

# BSBI News

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**Edited by Trevor James & Gwynn Ellis**

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*Baldellia ranunculoides* ssp. *ranunculoides* showing typical solitary growth form and relatively small, non-overlapping petals



*Baldellia ranunculoides* ssp. *repens*, showing dense growth form and large, overlapping petals

Both photos A Jones © 2014 (see p. 4)



Irish Ladies Tresses (*Spiranthes romanzoffiana*) habitat at Glen Park, Isle of Rum with photo of single plant inset. Both photos M. Ingram © 2014 (see p. 31)

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**Cover picture:** – Composite image of species recorded in flower during New Year Plant Hunt at Glengarriff Nature Reserve, Co. Cork. Photo L. Marsh © 2015 (see p. 82)

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## IMPORTANT NOTICES

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### From The President

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The inclusion with this mailing of a circular for *British Birds* (BB) magazine (a reciprocal arrangement with their publisher) has tempted me to ruminate briefly on a long-standing passion that has evolved alongside my involvement in British and Irish botany. BB has established itself as essential reading for birders of all persuasions, combining scholarly articles on ecology, systematics and identification with up to the minute reports on the occurrence of rare breeding species, migrants and vagrants. Despite a professional career centred largely on applied entomology, birds and plants have been the primary targets of my spare-time interests in natural history, taking me to some far-flung and exotic locations as well as the diverse range of habitats available closer to home.

In 2013, the BSBI exhibited at British 'Birdfair' (the birdwatcher's equivalent of Glastonbury) at Rutland Water with an award-winning stand and the offer of a lecture slot. At Louise Marsh's suggestion I gave a talk entitled 'Botany for Birders', exploring light-heartedly some parallels and contrasts in the activities between botanists and ornithologists, and connections between the disciplines. From a recording perspective, birders do enjoy some advantages. In

Britain the number of regularly-occurring bird species is approximately one-sixth that of vascular plants. In addition, birds move around to betray their presence and birdsong is an invaluable aid to identification. On the other hand plants stay where they are, allowing for detailed examination and a return visit if necessary. One potential cause of confusion for a birder/botanist is that the independent existences of the International Codes for Botanical and Zoological Nomenclature permit the same genus names to be applied to plants and animals. Thus, *Oenanthe* can refer to a water-dropwort or a wheatear, and *Prunella* to a self-heal or a hedge-sparrow!

One obvious contrast is that birding communities throughout the world are much larger than botanical ones, and prominent ornithological societies have access to resources that the BSBI can only dream about. This fundamental imbalance is totally at variance with the importance of these groups of organisms in shaping ecosystems and supporting biodiversity as a whole. Some ways of getting plants a better press and increasing people's interest in botanical recording were discussed at a recent meeting of the BSBI Council with the assistance of Mike McCarthy, former environmental editor and now environmental

columnist for *The Independent* newspaper. The discussion was wide-ranging but Mike was firmly of the view that there is very strong inherent public interest in plants (witness 385,000 members of the Royal Horticultural Society) that BSBI should be tapping into by communicating its role and achievements in more popular terms, and by identifying and gaining credit for public interest stories that emerge from its recording work. This is already underway as a key part of our publicity and outreach strategy, which has succeeded in attracting media attention for events such as the launch of the *Vascular Plant Red List*

for England and the New Year Plant Hunt (see Louise's report on page 82), but a lot more remains to be done.

The coming season promises to be exciting and productive, with this year's Annual Summer Meeting in Northern Ireland, publication of the *Hybrid Flora of the British Isles*, the first full year of the National Plant Monitoring Scheme and an impressive range of field meetings supporting the Atlas 2020 project as well as providing numerous training opportunities. Please take part and I hope you manage some rewarding and enjoyable botanising (and birding if appropriate!) over the next few months.

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### Notes from the Editors

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Another bumper issue this time, and our thanks to all contributors.

I am delighted to report that my fellow editor, Trevor, is making excellent progress after his operation last December. I am not saying his relative lack of involvement with the last issue is the reason for the unusual number of errors noted below, but it is a relief to have him more or less back to normal!

#### **Corrections to telephone numbers listed in the Administration and Important Addresses pages of *BSBI News* and *BSBI Yearbook***

A digit has been missed from our President Ian Denholm's mobile telephone number. The full number is 07974 112 993; the last digit (3) was omitted.

Louise Marsh's mobile telephone number, was also incorrect; her correct number is: 07971 972 529.

#### **Corrections to dates of Field Meetings *BSBI Yearbook 2015*.**

On page 50, Janice & John Conaghan meeting in West Mayo, Ireland is of course on **Saturday 29<sup>th</sup> August** not Tuesday.

Also on page 50, the dates of the *Atriplex* workshop in Bangor and Anglesey in September have now been changed from 11<sup>th</sup> to 13<sup>th</sup> to **18<sup>th</sup> to 20<sup>th</sup>** to fit when the Referee, John Akeroyd, can attend.

#### **Corrections to List of Irish VCRs in *BSBI Yearbook 2015***

A number of errors crept into the list and a replacement sheet is enclosed with this mailing which should be inserted after page 16 of the *Yearbook*.

## NOTES

### ***Baldellia ranunculoides* (Lesser Water-plantain) ssp. *ranunculoides* & ssp. *repens***

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*Baldellia ranunculoides* s.l. (Lesser Water-plantain) could be one the most important and least understood taxa in the British and Irish flora. It is endemic to the Atlantic countries of Europe and N. Africa, with a few Mediterranean outliers, but has recently undergone a serious decline across this range (Preston & Croft, 2001; Koslowski *et al.*, 2008). The British and Irish populations represent a large part of the species' global distribution and we

therefore have a significant responsibility for its conservation.

At the same time, however, there seem to be two subspecies, if not species, of *Baldellia* in Britain and Ireland – not to mention a possibly variable hybrid. The two principal taxa, referred to here as subspecies, are distinguished on the following characters (adapted from Koslowski *et al.*, 2008) (see also inside Front Cover):

<i>Baldellia ranunculoides</i> ssp. <i>ranunculoides</i>	<i>Baldellia ranunculoides</i> ssp. <i>repens</i>
Plant: ± 50cm high, almost always erect, rarely with prostrate inflorescences (and then very rarely rooting), with usually robust stems up to 3mm thick.	Plant: weak (but not always), creeping, rooting at the nodes of the inflorescence, with leaf rosettes up to 20cm high, with delicate, thin stems up to 1mm thick.
Flowers: small (± 15mm in diameter, rarely up to 18mm); petals not overlapping at anthesis.	Flowers: much larger (up to 22mm in diameter), petals overlapping at anthesis.
Breeding system: self-compatible.	Breeding system: self-incompatible.
Whorls of inflorescence: many (15-20) flowered.	Whorls of inflorescence: few (up to 5) flowered.
Fruit-stalks (peduncles): erect or arched-ascending.	Fruit-stalks (peduncles): vertically divergent, the top bent downwards.
Fruit-heads: large, up to 8mm across.	Fruit-heads: smaller, about 5mm across.
Number of fruits per head: up to 45.	Number of fruits per head: 15 (-20).
Fruit: 2½mm long, without papillae, deeply keeled (>1mm wide) and smooth, with an acute beak and without numerous hyaline papillae when ripe (×20 magnification).	Fruit: 2mm long, with numerous papillae, narrow (<0.9mm wide) with a persistent hooked beak and numerous hyaline papillae when ripe (×20 magnification).
Inflorescence: upright umbel or tier of 2(-3?) whorls without leaves, growing from c. April - August.	Inflorescence: decumbent, leafy, indeterminate shoot, usually rooting at nodes and growing throughout the year.
Habitat: temporary gaps within calcareous or mildly brackish pools, dune-slacks, ditches and mesotrophic water-bodies.	Habitat: shorelines and long-standing gaps in weakly acidic, Littorelletean heathland pools and oligotrophic lakes.
Flowering period: June-July (-August).	Flowering-period: June-October (-November).
Population structure: scattered, detached individuals.	Population structure: locally-abundant, networks of vegetatively spreading clones.

A note setting out these differences, with excellent illustrations, was circulated in 2011 during the Threatened Plants Project, but unfortunately too late for most recorders. However, it can still be seen at [http://www.bsbi.org.uk/Baldellia\\_ranunculoides\\_subspecies.pdf](http://www.bsbi.org.uk/Baldellia_ranunculoides_subspecies.pdf).

Both subspecies are morphologically very variable and readily overlooked in the non-flowering stage. The submerged, strap-shaped leaves are also very like those of other species in the Alismataceae (e.g. seedling *Alisma plantago-aquatica*) and, in the case of ssp. *repens*, closely resemble the stoloniferous *Luronium natans* (Floating Water-plantain). Fortunately, all forms of *Baldellia* are identifiable by the strong smell of Coriander in the crushed leaves.

Plants corresponding to *B. ranunculoides* ssp. *repens* are known from the Upper Killarney Lakes, South Kerry (v.c.H1), near Carmel Head, Anglesey (v.c.52) and, formerly, the Beaulieu River, Mid-Perth (v.c.88), with unconfirmed records from E. Norfolk (v.c.27) and the Channel Island (v.c.113) etc. Several accounts (e.g. Gilmour & Walters, 1954) suggest that it is, or was, more widespread and stoloniferous *Baldellia* is potentially overlooked. Intermediates with ssp. *ranunculoides* are also known, however, especially around St Davids, north Pembrokeshire (v.c.45) (Jones, 2006), and recent genetic work indicates a 'hybrid zone' in north-west Europe (including Britain and Ireland), with introgression between the two taxa (Arrigo *et al*, 2011). These studies actually find evidence to support the existence of the two taxa as full species: *B. ranunculoides* s.s. and *B. repens*, linked to separate south European refugia in the last glaciations.

Clearly, further information on *Baldellia ranunculoides* ssp. *repens* is very much to be desired, if only to resolve the current 'Data Deficient' status in the GB vascular plants

'Red List' (Cheffings & Farrell, 2005). This is very much a plant to look out for, especially in north-west Britain and Ireland, and, if you find any possibly stoloniferous *Baldellia* with large overlapping flowers, I would very much like to hear from you and will pay for the postage of specimens *etc.* if required.

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## Save field biology skills from extinction

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*This article appeared in Times Higher Education on 26<sup>th</sup> February 2015 and the BSBI is grateful for their kind permission to reproduce it here in full. It warns of a serious decline in graduates with sound biological identification skills. Three of the five co-authors, namely John Warren, Paul Ashton and Sue Townsend, sit on the BSBI's Training & Education Committee, which is keen to raise the profile of botany in British & Irish universities.*

It is widely accepted that the decline of field biology skills in the UK has reached crisis point. But so what? The ability to identify bugs, flowers and bird songs may be viewed as all rather quaint. The loss of these skills may be considered little different from the loss of other 'traditional country skills', such as basket weaving or Morris dancing. However, the lack of field biologists is keeping many people awake at night. Without recorders who can reliably identify bumblebees, how would we know that our pollinators are at risk and thus our future fruit crops in peril? Without records of first flowering dates, how would we know of the biological reality of climate change? Without identification skills, how would we recognise pest species threatening the economic future of our islands? The legal protection of our Sites of Special Scientific Interest is dependent on these sites containing lists of unusual species; without the ability to confirm the presence of these species much of our conservation policy has no foundations. It is estimated that each year there are less than ten UK graduates who are proficient enough in field ID skills to be employable and of these about half are arts graduates who are recreational (amateur) field naturalists. In contrast, a lack of basket weavers leaves us with a regrettable lack of willow baskets, but is hardly a cause for the national conservation agencies to call crisis meetings.

There are probably a number of reasons that have contributed to the decline in field biology. These include the rise of molecular biology, the loss of staff competent and comfortable in the field and the general

decline of outdoor experience by children. However a key factor has to be that the skills involved have been distinctly unappreciated. In fact we would argue that in educational circles this lack of appreciation goes much deeper. Educationalists have been guilty of formalising a gross undervaluing of the complexities involved in field biology. This has occurred through a naïve adherence to an incredibly damaging dogma that has influenced so much of modern educational practice. Ironically, this dogma that has been so detrimental of field taxonomy is Bloom's taxonomy.

In 1956 a committee of educationalists chaired by Benjamin Bloom proposed a classification system for learning outcomes. The objective of the group was to clarify the language used in the design of curricula and exams. They produced a theoretical framework that subsequently has been widely used to classify educational goals. There now are literally hundreds of textbooks, web pages and training courses that provide guidance on writing exam questions based around Bloom's taxonomy. These documents frequently include lists of approved learning objective verbs that are deemed appropriate when writing questions for different levels or years of study. Bloom's creed tells us that the lowest levels of cognitive skills involve recognising, identifying, naming and memorising. These abilities are considered inferior to the higher levels such as critically analysing, evaluating, criticising and reviewing. This sort of simplistic analysis has resulted in field biology skills being excluded from university



degrees time and time again as being too ‘simplistic’. However, ask those responsible for dropping these courses to distinguish *Galium saxatile* from *Galium sternerii* and they might just start to appreciate that ID skills are not so simple after all.

The *Galium* example illustrates just why those who blindly follow Bloom’s taxonomy need to learn a little more about biological taxonomy. It is not a trivial task to be able to differentiate between *closely related plants*. This is not a simple memory test. This is a task that requires critical analysis and many of the other higher skills. It demands developing logical thought processes, reviewing a host of information, and the final answer is usually arrived at on a balance of probability based on evaluating the likely underlying geology of the site where they were found. The fact is identification is not always a low-level learning outcome. Identification can involve combining many of the cognitive skills regarded as being more worthy. Thus, a field biologist would read a landscape, review the other co-occurring species and then conclude that the specimen from the acid conditions was probably *G. saxatile*. They may wish to corroborate this by using a hand lens to determine which direction tiny hooks along the

leaves point. The fact remains that to the naked eye these two plants look virtually identical. This level of complexity is why taxonomists generally take years to hone their skills, a fact that rather corroborates that it is not a low level cognitive skill.

Real taxonomists know that there are always cases when things are not black and white. Some individuals cannot be condemned to belong to one species or another by rote. Bloom’s taxonomists still need to learn this lesson. Sometimes what appear to be low level cognitive skills are in fact highly complex multifactorial tasks. We have already lost a generation of field biologists. Moreover, this lack of serious attention to identification skills has permeated down to primary schools, with connotations of the nature table and not something to be taken seriously in this technological age. Thus university students have had this dismissive message reinforced right through their schooling. If the skill set is not to be totally lost we need to act now to overcome this inertia and identify that identification is a worthy and noble set of complex skills that is likely to complement critical thinking elsewhere in the syllabus.

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### ***Taraxacum quadrangulum* Rail. new to the British Isles**

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(pryceeco@aol.com)

In recent years, during April and the early part of May, we have got into the habit of collecting a few dandelion specimens each time we are out botanising in Carmarthenshire. Encouraged by John Richards’ enthusiasm for receiving material for identification in the past and after attending the *Taraxacum* workshop at Treborth in April 2014, we are ashamed to say that we had accumulated over two hundred specimens during the last three springs and we were embarrassed to send such a large parcel to him in November. We were amazed that he said he would determine them during the following few weeks and return them by Christmas!

He was true to his word and the highlight was his determination of *Taraxacum quadrangulum*, a distinctive species of section *Ruderalia*, two plants of which were found at the edge of the tarmac playground and by the building of the disused primary school at Whitemill, near Carmarthen (SN462215) on 17<sup>th</sup> April 2012 (see Colour Section, Plate 2). The lozenge or diamond-shaped end lobe on the outer (older) leaves is diagnostic and distinctive. Its closest British relatives are *T. croceiflorum* Dahlst., which is more heterophyllous and has red-purple striped ligules with red ends, and *T. lacerifolium* G.E. Haglund, which lacks the distinctive lozenge-shaped end-lobe and is generally less robust.

In his covering letter John says that he would not normally have known what this distinctive material was, but it so happened that he had been trawling through a set of Dutch photographs that afternoon and it immediately rang a bell. It really is a very good match. John says it is one of the species Railonsala named after World War II in Finland, most of which proved to be eastern European adventives thought to have been imported with horse feed by the Nazis. It is probably adventive in the Netherlands too, but may be native in the Czech Republic. He anticipates that it will probably not last long in Britain, but it would be interesting to keep an eye out for it, particularly as the Whitemill plants were found within a few metres of the A40, a principal route for importing straw from England to sell at Carmarthen livestock mart.

Although Carmarthenshire is already relatively well covered, with a good representation of dandelion taxa, these latest collections yielded 14 new vice-county records, as well as 13 second vice-county records and 57 first hectad records! We are very grateful to John for his very prompt and enthusiastic service!

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*Taraxacum quadrangulum* Rail. Voucher specimen from Whitemill School, Carmarthen, v.c.44

## Plant recording in the Cairngorms National Park in 2014

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### Introduction

Without information on the location, distribution, frequency and populations of species, Government, Local Authorities, Conservation Agencies and NGOs would be unable to make informed decisions about many matters relating to nature conservation, the wider management of land and those factors that affect the environment. Overwhelmingly, that information has been obtained through the sustained efforts of amateur recorders over many years. I have, therefore, always felt that those who make use of this information, and hence derive a value from it, should look to support the network of recorders who actually collect the raw data on which they rely.

There are 26 Local Biodiversity Action Plans in Scotland. In the majority of cases these LBAPs cover a Local Authority area, but in two cases, Loch Lomond and the Trossachs, and the Cairngorms, the LBAP covers a National Park. Quoting from the Cairngorms National Park Authority (CNPA) website: “Cairngorms Nature is a new partnership where people and organisations come together, regardless of sector or background, with one thing in common – a desire to safeguard and enhance the outstanding nature in the Cairngorms National Park. Working together, we are more likely to achieve and share success and this means positive change for nature in the Park. Anyone can become a partner in Cairngorms Nature”.

In my limited experience of such matters, ‘partnership’ tends to mean there are no additional funds to support action on the ground and that ‘partners’ have to fund their own contributions, or seek their own funding sources; not an obviously fruitful avenue for volunteer plant recorders looking for support to cover costs incurred when recording.

Cairngorms Nature and the Cairngorms Nature Action Plan (CNAP) were officially launched in May 2013. Amongst the Outcomes and Actions listed in the Plan were

several which clearly demonstrated an overlap with what BSBI and its vice-county recorders (VCRs) were already doing and with the requirements for Atlas 2020. Text that particularly caught my eye included:

“Species mapping and monitoring will be even more comprehensive and up to date. Policy makers, practitioners and people working in the CNP will have easy access to the latest knowledge via a centralised database.

A CNP rare species dataset to inform land management.

Paid and un-paid researchers, recorders and enthusiasts already do a huge amount of good work. We would like to see this supported and developed, complementing a wide range of opportunities for people to contribute.

Highlight and encourage volunteer participation in biological recording schemes.

Support local and regional naturalist groups and biological recording schemes with training and advice.”

I thought this sounded very positive, and therefore contacted Andy Ford, the Cairngorms Nature Manager, and arranged an initial meeting to discuss whether the CNAP’s expressed wish to support recording extended to the possibility of a grant. It did! The proviso, quite correctly, was that I had to write a project proposal, and that the recording should be undertaken by a wider group of BSBI VCRs, members and other naturalists.

I approached and obtained commitments from eight BSBI VCRs and four other active recorders, and submitted a proposal to CNPA, which included a bid for travel and subsistence costs of £1,896. In return I estimated an in-kind contribution of £12,000 based on 72 man days of fieldwork, five days for data entry and three days for project management and reporting.

The primary objectives of the project were to: Update hectad (10×10km square) distributions to post 2000, in preparation for the next Atlas of the British and Irish Flora (Atlas 2020). Improve tetrad (2×2km square) scale coverage of the CNP by targeted recording in tetrads with a) few or no records in any date class, and b) with few or no records post 1987. Demonstrate the ability of the BSBI to collect and collate high quality botanical records from the CNP area, so as to benefit plant conservation in the CNP.

### Methodology

The BSBI Distribution Database (DDb) was used to map all tetrads within or overlapping the CNP with 50 or more vascular plant taxa recorded in the period 1987 – 2013. Expected taxa totals per tetrad vary enormously across the CNP from 50 or less, to (exceptionally) more than 500. The low value of 50+ taxa was chosen so as to not exclude some species-poor upland sites from the survey coverage map. Recorders were encouraged to target un-mapped tetrads. Decisions as to which tetrads to target were left up to the individual recorders.

Recorders were asked to make all records at tetrad or better grid reference precision. For the more notable records, they were asked to record at greater precision, following BSBI guidelines (Walker *et al.*, 2010). Particularly in v.cc. 94, 95 and 96, multiple records of individual notable species were made at different locations within monads or tetrads.

Each individual recorder, or group of recorders, arranged for their records to be entered into MapMate. All records were then synced to the BSBI Hub, and from there to the DDb. Once records were on the DDb, they were checked to see if grid references matched the recorded vice-county, any discrepancies being checked and corrected. Lists of taxa recorded were sent to each VCR for checking, and any suspect records investigated and corrected as necessary. Once all checking had been completed, the records were validated on the DDb, each being tagged as ‘Confirmed’.

### Results

The analyses and records referred to in this article include all plant records made in 2014 in the Cairngorms National Park (a total of 19,834), and which were on the DDb on 29<sup>th</sup> December 2014. Overwhelmingly, the records made in 2014 were directly supported by the CNPA grant, but some of the same individual recorders (and one or two additional people) also carried out other recording. Additional records made in 2014, but outwith the auspices of this project, were due to have reached the DDb early in 2015. With these additional records the 2014 total will be *c.*20,600.

A core group of 18 people collected 99% of all the records made in 2014 in the CNP. A full list of those providing records to BSBI in 2014 is given in the acknowledgements. The grant from CNP was fully spent. Eleven recorders claimed expenses; mean mileage claim was 487 miles (range 208 to 995 miles) at a rate of 40p per mile; accommodation costs totalled £144.

An electronic copy of the report to CNPA can be obtained from the author on request. In summary:

The exceptional records total in 2014 exceeds the number of records made in any single previous year in the CNP area.

Records were made within all nine vice-counties which overlap the CNP.

Records were made within 45 hectads, 236 tetrads and 396 monads, and were from 2,097 unique grid references. See Figure 1 p. 12.

In terms of increasing the geographic coverage of post 2000 recording in the CNP, there was particularly significant new recording in v.cc. 90, 92 and 96, with targeted infilling of gaps elsewhere.

All records were made at tetrad precision or better, and overall 60% of records were made at 100m precision or better.

632 species and hybrids were recorded.

624 new hectad records of 368 taxa were made. 11,073 new tetrad records of 649 taxa were made.

Four new alien taxa were recorded for the CNP and two new native hybrids.

994 records of 117 taxa included in the CNP Rare Plant Register (Amphlett, 2013) were made.

98 new hectad records of 71 taxa included in the CNP Rare Plant Register were made.

405 new tetrad records of 98 taxa included in the CNP Rare Plant Register were made.

It is invidious to cherry pick individual records or recorders, when so much has been achieved. However, a few examples of notable finds and examples of detailed recording may serve to illustrate outcomes of the project.

Two new patches of *Linnaea borealis* (Twinflower) were found, including a large patch (c.18×10m) found by Eric Meek on moorland in Glen Earnan, v.c.92. *Gnaphalium sylvaticum* (Heath Cudweed) is a notable plant of the northern part of the CNP. It is Endangered (GB Red List) and on the Scottish Biodiversity List, while its CNP status is Frequent. 35 records were made in 2014. Exceptional was Stewart Taylor's count of a minimum 6,000 plants in a field at Carrbridge, v.c.95. This appears to be the largest population ever recorded in Great Britain. *Carum verticillatum* (Whorled Caraway), CNP status Rare, was found near Whitewells in Rothiemurchus, v.c.96 in 2006. The location was surveyed in detail in 2014, and plants were recorded in 11 10×10m grid squares, within three 100m grid squares. In spring 2014, Andy Amphlett and Stewart Taylor searched areas of riverside shingle throughout Badenoch and Strathspey, looking for *Teesdalia nudicaulis* (Shepherd's Cress). This species is Near Threatened (Red List), on the Scottish Biodiversity List and has the CNP status Rare. Plants were found at 38 locations, with large populations recorded at several sites, e.g. at the River Spey/R. Calder confluence near Newtonmore. All records were made at minimum 100m grid reference precision. *Lycopodium annotinum* (Interrupted Clubmoss), Nationally Scarce, CNP status Frequent, was recorded at 21 locations in 12 tetrads, including several sites in a hitherto unrecorded part of Angus, v.c.90. *Pyrola*

*media* (Intermediate Wintergreen), Vulnerable (Red List), Nationally Scarce, Scottish Biodiversity List, CNP status Frequent, was recorded at 60 sites in 29 tetrads, with many new sites being found in v.c.92 by Eric Meek. *Salix lapponum* (Downy Willow), Vulnerable (Red List), Nationally Scarce, UKBAP, Scottish Biodiversity List, CNP status Frequent, was surveyed in detail in the Glen Markie/Geal Charn area, v.c.96 by Andy Scobie.

### Conclusion

The 2014 recording project was a great success. By providing direct financial support to volunteer recorders the CNPA helped BSBI to collect the greatest number of plant records in a single year in the CNP. A combination of targeting under-recorded areas and detailed recording of notable species, has significantly increased the overall knowledge of the flora of the CNP. In doing so the CNPA has also partially fulfilled at least six of the aims set out in the Cairngorms Nature Action Plan. The project demonstrated across vice-county boundary collaboration between VCRs, co-ordinated submission of records, and use of the DDb to collate, validate and analyse the records. Project planning, managing and reporting, and data entry took longer than estimated and budgeted for in the original proposal to CNPA. The time required to adequately address such matters should not be under-estimated. However, it was a very satisfying achievement to plan and implement this scale of project, undertake fieldwork, then submit, check and validate records, and report on the project within a calendar year.

There remain extensive areas within the CNP that lack localised modern plant records, and some areas for which there are no records at all. Further concerted and targeted recording is required to fill these gaps in our knowledge.

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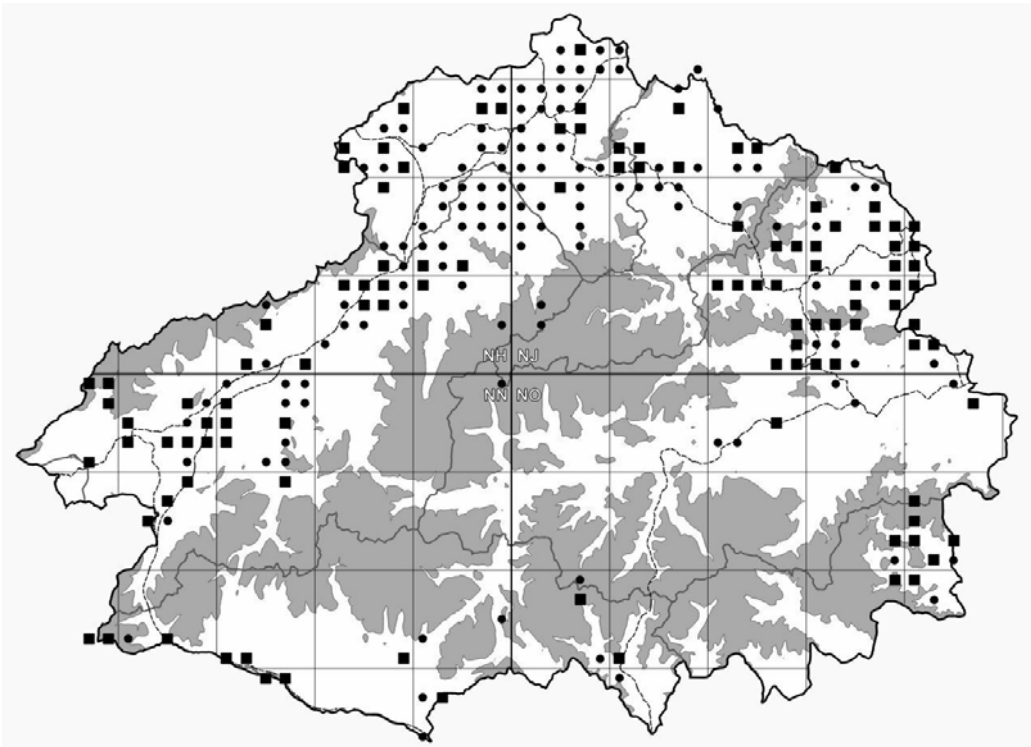


Fig. 1. Cairngorms National Park. Tetrad distribution of records made in 2014. Black squares 50+ taxa; black circles 1-49 taxa; vice-county boundaries - grey line; A roads - dashed line; land above 600m shaded; 10km grid lines - grey; 100km grid lines - black. The map utilises Ordnance Survey Open Data, and was created using QGIS 2.6.1.

## Notes on further complications in *Elytrigia* taxonomy

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While looking through specimens in various herbaria for *Elytrigia* hybrids (couch grasses), I noticed that the identifications of some specimens were evidently incorrect. It has also been suggested that the *Elytrigia juncea* (Sand Couch) subspecies should be recognised at the species level. These changes suggest further potential nomenclatural or taxonomic difficulties. *Elytrigia campestris* (Neglected Couch) ssp. *maritima* is briefly mentioned for completeness, and specimens were found that suggest a putative triple hybrid.

This is a much reduced version of a previous draft. Rather than a protracted article, it is a summary of the findings. References are given where necessary but a more comprehensive bibliography is given for information on which this study was based. Not being a taxonomist, I am unable to sort out the potential problems that arise from these findings, and these findings can be disputed by others. It is not meant to be an identification guide, which could be the focus of a separate article in future.

While Stace (2010) still uses *Elytrigia*, others no longer accept this split, based on the presence of rhizomes, and place them in *Elymus* (couch grasses) (Cope & Grey, 2009). Further study might be needed, as the rhizomatous taxa (*Elytrigia*) do not appear to hybridise with *Elymus*. Furthermore, *Elytrigia repens* (Common Couch) hybridises with *Hordeum secalinum* (Meadow Barley), and while the latter is not known to hybridise with *Elymus caninus* (Bearded Couch), an investigation is underway into a putative hybrid of Meadow Barley and Bearded Couch, which may occur in the UK. This could suggest a closer link between *Elymus* and *Elytrigia*.

Stace (2001) updated the taxonomy of *Elytrigia*, using specimens in the Oxford herbarium (OXF). The identities of some of these specimens were, in my opinion, incorrect. The following is a summary of those specimens, with all the names that were given on the specimen sheet. The accession number is given for clarity:

Summary of specimens, based on Stace (2001)

### OXF – 00097854:

*Agropyron junceum* × *A. repens*, Riddelsdell, Port Talbot, 7/1904

*A. junceum* × *A. repens*, det. Druce & Hackel  
*Elytrigia juncea* × *E. repens*, Stace, 2/2001, as lectotypus

= *E. atherica* × *E. juncea*, det. M. Wilcox, 2011

### OXF – 00097823:

*A. Hackelii*, Port Talbot, Druce, 7/1904

*A. pungens* × *A. repens*, A. Meldris in 1967

*E. atherica* × *E. repens*, Stace, 2/2001, Holotype [*E.* × *drucei* Stace]

= *E. atherica* × *E. repens*, M. Wilcox, 2011 (lacks certain diagnostic characters but on balance I agree, although not conclusive).

### OXF – 00097867:

*A.* × *hackelii*, 28614, Gt. Yarmouth, Norfolk, Druce, July 1904

*A. pungens*, A. Meldris in 1967

*E. atherica*, Stace, 2/2001

= *E. atherica*, M. Wilcox, 2011.

### OXF – 00097826:

*A.* × *hackelii*, 29845, Sker, Glamorgan, Druce, July 1904

*A. pungens* × *A. repens*, A. Meldris in 1967

*E. atherica* × *E. repens*, Stace, 2/2001

= *E. atherica* × *E. juncea*, det. M. Wilcox, 2011.

### OXF – 00097853:

*A. pungens* × *A. repens*, Blakeney, Norfolk, Druce, Aug. 1911

Confusing label with ‘× *A. hackelii*, det. Hackel’

Mentions possibly *A. pungens* × *A. repens* being at Blakeney in BEC report

*Agropyron* × *oliveri*, *E. juncea* × *E. repens*, Typus (? Holotypus), Stace 2/2001

*A. pungens* var. *littorale* × *A. juncea*, original diagnosis, Druce, 1912a, p. 38

= *Elytrigia atherica* × *E. juncea*, det. M. Wilcox, 2011.

As can be seen from this summary, for OXF-00097853, in my opinion, the original diagnosis for *Agropyron pungens* var. *littorale* × *A. juncea* (*Elytrigia atherica* (Sea Couch) × *E. juncea*) is correct. Druce never altered this on the sheet and then mistakenly used the binomial '*A. × oliveri*' for *Elytrigia atherica* × *E. repens* from then on. This was then mistakenly used in the floras that followed and recently it was subsumed (incorrectly) into *Elytrigia* × *laxa*, based on this specimen (Stace, 2001; 2010). The hybrid *Elytrigia atherica* × *E. juncea* is currently known as *E. × acuta* (see Stace, 2010). There is apparently no epithet for it in *Elymus* (Cope & Grey, 2009). Specimen OXF-00097823 has been given the new name *Elytrigia* × *drucei* Stace (again no epithet in *Elymus*, see Cope & Grey, 2009). However, while this is the most likely identification, it lacked obvious characters to be sure, such as any long hairs (to 1mm) on the upper surface of *E. repens*, and I could not find any hairs on the free margin of the leaf sheaths, a diagnostic character of *E. atherica* and its hybrids.

It is difficult to trace type specimens. The type for *Elytrigia* × *laxa* (in this case, *E. repens* × *E. juncea* ssp. *boreoatlantica*) is said to be in Uppsala (UPS), Sweden. These specimens belong to the Elias Fries collection; referred to as '*Triticum (affine?) laxum* – E. Fries, Herbarium normale, 06:94'. An examination of the specimens shows that they are *Elytrigia juncea* ssp. *boreoatlantica* × *E. repens*, e.g. V-525923 being a typical example of this hybrid. Similarly, a duplicate in Lund (LD) from the Fries Herbarium normale is correct; and there is also at least one duplicate in the Natural History Museum (BM), specimen BM0011010941. Interestingly, two other specimens, not of the Herbarium normale, one in UPS and one in LD named as this hybrid, are incorrect. The UPS specimen collected by E. Fries, 1817 [*Triticum laxum megastachium*, V-525926] is *Elytrigia atherica* × *E. juncea*; and the LD specimen [*Triticum laxum* LD-1238072] is *Elytrigia repens* × *E. atherica*, which seems to extend the range of these hybrids. Like

elsewhere in Europe, it suggests a review of herbarium material is required.

*Elytrigia atherica* × *E. juncea* is itself a complicated issue, notwithstanding the error for the Druce specimen (OXF-00097853). The nearest to a type held in Geneva (G), specimen G00303097, was thought to be originally from DeCandolle, as the label (*Triticum acutum* DC.) says "communiqué par Mr. DeCandolle" (to Moricand), but it is uncertain as to who collected it or when and where the specimen was collected. M. Ph. Moricand may have been the collector, later given to G in 1908 by his daughter, Moïse Étienne Moricand (dit. Stefano, 1779-1854). It superficially looks like *E. atherica* × *E. juncea* from a digital photo sent here. However, an examination of it showed it lacks certain diagnostic characters for either *E. atherica* × *E. juncea* or *E. atherica* × *E. repens*, but on balance the spikelets clearly suggest the former.

Further complications of nomenclature or taxonomy arise from Krisch (2007). This paper suggests that *Elytrigia juncea* ssp. *boreoatlantica* and *E. juncea* ssp. *juncea* should become species, *Elytrigia junceiforme* and *Elytrigia juncea* respectively. This would have to be altered slightly if the genus *Elytrigia* is universally accepted as *Elymus*. The two subspecies are very similar. Primarily, subspecies *boreoatlantica* (*Elymus farctus* ssp. *boreoatlanticus* in Cope & Grey, 2009) differs from the mainly Mediterranean ssp. *juncea*, in having smaller anthers (to 8.5mm), a particularly fragile raceme axis and ciliolate palea-keels throughout their length (Cope & Grey, 2009). The main problems are that, although *E. juncea* ssp. *juncea* is mainly Mediterranean, there is said to be some overlap in the west of its range (e.g. W. France), where it possibly forms hybrids with ssp. *boreoatlantica*; and the anthers are difficult to assess, as they are generally lost after flowering.

Cope & Grey (2009) still retain *Elytrigia repens* ssp. *arenosa* as *Elymus repens* ssp. *arenosus*. Scholz (1998) subsumed it into a non-British taxon, *Elytrigia campestris* as ssp.



*maritima* and this was adopted as such in Stace (2010). However, specimens used in the typification by Scholz (1998) in the Berlin Dahlem museum (**B**) were reviewed by me in **MANCH** (Manchester Museum), and also other material named by Trist (1995). Two plants in **B**, B10 0325537-94/2009-3 and B10 0325538-94/2009-4 (see images; Röpert, 2000a, b, c) were re-determined by Scholz as ssp. *maritima*. However, the latter was a small to medium sized *Elytrigia atherica*; clearly with hairs on the free margin of the leaf sheath and dehiscent anthers, but also in the main leaf ribs being distinctly square-topped and close together; the latter being another defining character of *E. atherica*. The former had an original label of *A. × obtusiusculum* Lange (*Elytrigia atherica* × *E. juncea*) but although this is a hybrid, the specimen is *E. atherica* × *E. repens*, (Wilcox, 2012).

Two other plants named by Scholz as *Elytrigia campestris* ‘ssp. *campestris*’ (B10 0020433–94/2009-1 & B10 0325536 94/2009-2) were fertile and differed in the main ribs being clearly rounded on top and well-spaced apart, not a character of *E. atherica*. At least one of two further specimens had ciliate free margins to the leaf sheath, showing that some have an affinity to *Elytrigia atherica*. These could be a further taxon at a rank yet to be decided, but they are not *E. atherica*. The taxon known as *Elytrigia campestris* ssp. *maritima* or *Elymus repens* ssp. *arenosus* does not exist (Wilcox, 2012).

While studying the hybrid plants in **OXF**, I came across two specimens which suggest a triple hybrid. They might just be two abnormal plants that are atypical for *Elytrigia atherica* × *E. juncea*, but they have characters of both these species and of *E. repens*. They have distinct hairs on the free margin of the leaf sheath (an *Elytrigia atherica* character); many short hairs over the ribs (an *Elytrigia juncea* character); and long hairs on the upper surface of the leaf ≤ 1mm (an *Elytrigia repens* character). The details are given here:

Sheet **OXF-00097879** with two specimens:

Label 1: Druce label (Herbarium Britannicum)  
– *Agropyron Hackelii* Druce (*A. junceum* ×

*repens*), New Romney, Kent, July 1902, G.C. Druce.

Label 2 reads: “*Agropyron repens* × *junceum*, New Romney, Kent, growing with both the parents and exhibiting a complete chain of intermediates: the toughness of *repens* gradually disappearing as the plants become nearer to the *junceum* parent. These are selected so as to show a fairly intermediate plant, which is probably the *A. acutum* of many English botanists, if not indeed of the ‘Flora of Kent’ for which the hybrid is not given, although *A. acutum* is recorded from between Romney and Dymchurch &c., July 1903. – G. C. Druce. – Yes – E. Hackel. All or nearly all the records of *A. acutum* in ‘Topographical Botany’ require confirmation, G. C. D”.

Label 3: A. Melderis, 1967 – *A. junceiforme* × *pungens*. [Later = *A. × obtusiusculum* Lange].

The right hand specimen is as Melderis determined *Agropyron pungens* × *junceiforme* [= *E. atherica* × *E. juncea*] (now labelled 00097879b). The other specimen (now labelled 00097879a) appears to be this putative triple hybrid, having clear characters of all three taxa, making it *E. atherica* × *E. juncea* × *E. repens*. This seems to be the only explanation.

The second specimen, **OXF-00097870**, of a putative triple hybrid was collected by C. Waterfall:

Label 1: *A. junceum* × *repens*, Isle of Wight, C. Waterfall, July 09 1907.

Label 2: A. Melderis, 1967 – *A. junceiforme* × *pungens*.

This specimen from the Isle of Wight, v.c.10, exhibits the same set of characters as 00097879a and it is difficult to call this anything else but *E. atherica* × *E. juncea* × *E. repens*. At present no other specimens have been seen like this in other herbaria.

It is clear from looking at specimens of these taxa, whether they are *Elytrigia* or *Elymus*, that there are still problems not only in identification but also in the nomenclature and taxonomy. Further work is required by an experienced taxonomist to solve some of these

problems. Type specimens for the hybrids need to be clearly designated (which would hopefully be a typical specimen) and the source published. It may also be useful to include experimental hybridisation, at least between *Elytrigia* (*Elymus*) *repens* (a rhizomatous taxon) and *Elymus caninus* (without rhizomes), and/or a genetic study needs to be carried out to see how closely related these grasses are, which might help resolve some of these issues; issues which are beyond my abilities.

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### ***Atriplex ×hulmeana* Tascher. in Anglesey (v.c.52): new or overlooked?**

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Oraches having the erect growth form of *Atriplex littoralis* (Grass-leaved Orache), but with leaves obviously broader and frequently more serrate than typical of that species, were found on the coast of Anglesey (v.c.52) in 2014 (see **Colour Section, Plate 4**). They resembled *A. littoralis* × *A. prostrata* (Spear-leaved Orache), a hybrid which was described and named as *A. ×hulmeana* by Taschereau (1988). Prior to publishing the full description, Taschereau (1986) had cultivated plants grown from seeds collected at the holotype locality (Wolferton, Norfolk, v.c.28). Crucially, Taschereau concluded in both the 1986 and 1988 papers that the variety of Grass-leaved Orache previously classified as *A. littoralis* var. *serrata* was in reality a segregant of the *A. littoralis* × *A. prostrata* hybrid. The leaves of the Anglesey plants were similar to some of those from the cultivation experiments and within the range of variability figured by Taschereau (1986).

A patch of oraches resembling this hybrid was first found on 11<sup>th</sup> June 2014, growing out of storm surge litter at the edge of dunes near

the mouth of the Cefni Estuary at SH39276586. Plants here having the somewhat broader and more serrate leaves grew alongside finer leaved ones typical of *A. littoralis*, with a few *A. prostrata* agg. amongst them. When re-visited on 20<sup>th</sup> August, only a few of the distinctive lower leaves remained on the erect plants. Nevertheless it was still possible to separate them by differences in serration of the upper leaves. This experience allowed plants separable from *A. littoralis* by leaf width and serration to be spotted at several other sites in south-west Anglesey at the beginning of September. These were on strandlines on the Malltraeth Cob embankment (SH408685), on the shore of the Menai Strait, between Barras and Tal y Foel (SH478652) and at two places along the small estuary at Aberffraw (SH357689). Herbarium specimens are being lodged in the National Museum of Wales.

To compare the Anglesey plants with herbarium specimens determined as *A. ×hulmeana* by Taschereau, we used Herbaria@home. Taschereau’s material in

Manchester University Museum includes plants from cultivation experiments and wild ones. Similarities were apparent between the terminal parts of branches on early season plants from Anglesey and young cultivated *A. ×hulmeana* plants. Of the wild, more mature, specimens determined by Taschereau, those from the Fylde Estuary near Preesall, Lancashire (v.c.60) were the most similar to the Anglesey ones.

Among the synonymy for *A. ×hulmeana* cited by Taschereau (1988), he linked the name *A. angustifolia* with *A. littoralis* var. *serrata*. Web searches led to a herbarium sheet in the Linnaean Society collections labelled as *A. angustifolia*. The image of it shows a plant that had leaves that were narrow, but obviously broader than *A. littoralis*. Metadata indicating the provenance of the Linnaean Society specimen is lacking, but an illustration by Sowerby in Smith (1883) and captioned *A. angustifolia* resembles it.

It was at first thought that *A. ×hulmeana* had not been recorded in Wales before 2014. However the name *angustifolia* was attached to an orache in both the 19<sup>th</sup> century floras of Anglesey and, in both, *A. littoralis* (Grass-leaved Orache) was listed separately. Davies (1813) had *A. angustifolia*, calling it Spreading Narrow-leaved Orache, but gave no localities. Griffith (1895) listed Narrow leaved Orache as *A. patula* (Common Orache) var. *angustifolia*, with a locality on the beach near Penmon. Although the 2014 Anglesey plants have lower leaves that are mostly more serrated than the *A. angustifolia* illustrated by Sowerby, there are sufficient similarities to suspect that those now referred to here as *A. ×hulmeana* may be the same as the Narrow-leaved Orache of Davies and Griffith. The recent Anglesey finds may thus not represent entirely new records for Wales. With records from only 13 hectads in the BSBI database (at 15<sup>th</sup> December 2014), *A. ×hulmeana* is

regarded as a rare taxon. As it is more obviously different from *A. littoralis* earlier in the summer, before the lower leaves are lost, it could be overlooked.

Some uncertainty remains about the most appropriate nomenclature to use for the Anglesey plants. When Taschereau (1988) described *A. ×hulmeana*, he applied the name to a hybrid derived in part from *A. prostrata*, without it being obvious whether he meant *s.s.* or *s.l.* *A. glabriuscula* (Babington's Orache) has an overlapping distribution with *A. prostrata*. The two are not always distinguishable and sometimes hybridise. Determining precisely whether *A. prostrata s.s.* alone might have contributed to the genetic makeup of plants that resemble *A. ×hulmeana* Tascher probably requires molecular evidence. For these reasons it may be appropriate to regard the Anglesey plants as *A. littoralis* × *A. prostrata* agg. or *A. ×hulmeana s.l.*

#### Acknowledgement:

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## A seven-year field study of the two *Platanthera* species growing in the UK

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### Introduction

*Platanthera bifolia* (Lesser Butterfly-orchid) (Fig. 1) and *P. chlorantha* (Greater Butterfly-orchid) (Fig. 2) (see Colour Section, Plate 3 for all figures) are at a molecular level almost indistinguishable (Bateman *et al.* (2009)), yet they are still considered separate species and they certainly look different. The former is whiter and less creamy than the latter, but position of the pollinia and viscidia is the most reliable way to discriminate between the two: the pollinia are divergent so that the viscidia are wide apart in *chlorantha*, parallel and close together in *bifolia*. In addition Stace (2010) states that *P. bifolia* is smaller in stature and smaller in all parts and that flowers are fewer. He also noted that *P. chlorantha* occurs usually on more calcareous soils. In their monograph, Harrap and Harrap (2005) make much the same assessment, but others differ and for example Bowmer (2008) says that size alone is not a differentiator between the two species. Studies have been made of the chemical composition of the floral scent but these are beyond the scope of amateur field studies.

The molecular and morphological divergence presents an interesting puzzle, which has given a focus for the last seven years to a field study monitoring populations of both orchid species on our shoreline croft on the Isle of Skye, where they grow close together, indeed intermingle in places. Physical properties of the orchids and some environmental factors have been measured to try to find discriminating variables, with the dichotomy in mind, and with an eye to whether they are in fact simply morphological polymorphs. All the flowering plants are marked so that the fate of individual plants year on year can be followed. Remarkably some plants have flowered every year over those seven years.

The comparisons that we have been able to make are unusual, because with intermingled

populations, some important environmental variables, such as climate, are nullified. To distinguish between the two species we relied upon the pollinia positioning, although occasionally we noted a degree of introgression, making the test imprecise. The two orchids grow in areas that have almost certainly never been ploughed and probably have only ever been used for low quality grazing or possibly an annual hay crop at best. The soils are thin, peaty and wet, overlying granite, or in some places a raised beach, with little more than 15 to 20cm of soil. There are no calcareous flushes; the raised beach is compacted gravelly granite.

The number of flowering plants has grown year on year, but dipped in 2014. The orchid areas are either mowed or strimmed once a year in early September, after seed set and dispersal, perhaps with some further strimming in the winter if the weather has been mild to peg back *Juncus effusus* (Soft Rush).

Table 1. Summary of flowering of *P. bifolia* and *P. chlorantha* in the study area.

Year	<i>P. bifolia</i>	<i>P. chlorantha</i>
2008	6	8
2009	8	25
2010	18	38
2011	20	67
2012	35	105
2013	41	104
2014	35	78

### Morphology

The data that we have gathered show statistically significant differences in the morphology of the two species as follows:

*P. bifolia* flowers consistently earlier than *P. chlorantha*. In the last five years, the average flowering date (note the average has been used rather than the earliest date

because it has greater statistical validity) *P. bifolia* has flowered before *P. chlorantha* by 8,7,7, 9 and 9 days respectively. Flowers appear on average 36 days (*P. bifolia*) and 37 days (*P. chlorantha*) after the first leaves appear above ground.

Height of the flower spike: *P. bifolia* – average 17.6 cm; *P. chlorantha* – average 25.8 cm.

Width of the lowest of the two basal leaves: *P. bifolia* – average 2.4 cm; *P. chlorantha* – average 3.3 cm.

Spur length: *P. bifolia* – average 1.6 cm; *P. chlorantha* – average 2.5 cm.

Summarising, *P. chlorantha* is later flowering and a more robust plant than *P. bifolia*, a finding that is consistent with Stace (2010) (and the vernacular names!), and physical size can be used to discriminate between the two species. But note that there is some evidence in the literature that the physical size of both species appears to decrease as one travels northwards, for example a study on spur length by Bateman and Sexton (2008). We are not sure that the difference in the date of flowering has been recognised previously; it might matter from a pollination perspective.

However we found no difference in the number of flowers on a flowering spike (*P. bifolia* – average 12.0; *P. chlorantha* – average 10.7, if the results for 2013 are excluded). In the latter year *P. chlorantha* was impacted by cool spring weather and a warm July, together with significant slug damage as the plants flowered. Our finding on the number of flowers contradicts the widespread view in the literature that *P. bifolia* has fewer flowers.

The seed-set efficiency, the proportion of flowers developing into a seed pod, appeared to be governed by environmental factors, especially climate, and slug damage (a significant problem as noted in 2013) rather than any interspecies difference. Seed-set in *P. bifolia* was fairly consistent year on year, with an average of 25.2%, whereas for *P. chlorantha* the average was 28.6% (but falling year on year), but there was much more yearly variability. In some years the seed set

efficiency was statistically significantly different, but in other years it was not and environmental factors, such as slug damage in 2013, seem to mask any real difference, if it exists. Figures 3 and 4 show plants of each species after seed set.

### Seeds

Measurements of the size of the seeds are shown below, together with those of other orchid species that grow on the croft for comparison.

Table 2. Seed sizes of orchid species at the study site.

<i>Platanthera bifolia</i>	0.75 × 0.12mm
<i>Platanthera chlorantha</i>	0.95 × 0.12mm
<i>Gymnadenia borealis</i>	0.48 × 0.20mm
<i>Dactylorhiza incarnata</i>	0.50 × 0.29mm
<i>Dactylorhiza purpurella</i>	1.00 × 0.25mm
<i>Dactylorhiza maculata</i>	0.79 × 0.18mm

The shape of *Platanthera* seeds is irregular, as can be seen in figures 5 and 6. The seed coat surrounding the embryo can be clearly seen. The oblong embryo itself is approximately 0.2mm × 0.06mm in each case. There are probably around 500 seeds in each seed pod, based upon the size of the seeds and seed pods and the assumed packing density.

### Tubers and roots

To determine the spread of roots, the extreme step of lifting a single plant of each species was undertaken (after examination they were replanted, without harm). As is well known, both species have two root tubers, but they are surprisingly small and shallow rooted. *P. bifolia* are shorter and look stouter – 13×10mm and 13×7mm; *P. chlorantha* are longer – 17×9mm and 21×8mm.

The tubers of each are no more than 2cm below the surface and the roots extend to a maximum radius of 4cm. Anything beyond 6cm away is therefore a separate plant, justifying the decision to consider a flower spike equivalent to a plant unless its leaves are

touching its neighbour. Figures 7 and 8 show the tubers and roots of both species

### Habitat

We looked for differences in the growing conditions of the two orchids. Soil pH, ground slope, soil temperature and moisture content were not significantly different, although equipment limitations might have been too crude to show them. Despite the crude test had *P. chlorantha* a preference for calcareous conditions, as several authorities suggest, we should have seen this in the soil pH comparison, but we found no such difference. The soil conditions suggested in any case that we would not. Soil moisture content was measured at flowering time and whilst no difference was found, it is recognised that ground moisture at other times of the year, particularly in winter might be important. We are looking at this using rainfall as a proxy to see if there are interspecies differences but our analysis is incomplete.

There was, however, a statistically significant difference in the sward height - the height of surrounding plants. Plants of *P. chlorantha* were commonly to be found where the sward was higher than the plant, whereas *P. bifolia* plants seem happiest in areas with less competition, although there is overlap.

Not only was the sward height different but there were also differences in the cohort of associated plants. In 2014, the associated plants growing within 15cm of flowering spikes of the two species were identified in early July. Five plants of *P. bifolia* and six plants of *P. chlorantha* were chosen as representative of different habitats (a comparison of two *P. chlorantha* with one *P. bifolia* plants, three paired plants and two outliers). *Potentilla erecta* (Upright Tormentil) and *Succisa pratensis* (Devil's-bit Scabious) featured near eight of the eleven chosen plants (equal numbers of both species). However, *Festuca vivipara* (Viviparous Fescue) was more often associated with *P. bifolia* (3 out of 4, compared with 1 out of 5), whereas *Angelica sylvestris* (Wild Angelica), *Pteridium aquilinum* (Bracken) and *Filipendula ulmaria* (Meadowsweet) were associated with two or

more plants of *P. chlorantha*, but none of *P. bifolia*.

### Separate species or morphological polymorphs – some circumstantial evidence

So are they different species? The conclusions particularly on the height, leaf width and spur length allied to the different pollinia arrangement confirm that *P. bifolia* and *P. chlorantha* are morphologically different. Are they different species or, as the molecular evidence purports to show, is this simply an example of morphological polymorphism? *P. chlorantha* can cope with greater lushness of the surrounding vegetation, and maybe lower light levels as a consequence, but by contrast *P. bifolia* is happiest in bare areas, with much less competition. The conclusions suggest speciation, but an anecdote is offered and some interesting correlation data which might point the other way.

**Anecdote:** Two plants of *P. chlorantha* grow in an isolated spot in habitat typical for that species. During the study period two plants of *P. bifolia* sprang up unexpectedly within 30cm of one of them, yet 70m away from the nearest plants of that species. A coincidence? That has happened elsewhere, especially in one spot where there is introgression, even though the habitat would definitely predict *P. chlorantha*.

### Correlations

Plant height and leaf width correlate quite strongly for both species. Plant height and the number of flowers also show reasonable correlation. Height and leaf width distinguish between the two species, but the number of flowers does not. Taking height v. leaf width, regression lines for the two species are almost a continuation of each other. Indeed, if a regression line is plotted through the combined data as if it was a single population, then the fit improves and there is a strong case for suggesting that they are indeed a single population.

In the case of height v. number of flowers, the equations for the regression lines for each species are again similar, but merely displaced. A plant of *P. chlorantha* will be between 5.5 and 6.0cm taller than one of

*P. bifolia* to produce the same number of flowers. If the displacement did not exist then because the regression lines are so similar, once again there is an argument that the populations are the same. Tenuous and not statistically robust but interesting nonetheless.

### Conclusions

So are they different species? Morphology strongly suggests they are, and our data show that there are differences in the physical size of the two orchids as well as the pollinia positioning. Environmentally we found no differences in soil conditions, although ground moisture merits further study, but sward height and the cohort of associated plants were different. However, our correlations point in the direction of a continuum and that one is just a bigger version of the other, adapting to different habitat conditions and light levels.

*Note: This is an abridged version of a longer note available on request to the authors.*

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## Probable yellow-flowered *Symphytum ×uplandicum*, and some thoughts on the derivation and status of the *Symphytum 'officinale'* complex

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Having taken over from Clare O'Reilly as *Symphytum* referee I have had a range of alien or alien hybrid comfrees to deal with and would like to thank all those who have sent in material. The main subject of this article will be specimens of *S. ×uplandicum* (Russian Comfrey) sent from Yorkshire by Mike Wilcox and described below, which would appear to be the first examples of yellow-flowered *S. ×uplandicum* to be reported. However, two other notable finds should be dealt with initially.

The first was sent by Paul Stanley from the Isle of Wight and was a taller and more tufted plant growing in what was apparently a patch of *S. caucasicum* (Caucasian Comfrey), with *S. orientale* (White Comfrey) also in the vicinity. Characters were broadly compatible with a *S. caucasicum* × *S. orientale* hybrid, which has not been previously described in the

British Isles (Stace, 2010). However, the '*caucasicum*' specimen sent to me had longitudinal purple striations on the corolla lobes, which I would take as indicating a *S. caucasicum* hybrid with *S. ×uplandicum* or *S. asperum* (Rough Comfrey) (Leaney, 2014). This could make the *caucasicum* hybrid a triple or quadruple hybrid, but if *Mentha* (mint) can do such things, why not *Symphytum*?!

Another significant find was a fascinating hybrid swarm of *S. ×hidcotense* (Hidcote Comfrey) derivatives, shown to me by Ann and Simon Harrap, which had seeded themselves around a wildflower nursery in Glandford, Norfolk. Four or five forms were present, all within a few yards of several enormous clonal patches of 'Hidcote Pink' (*S. grandiflorum* × ?*S. ×uplandicum*). All the forms were somewhat similar to the Hidcote,



but, despite there being no *S. grandiflorum* (Creeping Comfrey) anywhere nearby, most were very small and tending towards *S. grandiflorum*, with tiny, ovate, long petioled leaves, although in some cases with an erect habit, and ‘half-sized’, violet-blue flowers.

Hybrid swarms are usually interpreted as introgressives arising by repeated back crossing of an F<sub>1</sub> hybrid with one or both parents, but it would seem that ‘segregant swarms’ of F<sub>2</sub> or F<sub>3</sub> hybrids can occur, which may produce unexpected combinations of parental characters, or even completely new characters, such as small flowers. Hidcote Comfrey does not normally produce seedlings around the clonal patches, but with large numbers of flowers present, and numerous bees, such as in a nursery situation, it appears to have this capability. Much the same goes for *S. ×uplandicum*, which does not produce seedlings very often, but in similar circumstances might do so more regularly. One wonders if segregation of characters in F<sub>2</sub> and F<sub>3</sub> hybrids might explain some of the numerous forms found in *S. ×uplandicum* better than introgression. This will be discussed further below.

### The *Symphytum officinale/uplandicum* complex

The exact definition of *S. ×uplandicum* (*S. officinale* × *S. asperum*), and especially its separation from *S. officinale* (Common Comfrey), has long been a problem. *S. ×uplandicum* did not even appear in the original *Atlas of the British flora* (Perring & Walters, 1962), and even the account by former referee, Franklyn Perring, in the *Critical supplement* (Perring, 1968) was regarded as provisional. Both the *New atlas* (Preston, Pearman & Dines, 2002) and Stace (2010) state that *S. officinale* was probably still being over-recorded for *S. ×uplandicum*. The various forms of both taxa are perhaps best thought of as a *S. officinale/uplandicum* or *Symphytum ‘officinale’* complex, the latter term coined by Perring in his definitive account for the National Museum of Wales

‘Common Ground’ Symposium (Perring, 1994).

This complexity is only what one would expect for the hybrid *S. ×uplandicum*, which is fertile and can back-cross with *S. officinale* to produce an array of forms that are difficult to separate from *S. officinale*. However, five distinct forms of *S. officinale* itself have also been recognised, two of which share chromosome counts ( $2n = 40$ ,  $2n = 44$ ) with forms of the complex which have been described as *S. ×uplandicum*. It is possible that at least one or two forms that have been ascribed to *S. officinale* are in fact F<sub>1</sub> nothomorphs, introgressives or F<sub>2</sub>/F<sub>3</sub> segregants of *S. ×uplandicum*.

The classical accounts of the complex in the British Isles are in the National Museum of Wales ‘Common Ground’ symposium (Perring, 1994) and later in the *Plant Crib* (Rich & Jermy, 1998), both using chromosome counts obtained from the British Isles by Gadella (1971) and Gadella & Kliphuis (1972). The putative relationships between the various forms and cytotypes were laid out in a hybridisation diagram, which included *S. asperum* ( $2n = 32$ ), two forms of *S. ×uplandicum* ( $2n = 36, 40$ ), and five of *S. officinale*:  $2n = 24$  - cream flowered ssp. *bohemicum*;  $2n = 48$  - ssp. *officinale* (cream flowered var. *ochroleucum*; red-purple flowered var. *purpureum*); a  $2n = 40$  cytotype not reported recently from the British Isles but described by Gadella from Holland; and lastly  $2n = 48$  “peppermint-striped” forms, thought to be derived from crossing between the cream and red-purple forms of ssp. *officinale*. I have observed this happening very clearly in the Netherlands, on the lower reaches of the Maas River near Venlo, with all three colour forms, vegetatively identical, growing in a single patch. Perring always felt that ssp. *bohemicum* was confined to the fens of Cambridgeshire, Huntingdonshire and S. Lincolnshire, but it certainly occurs also in the Norfolk fen edge and along the rivers draining westwards into the fens (see O’Reilly, 2006; Leaney 2011).

Following the work of Perring, Kliphuis and Gadella, the standard view has been that

*S. ×uplandicum* has two distinct forms, either with pink buds, going on to a pink or pinkish-blue open corolla (the  $2n = 40$  form), or with very dark purple buds going onto a purple or violet-blue corolla (the  $2n = 36$  form). The latter is the flower colour found almost exclusively in Norfolk, and these plants can have a lot of white in the open corolla, as well as extremely long winging of the stem. However, Bob Ellis (vice-county recorder for v.c.27) showed me this year a population with pink buds, opening to near white, which had winging to the next but one leaf down, and which he thought might be an example of the  $2n = 48$  *S. officinale*, which is extremely rare in East Norfolk in my opinion. However, the upper leaf decurrence was not enormously wide (c.1.5-3cm) as in pure *S. officinale*, and the upper leaves were not very narrowly lanceolate as in that taxon. In addition, although *S. officinale* of the peppermint striped form might have red in the corolla, every plant examined had not red but pale blue in at least some open flowers, and these had a background colour of white, not cream. Again this indicates *S. ×uplandicum* rather than *S. officinale*.

This population illustrates an important point, namely that the standard accounts of *S. ×uplandicum* do not fit the situation found “on the ground”, and can be misleading. The two distinct genotypes ( $2n = 36$ ,  $2n = 40$ ), each with a characteristic association of stature, flower colour, degree of stem winging and indumentum, certainly do not fit with experience in Norfolk. We have, almost exclusively, forms with deep blackish-purple buds and violet, blue or purple open flowers, but these show very variable stature, leaf decurrence, and stem winging, very frequently with winging to the next but one leaf down. In the Perring descriptions, it is the pink budded form that has this long stem winging, and in the deep purple budded form the leaves are “not, or only very slightly decurrent”, with virtually no winging. The only population I have seen in Norfolk with pink buds and pure sky-blue open flowers, again shown to me by Bob Ellis, had petiolate, broadly ovate upper leaves (resembling *S. asperum* in these charac-

ters), but had only very slightly decurrent petiole wings, again the “wrong way round”.

It is interesting that the variation observed in *S. ×uplandicum*, in Norfolk at least, is virtually all towards *S. officinale*, inviting confusion with that taxon, and not towards *S. asperum*. The diagnostic features of *S. asperum*, an extremely short blunt-tipped calyx, short rigid prickle-like stem hairs, and ovate mid and upper stem leaves with rounded-cordate bases and fairly long unwinged petioles (therefore with no leaf decurrence at all), hardly occur in any *S. ×uplandicum* forms, except occasionally as regards petiole length and leaf shape. Both *S. ×uplandicum* and *S. officinale* have sessile, lanceolate upper stem leaves with cuneate bases that are at least amplexicaul, a long acute-tipped calyx, and an indumentum of long, weak bristles and very short, fine, hook-tipped hairs. The only way to separate *S. officinale* from *S. ×uplandicum* with long stem winging is to look for the very narrowly lanceolate upper stem leaves, with very broad decurrence, 1.5-3cms wide, and the characteristic flower colour – either intensely greenish-yellow buds opening to cream, or red-purple (carmine) without any pink, blue or violet. I do not find indumentum type very helpful in this separation.

Another difficulty with the usual account of the derivation of the various forms of *S. ×uplandicum* relates to the  $2n = 36$  purple-budded form. The Perring diagram explains this by hybridisation between  $2n = 32$  *S. asperum* and the  $2n = 40$  purple flowered form of *S. officinale* found in Holland by Gadella, but not known in this country since 1930 (Clement & Foster, 1994). This form of *S. officinale* (ssp. *uliginosum*) is described as nearly always having purple flowers, and as having “rough leaves with prickly hairs which are not as strongly decurrent” as the other forms of *S. officinale*, all characters suggestive of *S. ×uplandicum*. Could it not be that Gadella’s  $2n = 40$  ‘*officinale*’ is really just another form of  $2n = 40$  *S. ×uplandicum*? If this were the case, the  $2n = 36$  form of *S. ×uplandicum* could have arisen by backcrossing in the distant past between  $2n = 32$  *S. asperum* and this  $2n = 40$  *S. ×uplan-*

*dicum*. This would explain the short stem winging of the  $2n = 36$  form.

### The possibility of yellow- or cream-flowered *S. ×uplandicum*

Russian Comfrey is thought to be a form of *S. ×uplandicum* imported in the 19<sup>th</sup> century, either from Russia (Hills, 1976), or from Sweden (Perring, 1994), and is usually thought of as having pink, purple, blue or violet flowers. Forms with cream flowers were not described when it was being extensively grown in nurseries around the country soon after its introduction. However, there are several reasons to believe it could be around.

Lawrence Hills, Director-Secretary of the Henry Doubleday Research Association, gives a detailed account of the origins of Russian Comfrey (Hills, 1976) and mentions Sweden, only to say that *S. ×uplandicum* was first named in that country. He gives a clear description of it being imported in 1871 for Henry Doubleday, from the St. Petersburg Royal Botanical Garden, in the form of easily transplanted seedlings of hybrid plants, growing between rows of “clear sky-blue flowered *S. asperinum* [*asperum*] from the Caucasus”, and “cream-yellow flowered *S. officinale*”. If this was the case, then the pink or purple-budded *S. ×uplandicum* hybrids imported would have borne suppressed genes for cream or yellow colour, which could become occasionally operative in  $F_2$  or  $F_3$  segregates.

Although Perring nowhere mentions the occurrence or possibility of yellow or cream-flowered *S. ×uplandicum*, his hybridisation diagram clearly shows crossing between *S. asperum* and the cream-flowered form of  $2n = 48$  *officinale*, as well as with the red-purple flowered form! It is very possible that occasional  $F_1$  hybrids between native cream-flowered *S. officinale* and escaped *S. asperum* occurred in the late 19<sup>th</sup> or early 20<sup>th</sup> century when *S. asperum* was commonly in cultivation, or that such hybridisation occurred in horticulture.

Cream-flowered *S. ×uplandicum* could therefore have arisen in the British Isles either as  $F_2$  or  $F_3$  segregates from imported red, pink

or blue-flowered  $F_1$  hybrids, or as spontaneous  $F_1$  hybrids in this country. However, there is a third possible derivation indicated by Perring’s hybridisation diagram, which has an entity labeled  $2n = 44$  “*officinale*” (his quotation marks), shown as arising from pink budded  $2n = 40$  *S. ×uplandicum* crossing with cream-flowered  $2n = 48$  *S. officinale*. This should, to my mind, be regarded as an introgressive form of *S. ×uplandicum* and could well exhibit cream flowers. The  $2n = 44$  chromosome count by Gadella and Kliphuis related to two populations from Claydon in E. Suffolk and Twyford Forest in S. Lincolnshire, but unfortunately no mention was made of flower colour.

### Probable cream flowered *S. ×uplandicum* from Yorkshire

The yellow-flowered comfrey plants sent to me by Mike Wilcox from two sites in Yorkshire had subsessile, broadly lanceolate upper stem leaves and intensely greenish-yellow buds (exactly as in *S. officinale*), opening to a white (not cream) corolla, with pink patches fading to a very pale pink or off-white. These features could conceivably be read as indicating a form of peppermint-striped  $2n = 48$  *S. officinale*, but the leaf decurrence was very narrow (*c.*0.5cms) and, crucially, stem winging stretched down only about half-way to the next leaf. This type of stem winging is enough in itself to denote *S. ×uplandicum*, but, to my mind, pure *S. officinale* with yellow or cream flowers, even if of the peppermint striped form, should have no admixture of colour except of red-purple.

I am sure these plants did not derive their yellow flower colour from *S. tuberosum* (Tuberous Comfrey) – the hybrid *S. tuberosum* × *S. ×uplandicum*, an example of which was sent to me from Roxburghs (v.c.80) by Rod Corner, is a totally different plant (see Stace 2010), much closer to *S. tuberosum* than *S. ×uplandicum*.

I suspect that greenish-yellow budded forms of *S. ×uplandicum* have long occurred, but have been taken without close inspection to be pure *S. officinale* because of their flower colour. Much more commonly, I am sure that

forms of *S. ×uplandicum* with long stem winging have also been taken as *S. officinale*, without proper regard to flower colour, upper leaf shape, or width of the upper leaf decurrence. All forms of *S. officinale* are said to be more or less restricted to fens, marshes and the banks of rivers, streams and dykes; and plants growing on road verges or waste areas far from wetland habitats should be viewed with suspicion. Franklyn Perring always regarded *S. officinale* as essentially a lowland plant and much over-recorded in the north and west of the British Isles.

#### Request for *S. officinale* or *S. ×uplandicum* specimens

Bearing in mind these points, I would encourage members to have another look at comfrees hitherto taken to be *S. officinale* (either because of long stem winging or yellow/cream flowers or flower buds) and growing on road verges or waste areas – especially in England north of the Wash, Wales east of the lowland borders, Scotland and Ireland. Any previous mis-identifications should be reported to the vice-county recorder, along with any confirmed *S. officinale*. Over the next few years I would be grateful if vice-county recorders for these regions could report to me whether they think *S. officinale* really does occur in their vice-county.

Hopefully botanists will usually be able to distinguish *S. officinale* from *officinale*-like plants using the characters described earlier, at least after discussion with the v.c. recorder. I would be happy to adjudicate on difficult finds and would anyway like to be sent definite *S. officinale* found outside southern and central England, as well as suspected yellow or cream flowered *S. ×uplandicum*. I hope to visit Mike Wilcox's two Yorkshire populations of putative yellow-flowered *S. ×uplandicum* in late May, to take photographs and collect better herbarium material.

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## One hundred years of floristic change and nature conservation in North Lancashire

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### Introduction

When the *Flora of North Lancashire* was published (Greenwood, 2012) an account of botanical conservation was not included. The first ideas of nature conservation within the area started in 1911, when Charles Rothschild founded the Society for the Promotion of Nature Reserves (Sands, 2013). This heralded the first national survey of sites and in North Lancashire one site was thought to be of interest. This was described as “Fleetwood Lancashire, Ansdell, Rossall to Fleetwood Barracks, open sandhills, foreshore, a few scarce plants compiled by Wm. Yates, Burnt House, 16 Lime Grove”. The ‘site’ embraces a long coastline, now largely urban, but with a few fragments of sand dune at Lytham St Anne’s and developing sand dunes at Fleetwood, which were not present in 1911. No further interest was taken in nature conservation in North Lancashire until the first SSSIs (Sites of Special Scientific Interest) were established in 1951, following the National Parks and access to the Countryside Act of 1949

In this note the success or otherwise of protecting rare and/or endangered species since 1900 in North Lancashire is discussed, with special reference to four areas of contrasting landscape.

### Rare and/or endangered species

The native flora of North Lancashire comprises approximately 825 species and subspecies (taxa) and 113 archaeophyte species. Hybrids and the critical apomictic genera of *Hieracium*, *Rubus* and *Taraxacum* are not included. Approximately 50% of the total, 415 taxa, are thought to be extinct, rare and/or endangered. These taxa have been compiled from lists prepared from *Wild about the North West* (Regional Biodiversity Steering Group for North West England, 1999), Biodiversity Action Plan Long List (Lancashire Biodiversity Partnership website, 2010. Note: this was deleted in 2014 but a new one should be created shortly), and extinct, rare and very rare species as described by Greenwood (2012).

Table 1. Floristic changes (native and archaeophyte taxa) in North Lancashire

Total number of extinct, rare/endangered taxa	415	
No. present in SSSIs	225	54%
No. listed as Section 41 species**	26 (14 E; 7 extant in SSSIs)	6%
No. Nationally endangered*	137 (50 extant in SSSIs)	33%
No. of declining taxa	90	24%
No. of increasing taxa	42	10%
No. of extinctions 1900 - 1960	13 (1 A)	3%
No. of extinctions Post 1960	27 (5A)	7%

Notes: A = archaeophyte; E = extinct; \*Nationally endangered species are considered to be those marked as CR= Critically Endangered, EN = Endangered, VU = Vulnerable and NT = Near Threatened by Stroh, *et al.* (2014); \*\* defined under NERC Act 2000.

Table 1 indicates that 10% or 40 taxa have become extinct since 1900 (note Table 1 revises figures given in Greenwood, 2012). A further eight taxa were identified as having become extinct in the 19<sup>th</sup> century. However

90 taxa are thought to be declining, some rapidly and recently. For example *Glebionis segetum* (Corn Marigold), an archaeophyte, was shown to be frequent in the *Flora* (Greenwood, 2012) but by 2012 only one site was

still known. Similarly, *Ophioglossum vulgatum* (Adder's-tongue) was also frequent but there have been few recent records.

On the other hand 42 taxa are increasing and perhaps the most notable of these is *Cochlearia danica* (Danish Scurvy-grass), but others, e.g. *Carex disticha* (Brown Sedge) and *Ranunculus penicillatus s.l.* (Stream Water-crowfoot), are also extending their range. This leaves 234 taxa where populations and range appear stable, although population sizes may be small. Nevertheless, the number of increasing taxa are less than half those that are declining.

The number of native North Lancashire species lost in the 19<sup>th</sup> century was approximately 0.06 per annum. The rate of extinction may be low because changes to the landscape caused by Parliamentary Enclosure Acts of the 18<sup>th</sup> and early 19<sup>th</sup> centuries were mostly not recorded. These Enclosures brought into cultivation for the first time common lands of the 'waste' or 'wild' areas and must have caused the loss of many species, at least locally. In the 60 years between 1900 and 1960 the rate of loss accelerated to 0.18 species per annum, but from 1960 to 2010 the rate accelerated still further, to 0.44 species per annum, giving an annual rate of loss between 1900 and 2010 of 0.37 species, or, over *c.*200 years, 0.2 species per annum.

These figures are in line with similar analyses elsewhere (Preston, 2000; Walker, 2003; Braithwaite, 2013; Amphlett, 2013). The national average for the 20<sup>th</sup> century quoted by Walker (2003) is 0.5 species per annum. However in southern counties this may be 0.6 whilst in the north it is 0.4. On the other hand Braithwaite (2013) recorded 0.25 species per annum in Berwickshire and Preston (2000) recorded 0.8 species per annum in urbanised Middlesex and 0.7 species in the intensively cultivated county of Cambridge. Perhaps, surprisingly, Amphlett (2013) gives a figure of 0.41 species per annum in Banffshire.

If archaeophytes are included little difference to the rate of loss in North Lancashire is noted until after 1960. Then, the rate acceler-

ates from 0.5 to 0.6 species per annum. This reflects the importance of arable farmland for archaeophytes and the effectiveness of herbicides in the last 50 years.

These figures are all, to some extent, approximations, but Preston (2000) and Walker (2003) agree that the rate of loss is accelerating. The problems and variables involved in compiling figures for loss or decline of species is discussed by all the authors.

Little attention has been paid to the conservation of individual species in North Lancashire except for the protection of *Cypripedium calceolus* (Lady's-slipper), which has been re-introduced to the region. Conservation measures since the National Parks Act of 1949 were aimed at the conservation of habitats on the basis that, if the habitat is in good condition, then rare and endangered taxa would respond positively. Accordingly a network of core sites, SSSIs, was established, covering most but not all of the important habitats in North Lancashire. However, only 54% of rare and endangered taxa are found in SSSIs. Similarly, of the 137 nationally threatened species, 50 are extant in SSSIs, whilst of the 26 species of Principal Importance listed in Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2000 found at one time in North Lancashire half are extinct and only seven are still surviving in SSSIs.

### Case studies

Following the Lawton Report (Lawton, 2010) considerable emphasis is placed on conservation at the landscape level and on corridors linking important sites and habitats. Nevertheless the importance of core sites (mostly SSSIs) is recognised as still of major significance in nature conservation policies.

In an effort to assess the success or otherwise of rare and endangered species at the landscape level, four areas of North Lancashire, where reasonably accurate data exist, were selected. All contain SSSIs. This enabled a comparison to be made between the present and post 1960 floras of rare and endangered taxa in these areas. The landscapes chosen were:

1. Leck. An upland valley with exposures of limestone, but rising to over 610m (2,000ft) on Green Hill, with further exposures of limestone and grit and with extensive mires, heaths and grasslands,
2. Mid and Upper Hodder. A broad upland valley embracing pastoral and moorland areas, with exposures of grit and limestone rocks, together with extensive mires. The Upper Hodder differs from Mid Hodder with Stocks Reservoir and the plantations of Gisburn Forest, both developed from the 1920s. Many of the grasslands in the Upper Hodder form part of the North Pennines Dales Meadows Special Area of Conservation (SAC).
3. Lytham St Anne's. An urban coastal area but with fragments of sand dunes, forming part of Rothschild's original site of natural history interest.
4. Hawes Water and Gait Barrows. The whole area of limestone pavement, shell marl, woodland fen and open water is a National Nature Reserve and SAC.

Table 2. Summary of statistics: plants recorded since 1900 in areas of contrasting landscapes in North Lancashire.

Value	Leck	Mid Hodder	Upper Hodder	Hawes Water/ Gait Barrows	Lytham St Anne's
	SD6780	SD6750	SD7254	SD4776	SD3130
Total No of species	43	73	75	101	79
% of N. Lancs rare/ endangered	10%	18%	18%	25%	19%
No. in SSSIs (%)	19 (44%)	7 (1E) (10%)	31 (41%)	101 (100%)	46 (58%)
No. of species lost (%)	11 (25%)	29 (40%)	7 (9%)	16 (16%)	15 (19%)
No. of species lost in SSSIs (%)	3 (7%)	1 (1%)	0	16 (16%)	3 (4%)
No. lost not in SSSIs (%)	8 (19%)	28 (38%)	7 (9%)	0	12 (15%)
No. of species lost before 1960 (%)	7 (16%)	27 (37%)	7 (9%)	5 (5%)	5 (6%)
No. of species lost after 1960 (%)	4 (9%)	2 (3%)	0	12 (12%)	10 (13%)
No. of species nationally endangered (%)	13 (6E) (30%)	31(all E) (42%)	23 (6 E) (31%)	34 (1E) (34%)	23 (29%)
No. of Section 41 species	1	4 (all E)	1 (E)	6 (3E)	5 (2E)
No. Taxa recorded as new mostly after 1960	9 (21%)	16 (22%)	55 (73%)	10 (10%)	14 (18%)
No. of taxa recorded as new, mostly after 1960, excluding taxa not known in 1900 or presumed present in 1900	0	2 (3%)	13 (17%)	5 (5%)	3 (4%)

E = Extinct

Table 2 shows the results of the analysis. The number of rare and/or endangered taxa identified in each landscape varies from the upland valleys and mires of Leck, with 43 taxa, to 101 in Gait Barrows National Nature Reserve. The number or percentage of these taxa found in SSSIs varies from 100% for Hawes Water/Gait Barrows to 10% in the Mid Hodder, where only moorland areas are SSSIs.

In all the landscapes there have been losses. Many losses, mostly before 1960, were in Mid

Hodder, with 29 taxa accounting for 40% of the rare and endangered taxa found in the area. Fewest losses were seen in the Upper Hodder, with seven taxa, and Leck, with eleven taxa; and in the Hodder valley and Leck most losses were prior to 1960. Given the urbanisation of Lytham St Anne's and continuing disturbance to the remaining dune fragments, the loss of 15 taxa may seem modest, but it is similar to the losses at Gait Barrows National Nature

Reserve. In both areas, losses double after 1960.

A further interesting statistic is revealed when taxa are recorded for the first time after 1960. Several of these are for taxa newly recognised and therefore not known 100 years ago. Also, species newly recorded after 1960 may have been overlooked 100 years ago. If these taxa are disregarded the percentage of new and endangered taxa in each landscape varies from 0% for Leck to 17% in the Upper Hodder.

All the landscapes have been adversely affected by agricultural changes except for Lytham St Anne's, where extensive urbanisation has occurred. At Gait Barrows National Nature Reserve agricultural changes were modest, but drainage dating back over 200 years and the cessation of grazing from around the 1930s in many areas, and limestone removal in the 1970s, are significant interventions. Apart from changes in grazing intensity changes in Leck were minimal. However, in the Mid Hodder agricultural improvements and conifer planting in the woodlands reduced floristic diversity. As a contrast the Upper Hodder experienced massive human interference from the 1920s, with the building of a large reservoir, the opening of quarries and the planting of a large forest, mostly with spruce species.

Yet losses in Gait Barrows National Nature Reserve and SAC were considerable and accelerating where one might expect positive conservation over the last 50 years to have been most beneficial. Incredibly, the losses are similar to those on the devastated sand dune system at Lytham St Anne's. On the other hand the building of a large reservoir and planting of an alien forest should surely have been highly destructive to the native flora? The explanation of why this is not so lies in the detail of the developments. The building of the reservoir on an already 'improved' pastoral landscape caused few losses. It provided new habitats, with mesotrophic, fluctuating water levels that allowed the colonisation by long distance dispersal of species not formerly found in the area. Similarly, the quarries mostly opened to

provide stone for the reservoir, provided a refuge for some taxa that might have been lost elsewhere in the region, but they were also colonised by species not present in the area. A further consequence of the reservoir building was the abandonment of several upland farms, with only relatively low-level pastoral farming continuing. Furthermore, the forest planting avoided a semi-natural wooded valley and left some flushed areas undisturbed and free from agricultural use.

None of this reservoir and plantation landscape is designated as an SSSI, although Plant Life designated the reservoir as an 'Important Plant Area'; largely for its bryophytes. This is the only Important Plant Area in North Lancashire.

Thus what appears to have happened is that by a fortuitous by-product of water catchment and forestry management the Upper Hodder has become the most significant area for positive botanical conservation in North Lancashire. Alarming, perhaps the most protected area, Gait Barrows National Nature Reserve, has suffered as much as the urban landscape of Lytham St Anne's.

### Summary

The analysis of species change in the flora of North Lancashire shows that, over 100 years, the loss of taxa is accelerating. This implies that conservation policies, mostly implemented during the last 50 years, were only partially effective. It could be argued that the number of taxa lost and the accelerating rate of loss would have been greater had these policies not been in place. In particular, the creation of 41, mostly habitat-based SSSIs must have had a positive effect.

However, the case studies show that the most effective conservation measures in practice concern the development of the water and timber supply industries in the Upper Hodder valley. The benefit to plant taxa was incidental to the landscape policies implemented for the industries concerned. In contrast, the nature conservation policies implemented through the designation of core sites, such as SSSIs, has met with only modest success. It seems inevitable that many more



native plant taxa will be lost in North Lancashire in the coming years.

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Note: A detailed account, *One hundred years of nature conservation in North Lancashire. Vascular plants: how well have we done?*, on which this note is based, is published on-line at: Lancashirebotanygroup.weebly.com with a hard copy deposited at World Museum, Liverpool.

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## ***Spiranthes romanzoffiana* (Irish Lady's Tresses): a new species for the Isle of Rum**

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*Spiranthes romanzoffiana* (Irish Lady's Tresses) is a nationally scarce BAP species, found mainly along the west coast of Ireland and Scotland, with populations recorded on Mull, Coll, Tiree, Barra, Vatersay, Benbecula and South Uist and with a few mainland populations at Morvern and Kintyre.

The Isle of Rum has been visited and recorded by botanists since 1772, but there have been two main periods of botanical activity. The first was by Professor J.W Heslop-Harrison from 1937 until 1957 and the second by the BSBI between 2000 and 2006, culminating in *The flora of Rum* (Pearman *et al.*, 2008).

*Spiranthes romanzoffiana* had not been recorded during these visits and so it was a surprise to discover two specimens while doing routine checks on our grazing livestock on 14<sup>th</sup> July 2014, growing on a track in a field

near Kinloch village on the eastern side of the island (see inside Front Cover). This is not only a first record for the Isle of Rum but also a first vice-county record. On subsequent searching of the whole area I found a further 50 plants scattered across this large inbye field.

The habitat of this site appears typical of many other localities where the plant has been recorded, being a damp, marshy field, coming out as M23 rush pasture in the National Vegetation Classification.

The historical management of the site has been that of summer and winter grazing, with cattle and latterly winter grazing by Highland ponies, and localised poaching of the vegetation by livestock does occur. Sheep have not been grazed on the island for many years, although small numbers of Red Deer do occur on the fields quite regularly. Hay cutting has also occurred in the field, but not in recent

times, and there has been no application of artificial fertilisers or manuring for many years.

All these habitat management and environmental conditions appear to be optimal for the plant and support other studies of the species (Plantlife, 2005).

A key question is how long the species has been present on Rum. The plant is known to have an 'underground' phase, which may last some years before the right conditions occur for it to appear (Plantlife, 2005). Finding the plant on Rum suggests that it would be worth searching apparently suitable habitat elsewhere in western Scotland.

Scottish Natural Heritage intends to maintain the current management of the site, to monitor the population and to be vigilant at other sites where the plant could occur on the island.

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## What should the BSBI's role be in the conservation of botanically-rich roadside verges? – A Berwickshire perspective

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### Introduction

There is now a resurgence of interest in the conservation of roadside verges. In 2013, Scottish Natural Heritage commissioned a report by Hambrey Consulting: *The management of roadside verges for biodiversity*, and Plantlife is currently asking its members to petition their local Councils to "manage our 'Bee Roads' better". I have been led to ponder what role the BSBI might take in this matter.

I have stepped down after 36 years as BSBI vice-county recorder for Berwickshire, with the hope that my *Berwickshire BSBI botanical site register* (2013) is an adequate resource to stimulate botanical conservation in Berwickshire. However, there is no section on roadside verges, so I have now had to consider whether a follow-up document on this subject is desirable.

### The BSBI and botanical conservation

The BSBI has traditionally avoided direct involvement with the conservation of botanically-rich sites on the grounds that its team of volunteer recorders have more than enough on their hands in seeking to make comprehensive records of the flora of Britain and Ireland in each of a series of date-classes. So, the

BSBI's contribution to conservation has been very largely species-related. As the number of taxa in the flora is large, the strategy has been first to assess the conservation priorities of each in terms of their overall distribution frequency and then to concentrate on species deemed to be most at risk because of their low frequency and/or because of evidence of decline. This endeavour has led to 'Red Lists' and to the publication of County Rare Plant Registers (CRPRs).

Having published a CRPR for Berwickshire in 2004, I became disenchanted with the concept. The CRPR was useful to me and fellow recorders seeking to monitor the rare plant populations, but was only very marginally helpful to conservationists, because it was arranged by species, not by site. I decided to publish an updated version organised by site and achieved this goal in 2013. In the process I found that the rare or scarce species on their own were inadequate to allow a meaningful assessment of the botanical value of a site, but that it helped a great deal if axiophytes were listed along with the rare or scarce species, albeit in much less detail. As Berwickshire lacked any comprehensive listing of biodiver-

sity sites, a major challenge was to ascribe site boundaries. Site boundaries were essential if the botanical value of the sites were to be assessed in relation to the long-term viability of the plant populations of interest, as this is in large measure related to the size of the site as a whole. A map of each site was included in the County Botanical Site Register (CBSR), alongside the site description and species records.

My CBSR has taken the BSBI into new territory, but has not so far been taken up in other vice-counties, although some recent county floras include such comprehensive reviews of botanical sites that they are not so far short of my concept, but without site maps.

### History

There was a brief period around 1969 when roadside verge conservation was in fashion. In that year the Nature Conservancy sponsored a symposium in London on 'Road verges: their function and management', which sought to bring together those with statutory responsibility for our roads and conservation interests. Dr Franklyn H. Perring, as head of the Biological Record Centre, Monks Wood, presented a paper on 'The botanical importance of roadside verges'. This paper included the following evocative passage: "The general botanical importance of roadside verges is at its greatest in lowland arable England. In many areas the verge represents the last vestige of the grasslands which existed before the modernisation of agriculture. Permanent pasture remains only where the plough and the dragline cannot reach, and both reach further yearly. In this setting the roadside verge which crosses all the geological formations, runs up hill and down dale, is wet or dry, flat or sloping, sunny or sheltered, provides a complete picture of the grassland vegetation of the country. Destroy this and we destroy part of our heritage, as irreplaceable as the Parish Church or the village stocks. In many parts of lowland England the rich pasture of the past, gay with Buttercups and Oxeye Daisies can only live on now along roadsides that are unploughed and unsprayed."

There was a similar symposium in Edinburgh in 1970 and around that time the Scottish Wildlife Trust undertook a practical programme in the conservation of roadside verges. Bernard Gilchrist reported to the symposium that "50 verge sections have been designated – 13 in Berwickshire, 16 in the three Lothian counties, 16 in Perthshire and 4 in Orkney, but further sections are likely to be added in all these counties". Nearly all the verges selected were short stretches where a rare species was present. Some of the species selected were more or less ancient introductions such as *Persicaria bistorta* (Bistort), "opposite the north gate of Wedderburn Castle".

The programme soon lapsed. In Berwickshire the shortage of volunteers to monitor the sites was the critical factor. In the Lothians several factors led to disenchantment: volunteers found the task irksome, questioned the site selection, and were not happy that the management was producing the desired results. In particular the restricted cutting regime often allowed the spread of coarse grasses that overwhelmed the rarities.

There are numerous lessons to be learned from this failure. Perhaps the most obvious was the failure to see the selected rarity as a component in a plant community that might or might not be viable on the roadside verge in question. More important was the failure to appreciate the likely effect of eutrophication on the whole roadside verge network of Britain. In Berwickshire, as elsewhere, there has been a marked and progressive 'dumbing-down' or diversity-loss of the roadside verge flora due to fertiliser run-off from adjacent fields and to atmospheric deposition. This process has been accelerated by the practice of mulching the verge cuttings *in situ*, which further favours the spread of coarse grasses. Perring's vision of a roadside verge network that "provides a complete picture of the grassland vegetation of the country" is no longer a reality.

### Road verges as wildlife corridors

There is much to be said for examining the interest of roadside verges in the wider context

of their value to wildlife in general in acting as corridors between isolated habitat patches. Broadly speaking, narrow verges are of little use to insects, mammals and even birds unless they adjoin other features of interest, whether an extensive wood or grassland or just a strip of trees. Broad verges are much more useful.

While broad verges favour the botanical interest, it is for a different reason, as it relates to the degree to which they offer a buffer against the effects of eutrophication. With the exception of the special case of roadside halophytes, only the most widespread native plants can disperse effectively by using eutrophic roadside verges as a corridor. Just a few neophytes are doing so: one such is *Allium paradoxum* (Few-flowered Garlic). A much wider range of plants is dispersed by the transport network, but the plants do not use the verges as a corridor. They disperse either by seed being inadvertently carried to suitable habitat by man or vehicles or by the dumping of plant material, especially unwanted clump-forming perennials from gardens.

### **Berwickshire roadside verges**

If the botanical interest of roadside verges is not served by viewing them as wildlife corridors, logic dictates that their botanical conservation value must stand or fall on the long-term viability of each section as an individual botanical site. Such sites may be viable either in their own right or in conjunction with adjacent land.

I have now attempted to list the botanically interesting roadside verges in Berwickshire as a desk exercise, working with my two books *Berwickshire BSBI botanical site register* (Braithwaite, 2013) and *A short flora of Berwickshire* (Braithwaite, 2014), together with the BSBI MapMate database. I have listed 24 verges, ranging in length from 100m to 2,200m for further consideration. I have noted populations of the scarcer species, listing 46 populations of 28 species.

Parts of two of the verges were included in the list of verges designated by the Scottish Wildlife Trust in 1969. As re-defined, they are two of the longest stretches, at 900m and 1,800m respectively. The first, at Girrick, lies within a grassland site of 48 hectares on the

lavas of the Kelso Traps that is listed in the Site Register and extends into the adjacent fields. It is notable for *Dianthus deltooides* (Maiden Pink). The second, with grassland species on a mixture of light and heavy soils, part calcareous, part neutral, is largely adjacent to Hirsell Woods, also listed in the Site Register. It happens to support a colony of *Galium boreale* (Northern Bedstraw) that is not very representative of the overall habitat.

Six of the verges are at the sites of road re-alignment which has left steep banks, often with rock outcrops and water seepages. Two of these verges have been sown with wildflower mixes, which have been notably successful, although two species not native to Berwickshire have been introduced to one of them. One of the verges is an orchid site within the town of Eyemouth. Another, with clubmosses, is on the A68 near Soutra summit and is the only upland verge selected. A third is by the A1 south of Burnmouth, where a colony of *Vicia sylvatica* (Wood Vetch) is so spectacular that it attracts the attention of passing motorists. The vetch is even more spectacular on the sea braes below. On my own unashamedly subjective personal assessment, none of these six verges has sufficient interest to warrant inclusion in the Site Register.

Almost all the remaining 16 verges are on slightly calcareous sections of the predominantly neutral grassland that is most characteristic of lowland Berwickshire. They are either on steep banks, or are adjacent to woodland or species-rich grassland, or are unusually wide. The more calcareous sections favour *Agrimonia eupatoria* (Agrimony), *Knautia arvensis* (Field Scabious) and *Tragopogon pratensis* (Goat's-beard) and may be accompanied by the locally rare *Galium album* (Hedge Bedstraw), *Silvaum silaus* (Pepper saxifrage) or *Rosa rubiginosa* (Sweet-briar) (the last growing on a bank in front of the boundary hedge). These, except the *Rosa rubiginosa*, are all tall-herb species and grow with the very widespread *Centaurea nigra* (Common Knapweed), with *Filipendula ulmaria* (Meadowsweet) at the edge of the ditch (if present). Fairly widespread species

that are also well represented in these neutral grasslands are *Geranium pratense* (Meadow Crane's-bill), *Geum rivale* (Water Avens), *Schedonorus arundinaceus* (Tall Fescue), *Trifolium medium* (Zigzag Clover) and, more rarely, *Geranium sylvaticum* (Wood Crane's-bill). These do represent a vegetation community with conservation value that is now only modestly represented in Berwickshire. However it is very doubtful whether any of the sites warrant inclusion in a Site Register as, taken individually, the sites are relatively small and many have doubtful long-term viability. A community on light soils with *Silene latifolia* (White Campion) and *S. vulgaris* (Bladder Campion) is much rarer and only present in a depauperate state. In no way do the selected verges "provide a complete picture of the grassland vegetation of the county" in the sense that Perring envisaged in 1969.

If the provisional list is reduced to 18 verges by deducting the six most marginal ones, eight of those remaining are broad verges, where the removal of mown grass would be the main priority if conservation was attempted, and ten are special cases, such as rocky banks, where grass cutting is less of an issue. I would only rate the two verges already included in the Site Register as qualifying for such a listing. Both would benefit from the removal of mown grass after cutting.

#### Urban roadside verges

There is little scope for discussion about typical roadside verges in Berwickshire towns and villages: they are mown as short as a lawn and are very species-poor. Exceptions are two special cases where there are steep banks or rock cuttings. These two are included in the sites discussed above.

#### Railways

While railway cuttings and embankments are beyond the scope of this article, it is worth remarking that the disused railways of Berwickshire were once quite species-rich but are no longer so. Almost all have either been incorporated into the adjacent fields, have become dominated by coarse grasses or have scrubbed over. The mainline railway has not been botanised because of access restrictions,

although such reports as have been obtained from contractors, taken with what can be viewed from a distance, suggest that there is at least one stretch of significant botanical interest. It adjoins a coastal SSSI and is referred to in the Site Register.

#### Conclusions

My Berwickshire review illustrates some of the pitfalls in attempting to champion the conservation of each and every population of rare or scarce species that happens to persist on a roadside verge. I will not be revising the Berwickshire Site Register as no roadside verges have been identified that I consider worthy of inclusion as additional sites.

Meanwhile, I have used this article to promote my concept of County Botanical Site Registers as a worthy aim for the BSBI and suggest that this concept is helpful in defining the limits that BSBI might set to its role in the conservation of botanically-rich roadside verges.

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## A revision of the inventory of vascular plants for the Sefton Coast, north Merseyside (v.c.59, South Lancashire), with particular reference to the 2014 Red List for England

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### Introduction

Smith (2006) described attempts to draw up an inventory of vascular plants reliably identified on the Sefton Coast in north Merseyside (v.c.59). The first such inventory was completed in 1999, followed by an extensive revision in 2005. A wide range of sources was used to list species, subspecies and hybrids, both for the 28km-long coastal zone from Bootle Docks to Crossens and the sand-dune system, covering about 2,100ha between Crosby and Southport. Both nationally and regionally notable taxa were indicated, using information in the *UK Red Data list* (Cheffings & Farrell, 2005) and the *Biodiversity audit of North West England* (Regional Biodiversity Steering Group, 1999). Although not nationally listed, a small number of hybrids in *Salix* (willow) and *Juncus* (rush) was included as Nationally Rare or Nationally Scarce, based on their hectad distributions.

After 2005, field recording and literature searches added new taxa at an average rate of about 12 per annum until, by 2014, the total for the coast was 1,337 taxa, of which 1,207 had been recorded in the dune system (but see revised totals later).

### The 2014 revision

An impetus to update the inventory came in 2014 with the publication of *A vascular plant red list for England* (Stroh *et al.*, 2014). This details the current state of England's vascular plant flora, based on IUCN criteria. Reflecting declines of numerous plants in recent decades, the new list includes many taxa that were previously considered widespread and relatively common but are now rated Near Threatened (NT) or Vulnerable (VU), the latter meaning a high risk of extinction in the wild. A few have been raised to the status of Endangered (EN), these facing a very high risk of extinction. The Red List includes species and subspecies but not hybrids.

These new criteria affect a surprisingly large number of plants on the Sefton Coast. Thus, 32 of the coast's vascular taxa that previously had no threat status have been upgraded to national (English) significance, while 30 plants that were merely considered regionally important, *i.e.* "Species of conservation importance in North West England" (Regional Biodiversity Steering Group, 1999) now also benefit from a national ranking. In contrast, one species, *Salsola kali* (Prickly Saltwort), was downgraded from Vulnerable to Least Concern. Ten threatened plants listed under Section 41 of the 2006 Natural Environment and Rural Communities Act were given this designation in the revised inventory. Finally, the draft *South Lancashire flora* (D.P. Earl *in litt.*, 2008) was searched, especially for non-native taxa that had been overlooked during previous updates. This resulted in about a dozen additions of mainly long-extinct neophytes. A small number of taxa was deleted on the basis of unsatisfactory determinations. For example, putative *Juncus compressus* (Round-fruited Rush) on the "Lancashire" coasts seems to be a form of *J. gerardii* (Greenwood, 2012).

Table 1 (p. 39) summarises data for the revised 2014 inventory; the total number of vascular taxa being 1,345 for the coastal zone, while 1,204 were recorded for the sand-dune system. About 40% are non-native or introduced native plants, the number of native taxa for the coast and dunes being 800 and 752 respectively. Nationally and regionally notable taxa increased from 186 to 221 for the coast and from 177 to 208 for the dune system.

A relatively small number of vascular plants is considered to have become extinct on the coast since recording began about 150 years ago. As explained earlier, several extinct taxa were added from old records in the draft *South Lancashire flora*, raising the number of

probably or certainly extinct plants to 77 for the coast and 65 in the dune system. However, it should be emphasised that many taxa, especially in critical genera such as *Hieracium* and *Taraxacum*, have not been determined here for several years and it is not known whether all of them are still extant.

French (2014) examined the impact of the 2014 *Red List for England* on Cornwall, showing that the Near Threatened category had increased by 98%, while the Vulnerable group had grown by 34%, the equivalent figures for England being 64% and 12% respectively. A similar analysis for the Sefton Coast is shown in Table 2 (p. 39). The data indicate even bigger changes than in Cornwall, Near Threatened plants increasing by 267%, while the Vulnerable category is 120% larger. The number of plants considered to be Endangered increased 50% from four to six. The total number in all five threat categories has increased by 179% on the Sefton Coast compared with 37% in England.

### Habitats

The inventory shows which of ten main habitat types is occupied by each taxon. Analysis shows that by far the largest number and proportion of taxa are dependent on “disturbed ground” (33%) (Table 3, p. 40). This is land that has been disturbed by human agency, such as trampling, use of motor-vehicles, tipping (especially of garden waste), dereliction and agriculture, but also by Rabbit burrowing and erosion. Most of the non-native and introduced native plants are associated with this broad habitat type, while the frequent presence of bare soil allows colonisation by ruderal species and annuals. Not surprisingly, the next most important type is freshwater wetland, represented by dune-slacks, scrapes, ponds and ditches (18%). Many duneland specialists are associated with this habitat (Smith, 2009). The fixed-dune habitat is also important (14%), both this and humid dune-slacks being Priority Habitats in the EU Habitats Directive. Dune scrub (9%), dune grassland (8%) woodland (8%), salt-marsh (4%) and dune-heath (4%) support relatively low proportions of plants. Interestingly, mobile and embryo dunes, and strand-

line and shingle (both 1%) have the lowest numbers of taxa. This is presumably due to the fact that rather few species have adapted to the severe environmental conditions associated with these exposed habitats.

Further analysis examined the habitats of the 221 regionally and nationally notable taxa, the pattern being rather different (Table 4, p. 40). The importance of the “disturbed ground” category is now much lower (16% compared with 33% for all inventory plants). A likely explanation is that many plants associated with this habitat are neophytes, especially garden-escapes, these being excluded from the *Red List for England*. In contrast, there is a much higher proportion of notable plants associated with dune-slacks and related wetlands (36%, as opposed to 18% for all taxa), while there is a small increase in those found on fixed-dunes (19% vs. 14%). These habitats are considered to be the most important for nature conservation on the Sefton Coast (Smith, 2009). The proportion of notable taxa in other main habitats shows small increases (salt-marsh), small decreases (dune scrub, woodland) or little change (dune grassland, mobile/embryo dunes and strandline/shingle).

### Conservation value

Stace & Ellis (2004) gave the total number of vascular taxa in v.c.59 (South Lancashire) as 2,096. This figure has now been updated to an estimated 2,800 (D.P. Earl *in litt.*, 2014), reflecting a large increase in neophytes. Thus, in supporting 1,345 taxa, the Sefton coastal zone has about 48% of the entire vice-county vascular flora, the comparable figure for the dune system being 43%. This part of the coast and especially the sand-dune system therefore makes a significant contribution to the vice-county flora, itself thought to be the most species-rich in Britain north of Worcestershire (Stace & Ellis, 2004). The presence of over 200 regionally and nationally notable taxa is also of great conservation importance. This diversity may be attributed to the size of the dune system (the largest in England), the wide range of habitats present, an abundance of calcareous substrates and the geographical position of the coast, which supports plants

with both northern and southern distributions in Britain (Smith, 2009).

Although comparative data are hard to find, Sefton may have one of the most species-rich coastal dune systems in western Europe. For example, Newborough Warren, Anglesey, is thought to have about 600 vascular taxa, while Braunton Burrows in Devon supports around 500 (Smith, 2010), these figures being only 50% and 42% respectively of the Sefton dunes total. Similarly, a sample of dune systems in the Netherlands has fewer vascular plants, despite being mostly much larger in area than the Sefton Coast (R. Slings *in litt.*, 2009). The largest number listed for nine sites is 766 taxa at Noordhollands Duin (5,300ha) (Table 5, p. 40). However, it is understood that identification of non-native taxa and hybrids has been less intensive in the Netherlands than in Sefton (R. Slings *in litt.*, 2009).

In Cornwall, French (2014) found that the increased numbers of *Red List for England* vascular taxa were concentrated in key areas of conservation interest. He concluded that the new list was a more sensitive indicator of important plant communities and habitats and was better suited to the needs of wildlife conservation. These findings also seem to apply to the Sefton Coast.

Taking into account the impact of the 2014 *Red List for England*, this inventory revision confirms the outstanding botanical significance of the Sefton Coast, further justifying the many national and international conservation designations that apply to the coastal zone in general and the dune system in particular.

#### Acknowledgements:

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Table 1. Summary of revised Sefton Coast inventory data. Note: some ‘notable’ taxa occur in more than one category

Category	Coastal zone	Dune system
Total taxa	1,345	1,204
Species	1,138	1,028
Subspecies	69	63
Hybrids	138	113
Native taxa	800	752
Introduced taxa	544	452
% introduced	40.4	37.6
Extinct	77	65
Nationally Rare	14	14
Nationally Scarce	16	15
Section 41 species	10	10
Critically Endangered (England List, 2014)	1	1
Endangered (UK List, 2005)	4	4
Endangered (England List, 2014)	6	6
Vulnerable (UK List, 2005)	15	14
Vulnerable (England List, 2014)	33	30
Near Threatened (UK List, 2005)	15	14
Near Threatened (England List, 2014)	55	52
Species of Conservation Importance (regionally notable)	169	160
Total notable	221	208

Table 2. The number of taxa in each of the four IUCN categories, comparing the percentage increase for England with that on the Sefton Coast.

Category	England 2005	England 2014	% increase	Sefton Coast 2005	Sefton Coast 2014	% increase
Critically Endangered (CR)	40	58	45	0	1	0
Endangered (EN)	91	137	51	4	6	50
Vulnerable (VU)	156	175	12	15	33	120
Near Threatened (NT)	87	143	64	15	55	267
Total	374	513	37	34	95	179

Table 3. Main habitats occupied by vascular taxa in the inventory. Note: many plants occur in more than one habitat.

Habitat type	No. of occurrences	%
Disturbed ground	547	33
Slacks, scrapes, ponds & ditches	306	18
Fixed-dunes	235	14
Dune scrub	144	9
Dune grassland	137	8
Woodland	129	8
Salt-marsh	63	4
Dune-heath	63	4
Mobile & embryo dunes	28	1
Strandline & shingle	26	1

Table 4. Comparison of the main habitats of notable taxa with others in the revised inventory. Note: many plants occur in more than one habitat.

Habitat type	No. of occurrences of notable taxa	%	No. of occurrences of other taxa	%
Disturbed ground	41	16	506	36
Slacks, scrapes, ponds & ditches	92	36	214	15
Fixed-dunes	48	19	188	13
Dune scrub	7	3	137	10
Dune grassland	23	9	114	8
Woodland	7	3	122	9
Salt-marsh	17	7	46	3
Dune-heath	9	3	54	4
Mobile & embryo dunes	7	3	21	1
Strandline & shingle	8	3	18	1

Table 5. Numbers of vascular plants recorded on Netherlands coastal dune systems, compared with the Sefton Coast dunes.

Site	No. of vascular plants	Dune area (ha)
Ameland	522	5,730
Berkheide	305	850
Noordhollands Duin	766	5,300
NPZK	660	1,800
Schiermonnikoog	516	3,670
Terschelling	585	9,040
Texel	614	3,440
Vlieland	431	3,300
Voorne	638	1,440
Sefton Coast	1,204	2,100

## The occurrence of *Salix ×friesiana* on the Sefton Coast sand-dunes, North Merseyside (v.c.59: South Lancashire)

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### Introduction

One of the many botanical highlights of the Sefton Coast in north Merseyside (v.c.59) is the remarkable richness of willows (*Salix*), although several of them were probably planted in the past, either for basket-making or as ornamentals. So far about 33 different taxa have been identified here, 17 being hybrids. This compares favourably with around 42 *Salix* taxa in the whole of north Lancashire (mainly v.c.60), a region particularly rich in this group of plants (Greenwood, 2012). Not only does the Sefton Coast have a great diversity of willows, but several of the hybrids found on the sand-dunes are extremely rare nationally. While *Salix* is noted for its propensity to produce hybrids, only a few of them are locally frequent and widespread, the majority being relatively rare (Meikle, 1984; Stace, 1975). Previously, Smith (2014) described the status of the extremely rare *S. ×doniana* (*S. repens* (Creeping Willow) × *S. purpurea* (Purple Willow)) from the Sefton Coast. Like *S. ×doniana*, the parents of *S. ×friesiana*, *S. repens* and *S. viminalis* (Osier), are widespread and often frequent, but this hybrid also has a remarkably restricted distribution in Britain.

Meikle (1984) detailed the morphology of *S. ×friesiana*, describing it as a slender, erect or sprawling shrub 0.5 to 2m high. The rather crowded leaves are lanceolate, 4-7cm long, 0.5-1.5cm wide, dull green and thinly pubescent or sub-glabrous above and thinly or densely sericeous-pubescent or tomentose below, with narrowly recurved margins and an acuminate tip. The densely sericeous nature of the indumentum suggests that one of the parents in the Sefton individuals is *Salix repens* var. *argentea* rather than var. *repens*. These, together with other features, such as stature, make this a rather distinctive hybrid (see Colour Section, Plate 2), unlikely to be overlooked by botanists, although, as in all

willows, determination based on leaf characters is best left until late summer. There is, however, the possibility of confusion with two other rare taxa. The endemic triple hybrid *S. ×angusensis* (*S. repens* × *S. viminalis* × *S. cinerea* (Grey Willow)) was originally described from Barry Links, Angus (v.c.90) (Rechinger, 1950), being discovered on the Sefton Coast in 1993 (Meikle & Robinson, 2000). Though this taxon generally has broader leaves than *S. ×friesiana*, reliable characters to separate it from *S. ×friesiana* remain elusive, despite detailed morphological studies (Michell, 2001; Wilcox, 2005). *S. ×friesiana* may also overlap in some features with *S. ×subsericea* (*S. cinerea* × *S. repens*), although this hybrid typically has much shorter ovate-elliptic leaves. Meikle (1984) considered the latter a very uncommon taxon and, although several bushes have been recorded, its status on the Sefton Coast still requires clarification.

Elsewhere in Europe, *S. ×friesiana* has been recorded in Denmark, Norway, Sweden, Russia, Austria, Germany and Yugoslavia, although Meikle (1984) states that it is nowhere common and may have been planted in some of its localities.

### National status

*S. ×friesiana* was first collected in Britain in 1897 from river gravels near Brora in E. Sutherland (v.c.107) by E.S. Marshall (Meikle, 1984). It was 46 years before it was recorded again in a “grassy lane” at Formby, South Lancashire in 1943 by J.D. Massey and W.G. Travis (determined by A.J. Wilmott) (Savidge *et al.*, 1963). Few other places have subsequently reported this hybrid, the BSBI Maps Project ([www.bsbi.org.uk](http://www.bsbi.org.uk)) giving *S. ×friesiana* in only 13 hectads, four of which are on the Sefton Coast. The original E. Sutherland record is not mapped but those included are W. Ross (v.c.105), two hectads at Sandscale, Westmorland (v.c.69), two in south

Fylde, West Lancashire (v.c.60), north Wirral, Cheshire (v.c.58), W. Gloucestershire (v.c.34), Braunton Burrows, N. Devon (v.c.4) and Purbeck, Dorset (v.c.9). Another unmapped record is a female bush at Barry Sands, Angus (v.c.90) found in October 2003 by L. Tucker (*in litt.*, 2014).

It seems that bushes are generally scarce at most of these localities. Thus M.P. Wilcox (*in litt.*, 2014) recently resurveyed some Fylde Coast sites, confirming the presence of only one specimen at Lytham St. Anne's Local Nature Reserve, where there had previously been several. However, there may be other bushes on sites not visited. Earlier, Greenwood (2012) described this hybrid as "very rare" on the sand-dunes at Lytham St. Anne's, but did not specify population size. Halliday (1997) mentions a single bush at the Sandscale Haws carpark in 1992. Two were found in 2001 and a singleton was photographed there in June 2003 (M.P. Wilcox *in litt.*, 2013). E.F. Greenwood (*in litt.*, 2014) reports about 10 bushes present at Wallasey, Wirral (SJ2993) in 2014. Two specimens were identified at Braunton Burrows on 13<sup>th</sup> September 2003 during a BSBI field meeting (Webb, 2004).

### ***Salix ×friesiana* in Sefton**

The parents of *S. ×friesiana* are widespread on the Sefton Coast, *S. repens* being abundant, especially in dune-slacks, occurring mainly as the highly variable, usually coastal variety *argentea* (Smith, 2009). *S. viminalis* is more localised and often gives the impression of being planted. As remarked by Meikle (1984), this is one of the least variable of our willows.

Since its original discovery in 1943, *S. ×friesiana* has been found frequently in the Sefton sand-dunes. Thus, the South Lancashire Flora database (D.P. Earl, *in litt.*, 2009) included 71 records of this hybrid up to 2009, five being for the 1940s. Twenty are supported by voucher specimens, 19 in **LIV** and one in **MANCH**, these being mostly collected by the late Vera Gordon during the 1990s. I started recording *S. ×friesiana* in the early 1980s, during various botanical surveys. Then, from 1999, a more systematic approach was taken, logging specimens in 14 tetrads (four hectads) between Hightown and South-

port, a linear distance of about 15km. In addition to noting the grid reference of each bush, using a Garmin Etrex GPS unit, I also measured two diameters at right-angles and maximum canopy height. Bush area was estimated from the mean of the two diameters using  $\pi r^2$ . A particular recording effort was made in 2009, most sites being re-visited in 2014. Details of each specimen found, including location, date, grid reference, sex (where known), linear dimensions and maximum height of bush, were entered into an Excel spreadsheet, this being updated at regular intervals.

*S. ×friesiana* was generally found in dune-slacks, both wet and dry, *sensu* Ranwell (1972) and often associated with *S. repens*, although the hybrid also occurred less often on relatively dry fixed-dunes and on the edge of scrub or woodland patches. Male and female bushes were noted at roughly equal frequencies, Smith (2010) reporting the 2009 discovery of a bush at Cabin Hill National Nature Reserve (NNR) with bisexual catkins. This individual was still extant in 2014. The size and shape of leaves and nature of the indumentum varied considerably from one bush to another, but these characters were not investigated in detail.

It soon became evident that *S. ×friesiana* has a highly aggregated distribution in the dune system, some areas having large concentrations of bushes (Table 1, p. 46), while others support much smaller numbers. In total, 414 bushes of this nationally rare hybrid were recorded up to November 2014.

### **Bush dimensions**

Bush area and maximum height varied enormously. The smallest bush recorded had an area of only 0.01m<sup>2</sup>, while the shortest was 0.18m tall. The respective highest values were 196m<sup>2</sup> and 3.5m, the latter being considerably more than the maximum height of 2m for this taxon quoted by Meikle (1984). The relationship between area and height is shown in Fig. 1, p. 43. Because the scatter-plot is heavily skewed towards small values the data have been transformed to log<sub>10</sub>, giving a more symmetrical distribution. There is a statistically highly significant positive correlation

( $r = 0.765$ ;  $p < 0.001$ ), indicating a tendency for larger bushes to be taller, the relationship being quite strong, with an  $r^2$  value of 0.585.

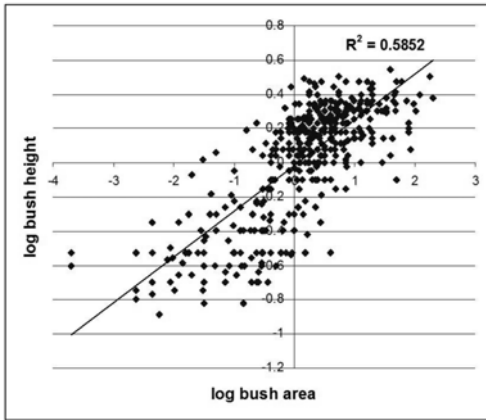


Fig. 1. The relationship between  $\log_{10}$  bush height and  $\log_{10}$  bush area ( $r = 0.765$ ,  $p < 0.001$ )

It seems likely that the size of bushes is related to age. This could not be measured directly but an indication was obtained from the estimated age of habitats supporting *S. ×friesiana* (Table 1), although this assumes all bushes arose at the same time. Thus the youngest site, Devil's Hole blow-out slack, began to vegetate in 2003 and was therefore about 11 years old by 2014. Twelve *S. ×friesiana* saplings appeared in 2012, increasing to 36 in 2013 and 82 in 2014, indicating considerable recruitment over time. By 2014, these young bushes had a mean area of  $0.28\text{m}^2$  (range  $0.002 - 2.7\text{m}^2$ ) and an average height of only  $0.35\text{m}$  (range  $0.13 - 0.93\text{m}$ ). Although the largest single bush ( $196\text{m}^2$ ) was at Hightown, Queen's Jubilee Nature Trail supported the highest mean area ( $23.6\text{m}^2$ ), these dunes having been reclaimed by the building of a coast road extension in the early 1970s. The habitat was therefore about 40 years old by 2014 (Table 1). Fig. 2 shows the relationship between mean bush area and estimated habitat age for the sites with the largest numbers of bushes. Although there appears to be an increasing trend, the relationship is not statistically significant ( $r = 0.272$ ;  $p > 0.1$ ). Evidently, factors other than site age are influencing the mean area of bushes; possibilities include exposure, variations in

hydrology and soil fertility and, as mentioned earlier, the recruitment rate of new plants.

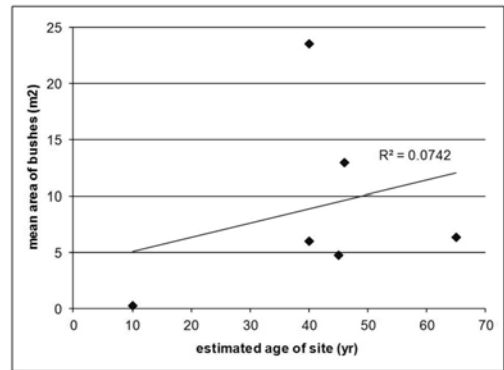


Fig. 2. The relationship between mean bush area and estimated site age for localities supporting the largest numbers of bushes ( $r = 0.272$ ;  $p > 0.1$ )

### Discussion

It is not understood why the Sefton Coast supports such large numbers of this rare hybrid, while other parts of the country do not. As already mentioned, the taxon is unlikely to have been overlooked, at least on the scale implied. It is well known that hybrids are often associated with dynamic habitats, such as dune systems, salt-marshes, river margins and bare ground created by human activity (Arnold, 1997). In Sefton, the highest concentrations of *S. ×friesiana* were found in places with a history of often anthropogenic disturbance. These included a newly-formed slack (Devil's Hole) in a blow-out thought to have originated from wartime military activity; slacks formed by recreational trampling during drought periods in the early/mid 1970s (Birkdale north frontals) (Smith, 2006); an area reclaimed from the sea in the early 1970s (Queen's Jubilee Nature Trail); sites subjected to commercial sand-winning in the 1940s and 1950s (Cabin Hill; Range Lane) and land disturbed by the building of the coastal road in the late 1960s (Birkdale slack 26) (Table 1). The Sefton Coast dune system has undoubtedly been subject to high levels of disturbance, with associated dynamism in the past (Smith, 2009), perhaps more so than many other comparable habitats. However, in recent decades the area has become increasingly over-vegetated and fixed, in common with

most other coastal dune fields in Britain and western Europe (Houston, 2008).

Nevertheless, it is evident that spontaneous hybridisation and colonisation are still taking place locally, as at Devil's Hole, and it is reasonable to deduce that this is mediated by seed dispersal. Michell (2001) found that fresh *S. ×friesiana* seed has a high germination rate, this being characteristic of the Salicaceae, whose taxa typically produce abundant small, short-lived, wind-dispersed seeds, with little or no dormancy period and high mortality (Karrenberg *et al.*, 2002).

The present study shows that *S. ×friesiana* bushes can live several decades and reach heights of up to 3.5m, although around 2m is more typical. It was also noted that leaf shape and indumentum characters are extremely variable, perhaps partly reflecting the high morphological variability of one of the parents, *S. repens* var. *argentea*. The apparent fertility of *S. ×friesiana* also raises the possibility of back-crossing to either of its parents, further increasing the likelihood of variation in the offspring. Karrenberg *et al.* (2002) suggested that hybridisation may enrich the genetics of *Salix* taxa, thereby facilitating their establishment in a wider range of habitats and encouraging speciation. Certainly, the relative abundance of *S. ×friesiana* on the Sefton Coast provides opportunities for further research, especially into the nature and causes of variation in *Salix* hybrids.

### Conservation

Preston (2004) argued that distinct hybrids that form persistent populations and have restricted distributions should be categorised as “plants of conservation concern”. *S. ×friesiana* would seem to qualify. The habitat of Sefton populations is statutorily protected by Site of Special Scientific Interest (SSSI) and *Natura 2000* designations, many also being situated in National or Local Nature Reserves with largely sympathetic management regimes. Being an urgent priority on most duneland sites, scrub control is a potential threat to this and other rare hybrids (Smith, 2009; 2014). However, the existence of a database, which has been copied to the major

Sefton Coast land-owners, allows individual bushes or populations to be identified and avoided during management operations. Thus, several bushes of *S. ×friesiana* were marked for retention in 2005 when a large scrub patch was cleared at Cabin Hill NNR (Smith & Kimpton, 2008). Another scrub management operation in the Birkdale frontal dunes in February 2014 had a less satisfactory outcome, when nine bushes of *S. ×friesiana* were felled by mistake, some being stump-treated. Fortunately, follow-up visits later in the year revealed that all the bushes had survived and had regrown to heights of up to 2m.

During this study, several bushes were lost to ‘natural causes’. Often this seemed to be due, at least in part, to winter de-barking by Rabbits, though Rabbit damage was much reduced after 2009 because of myxomatosis outbreaks. A bush in the Birkdale frontal dunes was repeatedly defoliated by Winter Moth (*Operophtera brumata*) caterpillars over several years, but survived, albeit with considerable die-back of branches. Dieback caused by sand-blasting or the effects of salt spray during gales was also noted on old bushes in exposed locations, some eventually being killed. Thus, in October 2014, two bushes were found dead at Ravenmeols and another had disappeared since the previous survey in 2009, representing a local mortality of 21% over five years. However, such losses have been more than compensated by the appearance of young plants, especially in newly formed habitats, such as Devil's Hole.

With over 100 *S. ×friesiana* bushes, Cabin Hill NNR has been winter-grazed by Herdwick sheep since 1992 and by Shetland cattle since 2010/11 (Smith, 2012). The cattle, in particular, like to browse willows, including *S. ×friesiana*. However, no mortality has been observed, the damaged bushes showing such vigorous shoot regrowth during the summer that their dimensions were virtually unaffected.

### Acknowledgements:

Particular thanks are due to Michael Wilcox for introducing me to the delights of hybrid

willows and for assistance in the field and helpful correspondence over the years. I am also grateful to Leslie Tucker and Eric Greenwood for details of the Angus and Wirral records of *S. ×friesiana* respectively. David Earl kindly provided copies of the *New atlas of South Lancashire flora* database. Natural England staff at Ainsdale and Cabin Hill NNRs permitted access to restricted areas of the reserves. Mary Dean and Mike Wilcox made helpful comments on a draft of the manuscript, while Catherine Highfield helped with statistical analysis.

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Table 1. Sites with the largest numbers of *Salix ×friesiana* bushes

Site	Grid ref.	No. of bushes	Mean bush area (m <sup>2</sup> )	Mean bush ht. (m)	Est. age of habitat (yr)	Origin of habitat
Cabin Hill NNR	SD2805	115	4.3	1.4	45	Sand-winning
Range Lane, Formby	SD2805	21	6.4	2.08	65	Sand-winning
Devil's Hole, Ravenmeols	SD2705	82	0.28	0.35	10	Slack formation
Birkdale frontals (N)	SD3116	49	6	1.67	40+	Slack formation & road building
Birkdale slack 26	SD3115	26	13	1.78	46	Road building
Queen's Jubilee Nature Trail	SD3216	30	23.6	1.93	40	Reclamation

### A very early *Drosera* record

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We are both interested in the discovery of our native plants. One of us (DAP) recently came across a record at the end of Pena & L'Obel's (1571) work *Stirpium adversaria nova* which seems to have been overlooked by modern botanists.

Here, in PHO's translation, they describe (on p. 454) a *Drosera* as follows:

"*Rorida or sun's dew & Δρόσιου* [this should be *Δρόσιον* (Drosion)] of more recent botanists, otherwise *Alchimilla* from Drosion. It was omitted after the ferns [*'capillares (herbæ)*', a former name for ferns].

This little herb is wonderful and has an efficacy by no means to be considered inferior to the majority of the plants most lauded among the ancients, to whom perhaps it was unknown: and even today it is not fully known to the herbalists of Italy, Narbonne or the Austrian region. Certainly it is native for the Northern peoples, who call it Dew of the sun or **Son dau**, so that its leaves may overflow with limpid sprinkling and a dewy summer [*'vt cuius folia aspergine limpida & rorulenta aestate madeant'*. This is somewhat obscure!],

which the sun's heat not only does not evaporate but seems even to increase and foster further. It may sometimes be met with in sandy places and wet ditches in France and Brabant. In England the administrative districts of Kent and Somerset so greatly abound with this plant that not far from the celebrated Abbey and mount named Glastonbury there is enough to suffice to load a Horse, with a fibrous root, in six or eight flexible reddish little tails, an inch and a half long; the oblong, concave little leaves, resembling a small spoon or ear-scoop, are clothed with purple hairiness; with a crenate margin, but glabrous and polished above, scattered with dewy droplets, with vine-like petioles three or four inches long, reddish and curved, bearing whitish little flowers; and they enclose round seeds in glumes to some extent like the pericarp of Pimpernel. The taste of the whole is acrid, rather astringent, somewhat acid and bitter, quite desiccating. For the descent of salty phlegm [*'Ad salsæ pituitæ decubitus'*] into the lungs (ulcers and consumption of which it heals) it is second to none; bruised





Photo 1. *Sedum sexangulare* at Mayford, Surrey (v.c.17)



Photo 2. *Sedum sexangulare* inflorescence



Photo 3. Shoot of *Sedum sexangulare* for comparison with *S. acre*



Photo 4. Shoot of *Sedum acre* to compare with *Sedum sexangulare*



Photo 5. Plan view of stem of *Sedum sexangulare* for comparison with *S. acre*



Photo 6. Plan view of *Sedum acre*



*Taraxacum quadrangulum* Rail. Whitemill School, Carmarthen (v.c.44), April, det. A.J. Richards, 2014. Photo R.D. Pryce © 2012 (see p. 7)



*Echium pininana*, Tayport, Fife & Kinross (v.c.85). Photo A. Edwards © 2014 (see p. 59)



*Euphorbia oblongata*, 5th January 2015, Pilton, Somerset. Photo H. Crouch © 2015 (see p. 88)



*Salix ?friesiana* at Cabin Hill National Nature Reserve, Sefton Coast (v.c.59), July 2014. Photo: P. Smith © 2014 (see p. 41)



Robert Poccock, botanist. Photo R. Burton © 2015 (see p. 56)



Fig. 1. *Platanthera bifolia*



Fig. 3. *P. bifolia* seed pods



Fig. 5. Seed of *P. bifolia*



Fig. 7. Root and tubers of *P. bifolia*



Fig. 2. *Platanthera chlorantha*



Fig. 4. *P. chlorantha* seed pods



Fig. 6. Seed of *P. chlorantha*



Fig. 8. Roots and tubers of *P. chlorantha*

All *Platanthera* photographs taken on Isle of Skye (v.c.110) by T. Swainbank © 2014 (see p. 19)



*Mentha cervina*, Chorley, Cheshire (v.c.58), habit (l) and close-up of flowers (r). Photos G. Kay © 2014 (see p. 58)



Lower leaves of *Atriplex ?hulmeana*, Cefni Estuary, Anglesey (v.c.52), 20th August. Photo I. Rees © 2014 (see p. 17)



*Eryngium variifolium*, Dysart, Fife & Kinross (v.c.85). Photo G. Ballantyne © 2014 (see p. 59)

together with lumps of raw salt [*cum salis nigri grumis*]. ‘*Sal nigrum*’ (black salt) is raw or unrefined salt], it breaks the skin when applied. The clear yellowish brown and golden dew that is distilled from the leaves and little flowers is drunk for the same conditions.”

The first record for any *Drosera* in England was in the third volume of Turner’s *Herbal* (1568: 79): “*Rosa solis* is a litle small herbe that groweth in mossey groundes and in fennes and watery mores.” He gives no illustration. Gerard (1597: 1366, wrongly numbered 1356) describes and illustrates (very poorly) two species of ‘Sun dew’, which he calls ‘*Ros Solis maior*’ and ‘*Ros Solis minor*’, but Johnson (1633: 1556), in his revision of Gerard, has (without stating that he has replaced the plates or the names) two excellent drawings, ‘*Ros Solis folio rotundo*’, clearly *D. rotundifolia* (Round-leaved Sundew), and ‘*Ros Solis folio oblongo*’, either *D. intermedia* (Oblong-leaved Sundew) or *D. anglica* (Great Sundew).

Both L’Obel’s text and his accompanying drawing suggest to us *D. intermedia* rather

than *D. rotundifolia*. In a manuscript held in the Natural History Museum, Richard Pulteney, in citing this record, adds the comment “at least as far as the figure goes”; in other words, we suggest, Pulteney thought that there was some doubt about the description being of this particular *Drosera* species. The illustration, with the manuscript annotation, comes from the copy scanned by the Real Jardín Botánico, Madrid.

Both species are still found on the Somerset Levels, although the former is now very rare (and *D. anglica* far rarer still). But both were not uncommon in Murray’s (1890s) day, though he does state that *D. rotundifolia* was the more common even then. But who knows what the Levels were like 300 years before that? *D. intermedia* would like more open ground, which might have existed before water levels were dropped and more vegetation became established. *D. intermedia* might more likely have grown in sufficient quantities to load a horse and have been easier to separate and collect from the surrounding vegetation!



## Ellen Hutchins – Ireland’s ‘first woman botanist’

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2015 marks the 200<sup>th</sup> anniversary of the death of Ellen Hutchins, who is widely regarded as Ireland’s first woman botanist. She was born on 17<sup>th</sup> March 1785 and died just before reaching the age of 30 on 9<sup>th</sup> February 1815. Despite chronic ill health she achieved an astonishing amount in her short life. She roamed the land and sea around her birthplace of Ballylickey, West Cork, collecting and identifying hundreds of species of plant. She specialised in cryptograms, particularly marine algae, bryophytes and lichens. Her work was highly regarded by contemporary botanists in Britain and Ireland, who included her records and illustrations in their publications. However, she never published in her own name and was so modest in the beginning that she even had to be persuaded to allow her name to be mentioned as a finder of any plant (Mitchell, 1999). As well as being an outstanding botanist, Ellen was an accomplished botanical illustrator, producing exquisite watercolours of seaweeds and many drawings for publications, such as Dawson Turner’s *Fuci* (Turner, 1807-1819) and L.W. Dillwyn’s *British Confervae* (1809).

Ellen first became interested in botany after being referred to Dr Whitley Stokes (1763-1845), a medical doctor at Trinity College, Dublin. As part of the treatment for her illness, Stokes suggested she take up an outdoor activity, subsequently tutoring her in botany and introducing her to people such as James Townsend Mackay (1775-1862), who wrote the first complete Irish flora in 1836 (Pearson, 1918; Parnell & Webb, 1991). On returning to West Cork, Ellen set about her botanical studies with vigour. Mackay visited her and encouraged her to study seaweeds, later saying “I am a little proud of having been instrumental on setting her agoing in a branch of Botany in which she has made a conspicuous figure – She had never examined or dried

a sea plant until I gave her a hint in the summer of 1805 when I had the pleasure of spending several days with her in Ballylickey” (Mitchell, 1999). After his visit, Mackay sent some of her samples to Dawson Turner (1775-1858), an English botanist who had recently published his *Fuci*. Thus began a correspondence between Ellen and Dawson spanning the seven years from 1807-1814 (Mitchell, 1999). Their letters contain much scientific information but many personal details too. While the two never actually met, their friendship was very significant to Ellen and she bequeathed her collection of plant specimens and drawings to Turner.

When Ellen started her work, few botanists had visited West Cork, which was considered “a distant outpost of the scientific world” (Woods, 1809; quoted in Lyne & Mitchell, 1988). West Cork has a unique flora, with a number of so-called Lusitanian species that occur almost exclusively in south-west Ireland, north-west Spain and northern Portugal. Perhaps as a result of this, it soon became apparent to the recipients of her specimens that the area held particular botanical interest. She was therefore asked by Turner in 1809 if she would prepare “a complete catalogue of the plants of all kinds that you have found in your neighborhood”. Her total list, not completed until 1812, ran to over 1,100 species (Mitchell, 1999).

Ellen recorded in the region of 200 species of algae. Lewis Weston Dillwyn (1778-1855), a renowned botanist and conchologist, who visited Ellen in Ballylickey in 1809, named *Cladophora hutchinsiae* (= *Conferva hutchinsiae*) after her. He wrote in his *British Confervae* that he knew “few, if any botanists, whose zeal and success in the pursuit of natural history better deserve such a compliment” (Dillwyn, 1809). Another seaweed, *Dasya hutchinsiae* was named after her by

William Henry Harvey (1811-1866), who was Professor of Botany, Trinity College, Dublin: “To her the botany of Ireland is under many obligations . . . she was particularly fortunate in detecting new and beautiful objects, several of which remain the rarest species to the present day” (Harvey; quoted in Salter-Townshend, 2015).

Sir William Jackson Hooker’s *British Jungermanniae* (1812-1816) gives an indication of her importance in the bryophyte field, as “her name is more or less connected with nearly every rare species found in that grand work” (Lett, 1915). She was first to discover Hutchins Hollywort (*Jubula hutchinsiae*), which Hooker named after her. *Herberta hutchinsiae* was found by Ellen in 1810, but identified by Hooker as *Jungermannia juniperina*. It was not elevated to a separate species level and named for her, until 1917 by Prof. A.W. Evans (Bell & Long, 2012). Ellen also discovered Bantry Notchwort (*Leiocolea bantriensis*). Having not been seen for more than 100 years in County Cork, this species was recently re-discovered by Irish bryologist Dr Rory Hodd in a remote gully in the Caha Mountains (Hodd, pers. comm).

In total Ellen found around 200 species of bryophyte and Sir James Edward Smith (1759-1828), founder of the Linnaean Society, praised her skills as a field botanist, saying “she could find almost anything” (Lett, 1915). He named the moss Hutchins’ Pincushion (*Ulota hutchinsiae*) after her, saying: “a lady whose numerous discoveries in the more difficult departments of Botany justly entitle her to commemoration in the specific name” (Smith & Sowerby, 1813).

William Borrer (1781-1862), an English lichenologist, mostly handled her lichen finds. She recorded over 200 species, several of which were new to science. One of these was *Thelotrema isidioides* (type locality: Bantry Bay), which has not been found since in Britain or Ireland. Indeed, it was not found anywhere else in the world for over 150 years until it was discovered in the Azores in the 1990s (Purvis & James, 1993). Three of the

other lichens she discovered are named after her: *Lecania hutchinsiae*, *Pertusaria hutchinsiae* and *Enterographa hutchinsiae*.

Ellen recorded over 400 vascular plants, including some of the typical Pyrenean-Mediterranean species found in West Cork, but largely absent from Britain, including Large-flowered Butterwort (*Pinguicula grandiflora*), St. Patrick’s Cabbage (*Saxifraga spathularis*), Irish Spurge (*Euphorbia hyberna*) and Strawberry Tree (*Arbutus unedo*). What is also interesting for the modern visitor to West Cork is some of the species missing from Ellen’s list. Fuchsia is the *de facto* symbol of West Cork and yet it did not exist in the wild 200 years ago. Also missing are all the alien invasive species now commonly found in the area, e.g. *Rhododendron ponticum* (Rhododendron), *Crocasmia ×crocasmiflora* (Montbretia) and *Gunnera tinctoria* (Giant-rhubarb). It is a stark reminder that nearly all the alien invasive species that we are battling to control only became established in the wild from the late 1880s onwards. Meanwhile many of the species no longer found in the Bantry area are species of disturbed ground and/or former arable weeds, lost due to changing agricultural practises, e.g. *Valerianella dentata* (Narrow-fruited Cornsalad) and *Camelina sativa* (Gold-of-pleasure).

Ellen did not find any vascular plants new to science. However, in 1812, Robert Brown (1773-1858), of Brownian motion fame and first Keeper of the Botanical Department in the British Museum, named a Brassicaceae genus in her honour: *Hutchinsia* (now *Hornungia*) (Mitchell, 1999).

Ellen’s specimens are now held mainly in the Royal Botanic Gardens, Kew, although some of her material can be found in other institutions, including the Natural History Museum (London), Cambridge University (her letters to Turner), Sheffield City Museum (which has 46 of her water colours) and Botaniske Museum (Oslo). An 1807 pressed seaweed of Ellen’s is possibly the oldest specimen in the William and Lynda Steere

Herbarium at the New York Botanical Gardens (Dutton, 2015).

### Events planned

Ellen was buried in Bantry, but her grave is unmarked and many people are unaware of her important contributions to science. To mark the 200<sup>th</sup> anniversary of her death, Bantry Historical Society, in conjunction with the National Parks & Wildlife Service and Ellen's relatives, are holding a series of events in and around Ballylickey, 26<sup>th</sup>-30<sup>th</sup> August 2015. These will include talks and guided walks, with some of the top botanists in Ireland, the erecting of plaques to mark her birth and burial places, an exhibition about her life & work, a display of her artwork and other memorabilia, and the development of a new dedicated website. Full details will be available nearer the time, e.g. on [www.glangarriffnaturereserve.ie](http://www.glangarriffnaturereserve.ie).

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Fig. 1.: Drawing of 'Fucus asparagoides' (= *Bonnemaisonia asparagoides*) by Ellen Hutchins, 1811; in the possession of her family. Photo M. Hutchins © 2014

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## Highest altitudes of British and Irish vascular plants: recent work in Perthshire

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### Background

Collecting altitudinal data was popular amongst 19<sup>th</sup> century botanists (Stöckli *et al.*, 2011), but more recently climate change has given this work added significance (*e.g.* Lenoir *et al.*, 2008; Gottfried *et al.*, 2012; Pauli *et al.*, 2012; Grytnes *et al.*, 2014). For Britain and Ireland, altitudinal limits were given in the species accounts which accompanied the distribution maps in *The new atlas of the British & Irish flora* (Preston, Pearman & Dines, 2002). How the data were derived is explained in detail in the text and reproduced on the BSBI website ([www.bsbi.org.uk/altitudes.html](http://www.bsbi.org.uk/altitudes.html)). Since then a spreadsheet of altitudinal limits has been maintained and is available in summary form on the BSBI website (Pearman & Corner, 2013). This replaces an older published version (Pearman & Corner, 2004).

Efforts have been made by the author to collect new altitudinal records from sites across Scotland. Surveys on Ben Nevis (1,344m; 4,409ft) in 2008 and on nearby Aonach Beag (1,234m; 4,049ft) in 2009, the highest and seventh highest mountains in the British Isles respectively, each produced six new highest altitude records. Work with a BSBI party in 2010 on Ben Macdhui (1,309m; 4,296 ft), the highest summit in the Cairngorms, and second highest in the British Isles, produced five new highest altitude records and confirmed five others (Pearman & McIntosh, 2011). This new information has been used to update the spreadsheet.

As joint vice-county recorder for Mid-Perthshire (v.c.88) I am well placed to add new records, as some 12% of all highest altitudinal records in the spreadsheet occur in the vice-county – many in the Breadalbane Range, with its highest summit, Ben Lawers (1,214m; 3,983 ft), the tenth highest mountain in the British Isles. A special effort has therefore been made to record the highest altitudes on a

number of Perthshire summits using a standardised approach. The purpose of this short note is to describe the method and present some of the preliminary findings from field work carried out between 2010 and 2014. It is hoped that this will stimulate further work on altitudes by botanists elsewhere in the British Isles.

### Field method

A recording card was devised that included the highest British altitudinal records for around 340 taxa that were most likely to be encountered above 300m in Mid-Perthshire. Where English, Irish and Scottish altitudinal records were listed separately in Pearman & Corner (2004), the Scottish figure was included. Two additional columns were included, for BRC code and an abbreviated species name.

Using the recording card alongside an altimeter (or reasonably accurate altitude reading from a GPS) it is easy to assess whether a population is above the highest known altitude and therefore that a more detailed record should be made.

Generally, the search for highest altitudinal records begins with a thorough search of the immediate area around the summit – the summit plateau, if there is one. Then it proceeds from the summit downwards, with a careful search for the first occurrence of each montane habitat (*e.g.* spring, rill, flush, lochan, rocky outcrop, cliff, heath, species-rich grassland, *etc.*). When each habitat is first encountered a very careful search is made, often on hands and knees, as the plants are often diminutive, due to the effects of exposure, the short growing season and/or grazing.

When a species was encountered above or within 10m of the highest previous altitudinal record a detailed record was made. A Garmin eTrex H GPS, with WAAS enabled (Wide Area Augmented System: a system to improve GPS accuracy that uses a network of additional

geostationary satellites around the equator to broadcast a signal which corrects the normal GPS satellite signals). This is commonly available on GPS receivers, but may need to be manually enabled. It was used to provide a 1m resolution grid reference and altitude reading after allowing sufficient time for the GPS's stated accuracy to fall to +/- 3 m. A note was also made of whether the species was flowering, fruiting, sporing or regenerating vegetatively.

In order to maximise the number of records made it was important to visit summits during the height of the season, in July or August. As the work is slow, it was also important to make early starts on days with good forecasts, as near perfect conditions are required to allow the surveyor to spend sufficient time at altitude.

Between 2010 and 2014 ten mountains were surveyed for altitudinal records: Cairn Gorm, Glen Lyon (1,029m), Stuchd an Lochan (960m), Meall Garbh (968m), Beinn Heasgarnich (1,078m), Creag Mhor (1,047m), Ben Lawers (1,214m), Ben More (1,174m), all in Mid-Perthshire; and also Creag Meagaidh (1,128m) in Westernness, and Sgurr nan Conbhairean (1,109m) in West Ross.

### Key findings

Forty two species were found at higher altitudes than in the past. In addition, *Prunella vulgaris* (Self-heal) was found at a new record altitude (825m) for Scotland. Many species were found at significantly higher altitudes than previously recorded. Table 1 lists the eight species found more than 100m higher than had previously been recorded.

Table 1.

Taxon	New altitude record		Superceded altitude record			Increase (m)
	Site	Alt. (m)	Site	Alt. (m)	Date	
<i>Lycopodium clavatum</i> (Stag's-horn Clubmoss)	Ben Lawers	1,110	Atholl District	840	1898	270
<i>Carex lepidocarpa</i> (Long-stalked Yellow-sedge)	Beinn Heasgarnich	992	Ben Lui	854	2005	138
<i>Dryopteris expansa</i> (Northern Buckler-fern)	Beinn Ghlas	1,075	Stob Binnein	945	1978	130
<i>Carex pulicaris</i> (Flea Sedge)	Beinn Heasgarnich	1,035	Wester Ross	915	1928	120
<i>Carex demissa</i> (Common Yellow-sedge)	Ben Lawers	1,155	Scottish Highlands	1035	1960	120
<i>Carex capillaris</i> (Hair Sedge)	Ben Lawers	1,150	Ben Lawers	1035	1972	115
<i>Carex caryophyllea</i> (Carnation Sedge)	Stuchd an Lochain	913	Sty Barrow Dodd	800	2006	113
<i>Juncus triglumis</i> (Three-flowered Rush)	Ben Lawers	1,175	Snowdon	1065	1904	110

Five species had records within 10m of previous records and would confirm previous findings in different locations. Table 2 lists these records.

Table 2.

Taxon	New Altitude Record			Confirmed Altitude Record		
	Site	Alt (m)	Date	Site	Alt (m)	Date
<i>Carex canescens</i> (White Sedge)	Creag Meagaidh	1,090	2013	Ben Alder	1,100	1962
<i>Carex norvegica</i> (Close-headed Alpine Sedge)	Meall Garbh	975	2010	Beinn Heasgarnich	975	1936
<i>Luzula multiflora</i> (Heath Wood-rush)	Carn Gorm, vc88	1,026	2010	Breadalbanes	1,020	1898
<i>Carex pilulifera</i> (Pill Sedge)	Ben Lawers	1,150	2010	Beinn a'Bhuird	1,140	1962
<i>Pinguicula vulgaris</i> (Common Butterwort)	Creag Meagaidh	1,010	2013	Beinn Heasgarnich	1,000	2010

Five new altitudinal records update those previously made on the same mountain: Table 3 below

Taxon	Site	Update		Previous		Increase (m)
		Alt. (m)	Date	Alt. (m)	Date	
<i>Carex capillaris</i> (Hair Sedge)	Ben Lawers	1,150	2010	1,035	1972	115
<i>Juncus articulatus</i> (Jointed Rush)	Carn Gorm, Glen Lyon	920	2010	865	2003	55
<i>Lotus corniculatus</i> (Common Bird's-foot Trefoil)	Stuchd an Lochain	949	2010	915	1932	34
<i>Menyanthes trifoliata</i> (Bogbean)	Beinn Heasgarnich	1,030	2010	1,005	1995	25
<i>Selaginella selaginoides</i> (Lesser Clubmoss)	Ben Lawers	1,170	2010	1,130	2003	40

Interestingly, many new altitudinal records update those made historically. Six records that update altitudinal records made in Victorian times are listed in Table 4 below.

Taxon	New altitudinal record				Previous altitudinal record		
	Site	v.c.	Alt. (m)	Date	Site	Alt. (m)	Date
<i>Stellaria alsine</i> (Bog Stitchwort)	Creag Meagaidh	97	1,088	2013	Grampians	1,005	1870
<i>Lycopodium clavatum</i> (Stag's-horn Clubmoss)	Ben Lawers	88	1,110	2010	Atholl District	840	1898
<i>Ranunculus flammula</i> (Lesser Spearwort)	Beinn Heasgarnich	88	1,035	2010	Breadalbanes	945	1898
<i>Luzula multiflora</i> (Heath Wood-rush)	Ben More	88	1,045	2014	Breadalbanes	1,020	1898
<i>Filipendula ulmaria</i> (Meadowsweet)	Meall Garbh	88	902	2010	Breadalbanes	880	1898
<i>Equisetum fluviatile</i> (Water Horsetail)	Beinn Heasgarnich	88	930	2010	Breadalbanes	915	1898

Many of the populations found at new record altitudes in Scotland apparently flower and fruit quite happily. Table 5 (below) reproduces the list of greatest altitudinal ‘increases’ in Table 1 and includes notes on reproduction.

Taxon	Site	Altitude (m)	Increase (m)	Notes
<i>Lycopodium clavatum</i> (Stag’s-horn Clubmoss)	Ben Lawers	1,110	270	Producing cones
<i>Carex lepidocarpa</i> (Long-stalked Yellow-sedge)	Beinn Heagsarnich	992	138	Fruiting
<i>Dryopteris expansa</i> (Northern Buckler-fern)	Beinn Ghlas	1,075	130	Sterile
<i>Carex pulicaris</i> (Flea Sedge)	Beinn Heagsarnich	1,035	120	Fruiting
<i>Carex demissa</i> (Common Yellow-sedge)	Ben Lawers	1,155	120	Fruiting
<i>Carex capillaris</i> (Hair Sedge)	Ben Lawers	1,150	115	Fruiting
<i>Carex caryophyllea</i> (Carnation Sedge)	Stuchd an Lochain	913	113	Fruiting
<i>Juncus triglumis</i> (Three-flowered Rush)	Ben Lawers	1,175	110	Fruiting

### Discussion

Whether the increases in altitudinal records reported here are real or just an artefact of recording intensity is unknown. The large number of records that confirm much older records suggest that under-recording is a significant factor. While some records undoubtedly represent higher populations that have been overlooked until now, others may be due to altitudinal shifts in distributions. Such shifts have been shown to be occurring in montane regions across the globe (Gottfried *et al.*, 2012). Evidence for the advance of more thermophilous species into higher altitudinal zones is now beyond doubt (*e.g.* Kullman, 2002; Klanderud & Birks, 2003; Parolo & Rossi, 2008) and this hypothesis may account for the increased altitude at which some lowland species have been recorded in this study. Much more work is required to test whether this is the case and it is hoped that the approach taken here will stimulate botanists to replicate it in other parts of the British Isles. Such studies, if based on a standardised approach (*e.g.* using the methods recommended by Stöckli *et al.*, 2011), will provide an important baseline from which to measure the impacts of future climate change as well as updating the information on altitudes included in the next Atlas of the British and Irish flora.

This will also build upon the results of recent re-visitation work in Scotland, which is helping us understand how our montane floras have changed over the last hundred or so years (*e.g.* Jaroszynska, 2014), and understand the reasons for these changes (*e.g.* Grytnes *et al.*, 2014).

Table 5 above may indicate that climatic conditions are not the limiting factor in determining the altitudinal limits for at least some species. The limiting factor may be the lack of suitable soils and substrates at altitude.

### Further work

All Scottish BSBI recorders and members are encouraged to collect altitudinal records using a standardised approach similar to that outlined above on the highest mountains in their vice-counties. The customised recording card can be downloaded from the BSBI website, as can an updated version of the spreadsheet. It would also be interesting to note whether populations found at new altitudinal limits appear to be reproducing (either sexually or vegetatively).

### Acknowledgements:

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On [bsbipublicity.blogspot.com](http://bsbipublicity.blogspot.com) you can find a link to the [pocockherbarium.blogspot.com](http://pocockherbarium.blogspot.com), and also a photograph of the front of the 'Robert Pocock', a pub in the centre of Gravesend, opened by Wetherspoons some ten or fifteen years ago on the site of a former furniture store; but nothing about the pub.

Apparently, when the Wetherspoons executives were casting about for a name for their establishment they saw the plaque with Pocock's name on it on the house where he

lived nearby in the High Street and made some enquiries about the man in the public library, just across Windmill Road from the pub. Just inside the pub on the left there is a plaque about him, surrounded by photographs of irrelevant plants (see Colour Section, Plate 2). I believe there is a plan to replace these with artworks based on scans of his specimens.

Is this the only pub to be named after a botanist?

## Adventives & Aliens News, 5

MATTHEW BERRY (Compiler), *Flat 2, 11 Southfields Road, Eastbourne, East Sussex, BN21 1BU*;  
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I would always be pleased to hear about non-native species doing particularly well in members' local patches – that is, species that seem to be increasing gradually or rapidly, or which have been an established but unpublished presence for many years. In my own area two species which easily qualify for inclusion in the first category are *Hypericum hircinum* (Stinking Tutsan) and *Cyperus eragrostis* (Pale Galingale). Whatever the books might tell us about their requirements, in my experience they seem only to need a modicum of moisture in order to thrive. I have seen a few plants of *H. hircinum* converted into thickets in the space of a few years on waste ground around Eastbourne (e.g. TV60789925, in the town centre, by The Avenue, where it might be built on). I have seen it doing as well or better in at least two other parts of the UK. It is particularly abundant and luxuriant along the Thames at Hampton Court, for instance (pers. obs. M. Berry & E.J. Clement). A brave person unafraid of incurring the wrath of George Hounsome, might dare to suggest it has the makings of a problem plant! In contrast, could the allied *H. ×inodorum* (Tall Tutsan) be decreasing?

The recent flurry of records for *Lepidium virginicum* (Least Pepperwort) from quite scattered sites (S. Hants, E. Sussex, the London area and Northern Ireland) might imply a common vector with multiple entry points. Traditionally, it has behaved as a casual in the British Isles, so is unlikely to persist in any of these cases (feedback please!). It already seems to have gone from its v.c.14 site at Newhaven (see Adventives & Aliens News 1).

*Mentha cervina* (Hart's Pennyroyal) has been recorded from a second British site recently (for details, see below). The first British record was for a site in S.E. Yorks (v.c.61), where it is extant, though there are suggestions that it was originally introduced,

so that this is probably the first truly 'wild' record. The 'Hart' of Hart's Pennyroyal presumably refers to the male Red Deer, as *cervina* is derived from the Latin for deer, though what the connection is I leave members to ponder. The issue of English names for plants also resurfaces in relation to two other records detailed below: *Euphorbia chamaesyce*, which seems not to have one (a gap I am ashamed to admit my imagination was not able to fill) [but various sources give 'Prostrate Spurge', others 'Creeping Spurge' – ed.]; and *Pratia pedunculata*, which seems to have at least three: Australian Lawn-lobelia, Matted Pratia and Blue Star-creeper. However I prefer Blue Lawn-lobelia, as it is consistent with Stace's English name for the white-flowered *P. angulata* (Lawn-lobelia). Plant records are arriving in dribs and drabs and not quite the steady stream that would be my ideal. Should you have concerns about a particular record being lacklustre, please still send it, as other members, myself included, might not agree! As always, my thanks go to those who have done just that.

### V.c.10 (Isle of Wight)

*Euphorbia mellifera* (Canary Spurge). North Wood (SZ488947), 7/3/2014, P. Stanley: edge of path under scrub. Well away from houses in this case, seedlings can sometimes be found close to garden plants in more urban settings. For a brief description and an account of earlier records in v.c.c. 1a, 1b, H6 and H12, see Paul Green's article, *BSBI News*, 94:29, and the same issue for a photograph, Colour Section, Plate 4. The prominent central white vein on the upper surface of the leaf, and the unusual abruptly mucronate leaf tip are useful spotting characters for young plants.

### V.c.13 (West Sussex)

*Acaena ovalifolia* (Two-spined Acaena). Coolhurst (TQ199298), 30/3/2002, A.Knapp: edge of grass at west end of

parking area; Coolhurst (TQ20002980), 12/7/2003, M. Shaw: stony area, SW corner of St. Mary's churchyard. Reported by J. Simm from this site in 1999 as *A. anserinifolia* (Bronze Pirri-pirri-bur) and by A. Hoare as the present species in 2000. Records of *A. ovalifolia* from this general area might go back much further in time to the mid-1950s and the days of R.C. Palmer (Clement *et al.*, 2005: 158).

#### V.c.14 (East Sussex)

*Malva alcea* (Greater Musk-mallow). Eastbourne Sovereign Harbour (TQ64433 02685), 26/8/2014, M. Berry: on low sandy bank, waste ground north side of Pacific Drive. *M. moschata* (Musk Mallow) grows nearby on the same bank. The third Sussex record since 2000.

*Cotoneaster brickellii* J. Fryer & B. Hylmo (Brickell's Cotoneaster). Seaford (TV47463 99948), 21/1/2014, M. Berry (det. J. Fryer): one bush, probably bird-sown, steep bank, north side of A259. This most closely resembles *C. lacteus* (Late Cotoneaster), in that it has late-opening, many-flowered corymbs, evergreen leaves and red berries with two stones. However, it flowers somewhat later, the corymbs appear less densely packed (fewer flowered?) and the berries are slightly smaller (*c.* 5 × 4mm *vs.* 6-7 × 5-6mm); while the leaves have more acute apices, less deeply impressed secondary veins and a paler (whiter) tomentum. The first British record, it was described as recently as 2001, the type being from China (Yunnan), collected by C.D. Brickell and A.C. Leslie.

*Euphorbia chamaesyce* L. Stone Cross (TQ6069704672), 4/9/2013, M. Berry & D. Nicolle (det. E.J. Clement): one plant in container holding small Orange tree, nursery off Dittons Road. Just recordable in this case, it should be added to the roster of annual, stipulate *Euphorbia* species brought in via plant containers, *e.g.* *E. maculata* (Spotted Spurge), *E. serpens* (Sand Mat) and *E. prostrata* (Fringed Spurge) (see Adventives & Aliens News 4). This was identified by comparing with authentic material, but

the best character by far is the sculpturing of the seed surface, which is unique in being "irregularly tuberculate-rugulose". The potted Orange might have come from Italy, where the spurge is a widespread weed. The first British record. Herb. M. Berry (MCB). *Dittrichia graveolens* (Stinking Fleabane). Coldean (TQ32980924), 20/9/2014, P. Harnes: on central reservation of A27, seen whilst in slow moving traffic. The first definite v.c.14 record, and the inevitable conclusion to this tale of a missing botanical link. An earlier sighting for the edge of the A27 closer to Lewes (comm. P. Stanley), proved impossible to verify on grounds of safety.

*Miscanthus sinensis* Andersson (Chinese Silver-grass). Brighton (TQ3209005290), 24/9/2014, A. Spiers: one plant at base of wall, De Montford Road, apparently self-sown. A popular ornamental grass, which is very rarely recorded, possibly because the cultivated clones are self-incompatible.

#### V.c.21 (Middlesex)

*Physostegia virginiana* (L.) Benth. (Obedient-plant). Teddington (TQ1480071300), 9/10/2013, P. Hyde (comm. M. Crawley): pavement crack outside 70 Connaught Road. A North American perennial herb belonging to the Lamiaceae, which is sometimes grown in gardens – the presumed source in this instance. It has congested heads of Skull-cap-like flowers most commonly in (shades of ) pink or white. The curious English name stems from the fact that the flowers are held on short pedicels that are wire-like, and, if one is pushed into a new position, will (obediently) remain in it.

#### V.c.58 (Cheshire)

*Mentha cervina* L. (Hart's Pennyroyal). Chorley (SJ723509), 27/8/2014, S. Hinsley (det. Aaron Woods?/conf. and comm. G.M. Kay): edge of small pond. Graeme informs me that "there is one main plant, with a small one beside it and another several yards away, so it has probably been there at least two years". It is a native of Spain, Portugal, France, Morocco and Algeria, and, unlike other *Mentha* species,



including *M. pulegium* (Pennyroyal), which have calyces with five teeth, *M. cervina* has calyces with only four. As a consequence Spanish taxonomists prefer to call it *Preslia cervina* (L.) Fresen. See Colour Section, Plate 4.

#### V.c.85 (Fife & Kinross)

*Eryngium variifolium* (Moroccan Sea-holly).

George Ballantyne has supplied a most valuable update to his account of naturalised *E. variifolium* at Dysart harbour (*BSBI News*, 122: 39-40). I quote him verbatim: “Further visits were made during spring/summer 2014, when it was obvious that some plants had indeed scattered their seed about – one rosette noted on the harbour wall in May had developed a fine inflorescence by July, while many of the original plants were merging with the ‘ordinary’ vegetation and others were occupying ground some way off, having become well self-sown”. See Colour Section, Plate 4.

*Echium pininana* (Giant Viper’s-bugloss).

Tayport, 6/8/2014, A. Edwards: single, very tall plant, waste ground in an urban area –

almost certainly self-sown. Probably the northernmost British record. See Colour Section, Plate 2.

#### V.c.H36 (Co. Tyrone)

*Lepidium virginicum* (Least Pepperwort).  
Cookstown (H810785), 2011, I. McNeill (det. T. Rich): pavement weed.

#### V.c.H39 (Co. Antrim)

*Pratia pedunculata* (R. Br.) Benth. (Blue Lawn-lobelia), Antrim (J161861), 2012, I. McNeill (det. Edinburgh Botanic Gardens): lawn weed, Belfast Road. The first Irish record? For drawings by H. Salzen and details of some earlier records, see Eric Clement’s note, *BSBI News*, 95:46-47; and the same issue for a photo, Colour Section, Plate 3.

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I would like to thank Eric Clement for his valuable contributions.

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## A taste of stonecrops

GEORGE HOUNSOME, 14 St. John’s Rise, Woking, Surrey, GU21 7PW;  
(george.hounsome@btinternet.com)

While botanising back in 2003 on a housing estate near Mayford, Surrey (v.c.17) my eye was caught by a stonecrop along the inner edge of the pavement (TQ00005669), at first glance seeming to be *Sedum acre* (Biting Stonecrop) but with unusual stem architecture. I took a fragment home and used Stace (1997) to key it out, quickly and cleanly determining it as *Sedum sexangulare* (Tasteless Stonecrop) (see Colour Section, Plate 1). The final gustatory test left none of the lingering pepperiness associated with Biting Stonecrop, so I was convinced.

Following on from this, I wondered how often I had missed it and whether it could be easily picked out from its far more common relative. The most obvious difference, which first drew my attention to it, is that even

without picking a piece you can see that on most stems the leaves are closely aligned in six columns (see Colour Section, Plate 1, Photos 5 & 6). Closer examination shows that they are cylindrical rather than tapering, so the bases do not overlap (see Colour Section, Plate 1, Photos 3 & 4) and, when chewed, it justifies the common name. It also has a tendency to go bright reddish/orange, something I have never noticed in *S. acre*, and it is said that gardeners grow it for this feature. It has the distinction of being one of the species listed in David McClintock’s supplement to that flora dear to the heart of ageing botanists, McClintock & Fitter (1956). In it he states that “it has neater, thinner more or less cylindrical, unpimpled leaves, more crowded and often in six distinct spiral rows, with no

peppery taste and smaller flowers with narrower petals. A rare escape on walls.” (See Colour Section, Plate 1, Photo 2). The specific name does not imply that use of the plant gives a new angle to a popular activity but is a reference to the hexagrammatic appearance of the stems.

*Sedum sexangulare* originates from Central Europe and is widespread, but not common, in England and Wales. The BSBI Distributional Database lists 186 records, most of them south of the Lake District, with a few in Ireland and one at Alloa in Scotland. This reduces to about 90 if you exclude duplicates and those not seen since 1950. Most are in areas of thin or zero soil cover on walls or rock faces, in cemeteries and at pavement edges. The species has been in the ‘wild’ since at least 1763, when it was found south of Cambridge and near Ely Cathedral (BSBI Distribution Database), but this is the first record from Surrey.

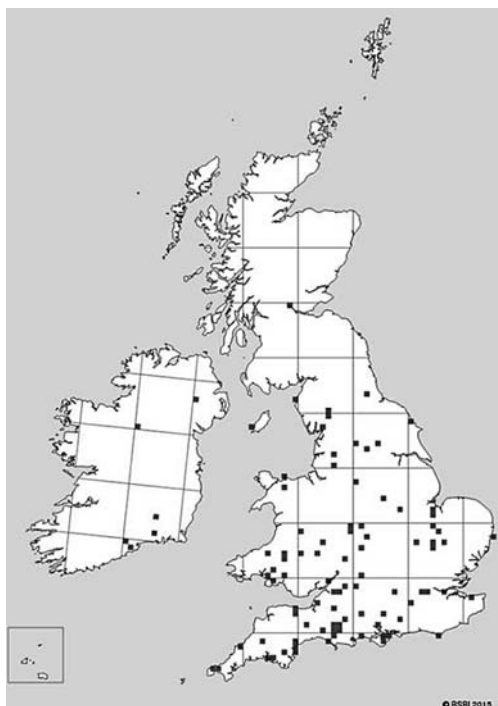


Fig. 1. Distribution of *Sedum sexangulare* in the British Isles (BSBI DDb, January 2015)

It may be more frequent than is apparent, being easily overlooked for *S. acre*, which the DDB shows as almost wall-to-wall in Britain apart from the Lakes and the Scottish Highlands. Having said that, I have checked a good few small yellow stonecrops since 2003 but not found it again until 2014 when, botanising with Dave Dawson, we found a few plants on a grave in Earlsfield Cemetery, also in v.c.17.

The colony at Mayford presumably originated from the garden of a resident with a use for xerophytes and the *RHS Plant Finder* (2007) lists a dozen or so suppliers, although I have never seen it for sale. The current owner of the nearest garden has a different horticultural approach and although still present in 2011 it was much reduced, being shaded out by shrubs. The fragment I brought home went into a pot and is doing well. If you have trouble remembering to water your pot plants, grow stonecrops - they do not mind it a bit.

#### Acknowledgements:

I would like to thank Eric Clement for helpful comments on this note.

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## *Sorbus austriaca* (Beck) Prain cultivated in Britain and Ireland

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For some time I have been worried by a distinctive, cultivated *Sorbus* with deeply lobed leaves and red fruit that I could not put a name to. I was shown numerous Danish specimens of the same plant, which had been named as *S. austriaca* when I visited Copenhagen herbarium (C) in March 2012, and in September 2012 Martin LepšI drew my attention to his paper showing *S. austriaca* was naturalised in the Czech Republic (LepšI *et al.* 2011). It has now been found naturalised in Britain as a bird-sown tree by R.E.N. Smith, by a bridge, Stover Country Park, Devon (SX832752), 22<sup>nd</sup> May 2014.

Fig. 1 shows the main characters. The leaves are ovate, greenish-white tomentose underneath, with deep, acute and strongly toothed lobes and 8-10 pairs of veins, and with small (c.10-11 × 11-13mm) red fruits. It is a relatively typical member of section Soraria (*i.e.* derived from *S. aria* (Whitebeam) group × *S. aucuparia* (Rowan)).

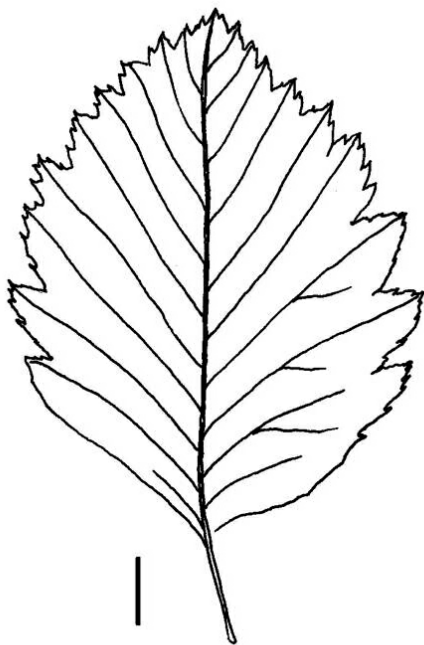


Fig. 1. *Sorbus austriaca* leaf, Stover Country Park, Devon. Scale bar: 1cm. (Del.: T.Rich).

It might be mistaken for *S. intermedia* (Swedish Whitebeam), but that has fewer, less toothed, obtuse lobes, and longer fruits, which are orangey-red.

In addition, I have seen the following material from planted trees:

Amenity planting, Kildgrove (v.c.39) (SJ839544), 12<sup>th</sup> June 2014, 'Lavateraguy' (iSpot 429578).

Two planted trees on remote rural verge, near Killington Reservoir (v.c.69) (SD59759232), 13<sup>th</sup> May 2011, D.A. Broughton.

Planted in Torr Righ Beag forest, Blackwaterfoot, Arran (v.c.100) (NR897313), 21<sup>st</sup> June 2007, T. Rich & D. McCosh.

Planted street tree, Killarney, Kerry (v.c.H2), 10<sup>th</sup> September 2008, T. Rich & A. McVeigh.

*Sorbus austriaca* is an endemic of the eastern Alps, Carpathians and Balkan peninsula, where it was split into four subspecies in *Flora Europaea* (2: 69), although these would probably be now treated as species. I have not investigated how our cultivated plants relate to the various taxa within the *S. austriaca* group.

### Acknowledgements:

I would like to thank Martin LepšI for confirming the identifications.

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## NOTICES

### BSBI Photography Competition Organiser – Vacancy

JIM MCINTOSH, *c/o Royal Botanic Garden Edinburgh, Inverleith Row, Edinburgh, EH3 5LR;*  
(Tel.: 0131 248 2894; jim.mcintosh@bsbi.org)

Over the past two years photographers have enjoyed participating in the BSBI Photographic Competition, and members have been delighted viewing displays of their work at the Scottish Annual Meeting and the Annual Exhibition Meeting. A total of thirteen competition images have been (or will be) printed in *BSBI News*, the Scottish Newsletter and the *New Journal of Botany*. The stunning image on the front cover of *BSBI News*, **128** of Snake's-head Fritillary was the winner of the 2014 competition by Ludi Lochner, for example.

The present organiser of the BSBI Photography Competition would like to stand down to allow her more time to follow other botanical interests. We are therefore looking for a keen volunteer to organise the competition in 2015 and subsequent years. Specifically the volun-

teer would receive photographic entries; arrange to have them printed; exhibit them at meetings and organise the competition. Most of the work would therefore be in a few weeks in October and November, a quiet time for many botanists (and photographers!).

It would be more important for the applicant to be a good organiser than a good photographer, although the post would obviously suit someone who is keen on botanical photography. Claudia Ferguson-Smyth, the current organiser, would be happy to help with any mentoring, training and advice that is required, and the volunteer would work closely with the BSBI Scottish Officer.

If you are interested in this volunteer vacancy – please get in touch with me before 30<sup>th</sup> June 2015.

### BSBI Ireland Annual Summer Meeting

JOHN FAULKNER, *Chairman: Committee for Ireland, Drumherriff Lodge, 37 Old Orchard Road, Loughgall, Armagh, BT61 8JD; (jsf@globalnet.co.uk)*

Come and be our guest, when the BSBI holds its Annual Summer Meeting at Coleraine on the north coast of Ireland, on 12<sup>th</sup> - 16<sup>th</sup> June.

If you go north on the B62 from Ballymoney, the ground rises gently. To your left is farm land, to your right the flat expanse of Garry Bog, with the Antrim hills in the distance. Ahead, the horizon is indistinct, enticing, ominous: the distance is all sky, as if to warn that you are heading for the edge of the world.

Geologists tell us that, sixty million years ago, you would have been in a vast expanse of volcanic activity as basaltic lava seeped relentlessly from cracks in the earth's crust. The alternative story is that the landscape was the handiwork of a giant, Finn McCoul. Finn's enemies were Scottish giants. One of them, Benandonner, came across a track made by

Finn from Ireland to Scotland, but had been frightened off by tall stories told him by Finn's wife. To hasten him on his way, Finn gouged out a great chunk from the middle of Ulster and hurled it at the Scottish giant, but it fell into the middle of the Irish Sea, creating the Isle of Man. His track to Scotland was later flooded by the sea, leaving a remnant we call the Giant's Causeway.

The Causeway is now a World Heritage Site and major tourist attraction. Much of the coast is dominated by basalt cliffs, with stretches where the underlying Ulster White Limestone presents a stark and impressive contrast to the dark basalt. The basalt forms a plateau stretching from the east coast of Co. Antrim to the centre of Co. Londonderry, with a wide, shallow dip in which lies the valley of the

River Bann. Coleraine itself is close to the mouth of the Bann, a large river whose catchment drains most of central Ulster including Lough Neagh. Around the mouth of the Bann, and to the west at the entrance to Lough Foyle there are extensive beaches and sand dune systems. Inland, there are glens dissecting the plateau, with remnants of natural woodland. On level ground, either side of the River Bann, are some of the best preserved patches of lowland raised bog in the British Isles.

Plant-wise, there are many specialities, from *Mertensia maritima* (Oysterplant) on the shore to alpiners like *Silene acaulis* (Moss Campion) growing at an unusually low altitude on Binevenagh. There is *Equisetum variegatum* (Variegated Horsetail) on slacks at the Umbra,

and a multitude of orchids on the dune systems. One plant familiar to visitors from Britain, but a real rarity as a native Irish plant, is *Geranium pratense* (Meadow Crane's-bill), found in a very restricted area near the North Antrim coast. Another speciality, for the sharp-eyed, is *Melampyrum sylvaticum* (Small Cow-wheat).

Details of the meeting and how to enrol are on an insert with this issue of *BSBI News*. They will also be posted on the Meetings and Irish pages of the BSBI website. In case you are wondering, I can reassure you that Irish hospitality has improved since Finn's time, so we are anticipating lots of demand. Book your place now ... but to be on the safe side, use an alias if your name happens to be Benandonner.

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## South London Botanical Institute launches new website and refurbished lecture room

CAROLINE PANKHURST, *Education & Project Manager, South London Botanical Institute (SLBI), 323 Norwood Road, London, SE24 9AQ; (Tel.: 020 8674 5787) (caroline@slbi.org.uk)*

The South London Botanical Institute (SLBI), based in Tulse Hill, has recently launched a new website and a newly refurbished lecture room, as part of its £100,000 support from the Heritage Lottery Fund (HLF).

The new website is highly user-friendly and allows visitors to take advantage of all of the SLBI's events and activities – from botanical workshops and talks, to tree walks, art and photography classes, suppers, plant sales, open garden evenings, school visits and children's holiday activities.

The stunningly refurbished lecture room now proudly displays a unique wallpaper designed by a local artist, Augusta Akerman, based on her drawings of plants in the SLBI garden and herbarium (see photo p. 64). The style of the art pays homage to William Morris, so reflects the period of the building, and is in a paisley-inspired design, reflecting the time spent in India by Allan Octavian Hume, the SLBI's founder. Around 15 plants from the garden and herbarium have been included, including *Gingko biloba*, the tree standing tall in front of the house and seen in the SLBI's logo.

The SLBI occupies an 1860s house in Tulse Hill, South London, with original fireplaces, shutters and carriage sweep with Edwardian features. Few internal changes have been made to the building since the 1940s. The HLF grant has enabled the redecoration of the lecture room, as well as conservation of the original Victorian windows and shutters throughout the building. The SLBI was keen to improve its environmental impact as part of the refurbishment, so as well as draught proofing its windows, the new lecture room includes a recycled chandelier from e-bay and super energy-efficient LED light bulbs.

Commenting on the completion of the new room and website, Roy Vickery, SLBI President, said:

“This is a great step forward for us. Not only have we been able to carry out much-needed conservation and refurbishment work, but we've done it in a special way, using a wallpaper unique to the Institute and full of its history. Our new website will help people discover our 'hidden gem', and we hope it will inspire more people of all

ages to come and share our passion for plants.”

The new website and lecture room were formally ‘launched’ at an event on Thursday 26<sup>th</sup> March, attended by Augusta Akerman, the wallpaper artist, as well as Jennifer Ullman from the Heritage Lottery Fund and key representatives from the SLBI.

Many of the Institute’s activities will take place in its newly refurbished lecture room, which is also available for hire. The Institute is open on Thursdays (10am. – 4pm.), Saturday mornings (10am. – 2pm.) and for events. Full details of all activities can be found on the new website: [www.slbi.org.uk](http://www.slbi.org.uk)



A section of the unique botanical wallpaper showing *Ginkgo biloba*. Photo © C. Pankhurst/SLBI'

## NEWS OF MEMBERS

### Marsh Awards for Botany, 2014

Notice has just come to us that the Marsh Award for Botany this year has gone jointly to our long-serving members Dr Rod Corner and Jeremy Roberts. We extend our hearty congratulations for well-deserved recognition of their contributions.

To quote from their respective citations: Rod Corner is recognised in particular for having “... contributed to the floras of Cumbria, Northumbria and Durham, and [being] a leading authority on the flora of Greenland. He has worked as the vice-county recorder for the Botanical Society of Britain and Ireland in Selkirk and Roxburgh for over 40 years.

Rod’s findings, knowledge and advice have hugely helped local staff of Scottish Natural Heritage and the Nature Conservancy Council. He is also an inspiring teacher, helping other botanists to develop their skills”.

Jeremy Roberts, meanwhile, is quoted as having “... done much work for Natural England on *Saxifraga hirculus* and other species. He discovered a filmy fern that was new to science in the Bewcastle fells and re-discovered the species *Ajuga pyramidalis*.

He has designed an excellent website for the identification of spike rushes, deer-grass and filmy ferns, and has been a Botanical Society [of] Britain and Ireland Referee for these species. Added to these achievements could be many other ‘firsts’ or re-discoveries - *Carex muricata muricata*, *Carex aquatilis*, *Alchemilla monticola* on Alston Moor and others”.

Full details of their award can be found at: [http://www.marshchristiantrust.org/Botany\\_Award](http://www.marshchristiantrust.org/Botany_Award)

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## REQUESTS & OFFERS

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### **Help us gather evidence of visible ozone injury across the UK: new smart-phone App for recording incidences of ozone damage to vegetation**

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BACON, J., *Centre for Ecology and Hydrology, Lancaster, LA1 4AP*

HARMENS, H., *ICP Vegetation Programme Coordination Centre, Centre for Ecology and Hydrology, Bangor*

HAYES, F., *ICP Vegetation Programme Coordination Centre, Centre for Ecology and Hydrology, Bangor*

Ozone is a naturally occurring chemical found in both the stratosphere (comprising the ‘ozone layer’, 10-40km above the Earth), and the troposphere (0-10km above the Earth). Additional ozone is formed in the troposphere as a result of chemical reactions between nitrous oxides and carbon monoxide released due to anthropogenic activities, particularly vehicle emissions. The concentration of ozone in the atmosphere is strongly influenced by the weather, and certain conditions (warm, sunny days) can lead to ‘ozone episodes’, with concentrations peaking at high levels for several days at a time.

Ozone is absorbed into plants through pores at the leaf surface, leading to cell wall and membrane damage and the disruption of photosynthetic processes in sensitive plant species. This damage can have numerous negative effects, including the appearance of visible injury on leaves and also a reduction in the quality and quantity of plant biomass and crop yield. Plant species can vary in sensitivity to ozone, for example wheat, soybean, pulses and tomato have been found to be the most sensitive (Mills *et al.*, 2007). This difference in sensitivity to ozone also has the potential to affect plant community composition, with ozone-sensitive species showing a reduced ability to compete with more tolerant species (Hayes *et al.*, 2009).

As ozone pollution does not result in the formation of residue on the leaves, visible leaf injury is the easiest way to detect damage. Ozone damage can cause small, pale yellow, cream or bronze coloured pin-head sized blotches (known as stipples) on the leaf surface. When ozone exposure is high for a prolonged time, these spots can join together, covering large areas of the leaf. While symptoms can vary between plant species, there are several diagnostic features that tend to be commonly found in ozone-damaged plants: 1) spotting on the leaves occurs between the leaf veins; 2) damage appears on the upper surface of the leaves, spreading to the underside in severe cases; 3) older leaves (towards the base of the stem and branches) tend to be more affected than younger leaves as damage is determined by the accumulated uptake of ozone over time.

In 2007, a synthesis report was published documenting over 500 incidences of visible ozone injury on crops, grassland species and shrubs growing in the field under ambient air conditions in 17 countries across Europe (Hayes *et al.*, 2007). We aim to re-visit this study by collecting new records of visible ozone injury worldwide. Using smart-phone technology for iPhones and Android phones, the ozone App allows incidences of ozone injury to be recorded as soon as it is spotted in the field. After registering, participants are

asked to upload photographs of ozone injured plants, while coordinates for the location where the injury was detected are recorded automatically using the phone's GPS. The broad vegetation type of the damaged plant and the species name can then be chosen from a list (or added by hand). Information on the symptoms of ozone injury (including the colour, location on the leaf and age of damaged leaves) is then requested from the user.

Questions designed to assist with quality assurance, for example specifying any previous experience of identifying ozone damage or plant diseases and describing recent weather conditions, will also be asked. For guidance, the App contains an 'Ozone information' section, which includes details of the key symptoms of ozone injury, and other causes of leaf damage that may be mistaken for ozone injury. There is also an 'Examples of ozone injury' page, containing photos of ozone injury on a variety of species (see inside Back Cover).

The App will be available to download in the spring of 2015. For those without a smart phone, a web-based recording facility has also been created. Both the App and web recording form will be available from our website: <http://icpvegetation.ceh.ac.uk/record/index>

The ozone injury smart-phone App will enable the collection of widespread evidence of ozone damage to vegetation around the world. This will allow us to build upon the list

of ozone-sensitive species worldwide and to validate risk maps, which predict where ozone levels are expected to be highest. As ozone damage is more likely to occur in the UK during 'ozone episodes', we will be sending email alerts to registered App users to let you know the best times to go and look for damage. We would like to encourage people to get involved and download the App this spring, to help us to gather as much data as possible. If you think you can help, please visit our website for more information.

For further details please contact: Dr. Katrina Sharps (contact information above).

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## Calling on the UK botanical community to help collect flowering time observations for UK orchids in 2015

KATH CASTILLO, *Department of Life Sciences, Natural History Museum, Cromwell Road, London, SW7 5BD*; ([k.castillo@nhm.ac.uk](mailto:k.castillo@nhm.ac.uk))

BSBI data are being used to support a new project currently being developed by the Natural History Museum in collaboration with Oxford University, which aims to engage the skills and expertise of the UK amateur and professional botanical community, as well as the wider public. The *Orchid Observers* project will combine field recording with online data transcription and herbarium specimen identification. This new approach aims to

bring together two main fields of biodiversity-based citizen science: field observation and online crowd-sourcing.

Orchids are an important part of the UK's rich botanical diversity and recent research indicates their flowering could be affected by climate change (Robbirt *et al.*, 2011; M. Spencer, pers. comm.). NHM curator of the British and Irish herbarium and BSBI county recorder for Middlesex, Dr Mark



Spencer, is the research lead for the project, which aims to further our understanding of the impacts of climate on the UK's flora using orchids as a model group. This research is part of a wider NHM project using museum collections to understand the impacts of environmental change on biodiversity (see: <http://www.nhm.ac.uk/our-science/our-work/origins-evolution-and-futures.html>).

The *Orchid Observers* project will engage participants in gathering new photographic records of orchids during 2015 and beyond which, combined with data extracted from c. 10000 digitised historical herbarium records (1830-1970) and modern BSBI records, will produce a c.180 year time series. By combining these data sets the project will compare flowering times with climatic records to build a record of flowering phenology for a range of key orchid species to determine whether any observed changes correlate with key climate parameters.

Addressing scientific challenges such as climate change requires large data sets. For the field-based aspects mass participation is necessary to cover the amount of field sites that need to be visited. Of the 56 orchid species that are established in the wild in the British Isles, 29 taxa have been selected for this study (omitting the specially protected species, sub-species and varieties). Collectively, the study taxa occupy a wide range of habitats and geographical distributions, which take in most regions across the UK.

The project developer teams acknowledge and value the expertise of the botanical community in the UK, particularly BSBI county recorders and members, many of whom possess expert knowledge of UK orchid taxonomy and geographical distributions. We also wish to engage the participation of the wider botanical community, local natural history societies, and the interested public.

We are asking volunteers to locate and photograph orchids in flower in their local area and upload their images and field records to the *Orchid Observers* website. Participants

will then be able to help classify and verify the species and flowering stage recorded in the photographs, explore the digitised herbarium sheets online, access information on the study species and distributions and help to classify data. By encouraging people to participate in the project we hope to inspire both amateur and professional botanists, and the next generation of botanical enthusiasts.

By collecting and submitting new records and participating in the online verification tasks, volunteers will contribute valuable contemporary data to BSBI records for orchid populations and distributions, in addition to contributing data to the NHM research. We wish to promote the BSBI and botanical recording in any way we can and all records will be made freely available to the BSBI and will be supported by verifiable photographic records.

The project is being developed by NHM researchers and Zooniverse, the Oxford-led platform which has allowed more than a million volunteers to discover planets, participate in particle physics and count penguins (<https://www.zooniverse.org/>). It is funded by the Arts and Humanities Research Council, through their Science and Culture Programme.

The *Orchid Observers* Zooniverse project will go 'live' in the spring, in time for the orchid field season. For further information and interest in participating in the project leading up to the launch please visit [orchidobservers.org](http://orchidobservers.org), or email: [orchid@nhm.ac.uk](mailto:orchid@nhm.ac.uk). Updates and links to information, and instructions on how to get involved, will be posted on the BSBI and NHM websites in due course.

#### Reference:

ROBBIRT, K.M., DAVY, A.J., HUTCHINGS, M.J. & ROBERTS, D.L. (2011). 'Validation of biological collections as a source of phenological data for use in climate change studies: a case study with the orchid *Ophrys sphegodes*'. *Journal of Ecology*, **99**: 235–241.

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## Money talks: developing egalitarian ‘citizen science’ frameworks in the 21<sup>st</sup> century

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Until comparatively recently, British botanical research was funded predominantly through central government, block grants being routinely given annually to the university sector and to prestigious national research institutes, including major botanic gardens and museums. But in the post-Thatcher world in which we all now live, competition has become the watchword and consequently money has taken centre stage, thereby calling into question the objectivity of 21<sup>st</sup> century science. Indeed, today’s professional scientist is likely to be judged less by their scientific outputs than by the amount of someone else’s money that, by hook or by crook, they bring into their host organisation. Thus have means become ends in themselves. Those research areas of greatest interest to BSBI, plant systematics and applied ecology, have fared especially poorly under this increased selection pressure, which was further intensified by the 2008 economic downturn. Money now talks, loud and clear.

In a parallel trend, one that is commonly advertised as enhancing the prospects of the best researchers but is also intended to reduce the associated workload on grant administrators, competitive funds are being allocated in fewer tranches of larger sums to more extensive research networks. Also, when developing research proposals, the members of those networks are increasingly being asked to justify the immediate societal impact of the projected outputs of their research. For better or for worse, the days of individualistic, blue-skies researchers in the mould of Charles Darwin are no more. As a general rule, the larger the number of organisations and individuals brought together into a single proposal, the greater is the likelihood of obtaining substantial funding, although of course any funds gained must then be apportioned among the various formal partners. When carefully and inclusively planned, such collaborations should provide considerable benefits to all concerned.

However, there is one fundamental difference between a good old-fashioned block grant provided by central government and a ‘modern’, one-off targeted grant, irrespective of whether it is provided by a governmental or non-governmental organisation. Specifically, that funding body is likely to have ideas of its own regarding how the grant should be spent and, all too often, those opinions are based on whether the activity or product can be clearly ‘branded’ with the name (and often the ideals) of the relevant funding body. In the case of the collation and provision of biodiversity information, the net result has been a plethora of branded projects, typically relatively short-term and often falling well short of the ambitious achievements that were predicted when the funds were originally sought. Unfortunately, the selection procedures for funding proposals are usually far more rigorous than any system developed to subsequently assess whether a funded project has genuinely given value for money. In short, responsiveness and transparency do not necessarily translate into efficiency or fairness.

One consequence of the wholesale restructuring of research funding post-1980 is that it has become much easier to fund a new project than to further develop an existing one. For example, it is much more attractive to produce a new biodiversity database (exciting, and readily branded) than to populate an existing database with genuinely useful volumes of data and expand the capacity of the associated IT platform (boring, and at best available only for cosmetic re-branding). No overarching review system exists to point out, in Emperor’s New Clothes fashion, that any database is valueless until it has been well-populated with quality data. Emphasising fiscal considerations in our nation’s science has created a research environment that is more complex and difficult for scientists to navigate. This in turn has created an environment that is more attractive to the increasing numbers of interstitial bodies (often labelling themselves as consultancies) who, in

exchange for performing ‘essential’ organisational and/or advisory roles, are able to feed off the funding streams that might otherwise pass directly from funding bodies to active researchers. It also creates an environment in which style can triumph over substance.

But just how relevant are these ‘big-picture’ issues to a dominantly ‘amateur’ society such as the BSBI? Well, in my opinion, they have become paramount. An increasingly popular way of demonstrating the direct relevance to society of a major grant proposal is to involve specialist societies such as the BSBI in the aforementioned research networks. There is no doubt in my mind that the BSBI has benefited considerably in the past from several such initiatives; but equally, there is no doubt in my mind that some such initiatives have cost the BSBI dear, other organisations taking much of the credit (and cash) for outputs based on unique, solid datasets that were hard-won over long periods by the BSBI’s committed and highly motivated members. This generosity on the part of the BSBI was arguably acceptable during a period when all biodiversity-related organisations were still finding their way in the Brave New World of ‘fiscal accountability’. However, the BSBI’s ambitions have rightly grown in recent years, and such ambitions inevitably incur greater expenditure. My thesis here is that the BSBI, and other like-minded independent organisations, cannot afford to continue handing over their crown jewels in exchange for, at best, a modicum of transient publicity.

Recent developments within the BSBI make clear that the Council are aware of these issues and are making concerted efforts to respond. They deserve our unqualified support. However, my long-held views on these matters were recently brought into sharper focus by discovering that one of the ‘progressive’ interstitial organisations had coordinated a network proposal that had been awarded £1.56m by the (wholly government-funded) Arts and Humanities Research Council. The aim is to pursue four ‘citizen-science’ projects, at least one of which relates to biodiversity studies; and another network coordinated by a British university has been awarded a further, linked AHRC grant of £0.75m to conduct a sociological study of these citizen scientists once they have been stimulated

into action by the initial grant. As far as I can ascertain from the information currently available, in neither case were the voluntary organisations, whose cooperation is essential for the success of these ventures, formally approached to help plan these projects, nor are they to receive any financial benefits from these extraordinarily well-funded networks. The active involvement of societies such as ours was, as usual, simply assumed but then explicitly stated in the funding proposals. The first project seemingly views the unparalleled specialist knowledge of the organisations as a freely available resource, to be tapped as and when is convenient, whereas the second project views us as a colony of self-maintaining laboratory rats. Neither attitude is particularly respectful.

Even when so blatantly taken for granted, it will be tempting for us to maintain our traditional stance of benign positivism and continue to enthusiastically participate in such projects. But I would argue that, should we choose to do so, we will continue to be taken for granted for the foreseeable future. To put the conundrum even more bluntly, in a ubiquitously monetarist environment, those who give their time and other resources for free, while others collect substantial rewards on their behalf, will not be respected. Citizen science projects could be (and indeed have been) pursued by organisations such as the BSBI with great success *in the absence of overarching interstitial bodies*. In contrast, such projects could not possibly be pursued by interstitial organisations without the active involvement of the troops on the ground – us!

Surely it is high time that voluntary organisations, today operating as the main repository for specialist expertise in natural history, are automatically viewed as full partners in citizen science and data-sharing enterprises? Ideally, the BSBI needs to place itself high in the food chain, certainly involving other like-minded societies where appropriate but also showing increased aggression in pursuing its laudable aims. Recent history has taught us that not only cash but also kudos and influence accrue to those who give the strongest appearance of leadership. Sadly, in today’s ultra-competitive and decidedly non-egalitarian funding environment, truth and beauty butter no parsnips.

## ***Potentilla crantzii*, *P. tabernaemontani* and putative hybrids**

M. WILCOX, 43 Roundwood Glen, Greengates, Bradford, W. Yorks., BD10 0HW:  
(michaelpw22@hotmail.com)

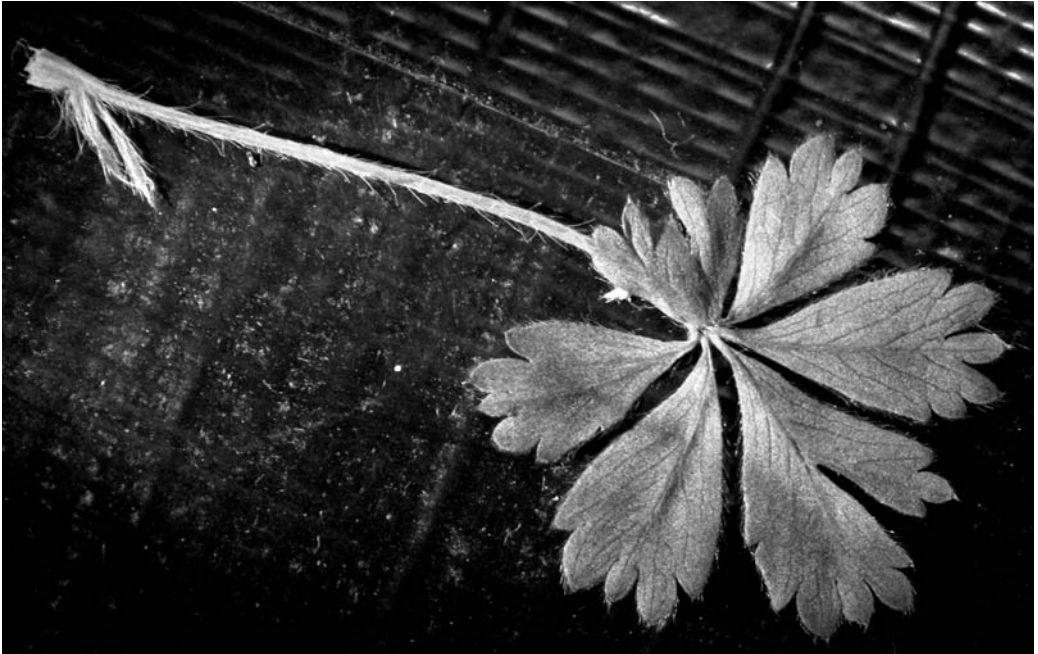
The two species *Potentilla crantzii* (Alpine Cinquefoil) and *P. tabernaemontani* (Spring Cinquefoil) and their putative hybrid(s) have, rightly or wrongly, recently undergone some changes (Sell & Murrell, 2014). This is a group that I have an interest in, but, as an individual, it is very difficult to get to sites, especially for the montane *P. crantzii*. In order to study these taxa more closely I would be interested in samples of the basal leaves only (particularly *P. crantzii* from montane areas), with their stipules intact (not the stem or its leaves or flowers). This means that you do not have to collect a plant at all. The basal leaves can easily be peeled off backwards and need only be 2-3 from a plant (an example is given in the photo below).

I have visited quite a few Yorkshire sites for these leaves, so there is less of a need for

material from there, although it could be one of the sites I have not managed to get to yet. It is more important to get Scottish material and some from northern England of *P. crantzii* than any other. These can be sent fresh or pressed. Your records are valuable and should be submitted for the Atlas recording, even from known sites. I hope to look at these over the period of Atlas 2020, but, given the difficulty of visiting at least some montane sites, this could take longer and your help would be much appreciated.

### **Reference:**

SELL, P.D. & MURRELL, G. (2014). *Flora of Great Britain and Ireland*. Vol. 2: *Capparidaceae – Rosaceae*. Cambridge University Press, Cambridge.



Basal leaf with stipules of *P. tabernaemontani*, Gait Barrows. Photo © B. Brown.

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## Ken Trewren's *Some taxa within the Dryopteris affinis complex: a field guide wanted*

STUART HEDLEY, *Westward House, Llanishen, Chepstow NP16 6QS*; info@stuarthedley.co.uk

I regret not snapping this up in 2014. It is now apparently out of print. Would any

members with a spare to sell please contact me on: info@stuarthedley.co.uk.

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### *Botany for naturalists*: free addition

JOHN PRESLAND, *175c Ashley Lane, Winsley, Bradford-on-Avon, Wilts., BA15 2HR*;  
(johnpresland2@tiscali.co.uk)

My book *Botany for naturalists* was published in April 2014. It has now been revised. The most significant change is an index of the special terms used in the book showing the locations where they are explained. I will be happy to email this item free to anyone who

bought the book. The other revisions are corrections and clarifications of the text, which will not significantly affect reading and using the book.

The revised edition is available on Amazon.

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## BOOK NOTES

JOHN EDMONDSON, Book Reviews Editor, *243 Pensby Road, Heswall, Wirral, CH61 5UA*;  
(bsbireviews@mac.com)

The following titles are to be reviewed in current or future issues of *New Journal of Botany*. Also included are notes on books that are not being given a full review (marked \*). Unsigned reviews are by the editor.

AKERROYD, J.R. *Docks and knotweeds of Britain and Ireland*. Botanical Society of Britain and Ireland, 2014. (BSBI Handbook No. 3, second edition). £16 p/b. ISBN 978 0 90 115847 5.

\*BALL, S. *Wild flowers of eastern Andalusia: a field guide to the flowering plants of Almeria and the Sierra de los Filabres region*. BrownDown Publications, 2014. £22.95 p/b. ISBN 978 0 9563961 1 2.

With a selection of 625 of the most commonly encountered species from this scenic and botanically rich area of south-east Spain, together with 575 colour photographs, this pocket-sized field guide covers a significant sample of the Mediterranean flora. It includes scientific, English and Spanish names. Visitors no longer need to

rely on C.M. Stocken's slim handbook *Andalusian flowers and countryside* and can leave the more substantial (and highly recommended) *Flowers of south-west Europe: a field guide* by O. Polunin & B.E. Smythies at home.

BRAITHWAITE, M. *A short flora of Berwickshire*. The author, Hawick. 2014. £20 (£25 incl. p. & P.)

JONES, V. *Yorkshire hawkweeds*. Yorkshire Naturalists' Union, 2014. £27.50 p/b. ISBN 978 0 9565378 2 9.

SELL, P. & MURRELL, G. *Flora of Great Britain and Ireland*. Vol. 2: Capparaceae – Rosaceae. Cambridge University Press, 2014. £125 h/b. ISBN 978 0 521 55336 0.

STROH, P.A. *et al.* *A vascular plant red list for England*. Botanical Society of Britain & Ireland, 2014. £16 p/b. ISBN 978 0 953971 86 2.

TISON, J.-M. & FOUCAULT, B. de. *Flora Gallica - flore de France*. Biotope Éditions, 2014. €89 h/b. ISBN 978 2 366620 12 2.

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## OBITUARY NOTES

Since the publication of *BSBI News* 127, we regret to report that the news of the deaths of the following members, including several of long standing, has reached us. We send regrets and sympathies to all the families.

**Mrs J.A. Burton** of Longniddry, East Lothian, a member since 1996

**Mr J.A. de Normann** of Box, Wiltshire, a member since 2001

**Mrs J.L.E. Goater** of Chandlers Ford, Hants, a member since 2004

**Mrs J.A. Green** of Thame, Oxfordshire, a member since 1976 (see below)

**Dr M.C.A. Griffin** of Cambridge, a member since 1990

**Mr D.H. Phillips** of Wrecclesham, Surrey, a member since 1954. His daughter writes: “Dad was a plant pathologist who worked for the Forestry Commission and before that for the Jersey Government. He had a degree in botany and a postgraduate msc and a phd in related areas. He studied fungal diseases such as potato and tomato blights. He also had some dealings with research into dutch elm disease”.

**Dr W.G. Pickering** of Gosforth, Northumberland, a member since 1996

**Prof. O. Rackham** of Corpus Christi College, Cambridge, a member since 1980 (see p. 73)

**Mrs J. Thomson** of Blewbury, Oxfordshire, a member since 1982.

Obituaries of some of these will appear in *BSBI Yearbook 2016*.

We are grateful to Prof Ian Trueman for this note on a former member of BSBI:

**Professor John Richard Packham** MSc PhD FLS was born in Brighton on 15<sup>th</sup> June 1930 and died in Bridgnorth, Shropshire after a short illness, on 11<sup>th</sup> March 2015.

He taught at the University of Wolverhampton for 30 years until 1994 and eventually became Professor of Ecology there. An enthusiastic field botanist, he played an active part in sustaining botany as an academic subject throughout his career. He published widely, particularly in woodland and coastal ecology. In 1975 Charles Sinker asked him to become executive editor of a proposed Flora of Shropshire which, together with others, including Frank Perring and Philip Oswald, they carried through to successful publication in 1985 as the *Ecological Flora of the Shropshire Region*. A seminal work, it played an important role in the development of the vice-county Flora and although Charles was the ‘presiding genius’, John was definitely the ‘chief executive’ in its production and contributed a great deal to the introductory chapters.

The BSBI is still looking for an Obituaries Editor and if any member would be prepared to take this on please contact John Poland, 13 Grasmere Close, Southampton, Hants., SO18 3NP; (jpp197@alumni.soton.ac.uk)

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### Dr Jean Anne Green, 25<sup>th</sup> May 1930 - 14<sup>th</sup> February 2015

DELYTH WILLIAMS, *BSBI Recorder: v.c.50 Denbighshire, Bryn Siriol, Graig Fechan, Ruthin, Denbighshire, LL15 2HA*; (delyth@siriolbryn.co.uk)

I am very sorry to be reporting the death of Jean Green on 14<sup>th</sup> February 2015. Jean was Emeritus Recorder for v.c.50 Denbighshire, having been Recorder from 1982 until 2009.

She joined the BSBI in 1976 and was first elected to the Welsh Committee in 1979, becoming Chair in the late 1980s.

Jean taught me so much about so many things in her quiet, unassuming and modest way. But she was a person of exceptional gifts and talents. Her qualities and skills were by no means restricted to botany. She was one of the first women to be elected Fellow of The Royal College of Surgeons, in 1957, although her career was curtailed, as it was in those days, following the birth of her children.

She was a talented musician, originally wishing to pursue this as a career, playing the flute and oboe in local orchestras. She had a lovely voice and enjoyed singing in the St Asaph and other local choirs. For many years she contributed extensively to the North Wales Wildlife Trust.

All of us remember her kindness and patience, sharing freely her extensive knowledge, providing tips and suggestions to encourage improvement and confidence. She always found something of interest to share

with us. One learner remembers her simple but effective technique of collecting together *Calystegia pulchra*, *C. sepium* and *C. silvatica* in order to show their differences. She was renowned for her amazing capacity for heading off in her wellies, undeterred, in all weathers, into bogs (her favourite), up hills, down cliffs, over walls, under fences and, as I vividly recall, straight through a large and high patch of stinging nettles.

In 2005 she prepared a botanical checklist for v.c.50 (Green, 2006). This is the first such publication for Denbighshire.

She leaves two sons, two daughters, eleven grandchildren and a large number of people who have a profound respect and affection for her and who feel a great sadness at her loss.

**Reference:**

GREEN, JEAN A. (2006). *The flowering plants and ferns of Denbighshire*. Powlsons, Colwyn Bay, for Countryside Council for Wales.

## Prof. Oliver Rackham, 17<sup>th</sup> October 1939 – 12<sup>th</sup> February 2015

TREVOR JAMES, 56 Back Street, Ashwell, Baldock, Herts., SG7 5PE;  
(trevorjames@btinternet.com)

Most members will probably have heard already of the death of that champion of British landscape and its ecological history, Oliver Rackham. He was taken ill at a dinner function, and died shortly afterwards. His passing is the loss of one of the most significant people in our understanding of our natural environment, and we all owe him an enormous debt for having raised the profile of what most people take for granted – the ordinary features of the landscape, which make up so much of the habitat of our flora and fauna.

His first book, on Hayley Wood in Cambridgeshire (1975), was itself an inspiration, coming at a time when I and others were just grappling with understanding our own ancient woodlands and their flora in Hertfordshire. It provided us a template for how to look at these places and understand what they represented; why *Hyacinthoides non-scripta*

(Bluebell) only occurred on one side of a bank in an old wood, not on the other; what was the significance of an old pollarded tree in an apparently old coppiced woodland; and what the presence of *Calluna vulgaris* (Heather) in an old wood signified in our area. More was to come with his *Trees and woodland in the British landscape* (1976); and then that detailed and exhaustive tome *Ancient woodland* (1980), which I remember watching him editing the manuscript of on a train from London to Cambridge; as well as more recent books on related themes, including *Woodlands* (2006) in the Collins New Naturalist series.

For botanists, perhaps the most important message that Oliver Rackham gave us to take home was that plants occur in habitats with an historical context, and that that context has everything to do with the way mankind has shaped natural ecosystems.

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## RECORDERS AND RECORDING

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### Panel of Referees and Specialists

JEREMY ISON, 40 Willeys Avenue, Exeter, Devon, EX2 8ES; (Tel.: 01392 272600)  
(Jeremy\_ison@blueyonder.co.uk)

No changes to report since the publication of *BSBI News* 128

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### Panel of Vice-county Recorders

PETER STROH, c/o Cambridge University Botanic Gardens, 1 Brookside, Cambridge CB2 1JE;  
(peter.stroh@bsbi.org)

Maria Long has written to inform me of Tony O'Mahony's retirement as vice-county recorder for the three (yes three!) vice-counties in Cork (H3, H4 and H5) after forty years of dedicated service. Tony has written fascinating accounts of his recording in Cork each year for *Irish Botanical News* (all back issues available on the Irish webpage: <http://bsbi.org.uk/ireland.html>), and in 2009 he published the excellent book *Wildflowers of Cork City and County*. Tony's contribution to our knowledge of the flora of Cork borders on immeasurable, and he will be sorely missed as a VCR, although his plans in 'retirement' to concentrate on the study of individual species, species-aggregates, and interspecific hybrids, as well as upgrading his knowledge of the genus *Apium*, for which he is the BSBI Referee, means that he will still be at the forefront of recording in the area. Tony has very generously offered to help any new recorders with identification of collected plant material and in assessing the status of taxa (*i.e.* whether native or naturalised). H24, Longford, is also now listed as vacant. Little

recording has been possible in this vice-county in recent years due to health reasons. The current vice-county recorder, Sean Howard, has offered help and support to any prospective recorder, joint-recorder or helper for Longford. If you are interested in applying for the position of VCR in Longford or Cork, please get in touch with Maria (maria.long@bsbi.org.). Note that you do not need to take on all three v.c.c. in Cork – one is more than enough for most mortals!

In Wales, Mark Duffell has stepped down as co-recorder for Montgomeryshire (v.c.47). In Scotland, Simon Smart, whom many of you will know from his work at the Centre for Ecology and Hydrology, has volunteered to take on the Isle of Jura within South Eubudes (v.c.102) as an 'Atlas 2020 Recorder' until the end of the 2019 field season, with Malcolm Ogilvie continuing as the main point of contact for all enquiries, unless specifically relating to Jura.

As usual, thank you to all VCRs, past and present, for your dedication, help and expertise.



## Recording precision 1950 - 2014

ANDY AMPHLETT, 72 Strathspey Drive, Grantown on Spey, Morayshire, PH26 3EY; (amphlett1958@gmail.com)

### Introduction

This article examines how the precision (resolution) of plant records, collected and collated by the BSBI vice-county recorder (VCR) network has changed over the period since 1950; to elucidate trends and the likely reasons for these trends; to assess if current BSBI recording guidelines (Walker *et al.*, 2010) are being met; and finally, to make some observations and suggestions about the future.

In Great Britain, the Ordnance Survey (OS) grid, which we now take for granted, first appeared on the OS’s One-Inch Map series between 1945 and 1947. The original BSBI Maps Scheme, which was to adopt the 10×10km OS grid square as its recording unit, was first considered by the BSBI Council in May 1950 and the first Atlas project was launched in 1954 (Perring & Walters, 1962). 1950 is therefore an appropriate start year for this analysis.

### Data and methods

The analyses presented here utilise the 35.34 million records held on the BSBI Distribution Database (DDb - <http://bsbidb.org.uk/>) on

03/02/2015, for the period commencing 1950. ‘Rejected’ or ‘doubtful’ records, and records without a site grid reference are excluded.

Data quality issues pertinent to the analyses include the following: some tetrad records are mis-attributed to monads, mainly owing to earlier databases not supporting DINTY format tetrad naming; site centroids may have been interpreted as precise grid-references; records without grid references may have had overly-precise grid references assigned to them, often at a later date and by someone other than the original recorder; finally, there are many duplicate records, although these do affect all precisions of records.

The number of records per date class (DC) and the mean number of records per year were both lowest in the period 1950–1969 (3.38 million; 169,000 per year) and highest between 1987–1999 (13.09 million; 1.0 million per year). Since 2000, the number of records per year has remained at a high level, only a little below the 1987–1999 mean (Figure 1.).

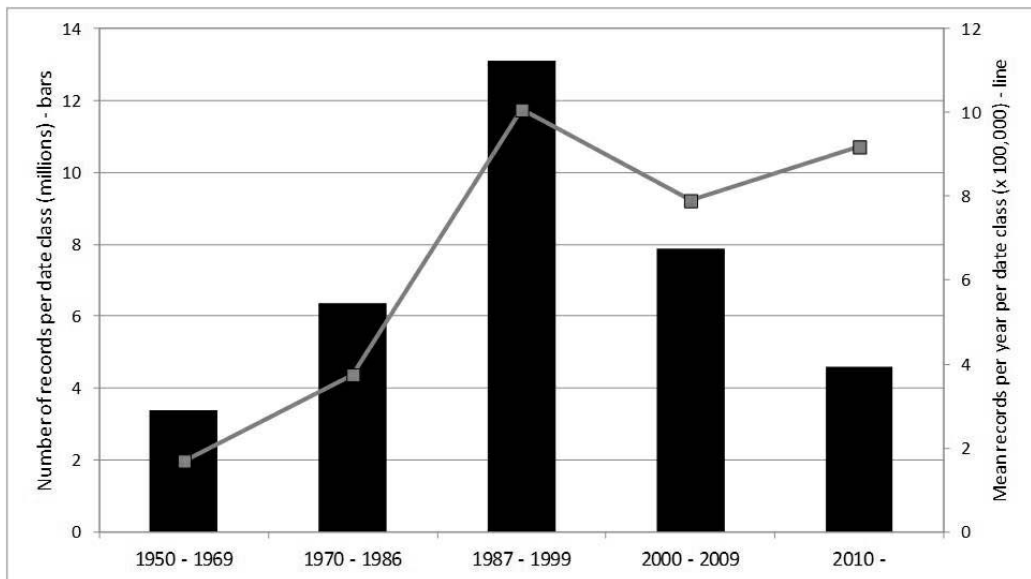


Figure 1. Number of records per date class (DC) and mean number of records per year per DC. Note the unequal number of years per DC.

Records were subdivided by DC for analysis, with the earliest, 1930–1969, being truncated at 1950. Three levels of analysis are reported: individual records, hectads and vice-counties. For each level, recording at hectad (10×10km), tetrad (2×2km) and monad (1×1km) or better precision are described. Quadrant (5×5km) precision records are not discussed. They only average 0.6% of records per date class.

## Results

### Individual records

Precision of individual records is shown in Figure 2. Hectad precision records comprised 51% of all records in the DC 1950–1969. Subsequently, recording at hectad precision, as a percentage of all records, declined rapidly, with just 7% of records in 1970–1986. There was a resurgence in the use of hectad recording in the period 1987–1999, when 16% of records were at hectad scale, coinciding with compilation of records for Atlas 2000 (Preston *et al.*, 2002). Since 2000, very few records have been made at hectad precision:

less than 2% for the decade 2000–2009 and less than 1% since 2010.

Tetrad recording was pioneered by Edees (in Staffordshire) and Dony (in Hertfordshire), with Edees commencing fieldwork based on tetrads in 1956. Tetrad records comprised 39% of all records in the DC 1950–1969, so only a little less popular than hectads at that time. Tetrads achieved their greatest popularity as a recording unit between 1970–1986, when 52% of records were at this scale. Since then, use of tetrads as the recording unit has steadily declined, to 38%, then 24% and since 2010 to 14% of records. If the trend continues, making records at tetrad scale will have virtually ceased by 2020.

Records at monad precision or better comprised only 9% of records in the DC 1950–1969. There was then a marked jump to 40% of records in 1970–1986. There was a further slight increase in 1987–1999, to 45%, before another marked increase since 2000, reaching 85% of records since 2010. Recording at monad precision or better is now more or less the norm.

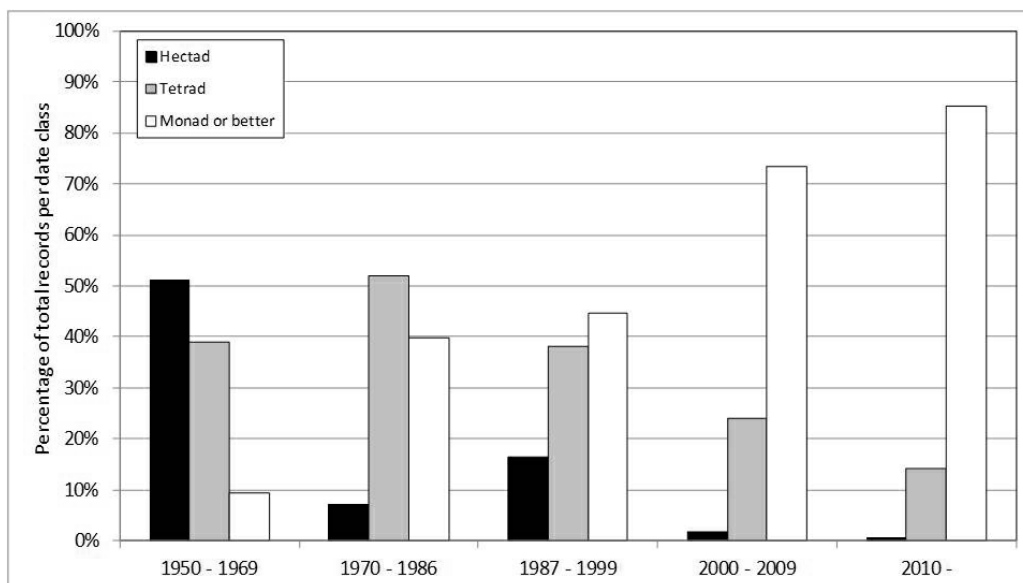


Figure 2. Percentage of records in each date class at three levels of grid reference precision

**Hectad and vice-county scale**

Recording at the hectad and vice-county scales was investigated by calculating the most frequent (modal) record precision in each hectad and vice-county, in each DC. Precision of records at the hectad scale is shown in Figure 3 and at the vice-county scale in Figure

4. The two sets of results are highly correlated (Spearman’s rank correlation coefficient = 0.989, n=15). This is not surprising, as decisions over approaches to recording tend to be made by vice-county recorders at the scale of their own vice-county.

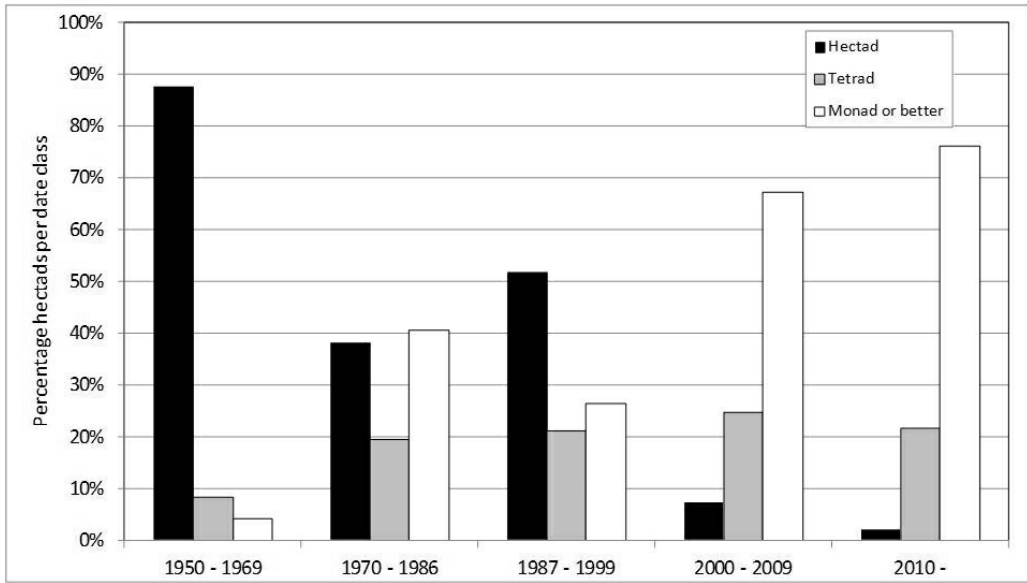


Figure 3. Percentage of hectads in each date class at three levels of modal precision of records.

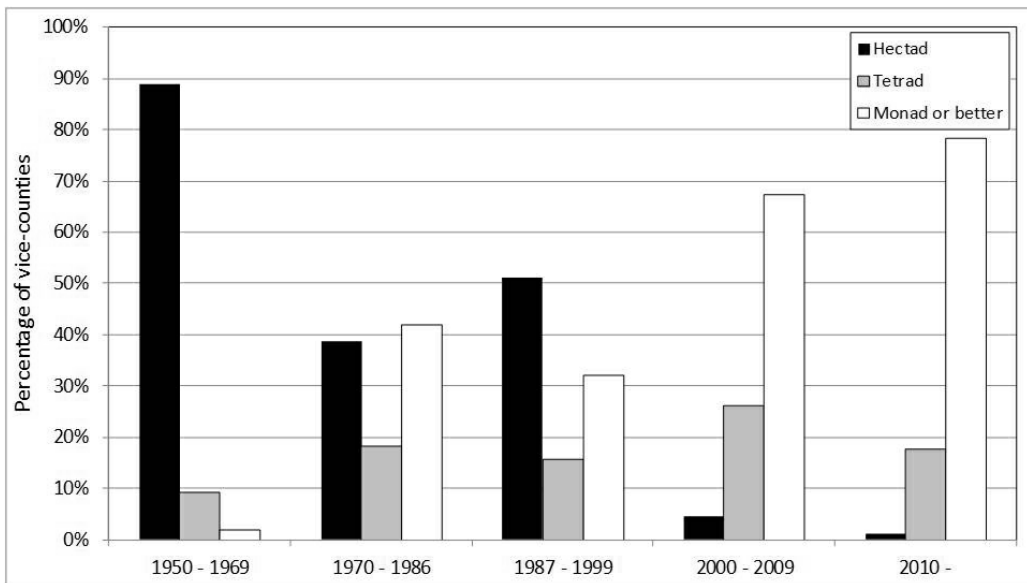


Figure 4. Percentage of vice-counties in each date class at three levels of modal precision of records.

In the 1950–1969 DC, 88% of hectads and 89% of vice-counties had modal recording precision at the hectad scale. In the following DC, 1970–1986, these values had declined markedly, to 38% of hectads and 39% of vice-counties. In the 1987–1999 DC, there was, as noted for individual records, a resurgence of hectad precision recording, up to 52% of hectads and 51% of vice-counties. Since 2000, there has been an overwhelming move away from hectad recording, with just 7% of hectads and 5% of vice-counties having modal recording precision at the hectad scale in the period 2000–2009; these figures falling to just 2% of hectads and 1% of vice-counties since 2010.

In the 1950–1969 DC, just 8% of hectads and 9% of vice-counties had modal recording precision at the tetrad scale. At the hectad scale, this increased to 19% in the following DC and has remained above 20%, fluctuating between 21% and 25%, in the subsequent DCs, between 1987–2014. At the vice-county scale, modal recording precision at the tetrad scale reached a maximum of 26% in the DC 2000–2009, otherwise varying within the range 16–18% of vice-counties.

In the 1950–1969 DC, just 4% of hectads and 2% of vice-counties had modal precision of recording at monad or better scale. This jumped to 41% of hectads and 42% of vice-counties in the DC 1970–1986. There was then a decline in the 1987–1999 DC, to 26%

of hectads and 32% of vice-counties. As noted earlier, recording at monad precision or better increased markedly since 2000, reaching 76% of hectads and 78% of vice-counties since 2010.

#### Precision of recording compared with BSBI guidelines

Walker *et al.* (2010) provide current BSBI guidelines for recording in the years leading up to Atlas 2020. With regard to the resolution (precision) of recording, the guidelines state that:

All recording should be carried out at tetrad resolution *or better*. Recording presence at coarser resolution (5×5 km squares and hectads) should be avoided.

Recording of all nationally and county rare and scarce and all UK priority species (*e.g.* UKBAP, Red List) should be undertaken at 100m resolution - *i.e.* six figure grid reference, *or better*.

Recording of scarcer axiophytes should be undertaken at 100m resolution *or better*, but lower resolution as appropriate for the more widespread axiophytes.

New county and/or hectad records, and re-discoveries of species thought to be extinct within vice-counties recorded at 100m resolution *or better*.

Analysis of records in the DDb against the first two of these guidelines, for the period 2010 onwards, is given in Table 1.

Table 1. Recording precision since 2010. Red List analyses only included taxa in categories CR, EN, VU and NT.

Precision	GB & Ireland	GB only (%)		England only (%)
	All records (%)	NR & NSc	GB Red List	England Red List
100m or better	25.4	58.2	71.8	44
Monad	59.8	33.7	21.9	46.9
Tetrad	14.1	7.4	5.5	8.7
Hectad	0.7	0.8	0.7	0.4
Monad or better	85.2	91.9	93.7	90.9
Tetrad or better	99.3	99.2	99.3	99.6

That all recording should be carried out at tetrad resolution or better has been comfortably met, with more than 99% of records achieving that target. However, it is worth noting that in the preceding DC, 2000–2009, almost 98% of records had already met this target. The guideline to record Nationally Rare and Nationally Scarce taxa at 100m precision or better has only been partially met, with 58% of records in Great Britain at that resolution. Recording of GB Red List taxa (in GB) has been slightly better, with 72% of records at 100m precision or better. However, only 44% of records of taxa in the England Red List were at 100m precision or better.

### Discussion

Prior to the advent of affordable personal computers and the widespread adoption by VCRs and other recorders of electronic data capture, collection of field records more or less had to be undertaken at the same scale as that intended for analysis and publication. This is why, in the 1950s, hectad and tetrad scale recording were adopted. Fieldwork for Atlas 2000 coincided with the transition to using computers, but much data was still submitted as hectad Mastercards (each card 46 pages long!). Hence the observed resurgence of hectad recording in the 1987–1999 DC referred to earlier.

The BSBI began a policy of encouraging and facilitating VCRs to use computer databases in 1995, initially using Aditsite, BioBase and Recorder, and latterly (and much more widely) MapMate. The use of MapMate for submission of ‘Local Change’ records in 2003–2004 revolutionised the way that recorders work. Since then, there has been almost complete adoption of computer databases by VCRs, with ongoing electronic submission of records.

Hence, the link between the scales of survey, recording, analysis, mapping and provision of records to third parties has been disentangled. The only limitation is that analysis and mapping cannot be at greater precision than the original field records. Combining records into a range of larger spatial units, *e.g.* monad, tetrad, hectad or vice-county, is an effortless process, using suitable computer software.

Spatial queries using bounded areas (irregularly shaped polygons) is now straightforward using GIS and this functionality is incorporated into the Ddb.

Tetrad recording, while in decline in terms of individual records since its peak in 1970–1986, has remained consistent (as modal precision) at 21–25% of hectads from 1987–2014. Despite the plethora of tetrad atlases, tetrad recording cards, and references to tetrad-scale surveys, tetrads were only the most popular recording unit in one of the five DCs (for individual records) and tetrads have never been the most popular unit when assessing modal frequency of records at the hectad or vice-county scale. Until so many datasets were collated in the DDb, it was not possible to appreciate this. However, tetrad mapping remains the scale of choice in published floras. Of 22 county floras published since 2000, 17 have mapped plant distributions at tetrad scale, compared with five at monad scale (Kevin Walker, pers. comm.).

What is really striking is that recording at monad precision or better was (for individual records) more popular than tetrad recording in 1987–1999 and in both DCs since. At the hectad and vice-county scales (modal precision), recording at monad or better precision was the most popular in 1970–1986 and in both DCs from 2000. The shift since 2000 to monad or better recording has been decisive. Since 2010, 85% of individual records have been at this scale, and 76% of hectads and 78% of vice-counties (both modal precision) have been recorded at monad or better.

Investigating further (Figure 5), recording at 100m precision or better peaked at 32% of individual records in DC 2000–2009 and has declined slightly since, to 25% of records. In contrast, monad recording increased to 60% of records since 2010.

So, in summary, tetrad recording was at the cutting edge of plant recording 60 years ago. Today monad recording is the most used and the current cutting edge has moved on to recording at 100m precision or better, using GPS.

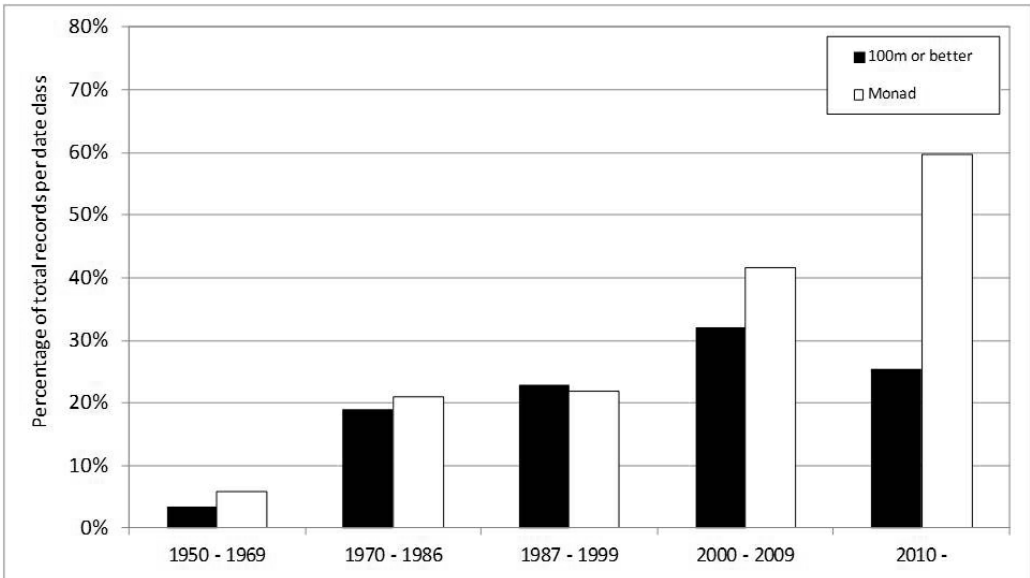


Figure 5. Percentage of records in each date class at monad and 100m or better grid reference precision

The new Red List for England (Stroh *et al.*, 2014) elevated numerous taxa to Red List status. Having not yet adapted to recording in accord with this new list, it is perhaps not surprising that a lower percentage of records submitted so far have met the guideline. However, over the same period, 91–94% of records of Red List, Nationally Rare and Nationally Scarce taxa have been at monad or better precision, which demonstrates the value of the default recording scale being at monad (or better) precision.

### Conclusion, observations and suggestions

This article has been about recording precision and how this has changed over the last six decades, in part driven and facilitated by technological change, but also because of the desire of recorders to improve on what went before. Over this period there has been an inexorable move to greater precision in recording. This was not planned but has been embraced by the BSBI through its projects and strategies. Plant records accrue over years and decades of effort and it is inevitable that a wide range of recording styles and recording precision will be present in any vice-county's datasets. Quite correctly, the BSBI Strategic

Plan (BSBI, 2014) stresses the importance of “respect for all our members and stakeholders, their opinions and endeavours”. So, in that spirit I make the following observations and suggestions:

Collect records at monad precision *or better*. Monads are four times as precise and potentially four times as useful as tetrads, but take little if any more time to collect and scarcely any more time to enter into a database. Monads are also more easily identified from a map and probably less prone to recorder error. Tetrads can still be used as survey or sampling units, but collect actual records at monad or better precision. For much more on sampling approaches see Groom *et al.* (2011).

Try to make every practical effort to record notable species at 100m precision or better. Higher precision records will always be of greater use to those who use the data, now and in the future. Achieving this will be a greater challenge than changing from tetrads to monads as the recording unit, but worth the effort.

I would recommend that at least all Nationally Rare and Scarce and all Red List & UKBAP taxa are removed from recording cards to encourage recorders to make detailed records on the front of the card. Similarly,

where Rare Plant Registers and Axiophyte lists exist, removing or at least marking such taxa should be considered.

I found that, in the areas where I botanise, there were so many taxa that ought to be recorded at 100m precision or better, that I decided to try to record everything at that level. Since 2007, using notebooks rather than recording cards, I have collected a mean of 4,100 records per year (maximum 7,000), with 90%+ at 100m grid reference precision or better. I have found this achievable, but I do not suggest that it is especially easy. But why not give it a try?

There are a number of vice-counties that collect vast numbers of high precision records and it would be interesting to hear accounts of how they go about collecting, collating and entering this data.

With GPS in every smart-phone and mobile device, it seems inevitable that some recorders will wish to move to electronic data collection in the field, if they have not done so already.

High precision GPS data (10m and especially 1m precision) is technically better represented as points with an error margin, rather than being 'coerced' into grid squares. Such records are bound to proliferate massively in the future and ought to be handled correctly by recording software. MapMate is not, currently, able to store error estimates for site grid references.

Site-based recording, assigning records to irregularly shaped polygons rather than to grid squares, has already been implemented within the British Trust for Ornithology's BirdTrack monitoring scheme. The DDb probably contains a large number of records allocated to site centroids and these would be best assigned

to their polygons. However, I do not see an end to grid-based plant recording and entry to databases using sites defined by grid references. Such an approach has served BSBI and many other recording schemes well over the last 60 years.

Ultimately what will matter is that a range of recording approaches are available to recorders, which are supported by the BSBI, and which are enjoyable and practical for the recorder to actually use.

#### Acknowledgements:

Jim McIntosh, Kevin Walker, Quentin Groom, and Tom Humphrey provided comments on an earlier version of this paper.

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## New Year Plant Hunt 2015: a record-breaking success!

LOUISE MARSH, *The Herbarium, Biology Dept., Adrian Building, University of Leicester, University Road, Leicester, LE1 7RH; (louise.marsh@bsbi.org)*

BSBI's fourth New Year Plant Hunt was held between 1<sup>st</sup> and 4<sup>th</sup> January 2015 and was our most successful yet, whether measured by numbers of participants, records received, species recorded in bloom, outreach success or amount of media coverage.

A total of 368 different species was recorded in flower, the highest number yet and a marked increase on the 2014 total of 222 species. 2,908 plant records were sent in this year (compared with 1,180 last year) by more than 300 people who took part in the Hunt across Britain and Ireland. They spent up to three hours hunting for wild plants blooming at New Year and we would like to say a huge thank you to all of them for contributing to these amazing results. (For Photos see front and back covers.)

### Unprecedented number of species in bloom

Tim Rich, NYPH co-founder, said: "368 species in flower is an unprecedented 15% of the flowering plants in Britain and Ireland. The books suggest there should only be 20-30 species in flower. The most commonly recorded plants were *Bellis perennis* (Daisy) and *Taraxacum* (Dandelion), each of which was recorded in 115 lists (75%). However, only 12 (3%) of species were recorded in more than half of the lists, and most were only rarely found in flower. 160 (43%) species were only recorded in flower once and 60 (16%) were only recorded twice. It was quite varied from site to site. As expected, the mild south and west of Britain had the highest numbers of species still in flower, with 72 species in Cornwall, but we also had lists of over 50 species from the east and north of England, and an amazing 39 flowering in Edinburgh".

### Record-breaking number of participants

It was astonishing to see so many records flooding in, from Guernsey to the Moray Firth and Norfolk to Donegal. 24 botanists from 12 Irish vice-counties contributed records and these had consistently high numbers of plants in flower too, with an average of about 20. This was almost exactly on a par with Britain. The

highest count in Ireland was 40 species flowering on Bull Island, in Dublin Bay, by BSBI's Irish Officer, Maria Long, and six fellow botanists. The west of Ireland also fared well, with *Arbutus unedo* (Strawberry Tree) in flower near Killarney, Co. Kerry (see back cover). In Galway City, Phoebe O'Brien recorded 22 species in bloom, having contrived to be in Brighton & Hove the previous day, where she recorded 20 species. She was invited to use the BSBI News & Views blog to compare her lists, and this was just one of 18 Plant Hunt blogposts, which aimed to showcase the excellent efforts of our volunteer plant hunters and to share some of their images of the plants they recorded in bloom. This approach helped to attract and engage a wider audience and resulted in a 'new record' for the News & Views blog, with more than 16,000 page-views during January.

### Analysing the records

Ryan Clark, taking over co-ordination of the Plant Hunt from Tim this year, analysed the records to see which plants were growing where. He said: "As in previous years, it was clear that urban areas tended to have more species in flower than rural areas. This is to be expected. There are more sheltered corners and disturbed ground supporting species with a short life cycle and high seed production. Around one third of the plants in flower proved to be species not native to Britain and Ireland, which may have escaped from gardens or cultivation. Plants from warmer climates may be continuing to flower in the mild autumn weather before winter frosts knock them back."

Tim and Ryan also agreed that the numbers of plants in flower this New Year did not indicate an early spring, commenting: "Although a few spring-flowering species like *Ficaria verna* (Lesser Celandine) were quite widely recorded, only 5% of the species recorded were spring-flowering native specialists, such as *Mercurialis perennis* (Dog's Mercury), and half of the records of spring flowering plants were from



just three species: *Corylus avellana* (Hazel), Lesser Celandine and *Primula vulgaris* (Primrose).”

### **Social media success**

Ryan’s contribution as our volunteer co-ordinator made it possible to process the volume of incoming records quickly, but it also helped us use social media more effectively this year, so we were able to reach a much wider audience than previously, building up interest in the Hunt among thousands of people who did not actually participate in recording but were happy to spread the word. Within 24 hours of posting the Plant Hunt results on our News & Views blog on 9<sup>th</sup> January, they had reached 377,000 Twitter account holders. These included followers of organisations such as the Natural History Museum, the Wildlife Trusts and Natural England, academics and researchers, as well as several hundred journalists and environmental commentators.

### **Wide media coverage for BSBI**

Our social media success helped the 2015 New Year Plant Hunt to achieve widespread coverage

in the national media, including seven articles in daily newspapers, reports in *Country Life* and *Country Living*, a page on the BBC Science & Environment website and an interview on Radio 4’s Today programme. Local coverage included four BBC local radio interviews and reports in three regional newspapers. International coverage included reports on two French news sites and interest via social media from American botanists. A similar Plant Hunt was also launched in the Netherlands and achieved wide media coverage there, with organisers keen to credit the BSBI as their inspiration.

### **New Year Plant Hunt 2016**

We hope that even more people will participate in next year’s Plant Hunt, whether by recording plants in bloom or by joining our volunteer team and helping us to process incoming data or spread the word via social media. Contact the NYPH team here to find out more: [nyplanthunt@bsbi.org](mailto:nyplanthunt@bsbi.org)

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## **NOTES FROM THE OFFICERS**

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### **From the Hon. General Secretary – CHRIS METHERELL**

*Woodsia House, Main Street, Felton, Northumberland, NE65 9PT;*  
(01670-783401; [chris@metherell.org.uk](mailto:chris@metherell.org.uk))

The role of the Hon. Gen. Sec. is in rather a state of flux, both as a result of the appointment of Jane Houldsworth as Head of Operations and the change from the ‘old’ to the ‘new’ BSBI, and so I am trying to tease out how best I can re-engineer the HGS functions better to assist the Society.

It seems to me that one of my major tasks should be to facilitate communication between the Trustees, Council and the various committees to ensure that robust decisions are taken by the appropriate people at the best time and with the best information available. I am working hard to make sure that everyone knows what decisions they are being asked to make and when. Alongside that is the BSBI’s Strategic Plan, and for the autumn round of committee meetings I shall be linking tasks to

specific committees to ensure that progress is made in the right directions. That should keep me busy for a few months!

As you will know, Jane and I have been reviewing the BSBI’s formal documents (Rules, Standing Orders and so forth) and by the time you read this all the committees will have been consulted and a first draft will have been seen by Council. This draft will be posted on the BSBI website and any comments are welcome.

The AGM will be held at the Natural History Museum on the 28<sup>th</sup> November 2015 (please note the change of date) alongside the Annual Exhibition Meeting. Last year’s event at Leicester was a great success and we look forward to seeing even greater numbers of members this year.

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## From the Head of Operations – JANE HOULDSWORTH

16 Carlisle Street, Bromley Cross, Bolton, BL7 9JF;  
(Tel.: 07584 250 070; jane.houldsworth@bsbi.org)

I often take this opportunity to bring items to the attention of readers that might not be picked up in the notes of other contributors. I have done this here, which has resulted in quite a mixture of topics!

Firstly, the BSBI has been looking to continue or boost the support provided to recorders through the continuation or increase in the funding received from external agencies. Through the Committee for Ireland, the BSBI has been working with the National Parks and Wildlife Service, which covers the Republic of Ireland, to try and secure funding which would allow an increase in the hours of the Irish Officer, Maria Long. We are still awaiting official confirmation but initial feedback has been positive.

The situation in Wales is different as we are looking to maintain at least some of the funding that has allowed us to employ a full time Welsh Officer for the past few years (well two, Paul Green and Polly Spencer-Vellacott). Natural Resources Wales (NRW) has provided the funding for this, but cuts to their budget mean it is no longer possible. As Paul Green's update on page 85 states, we are working closely with NRW to determine if any funding might be found to continue this post in some form.

An update on the outcome for these two posts will be provided in the September edition of *BSBI News*.

Secondly, I would like to highlight a series of species accounts that have been added to the

BSBI website at [www.bsbi.org.uk/species\\_accounts.html](http://www.bsbi.org.uk/species_accounts.html). They provide information on the identification, habitat, biogeography, ecology, threats and suitable management for a range of threatened and nationally rare and scarce plant species that have experienced declines in recent years in Great Britain and Ireland. The accounts provide a review of the available literature, including similar accounts produced by BSBI volunteers several years ago, in an easily digestible read that should be of interest to botanists, academics, conservationists and land managers alike. They have been written at the request of several organisations, including Natural Resources Wales, Natural England and Scottish Natural Heritage, and, at the time of writing, 22 are already available and a total of 80 are planned for upload to the website over the coming months.

On a totally different topic, by the time you read this note I will be taking maternity leave and the new arrival will quite possibly have made an appearance! I will be returning to my post in the autumn of this year. In the meantime, happy botanising!

**Postscript** – in an email message on March 24<sup>th</sup> Jane wrote: “I’m happy to announce the safe arrival of Esme Ashley Houldsworth who was born early this morning weighing 5lb. She’s small but perfectly formed!”

I am sure we all send Jane, Marc and Esme our best wishes.

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## From the Scottish Officer – JIM MCINTOSH

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(Tel.: 0131 2482894; jim.mcintosh@bsbi.org)

I celebrated 10 years in the post of Scottish Officer in November 2014. Coincidentally Scottish Natural Heritage funding for the project expired, so a new bid was prepared, submitted and was ultimately successful, after much discussion. It is for a 3.4 year period, until March 2018. While less than bid for, it is more than the previous grant, which in these

difficult financially straightened times is very satisfying indeed. We were asked to prepare an estimate of the notional value of the work undertaken annually by BSBI volunteers in Scotland. It was valued (conservatively, I think) at £230,000 and there is no doubt that this was key in securing such a good deal from SNH.

The other good news is that the anonymous donor who has supported the BSBI Scottish Officer project since its inception has very generously agreed to continue their support. In effect it means the BSBI are only left to cover a quarter of staff costs and half the office costs, which are, in any case, subsidised by the Royal Botanic Garden Edinburgh. All the other budget lines such as Recorder Support, MapMate Support, and the facilitators' costs of Recorders' Workshops and Recording Weeks are more or less wholly funded. We are, and I am, very

grateful to the anonymous donor and to SNH, RBGE and to all those BSBI volunteers!

### **BSBI Scottish Officer Report**

If you would like to know more about what the Scottish Officer is up to, you can read his Annual Report for 2014 in the forthcoming BSBI *Scottish Newsletter* and on the BSBI Scotland webpage. By the way, if you are a member living outside Scotland you can sign up to receive the annual *Scottish Newsletter*. Details are given on page 8 of the *BSBI Yearbook 2015*.

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## **From the Welsh Officer – PAUL GREEN**

*c/o Biodiversity & Systematic Biology, National Museum of Wales, Cardiff, CF10 3NP;*  
(Tel.: 02920 573152; 07772 111113; paul.green@bsbi.org)

Thanks to funding from Natural Resources Wales (NRW) there has been a BSBI Welsh Officer post since the summer of 2011 and I have been in that role as acting/full time/part time BSBI Welsh Officer for the last 2½ years. The first year, I was Acting Welsh Officer, covering Polly Spencer-Vellacott while she took maternity leave. From the second year, I became more permanent, working for 2½ days a week, job sharing with Polly and in the last eight months I have been working five days per week, covering Polly's most recent maternity leave. Wales has been lucky to have two Welsh Officers!

I have been based in the National Museum Cardiff, directly above the National Welsh Herbarium. Three workshops have been run at the museum, covering: *Polypodium*, a visit to the Herbarium and a *Euphrasia* day. As those who attended the *Euphrasia* workshop will have verified, it can be very cold where my office desk is, and coats are essential!

Having access to the herbarium specimens has been extremely useful. Often a particular specimen would have far more accompanying information than there is available on any database, helping with re-locating the plant in the field.

During the most recent three year contract with NRW, Polly and I have got to know the recorders and wider membership in Wales and have completed 166 survey forms of rare species, with 19 additional forms completed by

vice-county recorders and other volunteers. One of the ambitions of the last three years was to produce/update County Rare Plant Registers (CRPR) for each of the 13 vice-counties. To date 11 CRPRs have been published, with the 12<sup>th</sup> expected in April this year and the 13<sup>th</sup> currently at the draft stage. Wales will soon be the first country to have a CRPR for each vice-county, quite an achievement and down to the hard efforts of our recorders!

You may have heard on the grape vine that the BSBI is currently planning that the Welsh Officer post ends this summer. Unfortunately, BSBI was unsuccessful in securing any funding from NRW to continue the post after the current contract ends in June this year. However, there is a small glimmer of hope and, at the time of writing, the BSBI is working with NRW to do everything it can to continue supporting recording activity in Wales. Of course, there will be an update in the next edition of *BSBI News*, which will inform everyone of the outcome.

It has been a wonderful experience working in Wales, whether surveying rare plants or helping out vice-county recorders with IT problems. Only having one wet day out in the field in 2½ years while doing survey work - this can not be bad! Computers at times gave me far more grief! I can speak for Polly in saying we both have very much enjoyed our time working for the BSBI and will very much miss the job and the people we work with should it come to an end.

## Projects and publications in 2015: an update from the Publicity & Outreach Officer – *LOUISE MARSH*

*The Herbarium, Biology Dept., Adrian Building, University of Leicester, University Road, Leicester, LE1 7RH; (louise.marsh@bsbi.org)*

BSBI members really are spoilt for choice this season: whether you want to get out in the field or curl up with a good book, whether you feel up to some solo recording, would rather be part of a team, or want to botanise at a World Heritage Site, here are a few options to consider this year:

### Promoting projects in 2015

With only six seasons left in which to record for Atlas 2020, many botanists are ‘adopting a tetrad’ this year, either alone or with fellow members from their local botany group. Check out [www.bsbi.org.uk/local\\_groups.html](http://www.bsbi.org.uk/local_groups.html) for details of a local group near you.

Another option this year (at least for recorders in Britain and Northern Ireland) is to register for the new National Plant Monitoring Scheme (the NPMS). A flyer for the NPMS is enclosed with this issue of *BSBI News* and there is now a dedicated website where you can find out more: [www.npms.org.uk](http://www.npms.org.uk). There are some excellent resources to help you, and training sessions in the pipeline, so this scheme is a great way to get started with recording wild plants. You can also refer to a note in *BSBI News*, **128**, by Oli Pescott *et al.* that gives more information about the new scheme, which is a partnership between the BSBI, the Centre for Ecology & Hydrology, Plantlife and the Joint Nature Conservation Committee.

### Publications for 2015

It takes years of hard work to produce a BSBI Handbook, and the Publications Committee is pleased to report good progress towards publication of the following titles: *Euphrasia*, *Oenothera*, *Viola* and *Alchemilla*. Another long-awaited title is also now available: a flyer outlining details of the pre-publication offer for the new *Hybrid flora of the British Isles* by Clive Stace, Chris Preston and David Pearman is enclosed with this issue of *BSBI News*. The book covers 909 hybrids that have arisen spontaneously in Britain and Ireland, either in the wild or in gardens, as well as hybrids

occurring in cultivation and subsequently escaping into the wild. As well as colour photographs, the book boasts distribution maps showing where hybrids occur in the wild, and the authors acknowledge the contribution of fellow BSBI members whose recording efforts over the years make it possible for the BSBI to produce such maps. If your appetite needs further whetting, you can download Clive’s presentation ‘Hybrids 40 years on’, given at last year’s Annual Exhibition Meeting. The presentation is available from the BSBI website here: [http://www.bsbi.org.uk/exhibition\\_meeting.html](http://www.bsbi.org.uk/exhibition_meeting.html)

### The Annual Summer Meeting

This year’s Annual Summer Meeting will be held from 12<sup>th</sup>-16<sup>th</sup> June in Northern Ireland, using the University of Coleraine as a base. A flyer inside this issue of *News* gives further information and there is a booking form, so you can book your space. You can also read a note from John Faulkner, Chair of the Committee for Ireland, on page 62 of this issue. He outlines the venues we will be visiting, from glens, beaches and dune systems to the Giant’s Causeway (a World Heritage Site) and some of the species we hope to see, such as *Mertensia maritima* (Oysterplant), *Equisetum variegatum* (Variegated Horsetail) and *Silene acaulis* (Moss Campion). More details are available on the Meetings page of the BSBI website: [www.bsbi.org.uk/meetings.html](http://www.bsbi.org.uk/meetings.html), or you can email: [asm2015@bsbi.org](mailto:asm2015@bsbi.org). Whether you are a seasoned recorder or a newcomer to field botany, you will be warmly welcomed at the BSBI Annual Summer Meeting.

As always, you can follow the latest news about the BSBI on our News & Views page: [bsbipublicity.blogspot.co.uk](http://bsbipublicity.blogspot.co.uk), on our Twitter feed: <https://twitter.com/BSBIbotany>, or by contacting me at the address above; very helpful for the 362 days each year when *BSBI News* does not plop through your letterbox!

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## From the Hon. Field Secretary – JONATHAN SHANKLIN

11 City Road, Cambridge CB1 1DP; (fieldmeetings@bsbi.org)

The 2015 programme of field meetings at national, vice-county and local level is now well under way and we look forward to receiving the reports of the national meetings for publication in *Yearbook 2016* and on the BSBI blog. The details of meetings that were published in *Yearbook 2015*, updated where necessary, are now on the BSBI web page at <http://www.bsbi.org.uk/meetings.html>. We

aim to publish dates and outline details of meetings further into the future here as soon as they are known. I have also compiled a calendar of other meetings at national, vice-county and local level that I have been made aware of, and this is available on the web page under ‘Summary of Field Meetings’, which gives links to the appropriate site for further details.




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### Coordinator's Corner

PETER STROH, *c/o Cambridge University Botanic Garden, 1 Brookside, Cambridge, CB2 1JE;*  
(peter.stroh@bsbi.org)

After a winter working indoors, thankfully it is now warm enough to enjoy eating my lunch-time pasty outside in the tranquil surroundings of the Botanic Garden and plan days out recording for the Atlas. Of course, many hardier souls will have been out recording (and perhaps eating pasties too) over the winter months – there are always plants to be found, and it's not too challenging to amass a list of *c.*100 species, even on the darkest days of the year.

As you may have noticed, Atlas 2020 now has a logo as well as a dedicated (recently updated) web page, and all of the published guidance concerning recording for the project can be found here: [http://www.bsbi.org.uk/atlas\\_2020.html](http://www.bsbi.org.uk/atlas_2020.html).

A group of us is currently undertaking a complete revision of Booklet 1 (*notes on difficult and under-recorded taxa*), originally written for Atlas 2000. Once finished, it will be available as a PDF and also as a pamphlet. As

well as drawing attention to particular taxa where people have had recording problems, the booklet will also cover Stace 3 name changes, under-recorded hybrids, conflicting taxonomy, new species listed in Sell & Murrell, a list of aggregates, and much more! I hope that it will be a great resource to dip into for many years to come. Also nearing completion is a revision of Atlas 2000 Booklet 4 (a beginners guide to recording), which should be available on the Atlas 2020 web page within the next month or so. On the horizon, there are also botanists busily preparing new Handbooks for *Euphrasia*, *Oenothera* and *Viola*, and I hear whispers of a Fern Crib. All very exciting!

In other news, Oli Pescott at the Biological Records Centre (BRC) has very kindly offered to print recording cards for your Vice-county on nice rigid paper – please contact your country officer for further details on how you can receive these for free. Remember that you can

also find and print customised cards via the BSBI website (see <http://www.bsbi.org.uk/resources.html>). Of course it's not compulsory to use a recording card – a notebook is perfectly acceptable! The important thing is to get out in the field, have fun, and please digitise your records as soon as you are able, so that we have as up-to-date an idea of coverage as is possible.

If you would like to know where help with recording is most needed, then please do ask. I would strongly recommend adopting a hectad or tetrad – it is a great way of exploring your local area and brushing up on identification skills. There are also lots of field meetings taking place this year, many of which have the Atlas as their focus, so plenty of excuses to get out and about.

I am sure you know that the DDb is an amazing resource to have at your fingertips. Tom Humphrey has been very busy making it more user-friendly and adding many wonderful features, including updated distribution maps, which are certainly worth scrutinising here <http://bsbidb.org.uk/maps/>.

Finally, I thought it would be nice to use this column to highlight a plant that may be overlooked in your area. Please do contact me if you would like to recommend a species to feature in a future issue.

### Overlooked species no.1. *Euphorbia oblongata* (Balkan Spurge)

A naturalised perennial and favourite with flower arrangers and garden designers, *E. oblongata* has lime-green flowers showing from spring through to the late autumn months, upright, patent-hairy reddish stems that often grow to 60 cm, sometimes taller, and dark green leaves that are sparsely hairy on the underside but hairless above (see Colour Section, Plate 2 for photo). A close look with a hand lens at the glabrous capsules will reveal distinctive hemispherical papillae, quite a memorable character once seen. Look out for it in all types of urban environments - grass verges, roadsides and the edges of pavements, brownfield land, spoil heaps, car parks, churchyards and allotments. The current DDb distribution map shows post-1999 records thinly scattered across England, particularly in the south, post-1999 records from two tetrads in Wales, and one lonely record in Lanarkshire from 1997. There is no sign of it yet in Ireland. It is certainly spreading, seeds prolifically (see Bowen, 2000) and is probably under-recorded.

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## Atlas 2020: mind the gap!

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The aim of Atlas 2020 is to record a sample of tetrad (or better) squares in each hectad in every vice-county throughout Britain and Ireland. With five years of fieldwork to complete survey coverage for Atlas 2020, now is an excellent time to take stock and see where your gaps are if you are a vice-county recorder.

The main type of gap is, of course, in geographic coverage; where entire hectads are under-recorded or even completely unrecorded, or where less than the target number of sample squares have been surveyed in the hectad (we have previously suggested five in each full hectad). This might happen where the most accessible squares are surveyed, perhaps close to home, leaving those

in remoter, often peripheral, areas. But other coverage gaps may exist in odd places that you may be unaware of. MapMate can be used to look for such gaps but only holds a subset of all the records on the BSBI Database (DDb). If you are fully up to date with data entry and 'syncing' to the hub, then the DDb is generally a far better place to look.

There have been some recent developments which will help identify coverage gaps using the DDb. The first of these is 'my county' – a new menu option which should appear to the left of 'message board' when recorders log in, along with 'my mapmate records' – if you are a MapMate user. The 'my county' option has three tabs: 'Summary', which includes a year-

by-year breakdown of recording since 2000, 'Data validation' and 'Atlas 2020 survey coverage'. This last tab displays two colour-density maps of your vice-county. One shows the number of intensive tetrad surveys and the other shows the number of taxa not re-found since 2000. The underlying data can be seen by clicking links. It is absolutely fascinating – log in and take a look!

If you would like to drill down even further, then Andy Amphlett has produced two excellent spreadsheets available on the 'message board' under 'Help and Support'. Both of the spreadsheets analyse re-recording for Atlas 2020 in a vice-county: one at a hectad scale and the other at tetrad scale. Full operating instructions are included. I would thoroughly recommend that recorders use these analyses. If you run into any problems with the spreadsheets or using the DDb, then please post your queries on the 'message board'.

However, there are at least two other types of gaps. Many vice-counties have habitat gaps, where particular habitats across entire counties are under-recorded. Examples might include

montane, upland or aquatic habitats. Access difficulties may explain part of the problem here. Recorders need to think carefully about how best these gaps can be filled, but possible solutions might include Targeted Recording Groups, such as the Rough Crew idea which I have mentioned previously and will launch shortly in Scotland. Local recording groups may also be able to help or recorders could advertise in *BSBI News* for botanists to help record specific habitat for Atlas 2020 if required.

A third type of gap relates to species groups. Examples of this are Stoneworts and, more generally, aquatics, both of which are rather poorly understood and therefore poorly recorded. Field Meeting Secretaries and Country Officers might like to consider how they can help plug these gaps with training field-meetings and workshops. Identification training courses such as those offered by the Field Studies Centres would also be worth considering. In all cases, members with particular skills and aptitudes might like to volunteer to help recorders mind those gaps!

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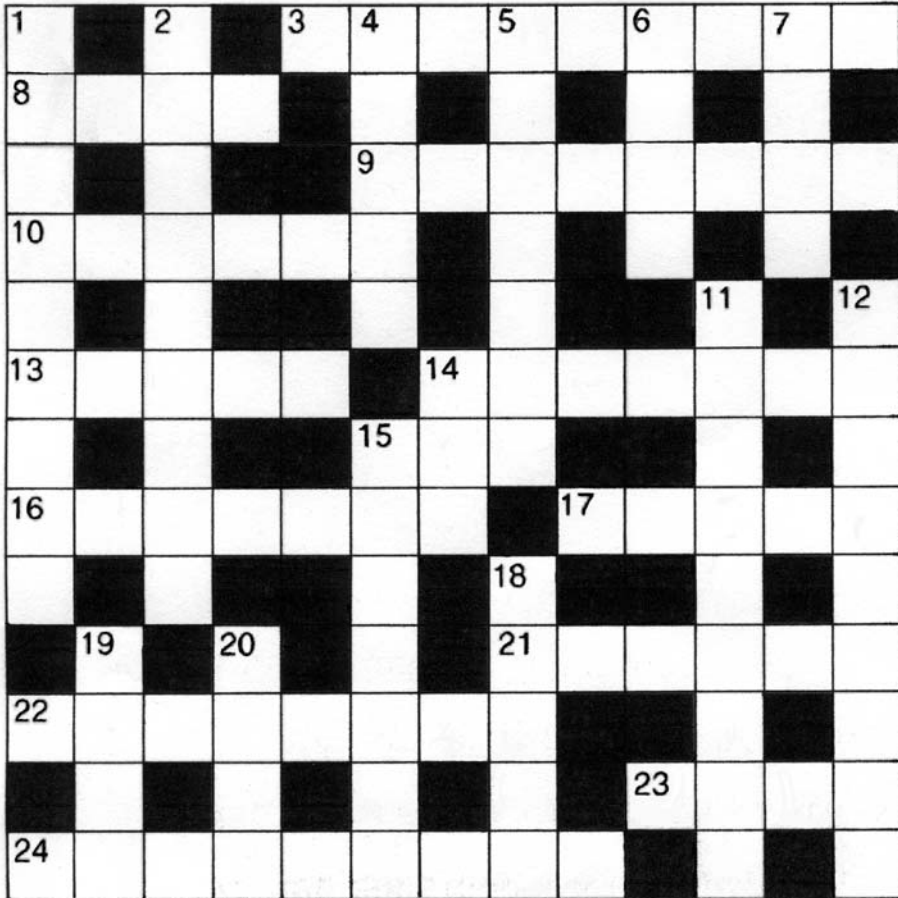
## Diary for 2015

CHRIS METHERELL, *Woodsia House, Main Street, Felton, Northumberland, NE65 9PT*; (01670-783401; [chris@metherell.org.uk](mailto:chris@metherell.org.uk))

Date	Meeting	Location
Wednesday 13 May	Committee for Scotland	Perth
Wednesday 1 July	Board of Trustees	London
Saturday 11 July	Welsh AGM	Plas Tan-y-Bwlch
Wednesday 16 September	Committee for Scotland	Perth
Wednesday 23 September	Meetings and Communications Committee	London
Wednesday 7 October	Records and Research Committee	London
Thursday 15 October	Publications Committee	London
Saturday 24 October	Committee for Wales	tbc
Wednesday 28 October	Training and Education Committee	Shrewsbury
Wednesday 4 November	Council	London
Saturday 7 November	Scottish AGM	Edinburgh
Wednesday 18 November	Board of Trustees	London
Saturday 28 November 2015	BSBI AEM & AGM	London

# BOTANICAL CROSSWORD 25

by CRUCIADA



### Across

3. USA tel. nos. are garbled in broadband reading (5,4)
8. Start a fight or make holes in argument over whether to do this to wild plants (4)
9. *Oenothera* extract uncle and cousin mostly found to have a blueish bloom (8)
10. Cultivated *Pyrus* in company with *Mus* species (6)
13. Honesty, in short, may be found on the moon (5)
14. The sort of ease given by *Viola tricolor*? (7)
15. Nightshade appears briefly in the sun (3)
16. Ate nuts, suffering result of toxic bacterium (7)
17. 122 aids to identifying difficult species (5)
21. Rag son about organized collections of tissue (6)
22. Worship without hesitation the skeleton of a leaf (8)
23. Long tree (4)
24. Fruit with style persisting for period of ten years, usually (4,5)

### Down

1. Ape we heard you left at being in charge first making a short sharp point (9)
2. More gradual than the one before – I mean, a cut is wrong (9)
4. What *Carex* have when head chopped off (5)
5. Advance of ice laid down at start of Silurian (7)
6. Queen Anne's trimming *Anthriscus* (4)
7. Authentic model of *Thalictrum* (4)
11. Finger Alison's glove? No, it's Reynard's (9)
12. Almost esteem cosy interior in environmental unit (9)
14. Why lettuce? This is the reason (3)
15. The other 15 phone gnomon (7)
18. 21s of colour vision seen on 23, for example (5)
19. Scottish environment agency admitted to close paths (4)
20. No alternative method exists for capitalizing appellation (4)



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## STOP PRESS

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### Long run of *Taxon* available

GWYNN ELLIS (General Editor), 41 Marlborough Road, Roath, Cardiff, Wales, CF23 5BU;  
(Tel.: 02920 496042) (gwynn.ellis@bsbi.org)

Any member interested in a long run of the journal of the International Association for Plant Taxonomy, *Taxon* should contact me at

the address above. The unbound copies are numerous and heavy and will have to be collected in person or full postal charges paid!

### Solutions to Botanical Crossword 25

#### Across

3. SENSU LATO 8. PICK 9. GLAUCOUS  
10. COMIICE 13. LUNAR 14. CARDIAC  
15. SOL 16. TETANUS 17. CRIBS  
21. ORGANS 22. VENATION 23. PINE  
24. DATE CLASS

#### Down

1. APICULATE 2. ACUMINATE  
4. EDGES 5. STADIAL 6. LACE 7. TRUE  
11. DIGITALIS 12. ECOSYSTEM  
14. COS 15. SUNDIAL 18. CONES  
19. SEPA 20. NAME

### Crib to Botanical Crossword 25

#### Across

3. anagram USA TEL NOS 8. pick a fight etc  
9. GLA/U (old UK phonetic)/COUS  
10. CO/MICE 13. LUNARia 14. heart's  
15. SOLanum 16. anag ATE NUTS  
17. C(=100)/RIBS(venation) 21. anag RAG  
SON 22. VEN(ER)ATION 23. double  
definition 24. charade

#### Down

1. AP<IC/U/L/AT>E 2. anag I MEAN A  
CUT 4. (S)EDGES (rushes are round)  
5. rev LAID/AT/S 6. folk name 7. T/RUE  
11. DIGIT/ALI'S 12. E<COSY>STE(E)M  
4. 'cos 15. 15ac = sun + DIAL 18. double  
def 19. cloSE PATHs (Scottish Environmen-  
tal Protection Agency) 20. No Alternative  
Method Exists

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*Baldellia ranunculoides* ssp. *ranunculoides* showing typical solitary growth form and relatively small, non-overlapping petals



*Baldellia ranunculoides* ssp. *repens*, showing dense growth form and large, overlapping petals

Both photos A Jones © 2014 (see p. 4)



Irish Ladies Tresses (*Spiranthes romanzoffiana*) habitat at Glen Park, Isle of Rum with photo of single plant inset. Both photos M. Ingram © 2014 (see p. 31)



James Lindesay and frozen nosegay, v.c.55. 4 Jan.  
Photo. J. Clough © 2015



Geoffrey Hall (recorder for v.c.55). 4 Jan.  
Photo. L. Marsh © 2015



Strawberry tree in flower at New Year. Muckross, Killarney, Co. Kerry. Photo. R. Hodd © 2015

All photos taken on the 2015 New Year Plant Hunt, see page 82 for details