M. Cox (MC); P. Greaves (PG); Sam Griffin (SG); John Hamer (JH); Stephen Hewitt (SH); David Hickson (DH); Robin Hodgson (RH); Dorothy Iveson (DI); Frank Mawby (FM); Kirsten Mawby (KM); Mo Richards (MR); Tristan Reid (TR); Jeremy Roberts (JR); Rob & Christine Shaw (R&CS); John Strutt (JS); Peter Wilson (PW).

Geoff Naylor

Field Meeting

21st January 2012: North Solway coast & Loch Ken **Leader: John Hamer**

Ten members set off from Carlisle at 9 am on a blustery day with heavy showers which made viewing difficult at times.

The first stop was at Newbie, where the tide was in and various ducks and waders were viewed, mainly from the car. Birds seen here included Grey Plover, Knot and Wigeon. Through a telescope Jeremy was able to pick out the Great Egret on the south side of the Solway. From there we moved to Powfoot where there was a large group of Pintail which gave good views.

We then followed the usual route via Brow Well and Caerlaverock to Glencaple. Along this stretch, we encountered a large finch flock, which this time included only Chaffinches and Tree Sparrows. Whooper Swans, Barnacle Geese and a few Pinkfeet were also seen and some saw a 'ring-tail' Hen Harrier. The stop at Glencaple produced a small flock of Goldeneye, and we then progressed to Auchenreoch for lunch. Several Goosander were present together with Tufted Ducks. Some members saw a Sparrowhawk on the other side of the loch.

At Loch Ken, water levels were very high and as a consequence, there were relatively few dabbling ducks, with Teal and Wigeon only present. There also few

geese visible, but Greenland White-fronts, Canadas and Grey-lags were all seen. For many, the highlight of the trip was the stop at the Red Kite feeding station near Laurieston, where at least 50 birds were present.

The journey back was notable for a Peregrine seen at Gretna and then a stop at the Starling roost at Linstock. Estimates varied but there were at least 30,000 birds, with Sparrowhawk and Merlin also present. We were able to get close to the swirling flock of birds, which gave a spectacular display.

A splendid day out and thanks to all who braved the weather.

John Hamer

Notes & Records

A record of the ground beetle *Bembidion normannum* Dejean from West Cumbria

On 2nd April 2011 while searching for beetles along the strand line on the shore at Parton north of Whitehaven, I discovered one specimen of this 2 mm long, shiny, all-black ground beetle. The beetle was found in a large accumulation of seaweed and other general debris washed up by a recent high tide towards the north end of the shore at (NX978.210).

Bembidion normannum is a coastal species where it is usually found in tidal refuse and saltmarshes. In Britain the beetle has been recorded mainly from the east and south coast areas of England (Luff, 1998). It tends to be rarer in the north and is absent from Scotland. It has previously been recorded from Cumbria (v.c. 70): F.H. Day had discovered specimens around the Moricambe Bay area of the Solway at Anthorn/Skinburness and Whitrigg.

Reference

Luff, M. L. (1998) *Provisional Atlas of ground beetles of Britain*. Biological Records Centre, Huntingdon.

R. W. J. Read, 43 Holly Terrace, Hensingham, Whitehaven, Cumbria CA28 8RF

The Striated Earthstar fungus (*Gaeastrum striatum* DC.) at High Hesket

Earthstars are often not detected until the persistent remains of their characteristic fruit bodies are exposed when surrounding vegetation has died back. Such was the case with the current record, which relates to a troop of about 15 *G. striatum* which I discovered in January 2012. This was on a low and rather dry south-facing bank beside a minor road in High Hesket (NY47.44). The bank was under an old

hedge which includes Elder (*Sambucus nigra*) overgrown with Ivy (*Hedera helix*). Despite being well past the fruiting period, the stalked inner fruiting bodies, with furrowed 'beak' and basal 'collar' remained. (Plate 3).

David Clarke and Dr B. Spooner of RBG Kew helped with the identification and a voucher specimen has been placed at Tullie House Museum.

Hopefully it may be possible to see the species in better condition at High Hesketh if it re-appears during the next autumn fruiting period.

Mary Smith, Ling Dene, Southwaite, Carlisle, CA4 0JH

[Earthstars are rarely reported in our area, so are always of interest. The Cumbria Biodiversity Data Centre database at Tullie House shows just four records for this species, two from the nineteenth century and two from the twentieth – Cumdivock churchyard in 1973 being one of the most recent. The two nineteenth century records are also from the Carlisle area. *Ed.*]

Black Poplar (*Populus nigra* subsp. *betulifolia*) in Cumbria

Black Poplar is an uncommon but widely distributed tree in the south of England and the Midlands reaching as far as Northumberland in the east and Cumbria in the west. According to Dr S. A'Hara (*in litt.*) the only two authenticated Scottish records are of planted trees in gardens. By contrast all four Cumbrian records are from semi-natural habitats, three being by the River Eden.

As mentioned in *A Flora of Cumbria* (Halliday 1997), the first county record was of a single tree by the river near Culgaith (GR NY600.298, Cumberland) where it was discovered by J. Kerr in 1994. Following an anonymous report, two trees were found further north the following year by R.W.M. Corner by the river above Langwathby bridge (NY567.335) and in a riverside pasture at Holmwrangle (NY516.483), while a fourth tree was discovered in 2006 by S.M. Colgate by a field ditch near Morland (NY606.245, Westmorland, plate 5); all four trees are very old, often leaning and with low sweeping branches. With only four known trees Black Poplar is virtually the rarest plant in the county.

Cottrell (2004) and a leaflet by the Cheshire Black Poplar BAP Group (undated) estimate the British population at about 7000 trees and declining. This makes it Britain's rarest native timber tree, 95% of which are elderly and more than 90% male. Another leaflet (Ash, undated) on identification mentions the frequent occurrence of remarkable spiral petiolar galls (plate 5 inset) caused by the woolly aphid *Pemphigus spyrothecae*. The presence of these host-specific galls appears to

be highly diagnostic and serves to distinguish the true tree from the Hybrid Black Poplar, *P. × canadensis* (*P. nigra* × *P. deltoides*). All four Cumbrian trees show these galls.

A paper (A'Hara *et al.*, 2009) appeared in *British Wildlife* on the use of DNA-fingerprinting in the conservation of the native Black Poplar. Their studies, based on 250 samples of leafy shoots from twelve counties from Wiltshire to Cleveland revealed the existence of fifteen individual clones. In response to a request for new material for the study, we decided to submit material from Cumbria. Accordingly, in 2010 we sent samples from all four sites, together with one from a suspect Black Poplar at Low House Wood (NY317.493), again by the River Eden. The results supplied by Dr A'Hara showed that all four trees belonged to the male clone '34', and represent the northernmost authenticated records. On the other hand the Low House Wood tree proved to be hybrid. Such hybrids are frequent and, as mentioned above, lack the distinctive galls.

The fact that all four trees are male strongly suggests that they are the result of old plantings and therefore not native in the county, as erroneously indicated in the *Flora*. In this respect they resemble another male tree common in the Eden valley – the willow *Salix × ehrhartiana*, a cross between the Bay (*S. pentandra*) and White (*S. alba*) willows.

There may of course be other Black Poplars waiting to be discovered and we would welcome receiving leafy stems, preferably with galls, for confirmation.

We would like to acknowledge assistance from Hilary Ash, Stuart A'Hara and Joan Cottrell in the preparation of this note.

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- A'Hara, S. *et al.* (2009) The role of DNA-fingerprinting in the conservation of the native Black Poplar, *British Wildlife*, **December 2009**: 110-115.
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 Halliday, G. (1997) *A Flora of Cumbria*. University of Lancaster, Lancaster.

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Cumbria Dragonfly records and the national Atlas project

2012 will be the last field recording year of a major project run by the British Dragonfly Society to map Britain’s dragonflies for the period 2000-2012. Many more records are still needed from our area. Commoner species are just as important as rarer ones and anyone with a garden pond can help by noting what occurs. Records of emergence are even better, since they prove breeding. Larvae or cast skins are another possibility: undamaged specimens of the latter can be sent

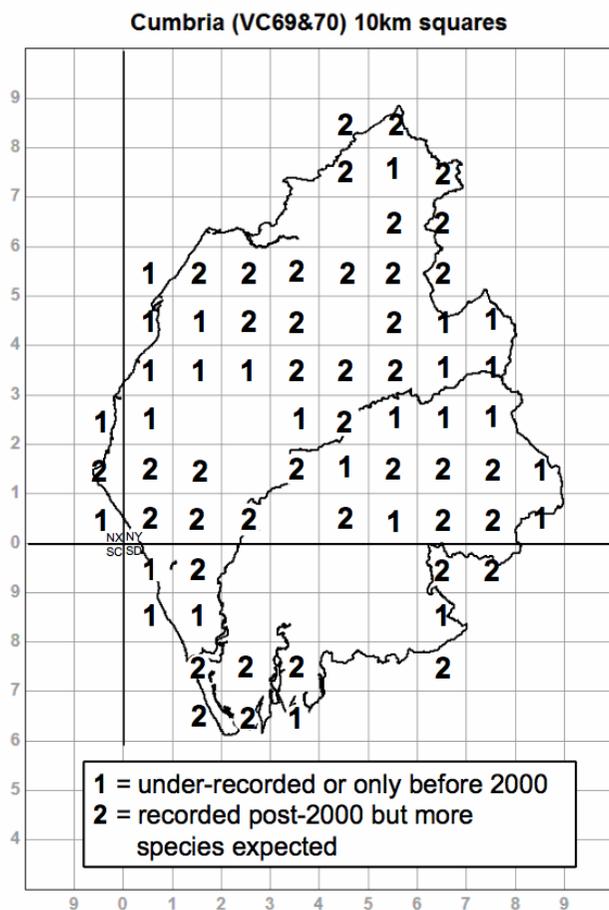


Figure 1: Priority 10 Km squares for dragonfly recording in 2012

to me for identification.

The map (figure 1) shows where records are most needed, though inevitably it is not fully up to date. (It is based on data held by the British Dragonfly Society in early April 2012.) Nonetheless, the map is a fair indication of which 10 Km squares are most in need of recording attention: the squares which are numbered being of high priority – with category 1 being highest. Updated versions of this map will be posted on the BDS website from time to time. Squares marked here as 1 or 2 will appear as red and amber squares respectively on the website maps; any squares appearing there in green in this ‘traffic light’ colour coding system will have received adequate coverage.

Please check www.british-dragonflies.org.uk/content/national-dragonfly-atlas. I can be contacted on david.clarke19@virgin.net, or at the address below. Please be aware that records received after December 2012 may be too late for inclusion.

David Clarke, Burnfoot, Cumwhitton, Brampton, CA8 9EX



The Bog Bush-cricket (*Metrioptera brachyptera*) at Wedholme Flow NNR

Russell Gomm

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Following the discovery of a population of the Bog Bush-cricket (*Metrioptera brachyptera*) on the southern fringe of Wedholme Flow (South Solway Mosses National Nature Reserve) in August 2006 (*Carlisle Naturalist*, 14 (2), and the stated intent to ‘carry out a more systematic and thorough search of likely places’, I paid regular visits to this and other south Solway bogs over the next five years (2007 to 2011).

Although I went on many occasions to Bowness Common, Drumburgh and Glasson mosses, I have so far not located *Metrioptera* elsewhere on the South Solway bogs. Latterly, therefore, I concentrated on the 680 or so hectares of Wedholme Flow.

The aim and method of search was very basic, I set out to record the presence or absence of the insect in individual 500 metre squares, and to produce a distribution map for the whole area surveyed. To do this I simply divided each of the one-kilometre squares covering the reserve into four 500 metre quadrants and walked into each section carrying a modified bat-detector. This picks up the ‘song’ of the male Bush-cricket (at about 20–30 kHz) from a range of up to 20 or 30 metres. I then located and noted the insects’ presence or absence at regular intervals with a GPS navigator. In general, I stopped to check for song every 100 metres or so, or at an obvious change in habitat.

For the best results I found that ideally, I needed a warm, sunny, windless day when the males were fully active. The slightest breeze rattles the stems of *Molinia*, *Myrica*, *Calluna* etc. and makes it difficult to pick out the song. From time to time I stopped to try and locate the crickets by sight. But they are expert at hiding, detecting movement from some distance off, zipping round behind a stem or leaf and promptly dropping to the ground where they become all but invisible. Any females that I encountered were therefore chance sightings of sudden movements in the vegetation as I struggled along over an uneven and at times, very wet bog surface.

I put the map (figure 1) together in September 2011, recording the presence of *Metrioptera* in thirty of the forty 500 metre squares. Absence was, in the main, from areas or habitats where it was fairly obvious that the insect would not occur, for example areas of dense bracken, open water or bare peat. I found also that they did not seem to be present in recently (last twenty or thirty years) revegetated strip

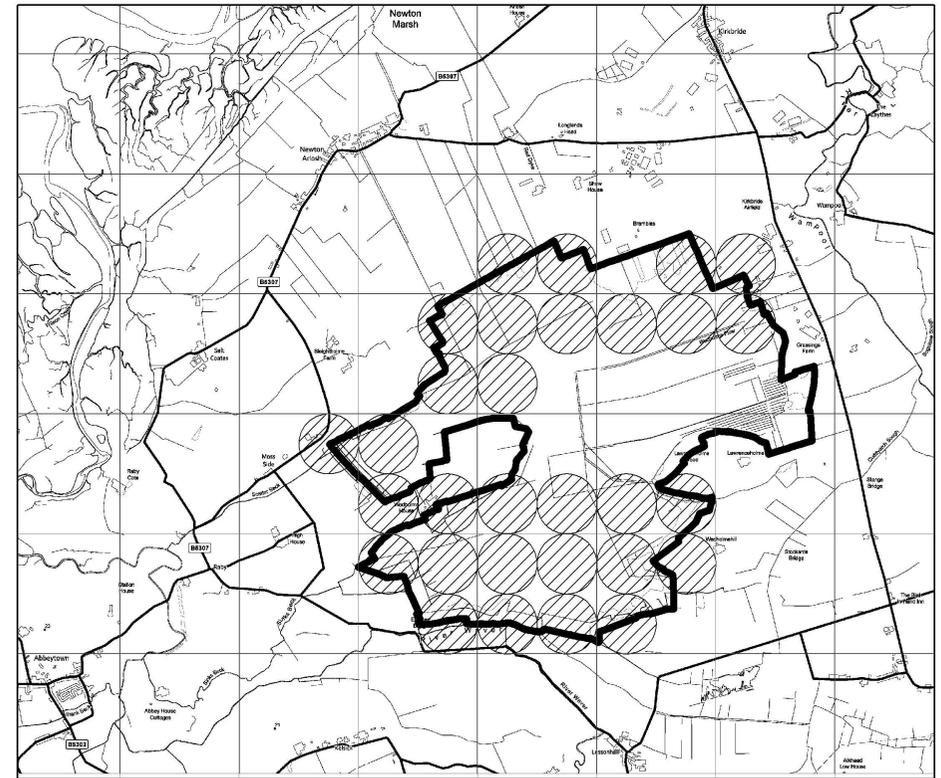


Figure 1 Records of Bog Bush-crickets in 500 × 500 metre squares, 2011
Map courtesy of Cumbria Biodiversity Data Centre, Tullie House Museum; contains Ordnance Survey data © Crown copyright and database right 2011.

workings, mostly dominated by *Molinia*, in tall, over-mature *Calluna* or in the marginal birch scrub woodland with bracken. A common feature appeared to be a basic *Sphagnum* carpet.

Defining accurately, or predicting objectively, where I would find *Metrioptera* within each 500 metre square however proved more difficult, even after five years! My only real conclusion is that those places where I would be most confident of finding the insect are the least disturbed areas within a range of sub-communities of National Vegetation Classification type M18 (*Erica tetralix*–*Sphagnum papillosum* raised mire). Up to now, I have not used any objective quadrat or quantitative recording, I simply noted species present in areas where I was finding crickets.

Consistently associated species: *Sphagnum* spp., *Calluna vulgaris*, *Erica tetralix*, *Eriophorum vaginatum*, *Eriophorum angustifolium*, *Rhynchospora alba*.

Frequently associated species: *Myrica gale*, *Narthecium ossifragum*, *Vaccinium myrtillus*, *Vaccinium oxycoccus*, *Andromeda polifolia*.

Occasionally associated species: *Empetrum nigrum*, *Molinia caerulea*, *Trichophorum germanicum*, *Cladonia impexa* (and other *Cladonia* species), *Drosera rotundifolia*.

All of this begs the question ‘why have we not found *Metrioptera* elsewhere on the Solway mosses where superficially at least, similar, ideal conditions appear to be present’?

Perhaps I have not looked long enough or hard enough? There are still places that look as though they may be worth checking, although the insect is so widespread at Wedholme that the survival of an undetected, small, restricted population that has not spread out into nearby suitable habitat within these larger sites seems unlikely.

Is the reason for their absence elsewhere on the Solway associated with past management? On each of these sites, including Wedholme, there is ample evidence both in the records and on the ground, of a complex history of fire, drainage and peat extraction, all of which are destructive to the habitats apparently favoured by *Metrioptera*, and yet, despite a wide range of natural and assisted habitat recovery, as far as we know, the insect is present only at Wedholme. It is impossible to say whether this is an ancient, relict, population. The species was first discovered there (a single individual) by Stephen Hewitt in 1991, and there are, after all, no old or recent records from Glasson, Drumburgh or Bowness Common. As its specific name *brachyptera* implies, the species (normally) has truncated wings and cannot fly.

The Bog Bush-cricket occurs frequently on the south Cumbrian mosses around Morecambe Bay, and, until recently was found in Galloway near Dalbeattie, so perhaps there are good reasons why it has never ‘colonised’ more widely within the south Solway mosses.

The Filmy-ferns (Hymenophyllaceae) of the Bewcastle Fells

F. Jeremy Roberts

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Introduction

The two UK species of *Hymenophyllum* are those small and insubstantial ferns, often overlooked as bryophytes, with their leaves a mere one cell thick. They are notably shade- and humidity-demanding, and grow most typically in very sheltered and humid habitats in aboriginal oakwoods of the west of Britain.

The more familiar Wilson’s Filmy-fern is sufficiently tolerant that it also occurs beyond the woodlands in shaded sites in ravines and on cliffs well up into the Lakeland hills, for instance to at least 670 metres altitude on Helvellyn (pers. obs.).

The second species, the very much more local Tunbridge Filmy-fern (*H. tunbrigense* (L.) Sm.), is largely restricted to the milder and damper southwest woodlands and ravines in Cumbria, being locally frequent in Eskdale, and not penetrating into the Lakeland hills away from the areas of old woodland (Halliday, 1997).

The filmy-ferns may well have been widespread throughout northern England during the so-called Climatic Optimum, about 9,000–5,000 years ago, at a time when woodland covered the landscape and extended well up into (or even overtopped) the hills. Since then, the widespread removal of woodland has restricted the filmy-ferns to the remaining patches of ancient woodlands, and to a few pockets where they have persisted in exceptional and chance circumstances.

Hence there is the distinct sense that existing sites are ‘relict’ in nature. This historical conjecture may explain why these species are so rare and scattered in the Pennines, and in their extension northwards, the Border ranges, where woodland destruction has been so pervasive and absence of woodland so prolonged.

However, it is clear that suitable micro-habitats for filmy-ferns can also persist, apparently over long periods – in regions currently well beyond existing natural woodland, such as deep within crevices amongst the boulders and crags of the ‘tors’ of exposed ridges.

Filmy-ferns in the Bewcastle Fells

The Bewcastle Fells lie in the far northeast corner of Cumbria along the Northumberland border. Far from any road-head, they are made more remote by an intervening and almost continuous belt of dense coniferous plantations, not all in public ownership. The western escarpment of the fells has a series of gritstone

'tors' – outcrops – stretching for over 6 kilometres, with the locally well-known Christianbury Crag at the northern end of the series (NY577.824) by far the most extensive, and also at the highest altitude (480 m O.D.).

Although not at any great height, the scarp experiences a quite severe climate with many days of cloud cover, and facing the full force of Atlantic gales, whilst also being open to dry and cold northeasterly winds.

Due to their remoteness, these fells have not been as thoroughly explored botanically as many more accessible Cumbrian hills.

Filmy-ferns were first recorded on the range as recently as 1957, when the Wilson's Filmy-fern (*Hymenophyllum wilsonii* Hook.) was recorded by Derek Ratcliffe on Tod Crag (NY585.799) in 1957. A few other records in the same area were made subsequently, but elsewhere in the northern Pennines and Border ranges this species has perhaps only three other sites.

In 2005 Mike Porter was shown a known patch of filmy-fern in a deep crevice on Long Crag at the south of the range (NY584.782). He soon realised that the colony was in fact not the expected Wilson's Filmy-fern but was Tunbridge Filmy-fern. This species was known in three very scattered sites in the wider Borders area – in Cumbria only in the Lyne valley to the west where Derek Ratcliffe knew a patch, now apparently gone, on a single boulder (Halliday, *ibid.*) – and in Northumberland, to the east of the high ground, at a couple of sites at lower levels (Swan, 1993). (However, it was found more recently by the author in July 2011 at a new site in western Northumberland, Spy Crag, above Lampert, in the upper Irthing valley (NY688.756, etc.) growing luxuriantly in at least twelve patches – probably the strongest site for either *Hymenophyllum* in that county.)

Eager to see the Tunbridge Filmy-fern in its 'new' site at Long Crag, I visited the area on 30th April 2009. On the ascent, it was a great surprise to find several patches of both species on crags, even before reaching Long Crag itself! Typical habitat is shown in Plate 6.

Having clambered down into one particularly large cavity formed by the slumping of boulders from the scarp-edge, I found it festooned with filmy-fern on all the walls and even on the floor. Initially assumed to be an especially luxuriant form of Tunbridge Filmy-fern, on closer inspection some characters seemed to be intermediate between the two species, perhaps suggestive of hybrid origin. This likelihood was however remote: I knew perfectly well that such a find would be new to science! The few fronds brought back were inadequate to prove such a presumption, and the puzzle was left for a later time when I could have a better look at the plant, and also attempt to uncover just how much filmy-fern and of what species there might be along the ridge.

In the event it was the spring of 2010 when I returned, exploring all the outcrops

from north of Christianbury Crag to south of Long Crag. In fact the exercise proved to be no more than a sampling exercise, rather than any thorough 'exploration'. It soon became obvious that *any* deep and dark space between, below, or behind loose boulders and slabs, or down vertical crevices and cracks of the jointing planes, could hold filmy-ferns – and such places were quite literally innumerable! Often the hollows were obscured behind or beneath deep heather in the haphazard jumbles of huge boulders below the scarps, making the exploration somewhat hazardous.

Four over-full days in April and May were devoted to visiting all the sets of crags along the escarpment. The largest set of crags, at Christianbury, over 300 metres long, took two-and-a-half hours to cover even rather cursorily, the eventual reward being just two patches of Wilson's Filmy-fern, at the very furthest point from where I had started!

Some patches of ferns were so far down narrow cracks that they were out of reach, and could not be sampled to identify the species. Where fissures could not be inspected by eye, being at right angles within the blocks, a few could still be inspected by inserting a camera and taking flash photographs, revealing a filmy-fern patch on one occasion!

Eventually, scattered along the ridge over several miles, twenty colonies of filmy-ferns were revealed, the majority being the Tunbridge Filmy-fern (eleven), with fewer of Wilson's Filmy-fern (seven). Many more are likely to have been overlooked.

The cavity with the puzzling plant from the previous year was carefully examined, and all patches there seemed referable to the same intermediate type.

A hybrid filmy-fern

It was a remarkable experience late in the evening on the last day I allocated to this work, and on the very last substantial crag to be explored, to come across a series of deep gashes in the scarp, large enough to be clambered down into. They looked perfect for filmy-ferns and sure enough as I peered down into the depths of the largest crevice, I saw on both walls spreading patches so dense as to make a deep blanket of long fronds. Here was the putative hybrid again (plate 7), separated from the 2009 site by a mile of heather moorland and blanket bog!

In many fern hybrids the sporangia (spore-capsules) demonstrate their sterility by aborting and shrivelling at an early stage. Checking the characters carefully back home, it was noticed that in the mature spring plants from both sites, the sporangia were often fully developed. However, in all cases, the spores within were white, and under the microscope were clearly colourless and empty of cell-contents. The sporangia are covered by membranes (indusia): those of the two

species and the hybrid – clearly intermediate in character – are shown in Plate 8.

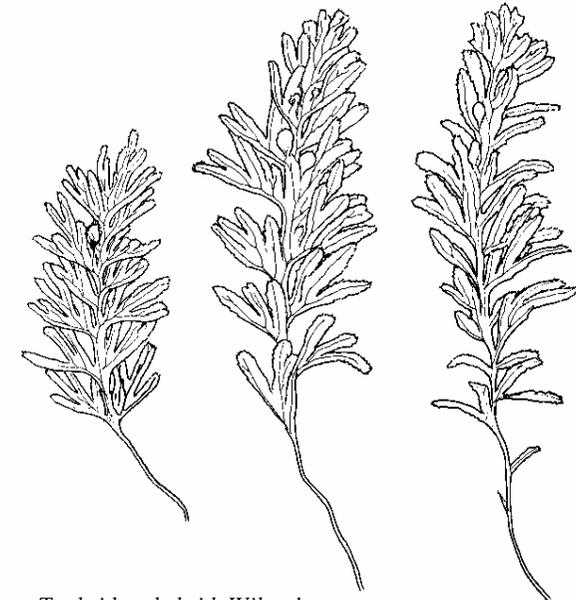
Sample specimens from each of the twenty sites were examined by Dr Fred Rumsey at the British Museum Botany Department, who has studied filmy-ferns in Madeira and the Azores for many years. Dr Rumsey was able to confirm my identifications of the eighteen colonies of the two species, and also the hybrid nature of the puzzling plants at the two sites described above. Work carried out by Mark Carine at the museum has corroborated the hybrid origin, and examination of the chloroplast DNA indicates that material from both sites have Tunbridge Filmy-fern as the maternal parent (Carine, unpublished). This is the first confirmed discovery of the F1 hybrid between the two native European *Hymenophyllum* species.

A polyploid complex is known in Madeira (where both species occur), evidently derived from this hybrid (Rumsey *et al.*, in prep.), and includes a third species, *Hymenophyllum maderense* Gibby & Lovis (Manton *et al.*, 1986). Chromosome studies have demonstrated that this plant is derived from the F1 hybrid by doubling of the chromosome complement – ‘allopolyploidy’, a process which allows such a hybrid to regain its fertility and so behave as a new species. The F1 hybrid is however not known on the island at present.

The hybrid has been formally described as *Hymenophyllum* × *scopulorum* F. J. Rumsey & F. J. Roberts (Rumsey & Roberts, 2012). The epithet derives from Latin *scopulus*, and implies a rock, crag or promontory, suggested by the habitats of the two known sites.

The outcrops supporting the two colonies of the hybrid are separated by a mile of open heather moorland. It is an intriguing puzzle as to how these two colonies of a sterile fern with very slow lateral growth and no other methods of propagation became established. Do they derive from two separate hybridisation events? Did the plant arise once, and somehow become dispersed so that it now occurs in two well-separated sites? Can the plant produce some fertile spores? – or has it done so in the past?

None of these possible explanations seems anything other than remote... but some sequence of events has brought about the existing situation! Given that hybridisation between these two species seems to be a profoundly rare event, its occurrence *twice* in one limited area seems unlikely. However, Dr Rumsey argues (*ibid.*, p. 96) that “*hybrid hot-spots* are known for pteridophytes, i.e. sites where either a range of uncommon hybrid taxa form and/or the repeated production of a single otherwise very rare hybrid occurs. What remain to be elucidated are which aspects of the environment or plant behaviour that may be acting to facilitate hybrid formation”.



(L to R) Filmy-ferns: Tunbridge; hybrid; Wilson's

(Jeremy Roberts)

Killarney Fern gametophyte

The remaining member of the British Hymenophyllaceae is the nearly fabulous Killarney Fern (*Trichomanes (Vandenboschia) speciosum* Willd.). Always a rare and very local plant, this was almost rendered extinct by gross over-collection during ‘the Victorian fern-craze’. It exists – or rather the sporophyte (the fronded form) exists – in a very few sites in Cumbria, and in other humid and mostly western regions of the UK. The surviving Cumbrian plants are small and vulnerable, and do not compare with some spectacular colonies in Wales, Scotland and Ireland, where sheets of hundreds or even thousands of fronds exist.

It was a great surprise when in late 1989 a visiting American botanist, Dr D.R. Farrar, pointed out the gametophyte (sexually-reproducing) generation of this fern at two sites in the Lake District, which had never before been identified in Europe (Rumsey, Jermy & Sheffield, 1998). (Similar gametophytes exist widely in north America in several similar species, in areas where the sporophyte is rare or unknown.) The gametophytes look very much like mats or felts of filamentous alga – and no doubt had previously been overlooked on that account. Crucially, these mats have an independent and effectively perennial existence, and presumably exist for long periods in the absence of the sporophyte. Indeed, some gametophyte sites may have arisen millennia ago at some distance from any sporophyte by chance settlement of spores.

We now know that this gametophyte form is quite remarkably widespread in Britain and more oceanic parts of western Europe, in similar habitats to the *Hymenophyllum* ferns, but considerably more widespread. However, it generally occurs much deeper into humid crevices. Indeed, sometimes it can hardly be seen without the aid of a torch. In Cumbria it is known in such places in sandstone caves and hollows along the River Eden, and in many similar sites in the Lake District. It is clear that it requires the high humidity and freedom from competition of its deep and dark habitats, but it is astonishing that it can photosynthesise successfully in the very low light levels pertaining. Its filamentous growth-form allows slow lateral growth, but the strands readily fragment and presumably can colonise new sites after transport perhaps by slugs or other invertebrates or by flood events – many existing sites are close to running water. It also produces multicelled ‘gemmae’ which break off and act similarly as propagules.

It was for a number of years thought that this gametophyte generation was not capable of producing the sporophyte generation, at least in present climatic conditions (and attempts at artificial stimulation had also failed). However, we now know what the juvenile sporophyte plant looks like – a very slender tongue-like structure, looking like some liverworts – and this has now been identified in many places where the gametophyte is known. In Cumbria, sites were found by the late Ken Trewren in the Eden and Lyne valleys. However, the mortality rate of these young plants is probably high, so that recruitment into the population of mature sporing plants is almost negligible. This fact, coupled with the inevitable natural loss of plants over the long term through habitat changes or erosion, and the human plundering already described, have rendered the sporophyte rare and precious.

The abundance of suitable humid nooks and crannies in the Bewcastle outcrops made it very likely that the gametophyte phase of Killarney Fern would be present there, and it was kept in mind during searches. However, it remained unseen until October 2011 when it was found in good form by Bruce Brown and Alison Evans. Ironically, the locality was the original Tunbridge Filmy-fern cleft on Long Crag, growing in cracks opposite, where it had been overlooked, as the present author and other visitors paid their respects to the filmy-fern on the other wall! It is very likely to be more widespread in the area. However, as Bruce Brown suggested (pers. comm.) it may be that the climate of the Bewcastle Fells, although evidently suitable for the gametophyte, is too extreme for the development of sporophytes.

Identification of *Hymenophyllum* filmy-ferns

When growing well, the two filmy-fern species can be separated with some confidence on growth form. Wilson’s makes often rather untidy patches, the

fronds mostly standing away from the rock surface. The fine segments of the fronds tend to droop at the tips, in a somewhat ‘clawed’ fashion. Tunbridge Filmy-fern fronds are generally rather paler and bluer in shade; the segments tend to lie more in one plane, and hence make often flatter sheets closer to the substrate, with the fronds somewhat overlapping.

Confirmation should always be made by examination of the indusium – the small two-lipped ‘pocket’ which encloses the spore-capsules like a purse. The lips of Wilson’s are longer than wide, and smoothly rounded at the margin. Tunbridge has a broader ‘purse’, and the margin is strongly and sharply serrated. These are small features and need a hand-lens to be seen clearly (plate 7).

There are other features which require a microscope. The chloroplasts of Tunbridge are relatively large and well-defined, with about 30-40 in each cell, whilst in Wilson’s they are much smaller, less well-defined, and number about twice as many per cell.

In all these features the hybrid *Hymenophyllum* × *scopulorum* falls between the parents. It does however show some hybrid vigour, making large patches in its two known sites, the fronds splaying out from the rock surface to make deep ‘blankets’ in parts. The indusium is wide, often almost circular, and the margins of the lips are undulating in outline or with a few blunt teeth. As stated above, the consistent abortion of the spores is the strongest confirmatory feature of the hybrid.

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An album of photographs of all three taxa and the habitats is at www.cig.canon-europe.com/p?p=DARVVunwxdX or (more readily) linked from the filmy-fern page on the author’s website at www.edencroft2.demon.co.uk

Conserving Aphrodite's Footwear – the re-introduction of Lady's-slipper Orchid (*Cypripedium calceolus* L.) into Cumbria

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The largest and most dramatic of our native orchid species proved so attractive to Victorian collectors that the species was virtually eradicated in the wild from Britain. The discovery, in the 1930s, of a single plant in North Yorkshire and the eventual threats to this survivor led to the formation of the *Cypripedium* Committee. The plant is categorised as Red Data Book Critically Endangered and is fully protected under Schedule 7 of the Wildlife and Countryside Act 1981.

The aims of the Committee were, and remain, to protect and maintain the single UK site in Yorkshire where the plant grows naturally in the wild, but also to restore the plant by re-introduction and introduction back into its former natural range in northern England. This once extended from Morecambe Bay in the west, as far north east as County Durham, and south into Derbyshire. The ultimate aim of the Committee is to re-establish self-sustaining populations of the plant in its former ranges. It was also decided that public access to plants growing in the wild, though not possible at the wild site, should be provided at a site or sites that were robust enough to take public pressure and where the plants may flourish. The initial site for this approach was at Ingleton Falls.

In partnership with the *Sainsbury Orchid Conservation Project*, and with the committed involvement of scientists at Kew Gardens, success with propagating seedlings from plants of native stock was achieved in 1983, this despite the lack of knowledge of the necessary fungal associations of this orchid. Not all former sites of the plant are known. In Cumbria, Scout Scar above Kendal and the nearby Whitbarrow Scar were two of the areas from which plants were once collected, and eventually exterminated (Halliday, 1997). The natural history and range of the plant in Britain is discussed in many popular publications, of which Harrap & Harrap (2009) is a recent fine example.

Whilst the restoration programme intends to re-introduce plants to former sites if conditions are judged to be acceptable, the decision was made early on to also introduce the species into sites where there was no historical evidence of their presence but which offered a good chance of the plant becoming established. This

policy has allowed for a more strategic approach to the restoration programme of the plant throughout its former range.

In 1989 the programme of reintroduction was started with the first six seedlings being planted in Yorkshire, and by 2003 some 2,000 seedlings had been placed back into the wild at 23 locations. However, these two-year old seedlings had a poor survival rate, and most failed to survive for more than a couple of years. Poor survival of such young plants was due to a number of factors, not least a certain naivety about where to place plants. Inappropriate soils and competing vegetation led to much early loss of young plants. Coupled with this was an alarming rate of damage by molluscs, bacterial infection, small mammals and rabbits. There was thus a very steep learning curve to discover how plants might best be re-introduced and protected whilst they became firmly established. Since 2004, older plants have been used in the introduction programme and this has allowed a much more successful rate of establishment, leading in many cases to flowering and even vegetative spread.

While it has never been possible to allow visiting to the extremely sensitive wild site, visiting has long been gently encouraged, with the full cooperation of the landowners, to a plant in Silverdale in North Lancashire. It is now believed that this is not of native stock, and is of central European extraction. Nonetheless, it has for many years provided the sole opportunity for people to view a flowering plant in a wild situation, and some 2000 visitors were recorded during the flowering period in recent years.

However, since 1995, the nearby Gait Barrows National Nature Reserve, managed by Natural England, has been a major introduction site, and now annually holds some 80 flowering plants. Since 2009 Gait Barrows NNR has become the main centre for public viewing, with managed easy access to many of the plants during the flowering period in May and early June. Also since 1995, attempts have been made to reintroduce the orchid into Cumbria (VC69 Westmorland) at four sites within areas of the Morecambe Bay Carboniferous Limestone. The results of these attempts and the lessons learned are explored further here.

Initially the location of the remaining native wild plant in Yorkshire – shaded, protected by a small northwards facing rock outcrop – in nutrient poor limestone soils, suggested the choice of micro-habitat and initial plantings in Cumbria sought to replicate these conditions. However, there is now a greater understanding of where plantings will be successful, following the experimental approach to site selection at Gait Barrows NNR and the four Westmorland sites. It has now become apparent that plants will do very well in a wider range of less shaded sites provided the soil structure and drainage is suitable, allowing the

selection of introduction sites to be broader, and including some offering micro-habitat conditions more akin to European sites.

Site 1: altitude 110m

This site was first planted in January 1995 and is the least publicly accessible site and is on private land. Some 100 plantings have taken place. A west-facing woodland site, it is generally shaded and soils are clayey poorly drained brown earths over limestone. The first plantings did not survive, but selection of better-drained locations and the use of older seedlings led to establishment and flowering in 2007. However, in 2010 it became obvious the plants were being endangered by extensive mollusc damage and also by badger activity, and all remaining plants were removed for rehabilitation and use at other more suitable sites.

Site 2: altitude 80m

This site was planted in 2006 on private land, and is not accessible to the public. This is also a west-facing woodland site, but plantings have concentrated on more open situations within the woodland, where the limestone soils are well drained. 17 plants have been introduced here and the use of older seedlings plants has ensured early establishment of several of these, although mollusc damage is still a worry. Flowering has yet to occur on this site, which is maintained by volunteers, and mollusc damage prevention methods are similar to other sites.

Site 3: altitude 80m

This was the first Cumbrian site to move towards choice of much more open locations, and followed the success of planting in similar locations at Gait Barrows NNR. In this case, appropriate soils were found beneath more westerly facing rocks with significantly less shade cover than Sites 1 and 2. Planting took place in 2009 with an additional autumn planting in 2010. The site has a good range of other orchids, with recorded maxima of 1,100 Early Purple and Common Spotted, some 100 Greater Butterfly, 45 Fly and a number of Common Twayblade. The site is akin to wood-pasture, with cattle grazing throughout much of the year. The open limestone grassland is rich in flora and in 2010 colonies of Dingy Skipper and Ringlet butterfly became established for the first time in living memory. This is the most accessible of sites and because of a team of local volunteers it receives an estimated minimum of 200 visits per season, some of which are multiple visits by local residents. (Plate 9.)

Currently this site uses the minimum of slug pellets, preferring copper rings, 'Slug-off' pellets and site hygiene to deter slugs and snails. The foliage has received virtually no damage from these two potential pests. However, in 2011 a number of new stems and flowers were missing and rabbit netting was installed as a precaution. However, vole and mice damage was later found to be the problem. Vole netting will be used in 2012. Limited watering of the surrounding soils has taken place during the very dry spells of spring weather experienced over the three years. Again, older seedlings were used in the introduction and plants have since flowered in all three seasons. However, the flowering time has become progressively earlier, in line with many local spring orchid species. A maximum of 16 flowers from 33 stems has been recorded. Two or three flowers have been fertilised each year by natural means. Seeds have been left to fall naturally.

Site 4: altitude 130m

This site was first planted in 2011 and with well-established mature seedlings being used, there was early success with flowering in the first season. Additional planting took place in 2012. The location is lightly shaded and the most southerly facing of all the sites. Nearby is a stable population of Dark-red Helleborines and other orchid species can be found within a few hundred metres of the site. The site is Open Access land and the location is quite likely to become known to the public. This planting is maintained by a band of local volunteers, and mollusc damage prevention is similar to other sites.

Potential Site 5: altitude 180m

This is a similarly open site to Site 4, and promising planting locations have been assessed and are awaiting confirmation from the Cypripedium Committee before introduction can take place.

Summary

The first few years of trial establishment on the Cumbrian sites have shown that reintroduction can be successful and many plants, where freed from the constraints of mollusc and mammal attack, are showing increased vigour year on year. The most productive sites have been accessible, enabling volunteers to monitor and tend to the plants from when shoot noses start showing in February, through the flowering period in late spring, and to seed production in summer. In the case of Site 3, the introduction project has become widely known in the nearby community and there is a developing local pride in their Lady's-slipper plants, thus ensuring appropriate levels of protection – and added value for the project.

Acknowledgements

The authors would like to thank the numerous volunteers who have given their time and energies to ensuring that the Cumbrian re-introduction programme, in these early days, has achieved at least a modicum of success, with much promise for the full re-establishment of Lady's-slipper Orchid back into our landscape in the future. Some sites involve National Trust land, and we are grateful for their support, and that of other landowners.

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The *Carlisle Naturalist* publishes material on all aspects of the natural history of Cumbria. General articles, results of personal research, news items, records and letters of relevance to Cumbrian naturalists are welcomed. Material accepted for publication must not be submitted in a similar form to any other journal.

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Computer files should be in rich text format or Microsoft Word and e-mailed to david.clarke19@virgin.net, or submitted on CD/DVD accompanied by a paper copy. **Bold** and *italic* may be applied to text, but do **not** attempt any other formatting, as this then has to be removed on import.

References should be given in full at the end of the article or note. Authority names should be given in full.

Illustrations should be in black ink; they must be originals and not photocopies. Whilst every care will be taken of original artwork, the editor can not be held responsible for any loss or damage.

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Standard abbreviations used in this issue:

v.c.: vice-county; NNR: National Nature Reserve

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Summer Field Meetings 2012

(Saturdays, full day, except where stated)

27th April (Fri evening): Watchtree Nature Reserve, newt survey

Leader Sam Griffin (016973 23939). Meet car-park (NY305538), 8 pm

11th May (Fri evening): Longtown Gravel Pits & River Esk, birds etc

Leader Jeremy Roberts (01228 560164). Meet layby on A7, NY376705 at 6.30 pm

26th May: Geltsdale, birds etc Leader Stephen Westerberg (016977 46717). Meet at Clesketts car-park (NY588584) at 10 am

2nd June: Ennerdale Leader Stephen Hewitt (07788 715392). Meet Bowness, Ennerdale, car park (NY109154) at 10.30 am

15th June (Fri evening): Lamonby verges, flower-rich grassland

Leader Anne Abbs (01228 710208). Meet Millfield Lodge car park (NY380342) at 7 pm

16th June (Sat evening): Watchtree NR, Bioblitz moth evening

Leader Liz Still (016973 51194). Meet car-park (NY305538) at 9.30 pm

17th June (Sun): Watchtree NR, Bioblitz CNHS team (07788715392) to survey wildlife of the site. Meet car-park (NY305538) at 9 am

30th June: Honister Pass and Borrowdale, insects etc

Leader Stephen Hewitt (07788 715392). Meet Honister Hause layby (NY230136) at 10.30 am (parking is limited)

14th July: Silloth Dunes, plants etc

Leader Geoff Naylor (016977 46663). Meet by the track to Silloth Nursing Home (NY103532) at 10.30 am

20th July (Fri evening): Cardew Mires, moth night

Leaders Mike Clementson & Liz Still (016973 51194), meet Tarmac Cardew Mires quarry car park (NY348509) at 9.30 pm

4th August: High Stand/Miltonrigg woods, plants (helleborines) etc

Leader Jeremy Roberts (01228 560164). Meet High Stand Plantation FC car-park (NY492496) at 10 am

24th August (Fri evening): Finglandrigg Woods NNR, Bat walk

Leader Robin Hodgson (01228 590804). Meet Finglandrigg NNR layby (NY281573) at 7 pm