Shropshire Botanical Society

Newsletter

Spring 2018

Shropshire Botanical Society Newsletter No. 36

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Past copies of the newsletter are available as pdfs from the Shropshire Botanical Society website: : http://www.shropshireecology.co.uk/botanical_society.html

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Front Cover:

Gentiana pneumonanthe Marsh Gentian at Cramer Gutter
(photo by Fiona Gomersall)

Our thanks to the Shropshire Wildlife Trust and the Field Studies Council for their generous support of our society. Both organisations support the work of the society in recognition of the importance of the contribution we make to understanding Shropshire botany.

Society News

Hilary Wallace

It was good to see such a good attendance at the rescheduled winter meeting on 3 February. Richard Lansdown gave an interesting update on the problems facing the conservation of Least Water-lily at Cole Mere. Following a very informal vote it seems that February might prove a more popular time for the winter meeting than trying to fit it in between pre-Christmas events when everyone is always so busy – so watch this space in future newsletters so you don't turn up at the wrong time. Mark's quiz proved as challenging as ever and prizes were gratefully received by those who managed to get at least some answers correct. We thank the field centre for stepping in with cakes to replace those that hadn't survived the Christmas freezer raids of some committee members.

By the time you receive this new letter spring will be with us and you will be keen to shake off the winter blues and get out there botanising.

This newsletter includes the programme of summer field visits for 2018 and you can get a flavour of what we do on these days out from articles by Penny and Sue. They are very informal affairs which provide a good opportunity for beginners to improve your botanical skills whilst also contributing useful records to inform site managers and land owners of what they have on their land. You will discover hidden corners of the county but see Fiona's article for the possibility of a trip to see one of Shropshire's rare species growing at a lovely heathland site on Anglesey.

Other articles in the newsletter include an update on what's been going on at one of our more northerly sites, Prees Heath, where attempts are ongoing to restore grassland and heathland habitats for the Silver-studded Blue butterfly.

Ruth has provided an interesting comparison of the pretty scabious species that occur in the county.

Spring Meeting and AGM

Date: Saturday 14 April 2018, 2-4 pm

Please note Change of Venue

The meeting will be held at Harley Village Hall. Harley is a small village on the A458 about half way between Cressage and Much Wenlock.

Speaker: Dr Natasha De Vere, National Botanic Gardens of Wales will talk on the DNA barcoding of our flora.

The talk will be preceded by the AGM so please do come along if you can.

Other events you might like to get involved in

Bioblitz: Prees Heath Common Reserve. Thursday 19 July 8.00 am till 10.00 pm.

The article on the restoration at Prees Heath might inspire you to go along to this event and find out more about this interesting site.

More details of the event are available from: Stephen Lewis (07900 886809) or at phwarden@sky.com

Field trip to Anglesey wetlands to count Marsh Gentians on 18th August.

See Fiona's article on Gentians at Cramer Gutter and you might fancy a summer trip to Anglesey to see some lovely heathland communities and also contribute to the scientific monitoring of this rare species which is being carried out by Natural Resources Wales.

Please contact Fiona directly if you are interested in this trip and want to find out more. FionaG@ShropshireWildlifeTrust.org.uk

One day courses hosted at Preston Montford Field Centre during summer 2018

These inexpensive courses are run by regular tutors for the Field Studies Council and are open to everyone interested in improving their field identification skills.

Some are entirely lab based whilst others will involve trips out into the Shropshire countryside.

Further details can be found on the FSC Web page (www.field-studies-council.org) or in the FSC Natural History Courses 2018 Brochure.

Course Title	Level	Tutor	Date	Cost
Limestone Woodland Flowers of Llynclys	Open to all	Fiona Gomersall	12/05/2018	£45
Identification of Woodland Plants	Intermediate	Mark Duffell	15/05/2018	£45
Plant Identification for Field Surveyors	Open to all	Mark Duffell	17/05/2018	£45
Plant ID for Phase 1 Habitat Surveys: Grasslands	Open to all	Mark Duffell	22/05/2018	£45
Introduction to Grasses (The Poaceae)	Open to all	Mark Duffell	29/05/2018	£45
Top 10 Plant Families	Open to all	John Handley	02/06/2018	£45
Field Identification of Common and Upland Grasses	Intermediate	Fiona Gomersall	09/06/2018	£45
BLS Introducing Lichens	Beginner	Catherine Tregaskes	09/06/2018	£45
Identification of Sedges and Allies	Beginner	Mark Duffell	19/06/2018	£45
Limestone Flora of the Oswestry Hills	Open to all	Fiona Gomersall	23/06/2018	£45
Heathland Plants	Open to all	Mark Duffell	10/07/2018	£45
Introduction to Mosses	Open to all	Martin Godfrey	14/07/2018	£45
Introduction to Aquatic Plants	Open to all	Mark Duffell	31/07/2018	£45
Tackling Daisies, Dandelions and Thistles (Asteraceae)	Open to all	Mark Duffell	09/08/2018	£45
Plant ID Using the Vegetative Key	Open to all	Mark Duffell	06/09/2018	£45

Interesting recent publications

This is new feature for the newsletter - we thought it might be useful for members to know about recent publications that are either of topical, local interest, or that are likely to help on field trips with plant ID.

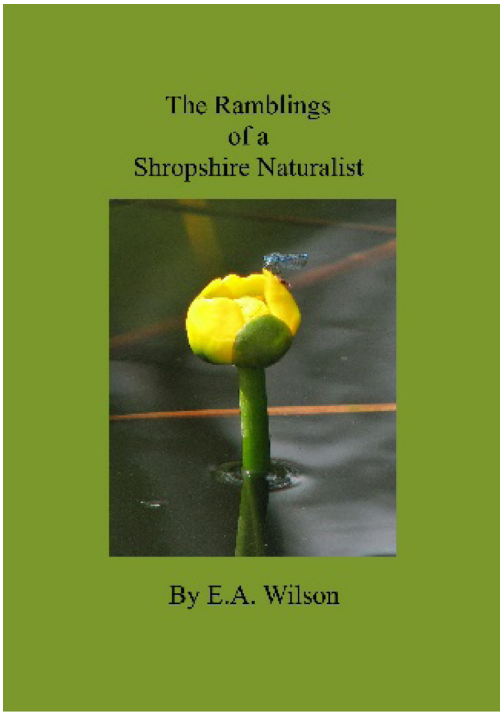
Two new publications by Shropshire Botanical Society

Mags Cousins

Internet self-publishing services have enabled us to produce two new publications, so hot off the press we present you with:

The Ramblings of a Shropshire Naturalist, by Edward Wilson

Edward A. Wilson was senior biology master at Ellesmere College and during that time he visited and studied the natural history of the meres, mosses, canals and hills of Shropshire, and formed a Field Club at the College. In the box of materials left to his family and given to Pam Bowen after his death was a typed collection of excerpts from his extensive writings, which Wilson himself had prepared, possibly for publication, entitled 'The Ramblings of a Shropshire Naturalist'. We have



included short pieces in past newsletters but have fulfilled what we suppose might have been his wish to publish the Ramblings as a little book. It is with thanks to John Harding who retyped them, that we are now able to present you with these delightful writings and hope that they will entertain, educate and inspire, much as E.A.Wilson did in life. They are reproduced in authentic form without changing nomenclature for current taxonomic terms. The books are available for purchase at £4.99 plus post and packaging from:

http://www.lulu.com/shop/edward-wilson/the-ramblings-of-a-shropshire-naturalist/paperback/product-23488572.html

Introduction to the genus Sphagnum. Some notes on identification, by Martin Godfrey

We are delighted to bring you an introductory guide to the common Sphagnum mosses by the experienced bryologist and skilled and enthusiastic trainer Martin Godfrey. In recent SBS newsletters

we have enjoyed and benefited from Martin's articles to help us get to grips with Sphagnum, and responding to popular demand we have compiled them into a full colour booklet. The 36 page booklet contains all the descriptions and images to help with the identification of this group with room for you to make your own notes. The booklets are available for purchase at £7.99 plus post and packaging from:

http://www.lulu.com/shop/martin-godfrey/introduction-to-the-genus-sphagnum-some-notes-on-identification/paperback/product-23511862.html

Enjoy and if you have any suggestions for further ventures into publishing, please get in touch with a member of the committee.

Other recent publications by Field Studies Council

Field identification guides are always useful and two recent FSC fold out charts might be of interest to those involved in site-based surveys of grasslands, heaths and mires.

Wallace, H.L. and Duffell, M. (2016) *Plant identification for Phase I habitat survey: grassland and marsh.* FSC. ISBN 978 1 908819 26 0

Wallace, H.L. and Duffell, M. (2017). *Plant identification for Phase I habitat survey: heaths and mires.* FSC. ISBN 978 1 908819 33 8

Both are available from the FSC web page. www.field-studies-council.org

If you come across any interesting articles or books, old or new, that you think members might be interested in please put pen to paper and send an article to the editor for inclusion in the next newsletter.

Summer field visits 2018

Dan Wrench

Saturday 5th May
Whixall: Furbers and Marl Allotment.
Car park just to the left over Morris' bridge. The actual site of the scrap yard may hold some interest worth retaining and the surrounding wet woodland could be explored. If the visit there is short we will move to either the Marl Allotment (parking at SJ500357, drive alongside the canal from Platt Lane) and/or to the pools and proper bog further along from Platt Lane, parking at Natural England Offices at SJ505365. For further details contact John Handley, 0797 709 5124, johnhandley11@gmail.com

Saturday 9th June
The Haycop, Broseley and Benthall Edge, Pattin's Rock Quarry. SJ 677018.
Meet at 11:00 am in the lane on the way onto the site. There is limited parking on site so please car share where possible. Parking on the road side a little further north along Dark Lane is possible. The Haycop is managed for butterflies in particular but has a good range of woodland and meadow plants plus some aquatics and marginal species around the pool. The party may move to Benthall Edge later if time permits. For further information please contact Penny Wysome, 01952 242617, pennywysome@yahoo.com

Saturday 23th June
Oswestry Racecourse.
Meet at 11:00 am at the main site car park at SJ259304. A good number of species have been recorded including Hybrid Avens, Sherard's Downy-rose, Pill Sedge, and even an old record for Yellow Mountain Pansy. Several rose and bramble species have been recorded for those keen on micro-species. For further details please contact Chris Walker, 07732 761157, candawalker@btopenworld.com

Sunday 15th July.
Battlefield Church and pools.
Meet at 11:00 am at the main site car park at SJ507168. There is a pool and damp hollows with a rich and interesting flora including Lesser Marshwort, Tubular Water-dropwort, and Bog Pondweed. We will then move to Battlefield Church where more pools and grassland used to have, and perhaps still retains, some species of interest. We may also pop in to the Battlefield 1403 cafe for refreshments. For more information please call Dan Wrench, 07718391794, danwrench@gmail.com

Thursday 19th July
Prees Heath Common Reserve.
Meet at the reserve car park at SJ557362. A Bioblitz led by Butterfly Conservation but all welcome. Marquee, equipment, toilets and refreshments provided. For more information contact Stephen Lewis, 07900 886809, phwarden@sky.com

Saturday 4th August
Brook House Clun.
Meet at Brook House at SO271793 where the acid grassland, a stream, pool (with native White-clawed Crayfish), and mire habitats are hoped to reveal some interesting species in the poorly recorded area near Clun. The visit will be led by Hilary Wallace and Mags Cousins. For further details please contact Mags Cousins, 07791 505641, mags@bagbatch.co.uk

A special visit to Angelsey led by Fiona Gomersall on 18th August with the option of camping overnight. This trip is to observe *Gentiana pneumonanthe* (Marsh Gentian) and help local botanists estimate the population size on an SSSI there. Please contact Fiona for further details at: FionaG@ShropshireWildlifeTrust.org.uk

Benign neglect – Shropshire Botanical Society visit to Maddock's Hill Quarry

Penny Wysome

On one of the hottest days of 2017, June 17th, seven intrepid members of the society headed into unknown territory. Maddock's Hill Quarry, part of the Ercall, between Wellington and Little Wenlock, had been excavated for aggregates in the past. Our geological member enlightened us as to the constituents of this, one being camptonite. However all workings had ceased some decades ago and as the land was privately owned the quarry was left to recover in secret. Access is by scrambling over banks or penetrating forest and had been deterred by rumours of the owner's habit of using the quarry for rough shooting.

Being unable to get permission to visit I took comfort from an advertisement from an agent selling the quarry which invited visitors. I optimistically did not put risk of being shot on the risk assessment so we forayed in. The sides of the quarry are largely wooded with much birch and hawthorn though some outcrops provide habitat for flowers more typical of limestone areas. The floor is mainly grassland which is a short cropped sward clearly grazed by deer and there is a small stream running from the quarry into the Ercall woods providing a wetland habitat and some quite muddy areas. I had done a brief recce and thought there would be enough botanical interest to make a reasonable visit but our main purpose was to record the plants as no recent records had been made.

The particular group of members happened to have excellent id skills and the combined haul of species was far more extensive than I had anticipated. 113 plants were recorded. This is a higher count than for the other Ercall quarries which have been monitored for some years. The first nice surprise was encountered on the walk up to the quarry. Large Bitter-cress *Cardamine amara* covers some of the wet ditch sides, unfortunately we were too late to see the purple stamens characteristic of this pretty plant, but it was good to see such a good number of specimens established here. Once over the earth bank we encountered positive grassland indicators such as Common Bird's-foot-trefoil *Lotus corniculata*, Oxeye Daisy *Leucanthemum vulgare*, Cowslip *Primula veris* and Common Knapweed *Centaurea nigra.* Moving on through a clump of *Alnus* and *Salix* we emerged into a wider grassy area which extended up the sides of the quarry. Wild Strawberry *Fragaria vesca*, Mouse-ear-hawkweed *Pilosella officinarum*, Cat's-ear *Hypochaeris radicata*, Yellow-wort *Blackstonia perfoliata* and the occasional Common Spotted-orchid *Dactylorhiza fuchsii*. Grasses included Crested dog's-tail *Cynosurus cristatus,* Red fescue *Festuca rubra* and, interestingly, Wood Meadow-grass *Poa nemoralis,* identified after some discussion.

What is perhaps more interesting is what we did not find. Despite the lack of any management there were very few of the negative condition indicators such as brambles, nettles, thistles, coarse grasses or large umbellifers. The wet areas yielded a selection of sedges with eight species of Carex, notably *C. panicea, C. remota, C. spicata* and *C. otrubae* as well as *C. flacca, C. hirsuta, C. sylvatica* and *C.leporina*. The common rushes Soft-rush *Juncus effusus* and Hard Rush *J. inflexus* were present as well as Jointed Rush *Juncus articulatus*. Fleabane *Pulicaria dysenterica* was found near the stream edges; again there was no domination by larger species.

Having endured high temperatures and the threat of being dehydrated the group completed the recording soon after lunch. Those unfamiliar with this area of Telford accepted an invitation to explore the shady Ercall woodlands and look at the other quarries before going home.

The contrasts between the hidden and the exposed quarries were stark, it seems that the deer are doing an excellent job of managing Maddock's Hill Quarry. Anyone interested with £100,000 going begging might want to put in an offer.

Shropshire Botanical Society – Out and about with beginners Oswestry Hill Fort

Sue Townsend

In the giddy heights of an English summer with the surrounding countryside humming with life, Sue Townsend, the Botanical Society Treasurer, looks back on two plant hunts where great records were made, learners engaged and conservation objectives were discussed. What more can you want from a beginners day?

The first field meeting was at Old Oswestry Hill Fort on 1st July 2017. Most of the records were taken at SJ2931. This fabulous ancient monument is owned by English Heritage and managed mostly through volunteer efforts. It was even reported in the Oswestry Advertiser as we were part of a Bioblitz event. The headline was "This was a special day as It's official – Oswestry Hillfort is a haven for wildlife galore" This event was organised by a Botanical Society member; Clare Knight who works for the Shrewsbury based consultants Turnstone Ecology. Photo 1 shows the entrance to the site against a backdrop of agricultural lowland.

Photo 1. The entrance to the Hillfort where everyone had to walk past our stand!

So we were not alone. Specialists in moths, bats, birds, bees, beetles, spiders and small mammals came from all over Shropshire to take part in the BioBlitz.

The aim was to take a snapshot of the hillfort's flora and fauna over 24 hours, most likely the first major ecological study in its 3,000-year history. Data was collected to guide on-going landscape maintenance to ensure it safeguards the hillfort's archaeological structures and thriving ecology. More than 400 species of flora or fauna were logged on the day, including an encouraging number of invertebrates not previously recorded.

The Botanical Society assembled from midday and Clare joined us along with members Dan Wrench, Tina Tearu, Ed Lomax and Gill Wilson. Members of the public joined in along the way and eagle eyes spotted plants which we were hunting from pre-existing records. Most of our searches were in the upper tetrad shown in Figure 1.

Old Oswestry was built and occupied during the Iron Age (800 BC to AD 43) and is one of the best-preserved hillforts in Britain. It remained in use for almost 1,000 years. It is composed of banks and ditches which would have been formidable obstacles to any attacker – but more importantly

Photo 2. The steep grassy ramparts with scrub and trees

for the naturalist gives a mixture of sands, clays and gravels lifted up and away from the influence of agriculture and roads to give us a selection of grassland habitats. The ramparts are among the most impressive of any British hillfort, enclosing a central area of 8.4 hectares. For centuries the slopes were densely covered by trees, and an 18th-century writer describes threading his way 'through the thorny intricacies of this sylvan labyrinth'. This tells us that there was scrub and perhaps wooded areas – but there are also deep clay lined pools which

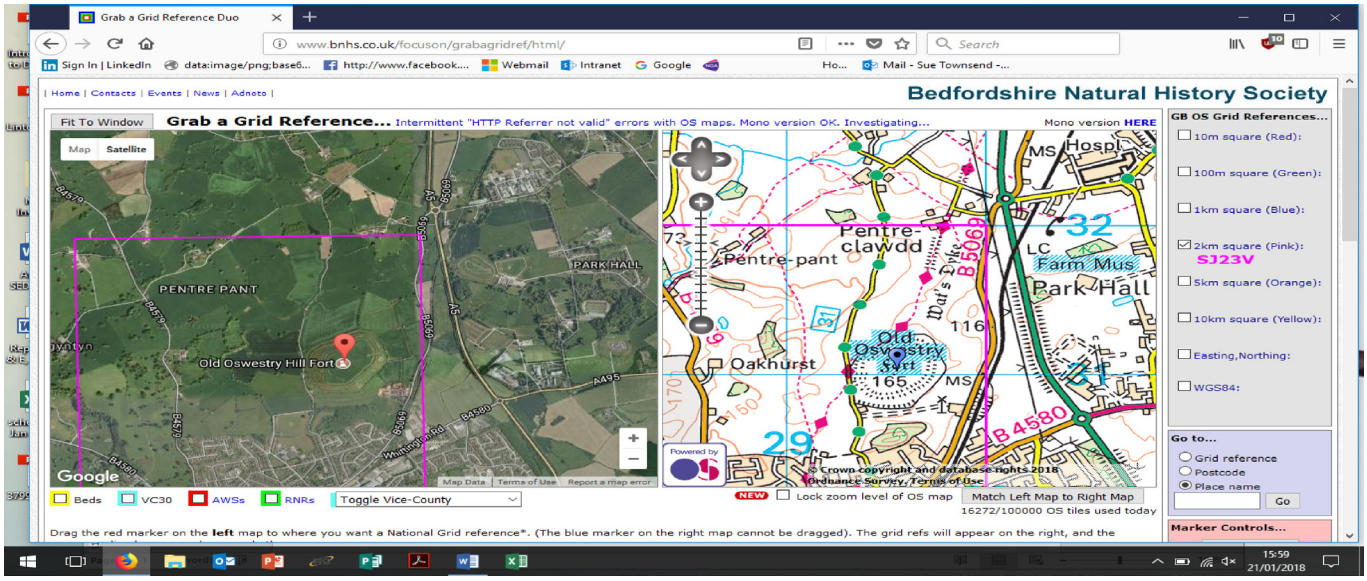


Figure 1 – aerial view and map of the site.

were a joy to descend into and discover some aquatics. Photo 2 shows the gradient and long grassland on the ramparts.

Our full list is a little long to include here – so I thought I would concentrate on the 21 axiophytes which you will all remember as those special plants, often but not always rare – but indicative of Shropshire's special flora.

A full list of the plants found at the site can of course be found at https://shropshireecology.org/ and all these records have been checked by Sarah Whild, our County Recorder, who received our 166 plant records for this site to add to this data. We did not record some species found in previous years, particularly the ferns Golden-scaled Male Fern *Dryopteris affinnis,* Broad Buckler Fern *D. dilitata* and Male Fern *D. felix-mas*; they were possibly there – but too small to confirm with no spores. We were also unsure of the presence of Nodding Bur Marigold *Bidens cernua* (there were some young shoots but in amongst the Trifid bur-marigold *Bidens triparta*) and the water starworts and Water Crowfoot *Ranunculus peltatus* were not found in the drying, shallow ponds. We saw no violets as they would have withered to nothing being spring flowers but other spring flowers were seen hidden amongst the lovely Greater woodrush *Luzula sylvatica*. These included both Bluebell *Hyacinthoides non-scripta* and Wood anemone *Anenome nemorosa* which were thriving relics of past woodland cover on the slopes. We were determined to work at the hawkweeds that we discovered on the steep sandy slopes and valiantly keyed them out using the well-known tome of Stace. We did send samples as pressed specimens to Tim Rich – national referee, as these are cryptic species that are very difficult for the non-specialist to determine. Tim was really helpful and got back to us within two weeks so we could add these to our species list with confidence. The hawkweeds *Hieracium argillaceum* and *H. vulgatum* were confirmed and to our delight we actually got one right ourselves!


Photo 3 Greater Broomrape © BSBI/Alex Lockton

Photo 4. Wild Basil © NBN Atlas

We found some really lovely plants and one of the highlights was Greater Broomrape *Orobanche rapum-genistae Thuill. (O. major auct.).* We found this in its usual place, just off the footpath in the patch of broom to the left of the path. It has been there for years and as a parasitic plant, has no chlorophyll but inserts its roots into the roots of the host plant and extracts nutrients direct from the Broom *Cystus scoparius*. It was very withered so our photos did not do it justice – this photo is taken from the BSBI website. Another lovely plant was Wild Basil *Clinopodium vulgare* found at the foot of one of the ramparts.

The day was a great success in terms of enjoyment and interaction with many other naturalists. We had fun, learnt some botany and rediscovered some lovely plants. The full list of axiophytes is shown in Table 1.

Table 1. Axiopyhtes found on Old Oswestry Hill Fort Summer 2017

Scientific name	**English name**
Aira praecox	Early Hair-grass
Alchemilla filicaulis	Common Lady's-mantle
Allium ursinum	Ramsons
Anemone nemorosa	Wood Anemone
Bidens cernua	Nodding Bur-marigold
Blechnum spicant	Hard Fern
Calluna vulgaris	Heather
Carex vesicaria	Bladder Sedge
Clinopodium vulgare	Wild Basil
Deschampsia flexuosa	Wavy Hair-grass
Galium odoratum	Sweet Woodruff
Hyacinthoides non-scripta	Bluebell
Hypericum pulchrum	Slender St John's-wort
Luzula sylvatica	Great Wood-rush
Lythrum portula	Water Purslane
Orobanche rapum-genistae	Greater Broomrape
Oxalis acetosella	Wood-sorrel
Polygala serpyllifolia	Heath Milkwort
Trisetum flavescens	Yellow Oat-grass
Vaccinium myrtillus	Bilberry
Veronica officinalis	Heath Speedwell

Books and websites used:

Botanical Society Database housed on the Shropshire Ecological Data Network website (2017) https://shropshireecology.org/index.php/shrops/showrecords/sites/484/offset/100

Grid reference and map from http://www.bnhs.co.uk/focuson/grabagridref/html/

Sinker CA (1964) North Shropshire Meres and mosses. *Field Studies* Volume 1 No 4

Stace,C.A (2010), *New Flora of The British Isles.* Cambridge University Press

Whild, S.A and Lockton, A (2014) *The Flora and Vegetation of Shropshire.* Shropshire Botanical Society.

I would like to thank Claire Knight and Turnstone Ecology for making the Botanical Society so welcome and English Heritage for their permission to use the site on the day.

Shropshire Botanical Society – Out and about with beginners Cole Mere

Sue Townsend

Following a visit to Old Oswestry, I was keen to revisit another site I knew in order to explore the delights of Cole Mere on a summer's day. This site is part of the Meres and Mosses landscape; a relic of the ice age. North Shropshire is famous for its wetlands and many of them are still extant having been formed over 10,000 years ago. Cole Mere was damned by glacial deposition and the subsequent lake partially filled over time with a mixture of sands and gravels until successional change began in earnest to deposit organic material and accelerate the change. This uneven surface gives us the structure of what we have in our area today with some areas still underwater; in this case the lake itself – where there is still a thriving sailing club. There are also slightly shallower areas where succession has led to marshy grasslands and damp woodlands over these deep rich peaty soils. This can be seen in the meadows to the east and the alder woodlands to the north. A map of the site is shown in Figure 1.

In many ways this is not a site for beginners as it is so diverse and complicated. The variable peat depth, management history and current use of the site has led to many difference plant communities including grasslands, woodlands, marshes, open ground and aquatics. However it is so lovely with so many interesting stories – it is a pleasure to sit on the grass and satisfy the simple pleasures of using a key. We started on the amenity grassland adjacent to the car park where we were joined by interested onlookers, dogs and picnickers. Our crack team of Shropshire Botanical Society members were Sarah Anstis-Smith, Mags Cousins, Frances Cooper, Neil and Pirkko Higson, Claire Knight and myself. On 8th July 2017 it was beautifully sunny so we settled on the grass with our Wild Flower Keys, hand lenses and botanical guides at the ready.

We started with what we could see and did a bit of plant spotting to raise our confidence. We found the inevitable daisies and dandelions, Perennial Rye- grass, plantains and even braved a moss or two just to get our eye in. We then bravely took a step over the stile and onto the meadow where a host of more interesting plants grabbed our attention and we turned to keys. One resource we found useful was a glossary to demystify some of the terms: We used the Field Studies Council fold-out chart shown in Figure 2.

We were then drawn to the plants we recognised as being different to those already seen and settled down with our Wildflower Key (Rose 2006) to key out selected species in the wet meadow. Despite being new to the game – it was interesting how our eyes were instantly drawn to two of the axiopyhtes

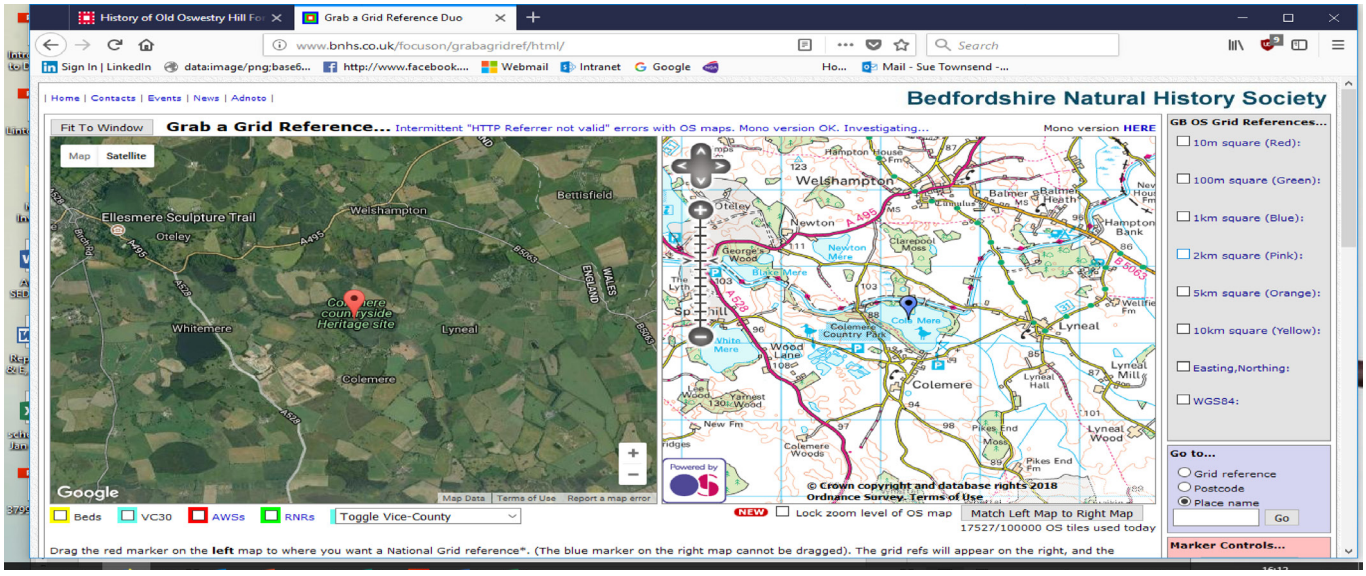


Figure 1 – Location of Cole Mere Country Park

Photo 1. A range of resources for the field

on site – Betony *Betonica officinalis* and Yellow Rattle *Rhinanthus minor* found nestled amongst the long sward of Red Fescue *Festuca rubra* and Yorkshire Fog *Holcus lanatus*.

We were very lucky to have Mags Cousins along on the day. Mags works with Natural England and the Shropshire Meres and Mosses are part of her remit. As Cole Mere is a Ramsar site for its bird interest and an SSSI for its geomorphology and a selection of botanical lovelies she was a real asset to keep us on track.

The SSSI citation states:

"There is a comparatively rich flora of aquatic macrophytes, including small pondweed *Potamogeton berchtoldii* fan-leaved water crowfoot *Ranunculus circinatus* and autumnal water-starwort *Callitriche hermaphroditica*. Lesser yellow water-lily (now known as Least Water-lily) *Nuphar pumila* occurs here at what is probably its only English locality – the main centre of distribution of this species is the Scottish Highlands.

Most of the surrounding woodland is of artificial origin but is included in the site since it is of value as a habitat for birds and adds to the diversity of the site. However, near the eastern end there is an area of semi-natural alder carr in which Greater Spearwort *Ranunculus lingua* and the rare Elongated Sedge *Carex elongata* occur. At the south-eastern end of the site there is an area of damp, rush-dominated pasture, with characteristic species such as Lesser Spearwort *Ranunculus flammula* and Carnation Sedge *Carex panicea*."

We did not find the Elongated Sedge *Carex elongata* but were delighted to find *Nuphar pumila* which has featured so much in the Botanical Society funded research with Natural England and was reported on in our last newsletter. Twenty-five axiophytes and two nationally scarce species – the Least Water-Lily *Nuphar pumila* and Twiggy Broom *Verbascum virgatum* – were amongst the 173 plant records submitted to Sarah Whild, our County Recorder, from our visit.

We all loved seeking out the Marsh Cinquefoil *Comarum palustre* shown in photograph 2 in the wetter parts of the meadow and were all very pleased to see the extent of the Meadow Thistle *Cirsium dissectum* on the edge of a wetter part of the eastern meadow. Even beginners could see these were indeed special.

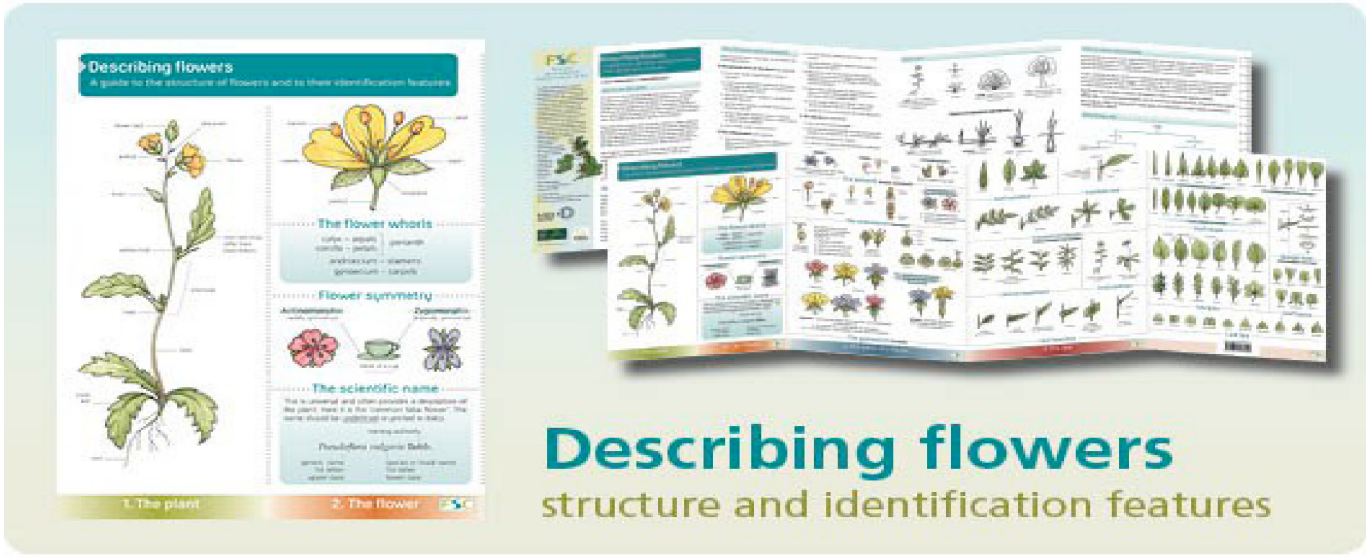


Figure 2. The FSC fold-out chart.

Photo 2 – Marsh Cinquefoil *Comarum palustre* @ Sue Townsend

Most of the records were gathered in Grid Square SJ4333 and the axiophytes recorded on the day were:

Scientific name	**English name**
Agrostis canina	Velvet Bent
Anemone nemorosa	Wood Anemone
Betonica officianalis	Betony
Carex nigra	Common Sedge
Carex panicea	Carnation Sedge
Cirsium dissectum	Meadow Thistle
Comarum palustre	Marsh Cinquefoil
Epilobium palustre	Marsh Willowherb
Equisetum fluviatile	Water Horsetail
Frangula alnus	Alder Buckthorn
Galium uliginosum	Fen Bedstraw
Hyacinthoides non-scripta	Bluebell
Hydrocotyle vulgaris	Marsh Pennywort
Luzula sylvatica	Great Wood-rush
Lysimachia vulgaris	Yellow Loosestrife
Nuphar pumila	Least Water-lily
Oxalis acetosella	Wood-sorrel
Ranunculus lingua	Greater Spearwort
Rhinanthus minor	Yellow-rattle
Scutellaria galericulata	Skullcap
Spirodela polyrhiza	Greater Duckweed
Stachys palustris	Marsh Woundwort
Stellaria palustris	Marsh Stitchwort
Succisa pratensis	Devil's-bit Scabious
Tilia cordata	Small-leaved Lime
Salix cinerea	Grey Willow

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We are grateful to the Shropshire Council and in particular Shaun Burkey for permission to use the site.

Sassy Scabious

Ruth Dawes

We have four species loosely termed Scabious in Shropshire. Field Scabious, *Knautia arvensis*, Devil's-bit Scabious, *Succisa pratensis*, and Small Scabious, *Scabiosa columbaria*, all belong to *Dipsacaceae* – Teasel family, whilst Sheep's-bit, *Jasione montana*, belongs to *Campanulaceae* – Bellflower family. I remember by telling myself that devils have sharp horns and sheep have bells in mountainous regions. Ignore Jacob's etc – don't go there!

Scabious flowers are usually blue, with the stamens well separated and the corolla split less than halfway to the base; the fruit is indehiscent and one-seeded. The Teasel family has **opposite leaves**. *Jasione montana* has dehiscent fruit with two apical short valves. The Bellflower family have **alternate leaves**. *Scabiosa* has a five lobed corolla whereas *Succisa* and *Knautia* both have 4 lobed corollas. Outer flowers are longer than inner ones in *Knautia* and bracts do not subtend the flower, whilst flowers are equal sized in *Succisa* with a bract subtending the flower.

Sadly, the lovely blue-lilac *Knautia arvensis* is becoming scarcer in our county and more restricted to small patches and individual clumps on roadsides in calcareous or neutral well drained grassland. It is always a pleasure to spot this one with its large flowers in unimproved fields. The roadside verge at Pant, Windmill Hill at Much Wenlock and fields in the Oswestry uplands are good places to see this one.

Dark violet-blue *Succisa pratensis* is more common and less fussy about habitat, tolerating wet or dry, acid or calcareous, light shade or full daylight. This late flowerer makes a fine sight en masse. There was a stunning sea blue carpet on the southern end of Llynclys Common in August 2016; how I wished I had photographed it as I had not seen it so dominant there before. Upon return in 2017 there was nothing like as much and I was told by the locals that the riding stables grazing this area had "topped" the vegetation here earlier in the year because the Devil's-bit was suppressing other useful vegetation for the horses to graze. So it is very interesting to see what changes in management do to the flora. There are fine stands of this species in the wet meadows at Colemere.

Little *Scabiosa columbaria* with its small blue-violet flowers and very finely dissected pinnate leaves is confined to our dry limestone sites and can easily be spotted at Llanymynech Rocks reserve.

Tiny sky-blue *Jasione montana* with its alternate, undivided leaves, prefers acid soils on walls, cliffs and banks, often in sandy, rocky places. It is usually found in our hill country, including Earl's Hill, but also in the sandy soil of lowland Prees Heath.

Species	Leaves	Flowers	Colour	Habitat
Knautia arvensis Dipsacaceae	Lower simple, upper pinnate, opposite	Corolla 4-lobed, Outer longer than inner. No bracts in florets	Blue-lilac	Dry grassy places, usually on light soils
Succisa pratensis Dipsacaceae	Simple, entire, opposite	Corolla 4-lobed, Equal-sized. Epicalyx extending beyond florets	Dark blue-violet	Wet and dry Acidic and calcareous Light and shade
Scabiosa columbaria Dipsaceaeae	Finely dissected and pinnate, opposite	Corolla 5-lobed, unequal. Bracts amongst florets	Blue-lilac	Dry calcareous
Jasione montana Campanulaceae	Oblong with petioles, alternate, undivided	In terminal congested heads. Dehiscent fruit	Sky-blue	Acidic, often sandy, rocky, bare

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Jasione montana

Scabiosa columbaria

Knautia arvensis

Succisa pratensis

The Marsh Gentians of Cramer Gutter

Fiona Gomersall

Marsh Gentian *Gentiana pneumonanthe* was first recorded at Cramer Gutter SSSI in 1962 by Charles Sinker when a Miss Aston showed him the plants, stating that they had been there at least since the 1950s. The earliest botanical records known for the site were made by the local botanist George Jordan (1783-1871) although he did not record the gentians. Cramer Gutter is now the only site for *Gentiana pneumonanthe* in the whole of the Midlands, the plant having disappeared from all other sites in this part of England.

The Marsh Gentian was already in decline in Britain by the 1930s and by 1962 had been lost from numerous sites. This was due mainly to drainage, development and neglect. The species is found in a number of locations in Hampshire and on a few reserves in Anglesey, for example Cors Erddreiniog NNR and Penrhoslligwy SSSI where there are relatively strong populations.

Cramer Gutter is a small, 4 ha Shropshire Wildlife Trust (SWT) reserve adjacent to Catherton Common lying within the parish of Farlow in south-east Shropshire. The site was purchased by SWT in 1988 with a grant from the Worldwide Fund for Nature.

The geology of the site is complex but mostly Millstone Grit and Old Red Sandstone which gives

rise to acid soils. However calcareous groundwater originating from an outcrop of Carboniferous Limestone at Oreton seeps to the surface on the reserve, giving rise to base-rich flushes.

The most interesting habitat of Cramer Gutter is the mosaic of M15b *Scirpus cespitosa-Erica tetralix* wet heath and M21b *Narthecium ossifragum-Sphagnum papillosum* mire. H8 *Calluna vulgaris-Ulex gallii*, dry heath dominates the site however and there is a fairly large area of MG6 *Lolium perenne-Cynosurus cristatus* semi-improved grassland. There are also small areas of both M23 *Juncus effusus/acutiflorus-Galium palustre* rush pasture and M6 *Carex echinata-Sphagnum recurvum* mire.

Gentiana pneumonanthe is found in the M15/M21 wet heath and mire in the centre of the reserve. Other species growing here include: Bog Asphodel *Narthecium ossifragum*, Common Cottongrass *Eriophorum angustifolium*, Round-leaved Sundew *Drosera rotundifolia*, Cross-leaved Heath *Erica tetralix*, Bell Heather *Erica cinerea*, Purple Moorgrass *Molinia caerulea* and Western Gorse *Ulex gallii*. Both of these latter species tend towards dominance on Cramer Gutter and the neighbouring Catherton Common. *Molinia* has increased by around 20% on Cramer Gutter over the last few years.

Gentiana pneumonanthe flowers from mid-August through to September and is counted annually on the reserve (see graph).

Between 1962 and 1987 the *Gentiana pneumonanthe* population on Cramer Gutter rose. The gentian grew in three clusters: mainly in a flush below the pond but also in the damp, open central part of the reserve and in its north-west corner. Francis Rose counted over 200 plants in 1987 but by 1995 the population had fallen to 80 (Lockton and Whild, 1991).

SWT has managed the reserve over the years by mostly cattle but also some sheep grazing and pre-2000, the gorse was periodically burnt by the grazier. The cattle tackled the grass well but had little impact on the gorse. It was decided to stop gorse management by burning as the practice appeared to lead to stronger gorse growth.

A decision to flail the gorse (which by this time was tall and covering quite a large area) was not made until the winter of 2006. There was a flush of gentians the following summer (97 were counted) but the numbers of plants have fallen steadily since, although there are fluctuations from year to year. There have been various efforts at gorse management since 2006 (with an accidental fire in 2015) but only 12 plants were counted in 2017. The gentians now grow in only one cluster, in the M15/M21 wet heath in the centre of the reserve. Management appears to have given rise to a homogenous vegetation in this area, where *Molinia caerulea* is dominant. Cooper (2017) analysed the data between the years 1962-2017 and has summarised this in the graph shown. Dan Wrench carried out statistical analysis of the trend and added this to the graph with Cooper's permission. The logarithmic analysis indicates that the gentian is in long term decline.

Highland cattle, looking towards Catherton Common

Cramer Gutter is a remote site, far from the Trust headquarters in Shrewsbury and there have been consistent problems over the years securing the right grazing for the site.

Gorse on Cramer Gutter

Six members of SWT staff and Trustees visited three *Gentiana pneumonanthe* sites in Anglesey in August 2017 to look at habitat and management prescriptions used by colleagues in Natural Resources Wales. Professor Ian Trueman very kindly wrote up the field visit and the following is a summary with Trueman's conclusion: the habitat at Cors Erddreiniog where *Gentiana pneumonanthe* is frequent is predominantly H8 *Calluna vulgaris-Ulex gallii* heath and the site is cattle grazed and subjected to a winter burn every 5-10 years. The cattle are excluded from the heath in the first season but thereafter seasonally graze the site. After 3 years, neither *Molinia caerulea* or *Ulex gallii* is dominant and the gentians thrive. Penrhosiligry SSSI, another good *Gentiana pneumonanthe* site on Anglesey, also has H8 heath (albeit at the damper end). Rodwell (1991) states that H8 heaths typically lack *Erica tetralix* (a species of wet heath and mire) and yet, along with Cramer Gutter both Anglesey sites include *Erica tetralix*. Trueman concludes that all three sites are transitional with wetter communities and that this is the optimum habitat for *Gentiana pneumonanthe* (Trueman, 2017).

This winter the gentian area at Cramer Gutter will be burnt and stock excluded until the following season. Some seed was collected last autumn and an attempt will be made to germinate these.

Chapman *et al*, (1989) state that populations of *Gentiana pneumonanthe* can persist for years without recruitment of young plants if the sward of a site is dense and dry. Although conditions may be altered to favour the gentian, it may be that the population is too old to produce viable seed. It may be that we are too late to save the population of *Gentiana pneumonanthe* at Cramer Gutter but we can only hope that this winter's management may have positive results.

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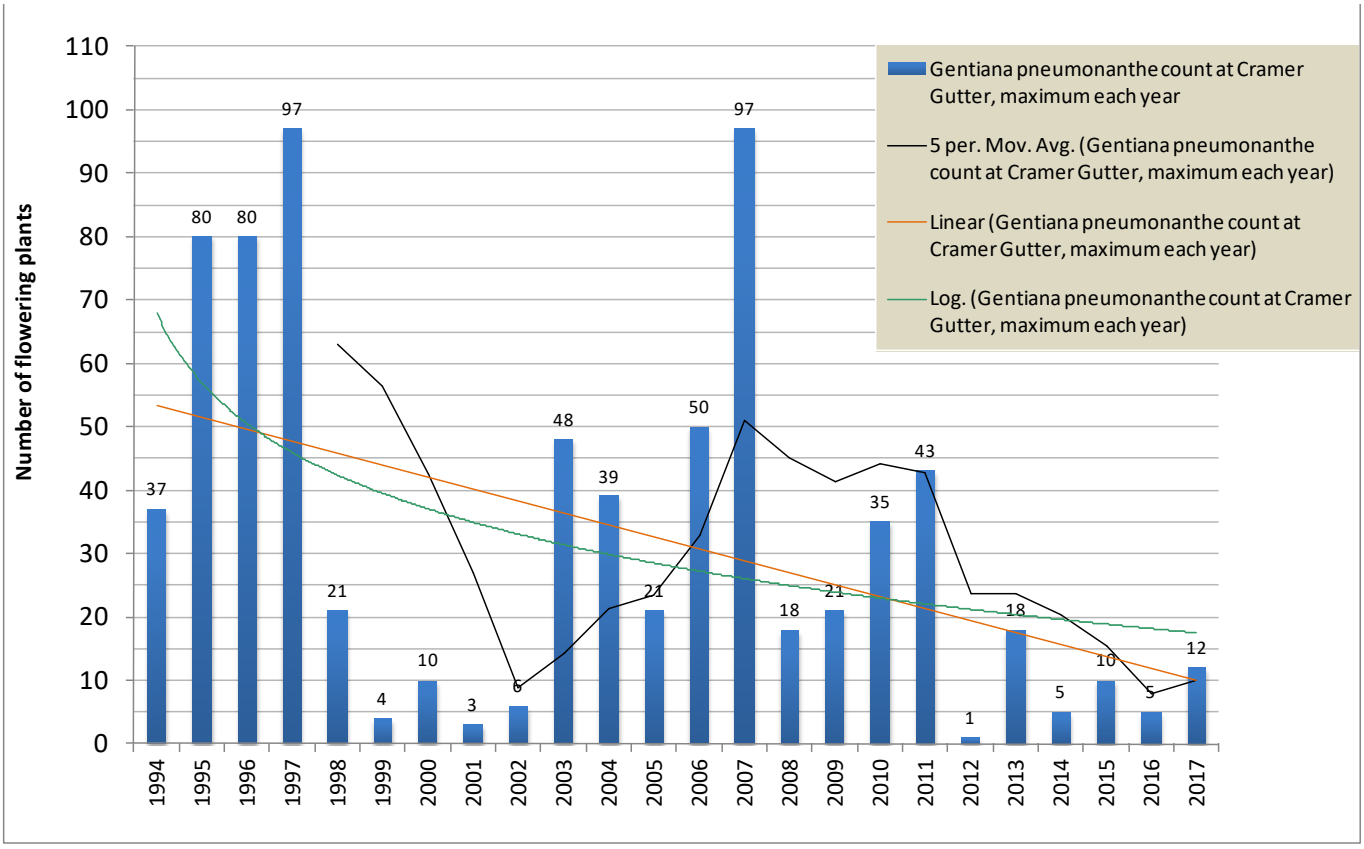

Evaluating the progress of habitat restoration at Prees Heath, Shropshire

Frances McCullagh

As reported in previous Society Newsletters (Lockton, 2013, Lewis, 2013) Butterfly Conservation bought 60 ha of Prees Heath Common in 2006, including the area designated as a Site of Special Scientific Interest, with the intention of reverting the approximately 29 ha of adjacent arable land to heath and acid grassland to increase the area of habitat suitable for Silver-studded blue butterfly (Davis, *et al.*, 2011).

In 2007, at the start of the restoration process, the existing semi-natural vegetation communities at Prees Heath Common reserve were surveyed, using the National Vegetation Classification (NVC) (Rodwell, 2006). Much of the site was bare sand, following deep ploughing, so the focus was on existing vegetation, south of the A41, primarily SSSI. The main vegetation types recorded along the runways were U1 *Festuca ovina-Agrostis capillaris-Rumex acetosella* acid grassland often in a mosaic with H8 *Calluna vulgaris-Ulex gallii* heathland with some W10 *Quercus robur—Pteridium aquilinum-Rubus fruticosus* woodland (Whild Associates, 2007).

Butterfly Conservation have been working to restore grass and heath communities since then using various combinations of deep ploughing, sulphur applications and repeated seeding and plug planting (Lewis, 2015). The management between 2007 and 2014 is summarised in Table 1 below. This shows that repeated treatments to add seed have been applied to the various areas. Recent research has shown that repeated applications of seed improve the chances of establishing target species in meadow restoration (Baasch, et al., 2016). There were early concerns about the mobility of bare sand and obviously the ongoing impact of agricultural weed species including Ragwort *Senecio jacobea,* Rose-bay Willow-herb *Chamaenerion angustifolium,* docks and thistles. All the areas have had regular spot spraying or weed wiping with glyphosate to treat weeds, although area 4 did not require this until after the deep ploughing. There has been ongoing work to control invasive weeds and scrub and to plant plug plants since then.

Obviously, this is not an experiment with replicated trials, it is an example of restoration where you keep trying until it works. However it is still important to evaluate the restoration periodically and identify if tweaks in management are needed. Evaluation of success is still a growing science, using a variety of measures like indicator or keystone species but it is also important to use a reference site for comparison (Miller, 2007, Wortley, *et al.*, 2013).

When should the restoration be considered a success at this site? Is it when Heather *Calluna vulgaris* is established? When the Silver-studded blue butterfly colonises? Or when the habitats start to resemble the reference vegetation? Arguably the answer to all these questions should be yes, at least as steps along the way.

In early summer 2017 a vegetation survey was undertaken to describe the existing semi-natural habitats present across the common, both SSSI and non-designated land, (the reference habitats) and to compare these to the restoration areas. This information can be used to look at the National Vegetation Classification for the areas, to look at condition assessment e.g. frequency of positive and negative indicators and also the host and nectar plants for Silver-studded blue butterfly.

National Vegetation Classification

Looking at the National Vegetation Classification for Prees Heath raises some interesting questions (table 2). Using the computer program MAVIS (CEH, 2015) to analyse the quadrat data showed that none of the communities, reference or created, are a good fit for national vegetation types, with a wide range of affinities suggested including sand dune. The paper keys (Rodwell 1991 *et seq.*) have been used to finalise an NVC community based on likelihood in the county and the amount of dominant species e.g. *Calluna vulgaris.* Created heath and reference grass are very obviously different habitats, although they might be best 'labelled' as U1 grassland. In fact all the habitats

Table 1: Summary of management treatments by area at Prees Heath common reserve. (Source: Lewis, 2015)	
Area	**Treatment**
Area 1, Control tower field (CT) Ex-arable, approx. 4.5 ha.	2007 - Deep ploughing to 60cm. 2cm depth bracken compost. Approx. 13kg/ha local meadow seed (including Melverley Meadows SSSI).
Area 2, Hangars field (HF) Ex-arable, approximately 6.5ha	2007 - Deep ploughing to 90cm, Sulphur approx. 1.2 tonnes/ha. 0.8kg of *D. flexuosa* (sourced on reserve) sown on western 0.5ha. *C. vulgaris* brash spread and compressed onto soil. 2008 – *E. cinerea* and *D. flexuosa* seed, harvested on site, in two applications. 2009 – 10,000 *E. cinerea* plug plants (grown from seed harvested on site), plus broadcast *E. cinerea* seed. 2012 – brush harvested *C. vulgaris* seed added 2013 - brush harvested *C. vulgaris* seed added 2014 - 2ha of tall heather cut with disc harvester
Area 3, east of runway (ER) field, meadow creation (approx. 8ha)	2007 - Deep ploughing to 90cm. 10kg of *A. capillaris* (Shropshire sourced) 2008 – mix of local and seed merchant meadow seed at ~ 20kg/ha to prevent sand erosion. 2009 – 40m diameter pond dug. 2010 – Local meadow seed approx. 2kg/ha. 2012 –pond spoil area – boom sprayed 2.5ha around pond. Harrowed, seeded and rolled with local meadow mix plus additional grass seed.
Area 3, east of runway (ER) field, heath creation (approx. 6.5ha)	2007 - Deep ploughing to 90cm. 10kg of *A. capillaris* (Shropshire sourced) Approx 1.2 tonnes/ha sulphur and *C. vulgaris* brash applied 2009 - 6.5 ha cut, collected and disposed of vegetation. Power harrow to root out mat of dead grass where needed. *C. vulgaris* brash applied. 2010 - *C. vulgaris* brash applied. 2012 – brush harvested *C. vulgaris* seed added 2013 – brush harvested *D. flexuosa* seed broadcast
Area 4, Corner field (CF) approx. 2.5 ha (a further 1 ha of this field, nearest the wood has not been treated).	2010 Boom sprayed. Deep ploughed to 90cm. 1.75 tonnes/ha sulphur. *C. vulgaris* brash applied. 2012 – wildflower & grass seed mix from seed merchant 9.5kg/ha. 2012 – brush harvested *C. vulgaris* seed added 2013 – wildflower & grass seed mix from seed merchant 9.5kg/ha. *C. vulgaris,* and some *E. cinerea* seed broadcast 2014 – *C. vulgaris* brash (from Hangars field) plus *E. cinerea* seed.

whether grass, 'heath', reference or created, could have been classified as grassland habitats. All the reference 'heath' is in very small patches with lots of grassland indicators present, so grassland communities could validly have been selected, even though the cover of dwarf shrubs was over 25%. The best match is for the created grass (using a meadow seed mix). However the created grassland is still species poor, whether it is considered as neutral grass or lowland acid grass (see condition assessment below).

Positive indicators

Another way of comparing habitats is to look at the frequency of axiophytes and positive indicators. Common standards monitoring includes a list of positive indicator species for habitats (JNCC, 2004, JNCC, 2009), not all of which would be considered as axiophytes, as they are not rare, but are still important components of those habitat types. In general reference habitat types had both more species and more combined indicator species than created habitat types, as shown in Table 3. As a measure of the evaluation of the progress of restoration at Prees Heath, this shows that created

Table 2: Top 3 results from MAVIS for habitat groups at Prees Heath

Habitat Group	Top 3 results from MAVIS	Best fit NVC community using keys
Reference Heath	U4a 47.10 SD12a 44.03 U1d 43.85	U1/H8
Created Heath	U1 46.19 U1b 40.82 U1d 38.44	U1/H12
Reference grassland	U1 45.49 U4b 45.42 U1d 44.92	U1
Created grassland	MG5 56.48 MG5a 56.05 MG6b 55.76	MG5

Numerical values are % similarity between the vegetation of the habitat groups and the published tables of Rodwell. Values can range between 0 - 100%; <50% is generally considered a poor fit but there are no absolute definitions.

habitats have not yet achieved similarity based on the numbers of indicators found.

Created heath had eleven indicators at lower frequencies than the reference heath including lower frequency of both Bird's-foot-trefoil *Lotus corniculatus* and Bell Heather *Erica cinerea,* the nectar species for Silver-studded blue. Only three indicators are present at higher frequencies in created habitats and one of those is Wavy Hair-grass *Deschampsia flexuosa,* one of the specifically sown species.

Interestingly the undesignated grassland north of the A41, was of equal quality to the grassland found in the SSSI area.

For grassland, fourteen indicators are found at higher frequencies in reference grass (see Table 4). Notably the host plant and one of the two main nectar species for Silver-studded blue are absent from created grass areas. Compared to the reference grass, the created areas have much less Mouse-ear-hawkweed *Pilosella officinarum,* Common Centaury *Centaurium erythraea, Calluna vulgaris,* Sheep's Sorrel *Rumex acetosella* and Silver Hair-grass *Aira caryophyllea.* However the created areas have a higher frequency of Eyebright *Euphrasia officinalis* agg. and Common Knapweed *Centaurea nigra.*

Common Standards Monitoring

Common standards monitoring (CSM) will look at numbers of positive indicators, but also looks at negative indicators to flag up management issues along with structural elements like bare ground for the benefit of species using those habitats. The created heathland is lacking the nectar plants for Silver-studded blue butterfly *Erica cinerea* and/or *Lotus corniculatus,* and there are still frequent negative indicators, mainly agricultural weeds and birch seedlings. The created grass areas do not meet the CSM target for the frequency of positive indicator species. Most grassland types

Table 3: Differences between reference and created heath habitats

Species name	% quads reference heath	% quads created heath	Diff. between reference and created heath	Indicator type
Pilosella officinarum	90	0	90	Indicator
Carex pilulifera	70	0	70	Axiophyte
Lotus corniculatus	80	33	47	Indicator
Erica cinerea	100	58	42	Axiophyte/CSM indicator
Cladonia [spp]	90	58	32	Indicator
Danthonia decumbens	30	0	30	Axiophyte
Veronica officinalis	30	0	30	Axiophyte
Aphanes arvensis agg.	40	17	23	Indicator
Carex flacca	20	0	20	Indicator
Leontodon hispidus	20	0	20	Indicator
Leucanthemum vulgare	20	0	20	Indicator
Myosotis discolor	20	42	-22	Axiophyte
Molinia caerulea	0	42	-42	Axiophyte
Deschampsia flexuosa	50	100	-50	Axiophyte

Table 4: Differences between relative amounts of combined indicator species for reference and created grassland.				
Species name	% quads reference grass	% quads created grass	Difference	Indicator type
Pilosella officinarum	67	0	67	Indicator
Centaurium erythraea	58	0	58	Indicator
Calluna vulgaris	50	0	50	Axiophyte/CSM indicator
Rumex acetosella	58	10	48	Indicator
Aira caryophyllea	42	0	42	Axiophyte/CSM indicator
Cladonia [spp]	58	20	38	Indicator
Filago minima	33	0	33	Axiophyte
Spergularia rubra	33	0	33	Axiophyte
Leucanthemum vulgare	33	0	33	Indicator
Aphanes arvensis agg.	58	30	28	Indicator
Trifolium campestre	25	0	25	Axiophyte
Erica cinerea	25	0	25	Axiophyte/CSM indicator
Ornithopus perpusillus	33	10	23	Axiophyte/CSM indicator
Aira praecox	42	20	22	Axiophyte/CSM indicator
Euphrasia officinalis agg.	0	30	-30	Axiophyte/CSM indicator
Centaurea nigra	8	60	-52	Indicator

need at least 2 frequent and 4 occasional positive indicators. Prees Heath reference grassland has 5 frequent and 2 occasional positive indicators for lowland acid grassland. The created grassland has just 2 frequent positive indicators (*Lotus corniculatus* and *Euphrasia officinalis* agg.) for MG5 grassland type, and this is based on larger quadrats. They lack *Calluna vulgaris* and *Erica cinerea* host and nectar plant for Silver-studded blue and again the frequency of agricultural weeds is too high. On the plus side there is a good frequency of the alternative nectar plant *Lotus corniculatus*.

In other news

In 2016, Butterfly Conservation did a full count for Silver-studded blue across Prees Heath Common, including areas outside of regular transects e.g. restored areas and land north of A41. As a result a total of 2954 butterflies were counted with most of the population found on the main SSSI runway, but there were also good numbers north of A41 with smaller numbers appearing in the created habitats particularly the older areas (Lewis, 2017). Evidence of breeding (egg and caterpillar) have been found in the first two of the three heathland creation areas (Lewis pers com.). Four Silver-studded blue were also recorded in July 2017 in the land newly acquired by Shropshire Wildlife Trust, the furthest north part of Prees Heath Common (Lewis, 2017).

Freshwater Habitats Trust looked at the pond created within the Prees Heath restoration area (Williams, 2017). They found 28 plant species, making it richer than most ponds in the countryside. It has a combination of both acidic bank-side wetland plants including Sharp-flowered Rush *Juncus acutiflorus*, Bog Pimpernel *Anagallis tenella*, growing alongside more calcareous Blunt-flowered Rush *Juncus subnodulosus* and Bristly Stonewort *Chara hispida,* which suggests that the groundwater feeding the pond must be calcium rich.

Prees Heath's pond flora included a number important species:

- Lesser Spearwort *Ranunculus flammula* has recently been included on the England Red List because of an estimated occupancy decline of 32% in England in last 10 years (http://bit.ly/2wYzpfg).
- Ragged-robin *Silene flos-cuculi* is now designated as Near Threatened in England because of a marked decline.
- Orange Foxtail *Alopecurus aequalis* borders on being red-listed with a worrying 42% decline in England (http://bit.ly/2wYzpfg).
- Bristly Stonewort *Chara hispida* although not red listed, is an uncommon stonewort. There are exceptionally few modern records of this species in Shropshire, making this an important county record.

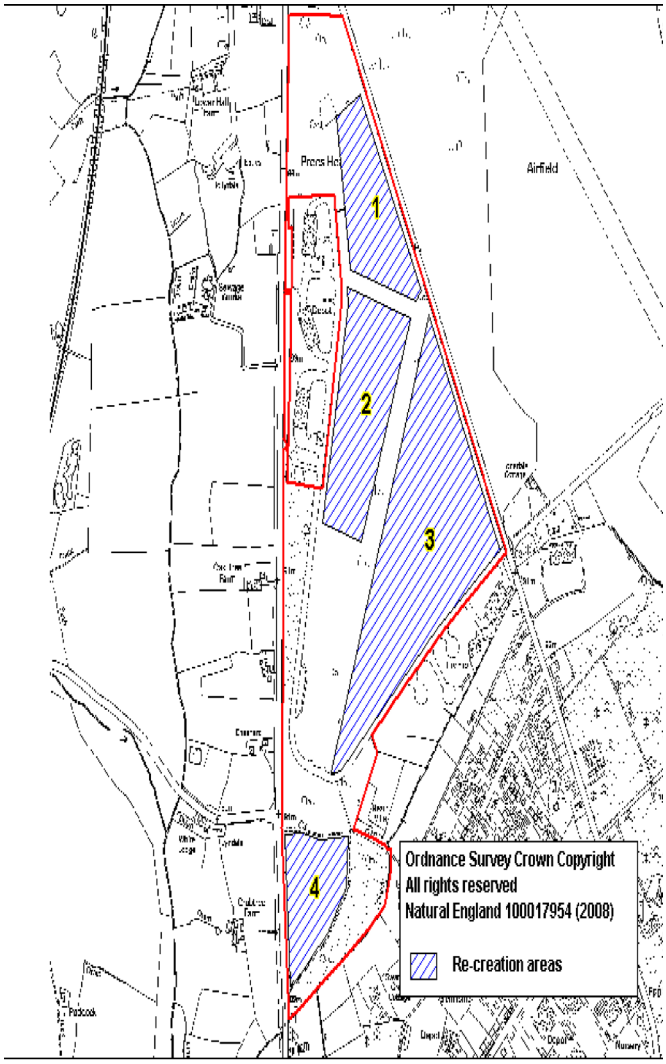

Figure 1: Habitat creation management compartments at Prees Heath Common Reserve. (Source: Lewis, 2015).

Discussion

So what can we learn from a study like this? The NVC can be a bit of a blunt tool when looking in this level of detail at a specific site, or indeed for setting targets for restoration. Comparing the frequency of positive indicators is a good way to see whether the restoration is approaching surrounding reference vegetation. It may also help to suggest next steps in terms of restoration.

The requirements of Silver-studded blue butterfly are relatively well understood compared to many species. The key requirement is the presence of abundant black ants along with the larval food plants, adult nectar sources, bare ground, short vegetation for egg-laying and taller vegetation for shelter and communal roosting (Lewis pers com.). It probably doesn't mind whether we label the habitat as a heathy grassland or a grassy heathland.

In order to create heath in favourable condition, for CSM, there would need to be 25-90% cover of ericoid species. The upper target would not be desirable for the Silver-studded blue, which needs lots of pioneer heather and bare ground. In many respects the restoration at Prees Heath is still in the very early stages, but the fact that the butterfly is using the restored areas has to be a very positive sign. There will be an ongoing requirement to manage agricultural weeds and tree seedlings, and management needs to make sure that neither *Calluna vulgaris* or *Deschampsia flexuosa* become over-dominant. This is clearly undesirable both in terms of re-creating the desirable vegetation, or to deliver the needs of the Silver-studded blue butterfly. Positive indicators will move around the site over time, but there may be things that can be done to help speed this up, including considering using larger grazing animals, and possibly moving small turves into the restored areas.

The pond survey is also thought provoking. Brown Moss SSSI/SAC is less than 1km away from the most northern part of Prees Heath Common. It would be helpful to think of these sites as part of a complex and aim to create more ponds and wetlands between Prees Heath SSSI and Brown Moss, but also look at the heathland areas at Brown Moss with a view to enhancing them.

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Figure 2: Reference heath at Prees Heath Common.