

BSBI

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 Botanical  
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# ADMINISTRATION AND IMPORTANT ADDRESSES

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BSBI Head of Operations	<p><b>MS JANE HOULDSWORTH</b>  7 Grafton Gardens, Baxenden, Accrington, Lancs. BB5 2TY  Tel. 07584 250 070; <a href="mailto:jane.houldsworth@bsbi.org">jane.houldsworth@bsbi.org</a></p>
BSBI Head of Science	<p><b>DR KEVIN WALKER</b>  Suite 14, Bridge House, 1–2 Station Bridge, Harrogate HG1 1SS  Tel.: 01423 526481 or 07807 526856; <a href="mailto:kevin.walker@bsbi.org">kevin.walker@bsbi.org</a></p>
BSBI Scotland Officer	<p><b>MR JIM MCINTOSH</b>  c/o Royal Botanic Garden, Inverleith Row, Edinburgh EH3 5LR  Tel. 01312 482894; <a href="mailto:jim.mcintosh@bsbi.org">jim.mcintosh@bsbi.org</a></p>
BSBI Wales Officer	<p><b>MS BARBARA BROWN</b>  Flat No 1, Claremont, East Street, Rhayader, Powys LD6 5DN  Tel. 07930 608 423; <a href="mailto:barbara.brown@bsbi.org">barbara.brown@bsbi.org</a></p>
BSBI Ireland Officer	<p><b>DR MARIA LONG</b>  c/o National Botanic Garden, Glasnevin, Dublin 9, Ireland  Tel. 00 353 87 2578763; <a href="mailto:maria.long@bsbi.org">maria.long@bsbi.org</a></p>
BSBI England Officer (& Vice-county recorders – comments and/or changes of address)	<p><b>DR PETE STROH</b>  c/o Cambridge University Botanic Garden, 1 Brookside, Cambridge CB2 1JE  Tel. 01223 762054 or 01832 720327; <a href="mailto:peter.stroh@bsbi.org">peter.stroh@bsbi.org</a></p>
BSBI Database Officer	<p><b>MR TOM HUMPHREY</b>  c/o CEH, Maclean Building, Benson Lane, Crowmarsh Gifford, Wallingford, Oxon OX10 8BB  Tel. 01491 692728; <a href="mailto:tom.humphrey@bsbi.org">tom.humphrey@bsbi.org</a></p>
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BSBI Publications	<p><b>MR PAUL O'HARA</b>  c/o Summerfield Books, Unit L, Skirsgill Business Park, Penrith, Cumbria CA11 0FA  Tel. 01768 210793; Fax: 01768 892613; <a href="mailto:info@summerfieldbooks.com">info@summerfieldbooks.com</a></p>

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SOCIETY OF BRITAIN AND IRELAND

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**Front cover** Backlit *Salvia pratensis* (Meadow Clary) (see p. 44).  
Bob Gibbons

Contributions for the next issue of **BSBI News** (no. 141) should be sent to the Editor Andrew Branson ([andrew.branson@bsbi.org](mailto:andrew.branson@bsbi.org)) by **26th February 2019**.

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## FROM THE PRESIDENT

I guess that every President has something for which they want to be remembered. Something they want to achieve while they have the chance. Well, it's time for me to confess. I want to revitalise the use and thus importance of herbaria. Of course, the days are long gone when children were encouraged to go out and pick wild flowers to press. Now the BSBI code of practice makes recommendations about collecting specimens which may in due course be preserved.

But our Victorian and Edwardian forebears had no such scruples and herbarium collections are full, too full, you may feel, of rare plants, some hunted to extinction by avid collectors. But we can at least make some atonement for their behaviour by actually using the collections they painstakingly amassed. That way the plants will not have died in vain.

This issue contains some tips on herbarium use (I wonder who persuaded Hazel to write that!), see page 42. However, what I would like to encourage you to do is actually to go and visit one, or more! Through the good offices of Richard Gornall, David Pearman and Louise Marsh, I have arranged

for a list of institutional herbaria to be available on the BSBI website. You can find it at [bsbi.org/herbaria](http://bsbi.org/herbaria). The details are, I'm afraid, likely to be out of date, but do not let that act as a deterrent. If every member made just one visit to their local herbarium, not only would everyone gain in botanical expertise, but also it would begin to send a message to museum curators that these are valuable resources to be preserved. In too many cases over the last ten years, we have heard stories of herbaria ending up 'in the skip' because no one used them. This is your chance to make a difference!

Please do not be put off by denials of the 'Herbarium? What's that? We don't have one.' type. Perseverance makes the achievement all the sweeter!

And, when you get back from your first visit, please spend a couple of minutes emailing me, in order to let me know about your experience and, if possible, updating the contact information.

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**Chris Metherell**  
BSBI President  
[chris@metherell.org.uk](mailto:chris@metherell.org.uk)



BSBI President-elect, Lynne Farrell, with Chris Metherell. See AGM report on page 74. *Louise Marsh*



# Life after the Atlas: what BSBI recorders want to do next

KEVIN WALKER, ROBERT NORTHRIDGE & PETE STROH

In the September edition of *BSBI News* we asked members for their views on the types of projects they would like to do once fieldwork for Atlas 2020 finishes at the end of 2019 (Walker *et al.*, 2018). This followed a consultation during the summer of 2018 when we asked all BSBI vice-county recorders (VCRs) to rank nine project areas (see Appendix) from 1-9, with 1 being their least favourite and 9 being their most favourite. Comments were also canvassed on the projects that interested them. We had responses from 89 VCRs (33 from England, eight from Wales, 25 from Scotland, 21 from Ireland and two from the Channel Islands) and 20 members.

Ian Strachan and Ian Bonner, VCRs for v.c.97, Westernness. Pippa Bonner

## How did VCRs score the project areas?

The overall VCR rankings for the nine projects are presented in Table 1. These show the mean score for

**Table 1.** Results of the survey of VCR views on post-Atlas projects.

No	Name	Total score	Mean score	Rank	Popular (score 7-9)	Rank	Unpopular (score 1-3)	Rank
1	Mapping	460	5.4	4=	42	3	30	5
2	Change	447	5.4	4=	33	4	22	7
3	Climate change	426	5.1	6	30	6	23	6
4	Education	539	6.3	1	47	1	11	9
5	Taxonomic	399.5	4.8	7	23	7	31	3=
6	Autecology	465	5.7	2	31	5	14	8
7	Interactions	297.5	3.7	9	14	9	44	1
8	Technologies	364	4.4	8	16	8	35	2
9	Holiday	463	5.5	3	43	2	31	3=

**Table 2.** VCR and BSBI members' ideas for projects to be carried out once fieldwork for Atlas 2020 is completed (n=152). For the sake of brevity, responses were grouped into broad categories. Projects/activities are ranked in terms of the number and percentage of respondents supporting each.

Project	Respondents	%
flora, checklist, Rare Plant Register (inc. alien plant register)	22	14
more focused surveys (species)	15	10
more focused surveys (sites)	11	7
spreading the message/collaboration/local groups	11	7
monitoring change (altitudes, Local Change, NPMS, species, sites)	9	6
training workshops/education	9	6
data for management/conservation (inc. axiophytes)	8	5
encouraging next generation of recorders/botanists	7	5
more focused surveys (driver)	7	5
improving learning resources	5	3
more focused surveys (habitats)	5	3
recording software (inc. mobile apps)	5	3
testing taxonomy (inc. DNA)	5	3
data management/verification	4	3
recording habitats more effectively	4	3
fun not work	3	2
recording abundance/frequency more effectively	3	2
taking a break/reflect/relax	3	2
scientific (network) research projects	3	2
fundraising	2	1
mapping infra-specifics	2	1
recording associate fungi (diseases, smuts/rusts)	2	1

Projects suggested by a single respondent: English names; more focused surveys; more focused surveys (all levels of expertise); more focused surveys (random sample); more focused surveys (monads); recording absences/nulls more effectively; photographic library; recording associates more effectively; recording change more effectively; recording status more effectively.

each project and the number of VCRs that scored it 7-9 (most popular) and 1-3 (least popular). Overall, education had the highest mean score, followed by autecology, holiday, and mapping/change (tied 4th). After education, the most popular choices were holiday, mapping, change and autecology. The most unpopular choices (in order of unpopularity) were interactions, technologies and holiday/taxonomy. Interestingly, the idea of a holiday was almost equally liked and disliked, even though it achieved a high mean score. Equally, autoecology had a high mean score (ranked 2nd) but was only ranked 5th in terms of popularity.

### VCR and member ideas for projects

Respondents also provided specific project ideas that interested them. These are summarised in Table 2. We have assigned these to relatively broad project areas, although clearly some of these are more specific than others. One of the most popular choices was the need for a short break (holiday) from large recording projects that gives time to complete county projects, such as floras or Rare Plant Registers. Of secondary importance was also a clear demand for more focused (targeted) surveys of specific species – especially those that are rare, scarce, and threatened – although indicators and globally important species were also mentioned. Equally, the need for site surveys (as opposed to list-making/square-bashing) was also frequently mentioned, especially surveys of species-rich sites and nature reserves (both officially protected and unprotected) and those that monitor change via repeat visits.

Many respondents also mentioned the need for more outward-looking projects that promote the study of botany to a more diverse range of groups. These ideas included working more collaboratively with other organisations at a local level and developing more local groups. Respondents also felt that BSBI could do a lot more to encourage the next generation of botanists, including engaging younger members through educational activities and providing training for potential VCRs. Similarly, many respondents focused on significantly

extending training and educational activities through field meetings and workshops, especially on the more difficult to identify groups.

There was also a clear emphasis on projects that focus on conservation and management, both in terms of highlighting the issues and also contributing useful information for land managers.

Other projects that received some support included more focused habitat surveys and those that addressed key drivers of change (e.g. climate change, nitrogen deposition, agricultural intensification, muirburn), as were projects to improve learning resources, recording software and our knowledge of new taxa, e.g. through the increased use of DNA sampling.

### Next steps

The results of this survey provide much food for thought. BSBI Council has therefore set up a small Working Group to consider the responses, as well as what key partners/stakeholders would like BSBI to do in the future. The group will then select and

develop these project ideas in line with the overall goals of the BSBI, likely sources of funding and the availability of staff and volunteer inputs needed.

### Reference

Walker, K.J., Stroh, P. & Northridge, R. 2018. Life after Atlas: what do members want to do next? *BSBI News* 139, 3–6.

### Kevin Walker

BSBI Head of Science, Suite 14, Bridge House,  
1–2 Station Bridge, Harrogate HG1 1SS  
[kevin.walker@bsbi.org](mailto:kevin.walker@bsbi.org)

### Robert Northridge

9 Coole Drive, Enniskillen, Co. Fermanagh BT74 6BS  
[robhannort@aol.com](mailto:robhannort@aol.com)

### Pete Stroh

c/o Cambridge University Botanic Garden,  
1 Brookside, Cambridge CB2 1JE  
[peter.stroh@bsbi.org](mailto:peter.stroh@bsbi.org)

### Appendix. Post-Atlas project descriptions

No	Project	Description
1	Mapping	Distribution mapping (i.e. mapping the distributions of all native and non-native species at hectad resolution or better)
2	Change	Monitoring broad-scale floristic change (e.g. structured monitoring of species/habitats through sample-based schemes)
3	Climate change	Monitoring the impact of specific environmental drivers (e.g. climate change, eutrophication, invasive aliens)
4	Education	Education and training (e.g. providing resources and learning opportunities for beginners and improvers, workshops on advanced taxonomy, field trips)
5	Taxonomic	Taxonomic research (e.g. investigating variation and new taxa, cryptic/critical taxa, hybrids)
6	Autecology	Autecology (e.g. collecting information on ecology, abundance and habitat requirements/associations of both natives <b>and</b> non-natives)
7	Interactions	Plant-insect interactions (e.g. pollinators, galls, parasites)
8	Technologies	Testing/developing new technologies for recording (e.g. identification/recording apps, eDNA, etc.)
9	Holiday/Write-up	A two-year 'holiday' to write a VC Flora, a VC Rare Plants Register, a VC species list, or similar.



*Gymnadenia conopsea* s.s. Pete Stroh

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# Mapping the near- cryptic fragrant orchids of Britain and Ireland

RICHARD BATEMAN  
& IAN DENHOLM

Within the edited volume published by BSBI that marked Clive Stace's retirement, one of us (Bateman, 2006) argued forcefully that each of the three ecotypes that represent British and Irish populations of *Gymnadenia conopsea* s.l. (Fragrant Orchid), actually merit species status (Fig. 1). In doing so, he was elevating to species level three taxa that had already been recognised and popularised as subspecies by Rose (1988, 1991), and was tacitly endorsing a statement made 68 years ago by Summerhayes (1951, p. 223): 'There is some evidence to support the view that there are several distinct varieties [of *G. conopsea* s.l.] present in this country.'

Bateman offered two main justifications for

recognising three species. Firstly, it was already apparent that the three species can reliably be distinguished by DNA 'barcode' markers such as ITS (Bateman *et al.*, 2003; Bateman, 2016). Secondly, we had already learned that, contrary to some opinions, the three taxa are not so morphologically cryptic as to be impossible to differentiate using morphology alone. Bateman (2006) also rashly promised the imminent publication of a detailed morphometric study that had already seemingly been completed by the present authors. Unfortunately, that work is only now approaching scientific publication.

While we work toward formal publication, we are well aware that 2019 is to be the final year of data collection for the third atlas of the British and Irish

flora and that the three then subspecies were greatly under-recorded in the 2002 second atlas (compare the two maps in Fig. 3). We also know from our long experience as BSBI co-referees for Orchidaceae that *Gymnadenia* species have become second only to putative *Dactylorhiza* hybrids as a source of orchid-related identification problems for field botanists. We therefore elected to preview here some of the more practical results of our morphometric survey by providing BSBI members with further assistance in the morphological identification of fragrant-orchids, hoping that this information will increase the frequency and accuracy of mapping of the three species during the final year of data collection for the new atlas.

### Analytical approach

We have been measuring 41 quantified characters on *Gymnadenia* populations since 1981, albeit sporadically. Our data matrix now encompasses ten plants per population measured *in situ* from nine or more populations of each of the three species. We also recently measured three populations of a further, even more problematic *Gymnadenia* taxon (we will return to this complication later in this article). Formal publication of our results will, as usual, focus on multivariate statistical analyses. However, if we take it as read that we have already circumscribed the three species optimally, here we can instead adopt a less sophisticated approach to developing identification advice by simply surveying the data on the basis of 50+ individual characters. Given that (1) we wished to keep the present analysis as simple as possible, (2) habitat preference is a good (though not wholly reliable) indicator of species identity, and (3) we are not aware of any site in Britain or Ireland that supports all three native *Gymnadenia* species, we decided to approach the problem by simply comparing the species as overall means and standard deviations, seeking the best characters to



**Figure 1.** Inflorescences of **(top)** *Gymnadenia borealis* (Heath Fragrant-orchid), **(middle)** *G. conopsea* s.s. (Chalk Fragrant-orchid), and **(bottom)** *G. densiflora* (Marsh Fragrant-orchid). Horizontal dimension of all images = 23.5mm. R.M. Bateman

**Table 1.** Provisional list of those characters most useful for distinguishing *G. borealis* and *G. densiflora* from *G. conopsea* s.s., together with estimates of the proportion of flowering plants that conform to the stated threshold.

Character	Threshold	Applicability
<b><i>G. borealis</i></b>		
Labellum width	≤ 4.9mm	97%
Labellum length	≤ 4.4mm	86%
Labellum, depth of sinuses	≤ 0.4mm	93%
Inflorescence length	≤ 48mm	89%
Flower number	≤ 24	77%
Stem diameter	≤ 3.0mm	76%
<b><i>G. densiflora</i></b>		
Bracteoidal leaves, number	≥ 4	91%
Leaf, length longest	≥ 125mm	77%
Plant height	≥ 30cm	65%
Flower colour (CIE x)	≤ 301	84%
Bract marginal cell length	≤ 70µm	76%
<b><i>G. conopsea</i> s.s.</b>		
Flower colour (CIE y)	≥ 230	80%
Flower colour, reflectivity (%)	≥ 28	77%

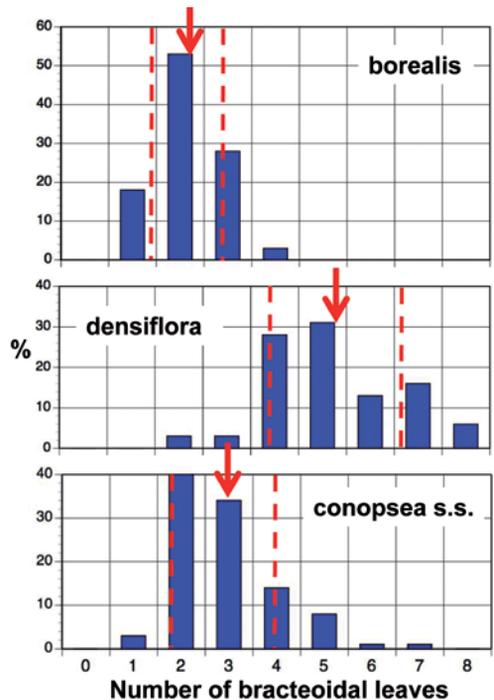
distinguish each pair. It soon became evident that, for most individual characters, one species tended to deviate from the other two. Our results, given in Table 1, undermine a large proportion of the characters previously considered diagnostic of the three subspecies/species by Rose (1988), Stace (1991) or Sell & Murrell (1996), but happily they also reveal a few new characters of genuine value.

**The most utilitarian morphological characters**

*Gymnadenia conopsea* s.s. (Chalk Fragrant-orchid) is, as we anticipated, shown by our data to occupy the morphological centre ground between the typically smaller *G. borealis* and larger *G. densiflora*. Table 1 shows that there is little to distinguish *G. conopsea* s.s. from the two remaining taxa other than a tendency toward paler coloured flowers. All three species typically have flowers on sheets 80 and 81 of the Royal Horticultural Society Colour Chart, but

*G. conopsea* plants reliably match C and D blocks, whereas the remaining species are often the darker B block and occasionally A block colours. Admittedly, field botanists lacking an RHS Colour Chart may find this character rather less than utilitarian.

*Gymnadenia densiflora* (Marsh Fragrant-orchid) also presents challenges to morphological identification, in part because moderately diagnostic characters such the slightly bluer flowers are difficult to detect and bract cell dimensions are impossible to measure in the absence of a calibrated microscope. Greater average vegetative vigour is evident in characters such as plant height and length of expanded leaves, but the most diagnostic character (never previously recognised as such) proved to be the number of bract-like leaves – those located below the inflorescence and failing to fully encircle the stem at their base. The majority of *G. densiflora* plants bear



**Figure 2.** Histograms for numbers of bracteoidal leaves in the three *Gymnadenia* species, showing that this is the most effective single character for distinguishing *G. densiflora*. Red arrows indicate mean values, dashed lines denote sample standard deviations.

four or five of these bracteoid leaves, whereas the majority of *G. conopsea* and *G. borealis* plants bear only two or three (Fig. 2).

*Gymnadenia borealis* (Heath Fragrant-orchid) is best recognised by its smaller flowers (labella normally less than 4.5–5.0mm), shallowly lobed labellum and modest stature, its inflorescence typically being shorter and containing fewer flowers than those of the other species. Despite its Latin name, *G. densiflora* has on average the least dense inflorescences (1.7 flowers per cm) and *G. conopsea* the most dense (2.1 flowers per cm). The apparent differences in density actually reflect relative flower sizes.

In short, the characters given in Table 1 readily distinguish *G. borealis* from *G. densiflora*; it is distinguishing either of these species from *G. conopsea* s.s. that is the greater challenge. Nonetheless, the threshold values given in Table 1 should permit accurate morphology-based identification in the great majority of cases.

### Comparison with previous taxonomic descriptions and identification guides

Anyone who has consulted the descriptions and keys of these three taxa in the floras of Sell & Murrell (1996) and Stace (little changed since the 1st edition of 1991) – both of which owe much to the earlier tabulation of characters by Rose in the *Plant Crib* (characters unchanged since the 1st edition of 1988) – will likely be scratching their heads by now and wondering what became of all the other supposedly diagnostic characters. In a few cases (enrolled lateral sepals, paler area toward base of labellum in *G. densiflora*, supposedly contrasting scents) we did not test those characters, but the remainder simply failed our test.

For example, Rose (1988) gave the spur lengths of *G. conopsea* s.s. and *G. densiflora* as 10–11mm and 11–13mm respectively, whereas our data show *G. densiflora* to have a slightly shorter mean spur length than *G. conopsea* ( $14.0 \pm 1.5$ mm versus  $15.3 \pm 2.4$ mm). The labellum length of *G. densiflora* was said to be 3.5–4mm long, whereas our plants averaged  $5.1 \pm 0.7$ mm. *G. borealis* supposedly possesses lateral sepals that are shorter but wider than those of

the other species, but the difference in length is considerably less than supposed and that in width is non-existent; *G. borealis* actually has the narrowest lateral sepals, and those of *G. conopsea* and *densiflora* approximate 3mm once any marginal recurvation has been taken into account (most noticeable in *G. densiflora*). And *G. densiflora* was said to bear its lateral sepals horizontally rather than with the *ca* 30° deflexion characterising the remaining species, whereas our data show the lateral sepals to be held on average 15° below the horizontal in *G. conopsea* and 5° below horizontal in the remaining species. Moreover, the line drawings of ‘full frontal’ flowers in the *Plant Crib* exaggerate the differences between the taxa, depicting extreme examples of both *G. densiflora* and *G. borealis* (as indeed does our own illustration of *G. densiflora* in Fig. 1).

Although we have always strongly encouraged plant identification primarily through the intrinsic features of the plants themselves, there is no denying that their flowering periods and especially their habitat choices play major roles in distinguishing the three *Gymnadenia* species. In a typical summer, flowering of *G. conopsea* and *G. borealis* peaks in the last two weeks of June and first week of July, immediately preceding *G. densiflora*, which peaks from the second to the fourth weeks of July. We suspect that frequent statements that *G. borealis* can flower into August reflect misidentifications of *G. densiflora* populations.

In terms of habit preference, a much more detailed account of the ecology of our native *Gymnadenia* species was given by Meekers *et al.* (2012). In brief, all three species avoid shade. *G. conopsea* is a plant of comparatively dry limestone soils, whereas *G. borealis* favours acidic soils with at least moderate water retention, most commonly found on heaths and hill pastures. Historically, *G. densiflora* was believed to be restricted to calcareous marshes. Thus, habitat preference can at least be used to reduce the range of possible identities from three to two species. However, recent studies have added an unwelcome complication to the apparently simple segregation of the three species into distinct ecotypes.

### Yet another complication

The figures presented in Table 1 for *Gymnadenia densiflora* include data for three unusual late-flowering populations that were targeted for measurement by us during 2016: two were located on the escarpment of the South Downs in Sussex and the third in the extensive dune system at Kenfig, Glamorgan. The Sussex downland populations near the villages of Ditchling and Heyshott were recognised as interesting by Lang (2001) and when they were later analysed for microsatellites by Campbell *et al.* (2007), Ditchling plants appeared subtly distinct from those of all other populations. More recently, Kreutz & Lewis (2015) suggested, albeit only on the grounds of traditional taxonomy, the possibility of synonymy between a large dune-slack population at Kenfig and the so-called *G. conopsea* (later *densiflora*) *friesica* occupying similar habitats in the Frisian Islands.

Our DNA data show a clear similarity between the Sussex and Kenfig plants within the overall spectrum of *G. densiflora*, though the current lack of either morphometric or DNA data from the Frisian populations makes inferring synonymy with Dutch *friesica* populations guesswork rather than hard science (Bateman *et al.*, 2018).

In any case, both kinds of data clearly show that the Kenfig and Sussex plants constitute a subspecies of *G. densiflora* that flowers at approximately the same time as *densiflora* but can tolerate drier habitats. It differs subtly from *G. densiflora densiflora* in a few characters, most notably in often having shorter spurs and a slightly bluer flower colour. Such populations are, to the best of our knowledge, rare, though we question whether adequate effort has been applied to finding and reporting them; there is no obvious reason why they should not be more widespread than is currently believed.

It is important to bear at the back of your mind the possibility of encountering these unusual late-flowering populations when conducting fieldwork. They represent a situation where a portable DNA sequencing device would be of considerably more help than any key aiming to assist morphological identification (Bateman, 2016).

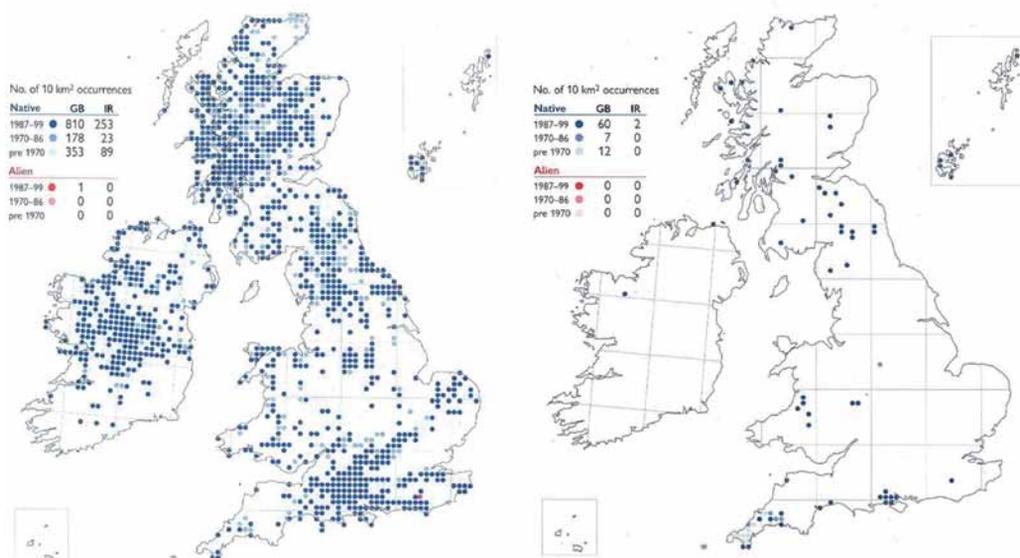
### Prospects for 2019 and beyond

We hope that the information encapsulated in Table 1 will assist botanists in making confident field determinations. If difficulties are still encountered and our help is sought as referees via digital images, we reiterate here our earlier statement that it is greatly advantageous to capture those images at a known scale, both of the inflorescence and the whole plant. Only then can the metric characters in our database be employed in seeking a stronger determination (Bateman & Denholm, 2014). Habitat and flowering time are also clearly significant. We would in addition need to know whether the plants depicted are typical of the source population, and whether hybridisation between *Gymnadenia* species is suspected.

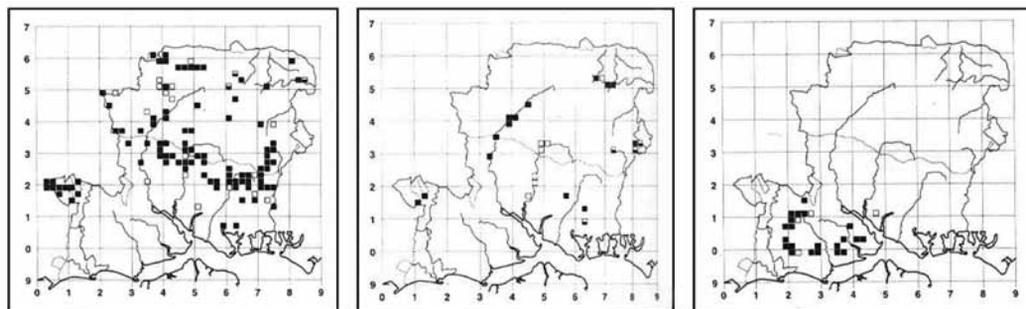
Sadly, the modest morphological overlap evident between the three species is nonetheless sufficient to preclude identification of hybrids on morphological grounds; they can only be identified with confidence using DNA data. In other words, hybrid fragrant-orchids are genuinely cryptic, even if their parents are not (quite). Localities supporting two of the three species appear to us to be uncommon. The Burren region of Co. Clare maintains some populations where *G. conopsea* *s.s.* occupies limestone pavements and *G. borealis* occurs in associated peat-filled depressions. In a few upland areas of Scotland such as Blair Atholl, *G. densiflora* occupies flushes and *G. borealis* the immediately surrounding heathland. And at a few Sussex downland sites, the early flowering of *G. conopsea* *s.s.* gives way to the later-flowering *G. densiflora* ? *'friesica'*.

The fact that metric characters play such a strong role in identification also means that identification of individuals atypical of their host populations should be avoided. Recent assertions such as the existence of a single plant of *G. densiflora* on Dunstable Downs, Bedfordshire appear to us highly suspect, while the theory that a population of *G. borealis* occupies downland in East Sussex has already been disproved using DNA data (Campbell *et al.*, 2007).

Does attempting to differentiate these three species justify the effort required? Well, we think



**Figure 3.** Comparison of maps presented in the 2002 Atlas, contrasting the comprehensive treatment for all three native *Gymnadenia* species combined (left) with the greatly under-estimated hectad numbers for *G. borealis* (right); only Hampshire and Cornwall are adequately covered.



**Figure 4.** Comparison of the tetrad distributions in Hampshire of *G. conopsea* s.s. (left), *G. densiflora* (centre) and *G. borealis* (right), illustrating the advantages of thorough, egalitarian coverage by knowledgeable surveyors (from Brewis *et al.*, 1996, pp. 300–301).

so. From a scientific viewpoint, this aggregate constitutes a valuable model system for studying (near-)cryptic, dominantly ecological speciation (e.g. Bateman *et al.*, 2018). The distinct ecological preferences of the three species make them valuable indicators of specific plant communities. At present, there is no evidence that *G. borealis* occurs outside the British Isles; Continental studies of *Gymnadenia* have instead focused on differentiating *G. densiflora* from *G. conopsea* s.s. (e.g. Stark *et al.*, 2011; *contra*

Delforge, 2016). If so, *G. borealis* ranks alongside *Dactylorhiza traunsteinerioides* as having the strongest case for being an orchid species endemic to Britain and Ireland; moreover, it appears on the IUCN Red List of threatened species (Rankou, 2011). As understanding of the distributions of these three species gradually improve, the pattern is becoming clearer; for example, we presently lack strong DNA or morphometric evidence that *G. conopsea* s.s. occurs in Scotland, where *G. borealis* clearly dominates.

Given that *Gymnadenia* aficionado Francis Rose was one of the three authors of the *Flora of Hampshire* (Brewis *et al.*, 1996), it is no surprise that the three species were thoroughly mapped in that ecologically diverse county. *Gymnadenia conopsea* s.s. is evidently the most widespread species in the county, preferring chalk downland, particularly along the South Downs escarpment (Fig. 4, left). The map for *G. densiflora* (Fig. 4, centre) shows a strong affinity for the environs of chalk rivers, notably the Test, whereas the map for *G. borealis* (Fig. 4, right) shows not only restriction to the New Forest but, more precisely, to heathlands that dominate the periphery of the Forest. These maps constitute a startling contrast in coverage with that shown in Fig. 3 (right).

We hope that, by encouraging fieldworkers to re-examine their local *Gymnadenia* populations during June/July 2019 (and subsequently), we can shift the pattern of national recording of the genus further in the direction of the impressive rigour of identification and evenness of taxonomic coverage that was achieved by Brewis *et al.* (1996) for the Hampshire flora, 23 years ago. Some recent authors have preferred to name *G. conopsea* s.s. the ‘Common Fragrant-orchid’, but current evidence is insufficient to show that it is indeed more common than its close relatives.

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## Richard M. Bateman

Jodrell Laboratory, Royal Botanic Gardens Kew,  
Richmond, Surrey TW9 3DS  
[r.bateman@kew.org](mailto:r.bateman@kew.org)

## Ian Denholm

Department of Biological and Environmental  
Sciences, University of Hertfordshire, Hatfield,  
Hertfordshire AL10 9AB  
[i.denholm@herts.ac.uk](mailto:i.denholm@herts.ac.uk)

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# *Botrychium nordicum* Stensvold & Farrar (Nordic Moonwort). A cryptic species new to Britain

FRED RUMSEY

In a recent worldwide molecular phylogeny of the genus *Botrychium*, Dauphin *et al.* (2017) recognise eight genetically distinct lineages within *Botrychium lunaria* (L.) Sw., in two major clades distinguished by the presence/absence of a 54 base-pair indel (an insertion or deletion of bases in the genome). Three of these lineages have comparatively recently been described and named after over a decade of study, as they show subtle but consistent morphological distinguishing characters: *B. tumux* Stensvold & Farrar, *B. lunaria* var. *melzeri* Stensvold & Farrar and *B. nordicum* Stensvold & Farrar. The remaining taxa: *Lunaria* '1', *Lunaria* '2', *Lunaria* '3', *Lunaria* '4' and *Lunaria* '5', while showing some geographical and ecological separation, cannot currently be morphologically distinguished: the sequence level divergence for the marker regions used in the plastid genome (psbA – trnH and trn L-F) does not reflect the morphological degree of separation.



*Botrychium nordicum*, Glen Shee Ski-lift, The Cairnwell NO138781, alt. c. 659m, 17/07/2017. Fred Rumsey

The known ranges of some of these taxa would not preclude their discovery within Britain and Ireland; indeed, some are to be expected. Perhaps the most widely distributed of all of the taxa is *Lunaria* '2'; this is widespread in mountains from North America, through Asia, the Carpathians and the Alps. *Lunaria* '3' in contrast is exclusively European and centred on the Alps, where it prefers limestone soils (Maccagni *et al.*, 2017). The major clade that contains *Lunaria* '1', itself widespread through Europe and in Iceland, tends to be more boreal. Within it, *Lunaria* '4' is currently known only from north Sweden and *B. lunaria* var. *melzeri* from the High Arctic. Given the disjunct occurrences of other arctic-alpine species in the British flora, the mountains of Snowdonia, Upper Teesdale, the Cairngorms, Shetland, and, in Ireland, the Burren,



*Botrychium nordicum*, Glen Shee Ski-lift, The Cairnwell NO138781, alt. c. 659m, 17/07/2017.  
Fred Rumsey



Possible *B. nordicum*, Ski-tow, lower slopes of Meall Odhar, v.c.92 NO149775, alt. c. 754m, 05/08/2010.  
Fred Rumsey

all on phytogeographic grounds, offer the greatest hopes for discovery of these taxa. Very few examples of British material have to date been examined. Indeed, we currently do not know if British material consists of the 'typical' i.e. *Lunaria* '1' lineage, or of any of the other lineages, or, indeed, several of them.

### A new British taxon revealed

The molecular sampling reported by Dauphin *et al.* (2017) did, however, rather unexpectedly reveal the presence in Britain of *B. nordicum* (Nordic Moonwort), based on a specimen collected by Heather McHaffie (McHaffie 155) at the Glen Shee ski-lift by The Cairnwell, v.c.92, in 2015. This population was seen and photographed during a visit of the British Pteridological Society in July 2017 (see photographs) before its identity was known. I have also seen what is almost certainly *B. nordicum* a little over 1km ESE of this site, on the slopes of Glas Maol, again in v.c.92, but very close to the v.c.89 boundary, and also close to ski-lift buildings.

It should be noted that typical plants of *B. lunaria* also occur by the major trackside linking these two locations.

Hitherto *B. nordicum* had only been reported from South Greenland, north-western Iceland, from its type locality near Vestnes on the western central coast of Norway, and from the Telemark Mountains in the south of Norway. The discovery in the central highlands of Scotland thus reflects a considerable extension of range southwards.

### Identification features

Morphologically *B. nordicum* is primarily distinguished from *B. lunaria* by the deeply incised pinnae margins, which are consistently present in the former but 'usually not' in the latter (Stensvold & Farrar, 2017). In their original description of *B. nordicum* Stensvold & Farrar (2017) also comment on the shorter length of the common stalk, i.e. the section of stem below the first pinnae (and point of divergence of the sporophore when fertile). The recent Scottish examples all have rather laxly

arranged sporangia, although this character has not previously been noted as diagnostic.

The reliability of the pinnule margin character remains to be tested. There are several gatherings at BM with multiple individuals from sites, some of which show the character, whereas others do not. In the absence of a DNA study it is impossible to say whether this reflects variability within a single taxon, or the presence of multiple taxa occurring sympatrically. Several authors using both allozyme- (Stensvold, 2008) and DNA-based studies (Stensvold & Farrar, 2017; Dauphin *et al.*, 2014; 2017; Maccagni *et al.*, 2017) indicate that cryptic *Botrychium* lineages do occur sympatrically, as also suggested by detailed morphological observation, e.g. Struck (2013). The allozymic studies of Stensvold (2008) also suggest that hybridisation between some taxa occurs and allopolyploid origins of some long recognised species, e.g. *B. boreale* and some more cryptic recently described taxa, e.g. *B. yaaxudakeit*, can be identified. There is evidence too for introgression, with some widely distributed recombined and stabilised F2 hybrids within the genus (Stensvold & Farrar, 2017), but in general the ability of taxa to retain their distinct morphological and genetic identities while in sympatry has been used as a strong argument for their recognition.

### Possible British & Irish distribution and status

Following the revelation in Dauphin *et al.* (2017) that *B. nordicum* occurred in the British Isles, a quick check at BM and on Herbaria@Home revealed many possible examples of this taxon, i.e. plants with deeply incised pinnae have been recorded from VCC: 49, 57, 59\*, 62\*, 64, 65\*, 66, 67, 69\*, 70, 71, 72\*, 75, 88, 90\*, 96\*, 98, 100 and possibly H20\* & H27, in addition to the proven examples from v.c.92. Vice-counties marked \* indicate sheets with mixed, i.e. incised and entire pinnuled plants.

These records can only be considered to be provisional in the absence of molecular investigation. If such work goes on to confirm the reliability of the pinnule margin character, we would have much greater confidence in re-assigning

herbarium material which would also allow a more informed view on past distribution and thus potentially decline.

In terms of its conservation status, I recommend we treat *B. nordicum* as DD (Data Deficient) for now, but it will almost certainly prove to be LC as it is likely to be primarily upland in distribution where moonwort populations have shown less decline. One consequence of its recognition is that *B. lunaria* s.s. may be revealed to be more threatened, reflecting its greater losses from lowland areas.

I would be very grateful for records of possible *B. nordicum* plants and where population sizes permit, samples of moonwort plants (a portion of a frond would suffice) upon which a molecular study can be performed.

### Acknowledgements

I am grateful to Heather McHaffie for alerting me to the presence of this plant in Britain and to Helena Crouch for comments on a draft of this manuscript.

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### Dr. Fred Rumsey

Dept. of Life Sciences, Natural History Museum, Cromwell Road, London SW7 5BD.

[f.rumsey@nhm.ac.uk](mailto:f.rumsey@nhm.ac.uk)



# *Lathyrus hirsutus* L.

## Native or not ... and should it really matter?

FRED RUMSEY

**L***athyrus hirsutus* (Hairy Vetchling) has always seemed to me to be one of the more overlooked and under-considered British plants. It was not mapped in the first Atlas (Perring & Walters, 1962) and because most British botanists are only familiar (if at all) with it as a scarce, non-persistent alien of waste ground, its extremely long history in natural vegetation in the Thames estuary is not known, or has not been properly considered. It currently languishes on the Waiting List (Cheffings *et al.*, 2005; Stroh *et al.*, 2014) and is dismissed by Stace & Crawley (2015) as a neophyte, while its few long-persistent natural grassland habitats face development, or chronic lack of management leading to loss to scrub, impacting on not just it but a wider suite of species of conservation concern.

This pea was first published as British by Merrett (1666), when it was found on the scrubby south-

*Lathyrus hirsutus*, Benfleet Downs, South Essex (TQ88), August 2015. Fred Rumsey

facing slopes of the Benfleet-Hadleigh Downs (TQ88) on Thames clay. It continues to grow in this general area, regularly accompanied by a range of local, scarce/rare annual/biennial species, including *Ranunculus parviflorus* (Small-flowered Buttercup), *Dianthus armeria* (Deptford Pink), *Vicia bithynica* (Bithynian Vetch) – itself of questioned status – and *Tordylium maximum* (Hartwort), which is even more contentious regarding its status, but mirrors *L. hirsutus* in many details. Close by, *Lactuca saligna* (Least Lettuce) still occurs; this is another rare and declining annual species of these grasslands, which used to extend up the Thames into and beyond London (as did *T. maximum*). Interestingly, no-one has questioned its native status.

Ray (1677) already knew *L. hirsutus* (as the ‘rough-codded chidling’) from fields about Hockley and Rayleigh (TQ89, ?TQ79) and elsewhere in the Rochford hundred in Essex (TQ88, TQ89), although he does not mention Merrett’s locality (south of Rochford). By the early 18th century, *L. hirsutus* was recorded from at least five contiguous hectads (TQ79: 88; 89; TL80; 90), extending further north and east around the Essex coast to Mundon, Latchingdon and North Fambridge (where Buddle was rector), and elsewhere in the Rochford and Dengie Hundreds, where it was known to a ‘who’s who’ of early British botanists: Ray, Buddle, Dale and, later, Lightfoot, Blackstone and Edward Forster. It was also known further west in the Nazeing area from the 1830s. Subsequently, the plant was recorded in adjacent hectads (TQ67, TQ78, TQ98) and in similar habitat on Sheppey (v.c.15) (TR07) where it has persisted since its first discovery prior to 1982 (Philp, 1982).

Early records are not clear as to the nature of the habitat – ‘fields’ could be cultivated ground, scrubby margins and headlands, or natural grasslands. They mention its association in some of these sites with *Lathyrus nissolia* (Grass Vetchling), *Vicia bithynica* and *L. aphaca* (Yellow Vetchling). The association with the last named is interesting as it too is a thermophilous annual, has a questioned native status, as many of its sites are clearly casual, and probably arose through seed contamination. Yet, as Sanford & Fisk (2010) argued in *A Flora of Suffolk*, its occurrence (and importantly persistence) in quality habitats with a well-defined ecology, rare similarly restricted associates, e.g. *Vicia parviflora* (Slender Tare), suggest it is native in

those sites. It is more distinctly calcicolous than *L. hirsutus* and prefers soils drier in the winter and so there is not full congruence to their respective ‘natural’ British distributions. Like *L. hirsutus*, it appears to have been more frequent and widespread in Essex in the early 19th century (*cf.* Gibson, 1862 *vs* Jermyn, 1974), although whether this is a reflection of more regular past introduction or conversely the loss of a native through changing land management is, for both taxa, debateable.

Many of the former sites for *L. hirsutus* were lost to arable and urban development, encroachment of scrub and changes in coastal defences, etc., but I believe the plant is also under-recorded, as these habitats and this part of Britain have not received much recording attention. Indeed, many of the recent records have been made by entomologists documenting a similarly restricted Thames terrace-grassland invertebrate fauna in coarser grasslands than favoured by visiting botanists. The rediscovery of the plant in TL90 in 2016 poses many questions: had it persisted overlooked since Ray’s time or did it return to the same natural vegetation as a weed? I would be very surprised if a detailed hunt did not re-find the plant in the North Fambridge area, where it was known for over 300 years up to 1902. It

Neutral grassland/grazing marsh reverting to scrub through under-grazing, near Pitsea, South Essex (TQ78), currently still supports one of the largest populations (October 2012). Fred Rumsey



is also to be expected in TQ99 and TR09, although difficulty of access to suitable areas under military occupation may account for the lack of records.

At its best-known site, the Benfleet Downs (TQ78), closely adjacent and an extension to Merrett's 1666 locality, Jermyn (1974) admits that some gardening went on to preserve the plant when its main area of distribution was unsympathetically managed for more than 20 years. This 'assistance' is reputedly still practised for *T. maximum* here and may also be true for *L. hirsutus*, although seed banks obviously exist and most extant patches have probably never been 'augmented'. We should not let distaste for this sort of *ad hoc* conservation operation cloud our judgement as to the plant's history and thus compromise its future.

### So can it be native... and should that even matter?

Various criteria have been developed to help critically assess native status, from David Webb's (1985) *Watsonia* paper to David Pearman's (2007) 'Far from any house...' in the same journal, summarised and discussed by Stace & Crawley (2015). The latter acknowledge the difficulty of applying criteria where taxa are believed to have a contentious native range within a wider clearly introduced one, another example being *Teucrium chamaedrys* (Wall Germander); see Rumsey, 2018. When we consider the chief criteria put forward:

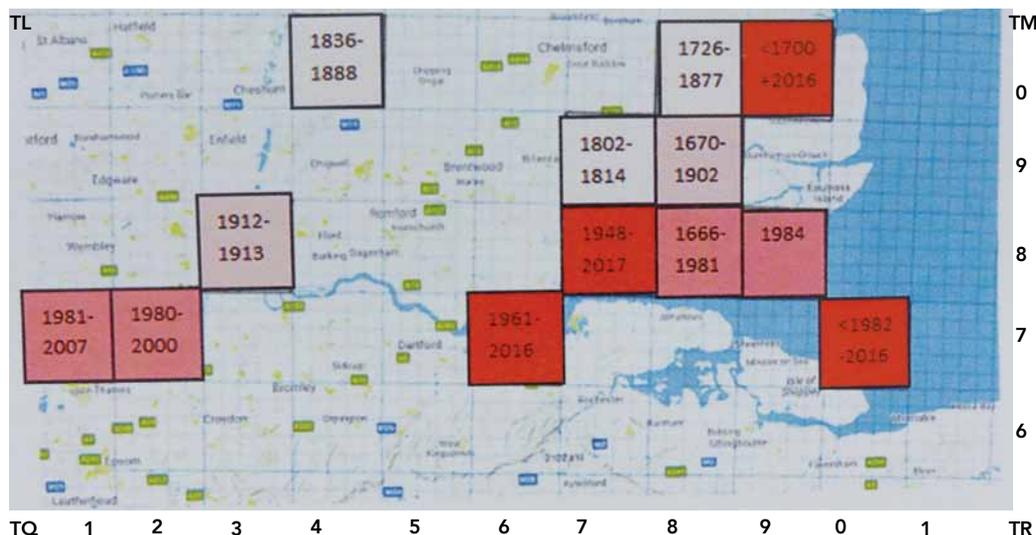
- The species was not widely cultivated, but early 18th century specimens at BM show that it was being grown by the leading botanists of the period at Chelsea and elsewhere (e.g. herb. J. Andrews). However, the source of these plants is unknown and possibly from Essex, not overseas.
- It has a first British date older than most neophytes (1666) and was clearly more widespread in the area earlier (most neophytes date from >1700).
- It occurs in a distinct (semi-)natural habitat.
- It occurs in a coherent range once obvious casual occurrences are excluded; i.e. there is predictability to its distribution and a definable niche in which it is expected to occur.
- It has not shown the rapid spread associated with

some neophytes, although clearly it has been repeatedly and sporadically introduced.

- In most natural sites the plant has persisted for 50+ to over 350 years. As Stace & Crawley (2015) document, natural grassland communities are amongst our least invaded habitats and, more widely, there are few examples of neophyte annuals showing an ability to persist for more than a few years in such communities.
- Extra-British distribution would certainly not exclude the possibility that this species is native, although it admittedly does not give it strong support. In northern France it is rare and declining (as in Basse-Normandie) and somewhat sporadic in occurrence, but is not always considered alien. It is fairly stable, if uncommon, further south.
- There is no archaeological evidence to support, or refute status.
- Genetics: the Essex material is morphologically not very variable. This suggests a limited genetic variability as might be experienced through introduction, but might also be expected for a bottle-necked natural population with no opportunity for gene-flow from external sources. No molecular investigation has been carried out to look for unique characters, or to resolve relationships with populations elsewhere in the range. This might profitably be done. Casual introductions associated with tips, wool shoddy, etc. from elsewhere in the UK show a wider range of morphologies, e.g. often possessing much broader proportionately shorter leaflets, more flowers per inflorescence, etc.

For a compelling case to be made that the species might be considered native I think one needs to be able to demonstrate that there is something different/special about the area in which the plant occurs, and how it performs there, such that a case can be made to treat these as different from where it is more obviously introduced.

I think that this case can be made based on the unique climate in the region where the plant has persistent British populations. This is the most continental area in Britain; the driest part of the



Distribution and persistence of *Lathyrus hirsutus* in the Thames estuary and surrounding area (based on BSBI DDb base-map).

country, with frequent soil-water deficit from May through to August. In summer, this is one of the warmest parts of the country, while in winter the influence of the Thames creates a milder climate than might be expected. The low rainfall and summer droughts help naturally maintain an open habitat allowing the persistence of annual species. This special quality of the area is less well appreciated by botanists as few rare taxa stand out, but a range of disjunct and scarce thermophilous invertebrate taxa are also present on the Essex side of the Thames corridor in the area now supporting the ‘native’ populations of *L. hirsutus* (see Harvey, 2000).

Away from this area, the species generally acts as a casual, rarely persisting in sites beyond 2-3 years from discovery. There are notable exceptions: the site at Halliloo Farm, Waringham (v.c.17) persisted from at least 1858 until 1932. At Richborough, in Kent, it occurred from 1936 until at least 1987, after which the site was partially developed. Elsewhere, the only persistent sites are on grasslands in London close to the Thames (Ham riverlands [pre-1976-2007+]; Wimbledon Common/Putney Heath [1980-2000+]), where I would argue it might also

be considered natural.

In its South Essex sites in recent years it has never appeared in cultivated ground, but always in fairly coarse natural grasslands in transition to scrub on roughly neutral clay soils that dry out and crack, in sites close to the coast. Plants from up-river in London but growing on scrubby sites close to the river are more problematic in status. However, I would look at the similar distribution of *Scilla autumnalis* (Autumn Squill), and more contentiously *T. maximum*, before definitely concluding that they cannot be native in this area. It is not easy to get a clear picture of the habitat and ecology of the species within what might be universally agreed to be its native range, but certainly where I have seen it in southern Europe it has occurred in not dissimilar somewhat disturbed and ‘scrappy’ grasslands. Many such plants where we struggle to characterise and define a native range are those we accept as archaeophytes.

*Lathyrus hirsutus* was clearly widely dispersed in South Essex by the mid-17th century, but not necessarily early enough to invoke archaeophyte status. Its first recorded locality by Hadleigh Castle supported gardens and an orchard developed by

Edward III when he redeveloped the castle in the 1360s, so perhaps seed returned from France with his retinue? While a natural extension of range into this most continental part of England is possible, one might argue that the species is more likely to have arrived in the British Isles as a seed contaminant during the high Middle Ages (mid-11th to 14th centuries) when legumes began to be more extensively grown, particularly on reclaimed marshland (Rippon *et al.*, 2014) and that it has persisted where climatic, edaphic and cultural conditions allow. That this has given it a discrete and predictable distribution, ecology, and, for some, a local cultural significance, for me is actually the most important factor when deciding whether it deserves conservation status. Sadly, as our rather Orwellian system stands with 'Native/archaeophyte good, Neophyte bad' possessing the native/archaeophyte label becomes all-important for salvation. That species become worthwhile if we have tolerated them as weeds pre-1500, but not so post that date is even less easy to justify than a restriction of attention to the purely native. A red-listing process with outcomes that lead into conservation action, that has space for global threat, and even for non-native species which have achieved cultural significance (if we ever satisfactorily manage to define that!) is, I believe, necessary. I would rather have a system that could cope with more subtle layered complexities, particularly when for many taxa we can never definitely know if they have arrived 'naturally'. If we cannot tell if it is native but here it behaves as one, then why can we not treat it as such, irrespective of its unknowable past.

Were this plea to drag Ray's 'Hairy-Codded Chicling' from the obscurity of the Waiting List to an assessment of Native/Alien it would then be appropriate to consider its threat status. If we accept the limited 'natural' area outlined above, fewer than ten locations exist where the plant is present and persistent. There have been clear losses from contiguous hectads over the last 30 or more years and recent losses of populations within hectads where the plant is still extant, e.g. just west of Benfleet station. The threat of development and

habitat degradation leading to an ongoing decline is a very real one. Accordingly I would propose a threat category of VU B2 a, b (i - v) for Red-listing purposes.

## Acknowledgements

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## Dr. Fred Rumsey

Dept. of Life Sciences, Natural History Museum,  
Cromwell Road, London SW7 5BD

[f.rumsey@nhm.ac.uk](mailto:f.rumsey@nhm.ac.uk)

# Comment: How big is a buttercup?

JOHN WARREN

Our botanical distribution maps are rightly a reason to be immensely proud of the BSBI. This data set is of global importance, providing an invaluable resource for professional scientists, amateur botanists, government departments and national conservation bodies. When meticulously recorded, changes in occurrence have provided solid evidence for the ecological effects of climate change and land-use change. Our maps document the spread of alien invasive species and reveal curious ecological stories, such as the march inland of halophytes thanks to the application of road salt. Despite the huge amount of work involved in assembling this information, no one can seriously question the value of the end product.

There is, however, always merit in any organisation asking why it does the things it does? 'Why' questions are always the most difficult ones to answer. Clarity in why you are doing something helps improve efficiency, focus and identify other activities that may also warrant attention.

Recording the national distribution of every species of plant in the British Isles is a massive undertaking; to tackle just once, let alone to update at regular intervals over such long-time periods. It requires an army of dedicated and highly skilled volunteers. It is a task that would cost the nation millions if it were to be carried out by a commercial company, (assuming any other organisation had the ability). Given the magnitude of the task, why exactly is it worth repeating the exercise? If the environment was not changing so rapidly, then perhaps there would be no necessity to remap our islands so frequently.

Perhaps we should ask the above question in another way. Why do we regularly remap the distributions of all our plant species and not re-record other botanical data? In fact, do we even

know who was responsible for recording most of our botanical information in the first place? How do we know how big a buttercup is? How many buttercups were measured? Where and when were these measurements taken? From what plant community was the sample taken? And, in the context of this discussion, if we were to take these measurements again, would they have changed?

Once you start to ask these sorts of questions, you can start to appreciate that there could be value in re-recording basic plant morphological data in a more methodical, standardised way. How many times have you struggled to identify an individual because it is atypically large or small? Do we have an appreciation of geographic variation of plant morphologies? As the climate changes are certain species increasing in size while others are decreasing? These are basic botanical questions that we struggle to answer.

Just as there are many valid reasons for regularly re-recording plant distributions, there is a whole host of rationales for wanting to re-record more basic botanical information. Not least of these being, we really don't know much about origins of the data that have been circulating in our standard floras for more than a century. Yes, this would

be another massive task, but one that could at least be started by a smaller group of people. It could be used to engage those with lower level botanical skills and potentially draw new members into the fold. Whatever your view, surely it is a question worth discussion. After all, are you really that confident you know how big a buttercup is?



**John Warren**

Aberystwyth

[johnmwarren@hotmail.co.uk](mailto:johnmwarren@hotmail.co.uk)

# iRecord for botanists – entering records online and using smartphones

KEVIN WALKER, TOM HUMPHREY & DAVID ROY

• iRecord is an online system for biological recording designed and maintained by the Biological Records Centre (BRC) at the Centre for Ecology and Hydrology ([www.brc.ac.uk/irecord](http://www.brc.ac.uk/irecord)). It is increasingly being used as a way of submitting, managing and sharing records, and now contains more than 1.08 million records for 3,227 plant taxa, together with over 150,000 associated photos. This total includes all ‘plant’ data and is the figure of records potentially available to BSBI, including plot records from the National Plant Monitoring Scheme (NPMS) and other Indicia-based surveys. Last year we briefly described the submission and verification of plant records via iRecord (Walker *et al.*, 2017). Here we provide a more detailed overview of its main features that are particularly relevant when recording vascular plants. In particular, we describe two new features that allow recorders to enter plant records more efficiently, and explain how records are verified and shared with vice-county recorders (VCRs) via iRecord, and why botanists might consider using it.

## How do I use iRecord?

Before using iRecord you need to register for a user account. This is easy to do by clicking on the ‘Create new account’ button on the iRecord homepage ([www.brc.ac.uk/irecord](http://www.brc.ac.uk/irecord)). You are then free to submit, comment on and share records for any taxonomic group. Individual sightings are entered using a simple ‘recording form’ that captures the species name, locality, grid reference and recorder with the option to add identification certainty, quantity, stage and photographs (Fig. 1). Unlike MapMate, iRecord allows you to enter a grid reference by clicking on a map or satellite image. Individual plant records can also be submitted using the iRecord smartphone app ([irecord.org.uk/app](http://irecord.org.uk/app)). This largely mimics the website recording form, capturing species name, location, grid reference (calculated automatically using the phone’s GPS), date, comments, abundance, stage and photographs. The app can be used in the field without a network connection. Records are stored on

the phone until they are saved, after which they are available on the main iRecord website.

The records submitted via iRecord are stored centrally by BRC and are available to view (but not download) by all other iRecord users via the main iRecord webpage. These can be searched using filters for any attribute (e.g. taxon, date, grid reference, recorder, etc.) including within a defined geographic area of interest (e.g. site, vice-county). Personal records can also be downloaded, viewed, queried or edited at any time under ‘My records’ on the website.

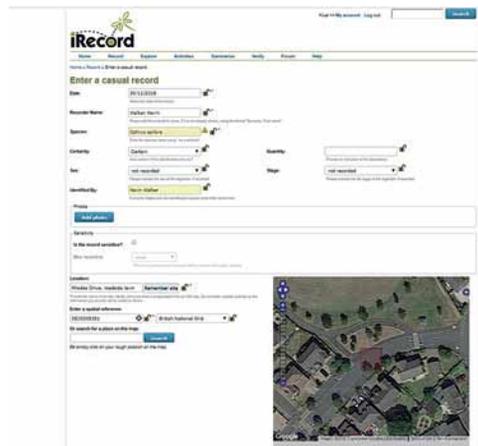


Figure 1. View of the ‘casual’ recording mode in iRecord.

## Two new features for botanists

### Plant Recording Form

iRecord worked with BSBI to recently introduce a ‘vascular plant recording form’ to the website, to allow entering of lists of species for grid squares (Fig. 2).

This iRecord form aims to mimic recording visits akin to completing a record (RP) card. Indeed, this can be a rapid and efficient way of capturing records from a card once returning from the field. In this mode each record is automatically assigned to the selected grid square with the option to add a more precise grid reference if available. Initially, details for the grid-square are entered (date, recorder name,

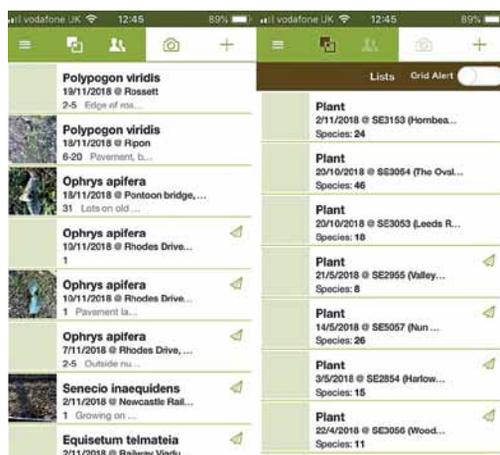


**Figure 2.** View of the vascular plant record card mode in iRecord used for entering lists of species for a grid-square.

number of recorders, location name, grid reference for the 1km or 2km square, vice county, time spent recording and any other information you want to capture about the square/recording event). Species are then added to this form along with any additional record-level information such as native status, stage (flowering, fruiting, etc.), finer grid reference where appropriate (the default is the grid square), and any comments. Photos can also be added using the 'Add images' tab.

#### Grid square recording mode on the iRecord smartphone app

Records can be submitted via the iRecord smartphone app in two ways: individually or using the 'grid-square' recording mode (Fig. 3). The latter mirrors the iRecord website form described above and allows you to select a tetrad or monad and add species sequentially as you wander through the square. For each species entered, the grid reference, recorder and date are added by default, but you can also add additional information to each record such as quantity, habitat, native status, stage (fruiting, flowering, etc.), determiner, comments, and whether the record should be marked as sensitive or not. The grid-square mode also has a very useful 'grid alert' which tells you when you have left the square. Once you have finished recording in a square the list is then submitted to iRecord in the usual way.



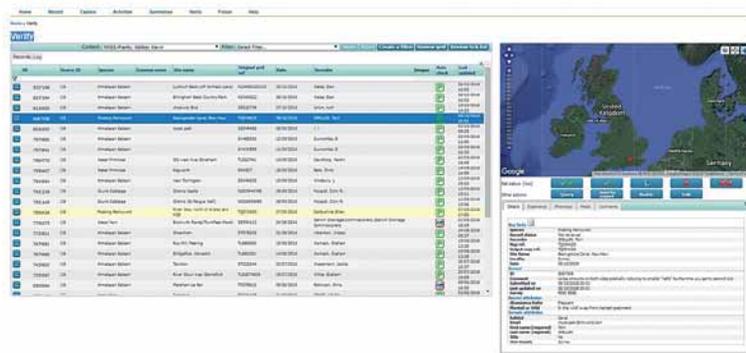
**Figure 3.** Recording modes on the iRecord smartphone app: left – single species entry, and right – grid-recording entry mode with lists for seven monads shown. Note that the 'green paper aeroplanes' indicate that species records/monad lists have been synced with the main iRecord website.

#### Validation and verification

Plant records submitted via iRecord are automatically checked for accuracy using a number of rule-sets. These include the level of expertise needed to identify a species (beginner, competent, expert) and whether a species has been recorded within the hectad before. Records of species requiring checking by an expert are flagged as needing verification before they can be accepted. Those that are out of range are simply flagged as such. Currently, plant records are verified at the vice-county or regional level by recorders appointed by the BSBI in consultation with the vice-county recorders, although many counties do not currently have verifiers. Verifiers access these records via the 'Verify' tab on the main iRecord webpage (Fig. 4), where there are options to flag a record as 'accepted correct', 'assumed correct', 'plausible', 'unable to verify' and 'incorrect'. At this stage verifiers have the option to contact the recorder and ask for clarification/further information, if required.

#### Where do iRecord records end up?

From early 2019, all iRecord plant records will be automatically synchronised with the BSBI Distribution Database (DDb) on an ongoing basis. The records will be kept separate and not imported to the main BSBI database until the VCR reviews



**Figure 4.** An example of records of non-native species requiring verification on iRecord. The details of the highlighted record for *Hydrocotyle ranunculooides* (Floating Pennywort) is shown on the map and table on the right.

them. Once incorporated within the DDb, VCRs will verify records in the same way as other datasets. Any changes to record status following verification will be exported back to iRecord so that recorders are kept informed about the status of their records. Once fully incorporated into the DDb iRecord records will be exported to the NBN Atlases alongside other data from the BSBI DDb. In the interim, all iRecord records of easy to identify species within their known range and verified plant records of more difficult to identify species will be sent directly to the NBN Atlas on a regular basis on behalf of the BSBI.

### Why should I use iRecord?

iRecord provides an efficient way of entering records to the DDb and has a number of advantages over locally installed packages such as MapMate. First, because the data infrastructure is maintained centrally, records are very secure and users do not need to install updates or bug fixes, for example, as a result of new versions/software updates or when operating systems change. Second, iRecord receives considerable support from a range of organisations, including national schemes and societies, and is therefore likely to provide a stable platform for many years to come. iRecord is also a key part of the work of BRC which has been supporting biological recording for over 50 years,

with a focus of working in partnership with national recording schemes and societies. Finally, and most importantly, many active plant recorders (including one of us), are already routinely using iRecord because it removes the need for digitisation of records during the winter months, thereby significantly freeing up time and reducing transcription error rates.

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### Kevin Walker

Suite 14, Bridge House, 1-2 Station Road, Harrogate HG1 1SS  
[kevin.walker@bsbi.org](mailto:kevin.walker@bsbi.org)

### Tom Humphrey

c/o CEH, Maclean Building, Benson Lane, Crowmarsh Gifford, Wallingford, Oxon OX10 8BB  
[tom.humphrey@bsbi.org](mailto:tom.humphrey@bsbi.org)

### David Roy

CEH, Maclean Building, Benson Lane, Crowmarsh Gifford, Wallingford, Oxon OX10 8BB  
[dbr@ceh.ac.uk](mailto:dbr@ceh.ac.uk)

## *Asplenium marinum* in Bath

HELENA J. CROUCH

**A***splenium marinum* (Sea Spleenwort) is a small native fern of coastal cliffs and walls, usually growing within the spray zone of the sea. It has a markedly Atlantic distribution, rarely grows at

altitudes above 20-30m, and requires a cool, moist situation, sheltered from full sun and frost-free in winter (Page, 1982).

On a visit to Bath (v.c.6) in July 2018, Mark and



*Asplenium marinum* in the basement of the Guildhall, Bath. Helena J. Crouch



*Asplenium marinum* and *A. scolopendrium* on the wall of the basement of the Guildhall, Bath. Helena J. Crouch

Clare Kitchen discovered some mystery ferns in the basement of the Guildhall. From a photograph of a frond, it was clear that these were *Asplenium marinum*. There are at least 15 plants, some large, growing on the inside of the outer wall of the basement, in mortar below the stone balustrade (see photographs). They had obviously been growing there for some years, shockingly unnoticed by regular basement fern-hunters. Whilst photographing them, I was approached by a security guard from the Guildhall and a bemused member of the public who asked whether I was 'collecting' man-hole covers. Apparently some eccentric people peer into basements to look at these instead of ferns!

Although its British and Irish distribution is almost entirely coastal, *Asplenium marinum* has been found inland before. There is apparently a specimen in Dillenius's herbarium (in **OXF**) collected in the 18th century from the walls of Slinfold Church in West Sussex (v.c.13), some 28km from the sea, but that was believed to have been introduced (Abraham *et al.*, 2018). On Guernsey, *A. marinum* grows at Castel Church in the centre of the island, 2.5km from the sea (pers. comm. FJR). In 2013, Fred Rumsey found a single sickly plant on a bridge in Tinworth Street,

Vauxhall, London (v.c.17); however, it failed to survive (pers. comm. FJR). The site in Vauxhall was remarkable in being far from the nearest recent native locations for *A. marinum*, in Hastings (v.c.14) and on the Isle of Wight (v.c.10), but it is less than 100m from the tidal River Thames.

The most spectacular inland occurrence of *Asplenium marinum* (photograph page 26) was discovered in 1979 by Robert Northridge on north-facing overhanging sandstone cliffs in the Lough Navar Forest Park in Co. Fermanagh (v.c.H33). Although the overhang of the cliffs may offer some frost protection, this site is remarkable in being 17km inland from the tidal estuary at Ballyshannon (on the west coast of Ireland) and at an altitude of 210m (Forbes & Northridge, 2012).

The Guildhall in Bath is at an altitude of only 20m and is less than 100m from the River Avon. It is, however, nearly 12km from the tidal reach of the River Avon at Hanham Lock, north-west of Bath, towards Bristol. This is another exceptional site for a species which usually grows within the reach of sea spray. The deep basements of the Georgian buildings of Bath provide a sheltered damp environment for ferns. A number of alien frost-sensitive fern species



*Asplenium marinum* in Lough Navar Forest Park, Co. Fermanagh. Helena J. Crouch

have been found in the basements of Bath, some persisting for many years (Crouch & Rumsey, 2007; Crouch, 2008; Crouch & Rumsey, 2010). The various species of *Pteris* and *Adiantum* are almost certainly of horticultural origin, but it seems extremely unlikely that *Asplenium marinum* would be cultivated in Bath. This species is native in North Somerset, growing at several sites along the coast of the Severn Estuary between Clevedon and Portishead, on Brean Down and on Worlebury Hill, near Weston-super-Mare. All these locations are more than 30km from Bath.

Mature ferns produce copious quantities of spores annually. In a study of the dynamics of dispersal of two native *Asplenium* species colonising walls in London, Edgington (2007) showed that although most new plants are found in close proximity to parent plants, long-distance dispersal also occurs, resulting

in 'plumes' of colonisation, following prevailing wind directions. The occasional discovery of plants of native *Asplenium* species far from their nearest known population, for example, *A. septentrionale* in Kent (Leonard, 2008), *A. viride* in central London (Rumsey, 1997) and the above-mentioned *A. marinum* in Vauxhall, provide evidence for (albeit extremely infrequent) long-distance spore dispersal and establishment. It is thus not unreasonable to suppose that the plants in Bath have arisen from a spore carried from the Somerset coast on the prevailing westerly wind, to a damp, frost-free suitable urban habitat. The presence of 15 individual plants of various sizes suggests that *in situ* propagation has occurred. Although they have clearly gone unnoticed for a few years, these ferns are now likely to receive even more admirers than any manhole covers in Bath.

### Acknowledgments

I would like to thank Clare and Mark Kitchen for alerting me to their exciting discovery and Fred Rumsey for helpful comments and information.

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### Helena J. Crouch

Bronwen, Farrington Road, Paulton, Bristol BS39 7LP  
[helenacrouch@sky.com](mailto:helenacrouch@sky.com)

# *Lathraea squamaria*, its hosts, and the Irish Species Project

JOHN FAULKNER

The findings of the BSBI Irish Species Project (ISP) were summarised in *Irish Botanical News* No. 27 (Long *et al.*, 2017). My aim here is to examine more closely the findings on one of the species included in that study, *Lathraea squamaria* (Common Toothwort), and consider in particular the range of hosts that it parasitises. I will also share a few ideas on the success and limitations of this type of study.

## The Irish Species Project

In 2014-15, Irish BSBI members were invited to survey eight named plant species. The method was similar to that used in BSBI's Threatened Plant Project (Walker *et al.*, 2017). Vice-county recorders were given a sample set of pre-2000 records from the BSBI Distribution Database (DDb). The selection process was randomised, but skewed in favour of sites defined with greater resolution. Surveyors were asked to revisit these pre-selected sites, primarily to establish if the species was still present.

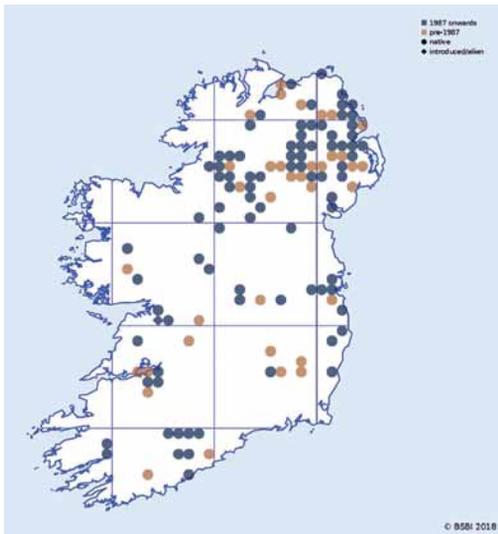
For the ISP, the selection of species was based on their interest in the Irish context, whereas for the Threatened Plant Project it had been based on threat levels in Great Britain. The main criteria for selecting species for the ISP were apparent decline, as determined from the records in Atlas 2000, and distinctiveness, so as to preclude doubts over identification in the field. As a group, the eight species were chosen to represent diverse habitats and, so far as possible, to facilitate an even distribution of sites covering all vice-counties in Ireland.

Why was *Lathraea* chosen as one of the eight? There was less reason to suppose it was under serious threat than most of the other seven. Atlas 2000 (Fig. 1) showed it is as recorded as a native in 120 (12%) of all 1,008 Irish hectads. Of these, 84 (70%) had records in the 1987-1999 date class, a percentage which is in line with many other widespread but scarce species. Nevertheless, there were some unexplained features of the distribution shown in Atlas 2000. While



Flowering spikes of *Lathraea squamaria*.  
Robert Thompson.

the species occurs throughout Ireland, there was a much greater density of hectad records in Ulster as compared with the other three provinces. In the Midlands, mid-south and the western fringe records were very markedly sparse. The most compelling reasons for including *Lathraea*, however, were quite different. Its inclusion would prompt botanists to emerge from their winter slumbers early because it has to be recorded in spring; and it would arouse interest beyond the enlightened few as an unusual, rather mysterious, parasitic plant.



**Figure 1.** Atlas 2000 distribution map of *Lathraea squamaria* in Ireland. Blue: 1987 onwards. Brown: pre-1987 only.

For all species in the project, data about habitat, population size and extent, and associated species were requested. In the case of *Lathraea*, surveyors were additionally asked to note the apparent host species. As well as the pre-selected populations, participants were encouraged to record the same data in other populations, whether previously known to them or newly discovered.

### *Lathraea* sites

In practice, of the 50 *Lathraea* sites pre-selected from the BSBI database, only 17 were actually surveyed, mostly by vice-county recorders themselves. Encouragingly, *Lathraea* was refound at 15 of these 17 sites, covering all four provinces. At one site where it was not refound, it was present only 200m away. At the other, it had apparently disappeared completely, which the surveyor attributed to tree removal.

From the returns, it can be inferred that the main reason for sites not being searched was that they had not originally been pinpointed with sufficient accuracy to facilitate rediscovery of the site. The quality of Irish records in the DDb as a whole is immensely variable. Many, especially older ones, are only located to hectad level. To exacerbate this difficulty, the use of the extended British grid in recording for the first BSBI Atlas (1962), and the subsequent reallocation

of records to hectads on the Irish grid means that one cannot even be sure that the hectad is correct. Many older records are also dated imprecisely, e.g. by date classes of 10+ years. The site selection process was intended to give priority to sites that were more precisely located, but this priority conflicted with the aim of even coverage. Some vice-counties had an abundance of high-resolution records, whereas others had relatively few or less precise records.

The data from the 15 pre-selected sites where *Lathraea* was refound were supplemented by data from more than twice as many additional sites. Thus there is information from a total of 51 sites about population size, habitats, associated species and host trees.

The habitats where *Lathraea* was found were usually described by surveyors as deciduous or mixed woodland. Many were situated on former demesnes (lands held by manors for their own use, often enclosed by a wall). From the descriptions or associated sketch maps, it could be inferred that about half of the sites were either on river or stream banks, or at least within a few metres of running or standing water.

### Associated species

Associated species of vascular plant (other than trees and shrubs) were recorded in plots of 1m radius centred on a representative individual of the target species. Sixty species in total were recorded as associates of *Lathraea*, a surprisingly large number given that it grows in shade, and often very dense shade at that. Only 15 species, however, were recorded in five or more of the quadrats. They are listed below against the number of times they were recorded.

<i>Hedera helix</i> s.l.	Ivy	27
<i>Ficaria verna</i> s.l.	Lesser Celandine	19
<i>Arum maculatum</i>	Lords-and-ladies	16
<i>Anemone nemorosa</i>	Wood Anemone	14
<i>Allium ursinum</i>	Ramsons	13
<i>Hyacinthoides</i> spp.	Bluebell	13
<i>Taraxacum</i> agg.	Dandelion	11
<i>Rubus fruticosus</i> agg.	Bramble	11
<i>Conopodium majus</i>	Pignut	10
<i>Polystichum setiferum</i>	Soft Shield-fern	10
<i>Viola</i> spp.	violet	9
<i>Veronica montana</i>	Wood Speedwell	9
<i>Heracleum sphondylium</i>	Hogweed	8
<i>Asplenium scolopendrium</i>	Hart's-tongue	6
<i>Geranium robertianum</i>	Herb-Robert	6

**Table 1** Tree and shrub taxa recorded as hosts of *Lathraea squamaria*, in decreasing order of frequency. Numbers in brackets indicate that the surveyors were uncertain that the species was a host.

Taxon	English name	Family	Frequency
<i>Corylus avellana</i>	Hazel	Betulaceae	14 (+3)
<i>Prunus laurocerasus</i>	Cherry Laurel	Rosaceae	9 (+2)
<i>Acer pseudoplatanus</i>	Sycamore	Sapindaceae	8
<i>Tilia</i> spp.	Limes	Malvaceae	6
<i>Populus</i> spp.	Poplars	Salicaceae	5
<i>Prunus lusitanica</i>	Portugal Laurel	Rosaceae	3
<i>Ilex aquifolium</i>	Holly	Aquifoliaceae	2 (+2)
<i>Ulmus</i> spp.	Elms	Ulmaceae	1 (+2)
<i>Aesculus hippocastanum</i>	Horse-chestnut	Sapindaceae	1
<i>Crataegus monogyna</i>	Hawthorn	Rosaceae	1
<i>Fagus sylvatica</i>	Beech	Fagaceae	1
<i>Hedera</i> sp.	Ivy	Araliaceae	1
<i>Larix</i> sp.	Larch	Pinaceae	1
<i>Prunus avium</i>	Wild Cherry	Rosaceae	1
<i>Quercus</i> sp.	Oak	Fagaceae	1
<i>Fraxinus excelsior</i>	Ash	Oleaceae	(2)
<i>Picea</i> sp.	Spruce	Pinaceae	(1)



*Lathraea squamaria* at base of a Sycamore tree with understorey of Cherry Laurel, beside Tynan River, Co. Armagh. John Faulkner

All of these 15 are woodland plants with a preference for neutral to base-rich soils. The association with *Allium ursinum* is perhaps the most significant one. It is the least frequent of the taxa listed, occurring very patchily in about one third of all Irish hectads. Like *Lathraea*, it is sparser in the Midlands and

the western fringe. What the two seem to have in common is a partiality for flushed non-acid woodland soils.

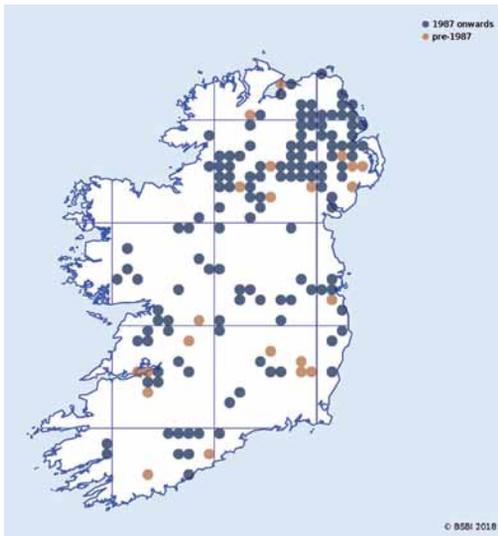
### Hosts of *Lathraea*

Nearly all surveyors recorded the species of tree or shrub which appeared to be acting as hosts. Some of their notes were qualified with a question mark or a term such as ‘possibly’, presumably because they were unsure that it was a host, rather than unsure of its identity. They had not, of course, been asked to dig out and trace haustorial connections between the *Lathraea* and the supposed host species, so an element of doubt in some instances is not only reasonable, but almost reassuring!

Table 1 lists the number of occurrences of each of the host species (or aggregate species), indicating where necessary when the surveyor was uncertain. Seventeen different hosts, from 11 plant families, were identified. *Corylus avellana* was the most frequently recorded host, but it was the only native Irish species among the top six. Second and third place in the list were occupied by *Prunus laurocerasus* and *Acer pseudoplatanus*, two species often found together in demesne woodlands. The second most frequently recorded native host, but in seventh place overall, was *Ilex aquifolium*.

Populations varied in size from one flowering spike up to c. 3,900, but most lay within the range 11 to 500. The data do not facilitate an analysis of host taxon against population size. All that can be discerned is that the largest populations tended to be at the sites with several host taxa, and that they extended up to

1,500m across. Different surveyors might have classified these as multiple populations or sites. One notable feature was that the most concentrated (c. 1,250) and the second most concentrated (c. 1,000) masses of flowering spikes were both found at the base of *Populus* (poplar) trees, at different sites but both within v.c.H37.



**Figure 2.** Current DDb distribution map of *Lathraea squamaria* in Ireland. Blue; 1987 onwards. Brown: pre-1987 only.

### Conclusions

Putting a spotlight on *Lathraea* through the ISP has helped to bring into focus several issues, some specific to this species and some wider. Firstly, *Lathraea* is an example of a species well suited to this type of study as it is readily identifiable, very site-faithful and relatively easy to find provided you look for it early enough in the year. The number of pre-selected sites resurveyed was slightly higher than for any of the other species in the ISP. *Botrychium lunaria*, for instance, was very problematic in that it was hard to relocate and surveyors could not be at all confident that it was absent even when they failed to find it (Long *et al.*, 2017).

Nonetheless, even for *Lathraea* the proportion of pre-selected sites resurveyed (36%) was well below the equivalent figure for the BSBI-wide Threatened Plant Project (51%: Walker *et al.*, 2017). While other factors such as the relative scarcity of Irish botanists may have played a part, a major reason for this may have been the relatively small number of pre-2000 records for many Irish vice-counties, and the high proportion of these defined at hectad level. There were simply too few high-resolution records in the database from which to select sites for resurvey. Naturally, this is a matter that cannot be corrected in retrospect to any significant extent. However, the DDb shows very

clearly that the great majority of post-2000 Irish records for all species are at monad level or better. Future generations will be much better placed to carry out studies involving resurveys.

The findings, although based on a small sample, strongly suggest that *Lathraea* is holding its own in Ireland, and that the absence of a 1987-1999 record from those hectads where it had been previously recorded did not necessarily indicate a loss. Perusal of current records in the DDb (Fig. 2) reinforces this point. As of now (19th November 2018), there are 152 hectads showing all-time native records. Only 22 hectads remain where it has not been recorded since before 1987, and at least one of these represents a record that did not appear in the Atlas data. In other words, since 2000 *Lathraea* has been newly found in 32 hectads and refound in 15. Notably, some of the newly discovered sites are in the Midlands or mid-south, where previously records were few and far between.

In respect of host species, the findings may be a surprise if your main source of information is the standard Floras. They generally agree that *Lathraea* is parasitic on the roots of trees, and that *Corylus avellana* is one of the main host species. Beyond that point, divergence sets in. Take, for instance, four works fundamental to BSBI's work. Webb (1972) in *Flora Europaea* lists 'most frequent on species of *Corylus*, *Alnus* and *Fagus*'. The *New Atlas* (Preston *et al.*, 2002) says 'especially *Corylus*, *Fraxinus* and *Ulmus glabra*'. Stace (2010) gives 'especially *Ulmus* and *Corylus*'. *Webb's An Irish Flora* (Parnell & Curtis, 2012) is the only one of the four to include a non-native host, stating 'especially hazel and sycamore'. Collectively, they may give an impression that, *Corylus* apart, no one is quite sure what the main hosts are but that most hosts are native species.

A much more comprehensive list of hosts is given in the *Flora of County Fermanagh* (Forbes & Northridge, 2012). Primary hosts are listed as *Corylus avellana*, *Prunus laurocerasus* and other members of the Rosaceae, plus *Ulmus glabra*, *Alnus glutinosa*, *Sambucus nigra* and *Acer pseudoplatanus*. Much less frequent hosts are given as *Rhododendron* spp., *Salix* spp., *Populus* spp., *Fagus sylvatica*, *Tilia* spp. and conifers including *Picea* spp. and *Chamaecyparis lawsoniana*. The list is based on a literature search, relating to the wider range of *Lathraea*, rather than to records from within Ireland. Nevertheless, it corresponds well to the findings of the ISP. All but six of the 17 taxa in Table 1 are included

in the Northridge & Forbes list, and the three at the top of the table are all quoted as primary hosts. Native Irish species are narrowly in a minority in both lists.

As well as all the taxa mentioned above, two others have been recorded as likely hosts in Ireland; *Cotoneaster* sp. (Hackney, 1992) and *Betula* sp. in a semi-natural hazel-ash woodland (Cotton, D., pers. comm.). A possible scenario is that, until 200-300 years ago, *Lathraea* was an occasional parasite of *Corylus* and, more rarely, other species in native woodland. The widespread planting of new woodland, parkland and avenues on Irish demesnes in the 18th and 19th centuries, by introducing new hosts, would have opened up fresh opportunities for *Lathraea* to exploit. As there is relatively little native woodland left, the current distribution of *Lathraea* may reflect that of the surviving demesne plantations as much as any other factor. However, it seems highly probable that more populations of *Lathraea* remain to be discovered, especially outside Ulster.

#### Acknowledgements

I am grateful to Maria Long for her wide-ranging input to the Irish Species Project and comments on this paper. Also to the many vice-county recorders, BSBI members and others who contributed to the ISP and are listed in Long *et al.*, 2017.

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#### John Faulkner

Drumherriff Lodge, 37 Old Orchard Road,  
Loughgall, Armagh BT61 8JD  
[jsf@globalnet.co.uk](mailto:jsf@globalnet.co.uk)

## The putative hybrid *Limonium x neumanii* (*L. vulgare* x *L. humile*)

MICHAEL WILCOX

It had been a while since I had seen *Limonium humile* (Lax-flowered Sea-lavender) and I thought I had found it in North Somerset (v.c.6) with the hybrid *L. x neumanii* C.E. Salmon in the presence of *L. vulgare* (Common Sea-lavender) in 2016. After sending the information about it to the Vice-county Recorder and discussion on these, and then having reacquainted myself with *L. humile*, I realised that the Somerset plant thought to be close to *L. humile* was one of the putative hybrids. This was at Burnham-on-Sea, (ST3047). There were other similar plants here with at least one plant of *L. vulgare*. It suggests that there is a spectrum in the hybrid-type plants.

On a second visit to Somerset in 2017, I visited

two other sites and found plants that also appear to equate to *L. x neumanii* in the presence of *L. vulgare*. These plants are often intermediate, though seemingly forming a spectrum towards *L. vulgare*, and again I could find no plants of *L. humile*, (some are very open, well branched, with neat rows of flowers closer to *L. humile*, but clearly not that species). These other two sites were: Alstone, within ST3047 (this visit was to study *x Elytrordeum langei*, an intergeneric grass hybrid, which occurs at this site), and Brean Down saltmarsh, ST3058. I found the putative *L. x neumanii* in both.

I recall having seen presumed hybrids like this in a few other places in more northerly sites, and one such site was at Glasson Dock (Lancaster) on the estuary



**Main photograph, left to right:** *Limonium humile*, *L. vulgare* and *L. x neumanii*. This shows the very skinny nature of *L. humile*, with spaced out flowers and shows similarities to *L. x neumanii* which has open branches and flowers in closer neater rows. The *L. vulgare* in the middle has dense heads of flowers much overlapping.

**Insets, left to right:** *L. humile*, with distinctly single, spaced flowers; *L. vulgare*, with very dense heads of overlapping flowers; *L. x neumanii*, showing the flowers in rows with a short gap between them.

Glasson Dock, estuary, July 2018. Michael Wilcox

there, SD4456. I revisited the site this year (2018) and all three taxa were present. Good patches of *L. humile* occur there with a good number of intermediates and *L. vulgare* growing side-by-side. This clearly boosts the idea that the intermediate plants are hybrids. Also, hybrids occur with both parents on the north-east

coast along Greatham Creek, Teesmouth, NZ5025, which I recorded in 2015 (whilst searching for an old record of  $\times E. langei$  again, but this was not found and is another story).

*Limonium vulgare* has densely bunched flowers and is quite distinctive, as is *L. humile* which has single,

spaced out flowers (i.e. a distinct gap between each flower, at least the whole length of a flower) and therefore looks very skinny in the field. The putative hybrids are open, (well-branched) relatively skinny plants with the flowers in fairly neat rows with a small gap or more or less touching (and usually contiguous); see photographs opposite showing all three in a fairly typical form. These are from Glasson Dock where they were growing next to each other. These have been pressed as the skinny nature, particularly of *L. humile* and less so *L. x neumanii*, are difficult to photograph in the field. See opposite also for close-ups of the flowers of each.

It seems, from the North Somerset sites, that *L. vulgare* and *L. x neumanii* can occur in the absence of *L. humile* and that they can form a range of intermediates. These plants should be looked for in appropriate coastal sites around Britain, especially further south where *L. humile* is said to be absent. The Somerset plants may represent the most southerly records of the (putative) hybrid, although further searches might reveal other sites.

I hope this note encourages people to look for these taxa. Although not confirmed by a referee, surely these skinny plants with neater rows of flowers must belong to *L. x neumanii*, as they do not seem to belong to either parent, and that it seems fairly obvious when growing together at sites like Glasson Dock and elsewhere. I did find there were some differences in the pitting on the underside of the leaves between the two species, but as it was slight it would not be useful in detecting the hybrids from vegetative characters.



*Limonium x neumanii*, northside of River Brue estuary, North Somerset. 14.07.2016. Michael Wilcox

**Michael Wilcox**

43, Roundwood Glen, Greengates, Bradford  
BD10 0HW.

[michaelpw22@hotmail.com](mailto:michaelpw22@hotmail.com)

## *Rosa x suberectifomis* Wolley-Dod in Berkshire

ROGER MASKEW, GARETH KNASS & ANDY CROSS

In August 2018, Roger Maskew and Gareth Knass spent a few days recording roses in Berkshire (v.c.22). On 8th August we were joined by Andy Cross and visited part of the Rooksnest Estate, a shallow valley of arable land, bordered by wooded slopes and trackside chalk scrub, on the Lambourn Downs, south-west of Eastbury (SU3477), where GK had recently found a small population of *Rosa sherardii* (Sherard's Downy-rose). This is a rare species

in Berkshire, as apart from several late 19th century and early 20th century confirmed records (BM, OXF) there is only a single modern record for 1987 (Crawley, 2005). Also in the vicinity were several scattered bushes of *R. tomentosa* (Harsh Downy-rose).

After a few hours of recording, we came across a downy-rose type bush in trackside scrub which immediately struck us as being somewhat different and we began to consider it as possibly the hybrid *R. x*



Sterile hips of *R. x suberectiformis*. Gareth Knass



Partially sterile hips of *R. x suberectiformis*. Gareth Knass

*suberectiformis* (*R. sherardii* × *R. tomentosa*). Some vouchers and photographs were taken, and after further examination later in the day, RM was able to confirm the hybrid.

In essence, the hybrid has mainly biserrate leaflets with glandular margins, but with only a few glands on the abaxial side, more in common with the majority of the local *R. tomentosa*, whereas the somewhat glaucous foliage, the mainly spreading-erect sepals, all still attached to the hips, and some stylar orifices approximately one-third the diameter of the hip disc, are all characters more typical of *R. sherardii*. The pedicel length is intermediate, with some reaching 2.0-2.5cm, almost twice as long as the hips, and in common with both species all the prickles are slender and curved, with some slight variation in size. One very noticeable feature is the rather small hips, some having a spongy feel to them and, when opened, containing only one or two mature achenes, while others are completely sterile and abortive, easily falling off together with the pedicels. RM has re-examined specimens collected by J.M. Smith (det. G.G. Graham) from Chorley, S. Lancs. (v.c.59) in 1987, and by himself and A.L. Primavesi from Hanley Broadheath, Worcs. (v.c.37) in 1998, and found them very similar in all respects to the Berkshire specimen, except that both of them appear to have mainly fertile hips.

In southern England *R. tomentosa* is a locally frequent species, whereas *R. sherardii* is virtually confined to the far west, gradually becoming much

rarer further east, with the only recently confirmed modern records coming from the New Forest (v.c.11). However, further north in Britain there is a large overlap in the distributions of the two species, and even allowing for the fact that hybrids between species from the same subsection are the most difficult to recognise and therefore easily overlooked, it is surprising this hybrid remains so rare. The previous most southerly known site was the one in Worcestershire mentioned above, which was destroyed a few years later. Otherwise there are less than 20 British and Irish records, and as far as is known none of these have recently been confirmed.

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#### Roger Maskew

Coppice House, Bannals Lane, Stoke Bliss, Worcestershire WR15 8RZ

[h.maskew@btinternet.com](mailto:h.maskew@btinternet.com)

#### Gareth Knass

31 Spring Meadows, Great Shefford RG17 7EN

[garethknass@yahoo.com](mailto:garethknass@yahoo.com)

#### Andy Cross

36 Bartram Road, Eling, Hants. SO40 9JG

## The rediscovery of *Silene acaulis* at Dunaff Hill, East Donegal (v.c.H34)

JOHN CONAGHAN, MAIRÉAD CRAWFORD & OISÍN DUFFY



A small cushion of *Silene acaulis*, with the previous year's seed capsules visible. Oisín Duffy

*Silene acaulis* (Moss Champion) is a striking, cushion-forming, arctic-alpine species which has a circumpolar distribution. On the island of Ireland the species is considered to be rare, having previously been recorded from five vice-counties, occurring in a total of only nine hectares. In West Mayo (v.c.H27), East Donegal (v.c.H34) and Londonderry (v.c.H40) *S. acaulis* has been recorded from only one site. However, the species is locally abundant on limestone cliffs on the extensive Ben Bulbin plateau on the border of counties Sligo (v.c.H28) and Leitrim (v.c.H29) (pers. obs.). In Northern Ireland, *S. acaulis* is sufficiently rare to warrant legal protection which has resulted in its inclusion in Schedule 8 Part 1 of the Wildlife (NI) Order 1985.

In County Donegal, the species has been recorded only from one site in East Donegal (v.c.H34), namely Dunaff Hill, which is located on the Atlantic north coast of the county. The rarity of the species is somewhat surprising given that Co. Donegal contains a number of good sites for arctic-alpine species, including Slieve League, the Poisoned Glen and the nearby Bulbin Mountain. The first record of the species at Dunaff was made by Charles Moore who

noted the species at the site in the mid-1800s (Moore & More, 1866). Subsequently, the species was seen by Henry Chichester Hart in the late 1800s who recorded it at a number of locations on the cliffs. He noted that the species did not seem to occur in great quantities (Hart, 1898) and that it grew 'in a place that some people would not care to linger over' (Hart, 1899).

To the best of our knowledge, the species had not been seen at the site since the 1890s. On 27th May 2018 we set out to look for the species on the cliffs which dominate along the eastern side of the headland. After an hour of walking from Rockstown Harbour we happened upon a striking, south-facing, black cliff. After a few minutes of precipitous investigation we found six small mounds of *S. acaulis*, no more than 20cm in diameter, growing on steeply sloping rock outcrops at a relatively low elevation of approximately 100m (grid ref: C 3187 4918). No fresh flowers were noted on the day of survey. However, the withered flowers/seed capsules from the previous year's growth were frequent. The cliff on which the species grows appears to consist of a basalt intrusion which occurs along a prominent fault between granite rock to the south and quartzite to the north (Long &

McConnell, 1997). The base-rich nature of the basalt bedrock at this location is presumably responsible for the presence of the species. It is also of interest to note that the associated geology of the closest known site for *S. acaulis*, i.e. Benevenagh in v.c.H40, is also basalt.

Most of the cliff surface is dominated by ungrazed maritime grassland vegetation with prominent *Festuca rubra* (Red Fescue) and *Armeria maritima* (Thrift). Most of the low mounds of *S. acaulis* grow on sloping rock outcrops with little other vegetation growing in close association. The sparse vegetation which grows within 50cm of *Silene acaulis* includes species such as *Thymus polytrichus* (Wild Thyme), *Calluna vulgaris* (Ling), *Anthyllis vulneraria* (Kidney Vetch), *Plantago maritima* (Sea Plantain), *Polygala vulgaris* (Common Milkwort), *Plantago lanceolata* (Ribwort Plantain) and *Festuca rubra*. No other arctic-alpine plant species were noted growing in close proximity. However, *Sedum rosea* (Roseroot) is frequent on cliffs in the general vicinity.

The rediscovery of this site for *S. acaulis* is important given the rarity of the species in Ireland. It is possible that further plants of the species grow on the more inaccessible and precipitous areas of cliff.

However, it does not appear likely that the population is large.

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## John Conaghan

11 Dun Ard, Craughwell, Co. Galway  
[johnconaghan18@gmail.com](mailto:johnconaghan18@gmail.com)

## Mairéad Crawford and Oisín Duffy,

7 Oakland Heights, Drumkeen, Co. Donegal  
[maireadecrawford@gmail.com](mailto:maireadecrawford@gmail.com), [oisinsduffy@gmail.com](mailto:oisinsduffy@gmail.com)

# *Gnaphalium luteoalbum* – a couple of mysteries

FRANCES WATKINS

**O**n 7th June 2018, Sally Abbey, Susan Erskine and I visited the village of North Leigh, near Witney, in Oxfordshire (v.c.23) for the purpose of recording for the 2020 Atlas. In a car park outside a disused garden centre, we found a cudweed. I was sure that I recognised it as *Gnaphalium luteoalbum*, having found it before in the Isles of Scilly and also several times in New Zealand. Nevertheless, to be sure, we keyed it out in Stace (2010). Unfortunately, we came to grief in couplet 25 in Key E of Asteraceae. We could clearly see stolons and so chose the ‘perennial’ option. This led us to *Antennaria* and *Anaphalis*, both of which we knew it was not. Going back and choosing the ‘annual’ option landed us nicely on *G. luteoalbum*.

Intrigued, however, by having had wilfully to disobey Stace, I looked the species up in several other books when I got home. *Flora Europaea* (Tutin *et al.*, 1964–80) and Clapham, *et al.* (1962) both clearly state

that the plant is annual, so I decided to check in the *Flora of New Zealand*. Volume 1, which covers native dicots in New Zealand, states that *G. luteoalbum* can be perennial. I felt much happier.

Nevertheless, a new mystery now appeared. The status of the plant in Britain and Ireland is that it is probably native in Norfolk and perhaps a few other places in south and east England, but that elsewhere it is introduced. This fitted with the ruderal site where I had found it in the Isles of Scilly and the similarly ruderal site in North Leigh. The *Flora of New Zealand* Volume 1, however, states that it is native. Allan (1961) states, ‘The forms of *G. luteo-album* found in N. Z. still require much study, especially in relation to European forms, which may have naturalised representatives. It seems inadvisable to create new names till such a comparison has been made.’ Indeed, the species, under the name *Pseudognaphalium luteoalbum*, is also mentioned in Volume 4 of the *Flora of New Zealand*



*Gnaphalium luteoalbum* at North Leigh, Oxfordshire, showing the stolons. Frances Watkins

that deals with introduced plants (Webb *et al.*, 1988).

So, here was a confusing picture! I know that *Pteridium aquilinum* (Bracken) is native here and also in New Zealand, but somehow it seemed implausible that *G. luteoalbum* could be native in two places so widely separated. I decided that I needed to consult a proper taxonomist and I showed the plant to Stephen Harris, Druce Curator of the Oxford University Herbaria. He confirmed our identification of *G. luteoalbum* and took the specimen (with its stolon) to press and put in the Fielding-Druce Herbarium. He had a great deal of information about the mysteries I have described and his comments follow.

‘One specimen in OXF, collected by Fred Robinson on sandy land at Thompson, Norfolk (v.c.28) in 1914, appears to have stolons. Sykes & Wilson (1990) reported that experimental plants of New Zealand *G. luteoalbum*, covered with up to their own height in sand, responded by elongating their stems, which rooted at the nodes.

‘Allan’s point that there are many different New Zealand forms of *G. luteoalbum*, and that the affinities of these plants require more study in relation to those found in Europe is well made. Another New Zealand plant with high levels of morphological and genetic variation, and complex affinities to European populations, is the 19th-century European introduction *Hieracium pilosella* L. (Makepeace, 1981). I wonder whether *G. luteoalbum* has started to differentiate in New Zealand in a similar way, following an early introduction from Europe. The species has many features one might expect of a successful introduced species.

‘The distinction between native and introduced can be difficult to make, especially for species with wide disjunctions. Such distributions invite explanations based on some areas having native populations, and others having introduced populations. However, one must remember that, in addition to *Pteridium aquilinum*, there are species with



*Gnaphalium luteoalbum* at North Leigh, Oxfordshire. Frances Watkins

very wide, apparently native, natural distributions. For example, the distribution of *Carex microglochin* Wahlenb. [Bristle Sedge] is thought to be a case of long-distance dispersal from the Arctic to the sub-Antarctic islands (Escudero *et al.*, 2010).’

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Frances H Watkins

[frances.watkins@anthriscus.co.uk](mailto:frances.watkins@anthriscus.co.uk)

Stephen A Harris

[stephen.harris@plants.ox.ac.uk](mailto:stephen.harris@plants.ox.ac.uk)



## INTRODUCING MY VICE COUNTY

### Offaly v.c.H18

Recorder: Fiona Devery

Offaly, formerly known as King's County, is a landlocked county located in the heart of the central plain of Ireland. Low-lying and mainly underlain by Lower Carboniferous limestone, it is bounded to the west by the broad River Shannon and to the south-east by the Devonian Red Sandstone and Silurian Shales of the Slieve Bloom mountains. The only other notable feature of height in the landscape is near the Co. Westmeath border where the volcanic plug of Croghan Hill rises from the surrounding low countryside. The general topography of Offaly is gently undulating and strongly influenced by Quaternary deposits of peat, gravel, sand and till. The vegetation is, in the main, calcicolous, with the exception of the bogs and Slieve Bloom area. Farming is relatively intensive, with a considerable proportion of farmland consisting of improved grassland.

There is a long history of plant collecting in Offaly, beginning in the 17th century with the pioneering botanist Richard Heaton (1601-1666) of Ballyskenagh, who is regarded as the first recording Irish botanist. This clergyman was the first collector and discoverer of Irish plants and contributed records to *Phytologia Britannica* (1650), one of the earliest British floras, compiled by William Howe (1620-1656). Two centuries later the pioneering microscopist, naturalist and artist Mary Ward (née King) (1827-1869) collected

Clara Bog. V. Macartney. **Inset** The county flower: *Andromeda polifolia*. V. Macartney

plants as a young woman in the Fermanagh area, as well as around Birr Castle, where her cousin William Parsons (1800-1867), the celebrated astronomer, lived. She became the world's first automobile fatality when she was thrown from a steam carriage in the town. Birr Castle Demesne, on the confluence of the Little Brosna and Camcor rivers, is still interesting botanically, with a lake, hay meadow and such plants as *Butomus umbellatus* (Flowering-rush), *Lathraea squamaria* (Toothwort) and *Leucojum aestivum* (Summer Snowflake).

Robert Lloyd Praeger (1865-1953), arguably Ireland's foremost naturalist, botanised in Offaly (1895-1901), collecting many of the first county records, which he published in his iconic books *Irish Topographical Botany* (1901) and *The Botanist in Ireland* (1934). Much of the modern groundwork in recording was by the two previous recorders in Offaly, namely Dr J.G.D. (Keith) Lamb (BSBI Vice-county Recorder (VCR) from 1970 to 1996) and Mrs Aideen Austin (VCR from 1997 to 2006). Dr John Feehan, a local botanist and geologist, has written extensively on the flora of Offaly in many of his books, including *The Wildflowers of Offaly* (2009) and *The State of the Wild in Offaly* (2007).

## Wetlands

Raised bogs are a characteristic landscape feature of the Irish Midlands. Historically, Offaly was covered by vast areas of raised bog (peatland once covered 34% of the county), but this is now greatly reduced by peat extraction. The remaining intact bogs are now protected as Special Areas of Conservation (SACs). The calcifuge flora of raised bog is well expressed in Mongan's Bog, near Clonmacnoise, one of the few remaining raised bogs with active areas of growth. The county flower *Andromeda polifolia* (Bog-rosemary) is frequent on the site, with *Drosera anglica* (Greater-Sundew), *Utricularia minor* (Lesser Bladderwort), *Rhynchospora fusca* (Brown Beak-sedge) and *Vaccinium oxycoccos* (Cranberry) in the wetter areas and the bog pools.

Clara Bog is one of the best remaining examples of a relatively intact raised bog in western Europe. Notable plant species include *D. anglica*, *V. oxycoccos*, *Melampyrum pratense* (Common Cow-wheat) and *Huperzia selago* (Common Clubmoss). *Epipactis palustris* (Marsh Helleborine) and *Platanthera bifolia* (Lesser Butterfly-orchid) are present on the more alkaline edge near the road. Raheenmore Bog, near Daingean, is the deepest

remaining raised bog in Ireland, with *A. polifolia*, *D. anglica* and *V. oxycoccos* present. July and August are the best times to see the flora of the raised bogs.

The loss of so many raised bogs to peat harvesting by Bord na Móna (a semi-state body set up to develop the peatlands) has been mitigated by the emergence of a mosaic of interesting habitats on the old cutaway bogs. Cutaways are used for farming, forestry and renewable energy projects, but vast areas have been left to regenerate naturally, or with little intervention, forming a new landscape and new areas of wilderness. These dynamic and evolving habitats now form lakes and wetlands which abound with *E. palustris* and *Dactylorhiza incarnata* (Early Marsh-orchid) in many of its subspecies, including ssp. *coccinea*. *D. traunsteinerioides* (Narrow-leaved Marsh-orchid) has recently been recorded from Finnermore Lakes. Sections of marl and deposits of sand from beneath the bog form areas of high alkalinity among the peat remnants. These support calcicole species such as *Blackstonia perfoliata* (Yellow-wort), *Ophrys apifera* (Bee Orchid), *Erigeron acris* (Blue Fleabane) and *Carlina vulgaris* (Carlina Thistle). Mount Lucas has the only site for

*Drosera anglica*. V. Macartney



*Dactylorhiza traunsteinerioides*. Fiona Devery



*Pyrola rotundifolia* (Round-leaved Wintergreen) in Offaly and hosts many orchid species. The orchids are at their best in late May and June.

The majority of Offaly's lakes are small, infilling and edged with fen. Finlough, Pallas and Derryadd are typical and fen species such as *Carex limosa* (Bog Sedge), *C. lasiocarpa* (Slender Sedge), *C. diandra* (Lesser Tussock-sedge), *C. limosa* (Bog-sedge), *Cladium mariscus* (Great Fen-sedge) and *Eriophorum latifolium* (Broad-leaved Cottongrass) occur. The rare *Ophrys insectifera* (Fly Orchid) is recorded from Lough Coura. The Grand Canal

River Shannon backwater. V. Macartney



*Lathyrus palustris* at Shannon Callows. V. Macartney

enters Offaly near Edenderry and crosses the county through Tullamore to join the River Shannon at Shannon Harbour. Accompanying the more familiar canal plants is the rare and protected *Greonlandia densa* (Opposite-leaved Pondweed), with *Ranunculus circinatus* (Fan-leaved Water-buttercup), *Sagittaria sagittifolia* (Arrowhead) and *Ranunculus lingua* (Greater Spearwort) frequently recorded from the canal.

The Shannon Callows (seasonally flooded grassland ecosystems found on low-lying river floodplains) are of high biodiversity value and while diminished in size, owing to farm intensification and drainage, are protected as late-cut hay meadows. The drains and inlets hold distinctive plants including *Sium latifolium* (Greater Water-parsnip) and *Greonlandia densa*. The uncommon *Lathyrus palustris* (Marsh Pea) is found along with *Thalictrum flavum* (Common Meadow-rue), *Oenanthe fistulosa* (Tubular Water-dropwort) and *Stellaria palustris* (Marsh Stichwort). *Hordeum secalinum* (Meadow Barley) occurs on two sites on the callows. Occasional hummocks of drier, calcareous grassland support species such as *Anacamptis morio* (Green-winged Orchid).



A series of eskers at Clonmacnoise. *Fiona Devery*

## Uplands and eskers

The Slieve Bloom Mountains are predominantly covered with blanket bog and forestry and poor in plant species. The glens and river valleys provide more interest, with *Oreopteris limbosperma* (Lemon-scented Fern) finding its only known Offaly station at Glenafelly. Areas of flush and fen occur where streams cut through calcareous glacial drift, giving rise to species such as *Eriophorum latifolium* and *Equisetum variegatum* (Variegated Horsetail), as well as interesting tufa formations along the rivers. The Silver River Eco Walk at Cadamstown, cutting through a deep wooded gorge, is the finest example of such features in the county. The walk also has a good display of spring flowers, along with *Dryopteris aemula* (Hay-scented Buckler Fern) and *Hymenophyllum wilsonii* (Wilson's Filmy-fern).

Eskers, from the Gaelic word 'eiscir', are typically long sand/gravel ridges or waves of hills deposited by melting ice at the end of the last Ice Age. Those of the Irish Midlands are considered geologically to be among the finest in the world. The light sandy soils support dry, calcareous grasslands which are often orchid-rich, with characteristic species such as *Anacamptis morio*. Unfortunately, many are now fertilised with the resulting loss of biodiversity.

Old roadways often run along or beside eskers, for example, the Pilgrim's Road at Clonmacnoise which has views of eskers, callows and the River Shannon. The rare *Neotinea maculata* (Dense-flowered Orchid) has recently been refound in the area. At the Ridge Road, near Birr, *Rubia peregrina* (Wild Madder) scrambles through the hedge bank, with *Geranium sanguineum* (Bloody Crane's-bill) and *Rosa spinosissima* (Burnet Rose). Abandoned sand quarries provide refuges for many rarer esker plants such as *Galeopsis angustifolia* (Red Hemp-nettle), *Carlina vulgaris*, *Clinopodium acinos* (Basil Thyme), *Erigeron acris*, *Gymnadenia conopsea* (Fragrant-orchid) and *Gentianella amarella* (Autumn Gentian).

## County rarities

*Neotinea maculata* is the only member of the 'Lusitanian flora' found in Offaly. The very rare *Eriophorum gracile* (Slender Cottongrass) is known from just one site. Among the other scarce species found are *Rosa agrestis* (Small-leaved Sweet-briar), *Rhynchospora fusca*, *Ophrys insectifera*, *Spiranthes spiralis* (Autumn Lady's-tresses), *Dactylorhiza traunsteinerioides* and *Juniperus communis* (Common Juniper).

## Places of interest

There is a visitor centre at Clara town library (<https://www.clarabognaturereserve.ie/visit-us/menu-item-visitor-centre/>). Lough Boora Discovery Park, a series of new lakes and wetlands, is the oldest of the cutaway bogs. It recently won the Royal Town Planning Institute (RTPI) Ireland's Best Place Award 2018. For more information and directions (<http://www.loughboora.com/nature/lakes-wetlands/>). Mount Lucas Wind Farm Walk and Cycle Park (<http://www.bordnamona.ie/corporate-responsibility/amenities/mount-lucas/>), near Edenderry, is another of Bord na Móna's cutaways which is open to the public (weather permitting).

## Offaly Naturalists' Field Club

The Offaly Naturalists' Field Club holds a number of field meetings, some of which have a botanical theme. Contact Amanda Pedlow, Heritage Officer, Offaly County Council (<https://www.offaly.ie/eng/Services/Heritage/Biodiversity/Offaly-Naturalists-Field-Club-Programme-/>).

## Fiona Devery

Emmet Street, Birr, County Offaly R42 XK73  
Ireland

[findevery@yahoo.co.uk](mailto:findevery@yahoo.co.uk)



Chris Methrell at the University of Reading Herbarium (RGN). C. Methrell

## BEGINNER'S CORNER

### Using herbaria

HAZEL METHRELL

A herbarium contains labelled plant specimens for study. This is a fantastic resource for botanists at any stage in their botanical development, from 'how do I tell the difference between these forget-me-nots?' to 'how do I spot a *Polystichum* hybrid?' Think of it as a fully annotated botanical garden with specimens of native plants. Here are some good reasons to visit your local herbarium:

- You can examine many specimens of the same species to see the natural variation within a species. If you are new to a region, you can get acquainted to local variants of the common species to help you to recognise them.
- You can compare subspecies, hybrids or species within the same genus, to clarify the differences to look out for in the field, and the 'jizz' characters that can help. I like to annotate my books with these, but others may prefer to have a separate notebook.
- You can test out a key on the specimens, to get a better grasp of the structures being referred to, and how they vary. What triangle are they referring to in *Myosotis*? What is a staminode anyway?

- You can see rare plants which will then give you greater confidence in identifying them if you should see them in the wild.
- Herbaria are a useful way to see plants that may be otherwise difficult to examine, e.g. rare orchids.
- The labels will often give site and date information which may be useful in identifying historic changes in distribution.
- Some collections include some 'type specimens'. These are the original plants used by the first scientist to define the species. For example, the Linnean Society has many of the actual plants used by Carl Linneus. These files are usually given red covers or edges. By comparing plants to a type specimen it may be possible to confirm a determination in difficult cases.
- This study can be done at any time of year, so winter need not be a botany-free time!

#### How to find a herbarium

There are extensive professional herbaria attached to some of the larger universities, for example, Manchester, Leicester, Birmingham, Leeds, Reading and Plymouth. There are also national herbaria

at Royal Botanic Gardens, Kew and Edinburgh, Glasnevin Gardens, in Dublin, and the National Museum of Wales, in Cardiff. It is suggested you phone or email them to make an appointment and check their opening hours. Let them know you are a BSBI member and if possible what genera or area you want to study.

There are many small herbaria, often run by charities and volunteers, and herbaria in regional museums where more detective work may be needed to find the person to contact. A list is available on the BSBI website; however, this needs updating. If you visit any herbarium, or know of others not on the list, do let us know of any up-to-date information. Please email the President at [herbaria@bsbi.org](mailto:herbaria@bsbi.org).

### Etiquette

Bring your notebook and flora, pencils and a hand lens. A camera and post-its are also handy. Do not bring your own specimens. The examples in the store have been treated to destroy boring beetles

The Herbarium at Royal Botanic Gardens, Kew.  
C. Metherell



Researchers at the University of Cambridge Herbarium. C. Metherell

and fungi, and the curators will not want any new infections. You can bring photos of your mystery plant, or have the original in the car so you can nip out and check the details.

Different institutions use different filing systems, but the curator will show you how to find what you want.

The folders are stored flat and you lift them out, keeping them horizontal, onto a table. As you go through the sheets lift each one to the side without turning it over or holding it upright. If you remove any sheets to compare them, pop a post-it in to mark where it was taken from. Do not write on the sheets, or try to turn over leaves; they are brittle. Let the curator know if any are damaged. They are usually happy for photos to be taken. Ask whether you should return sheets and folders to their original positions, or whether they should be left to be re-filled by staff.

Don't try to do too much. A couple of hours of concentration on tiny structures are often enough. Food and drinks are not allowed in, so take a break by going out for a while.

Herbaria are a wonderful botanical resource that need to be used to justify their continued existence. So go and visit a herbarium (or several) this winter, and learn a lot in the process.

Hazel Metherell  
[hazelmetherell@gmail.com](mailto:hazelmetherell@gmail.com)



# PHOTOGRAPHING WILD FLOWERS: Part 1

BOB GIBBONS

The arrival of digital cameras over the last decade or so has changed photography enormously in so many ways. For bird and mammal photographers, the change has been dramatic and the standard of such photography has leapt up hugely. Flower photography, by contrast, has become much easier, but the standard has not gone up in the same way.

To the flower photographer, the advantages include the increased portability of modern digital cameras, the ease of close focus, the ability to change the 'film speed' at will, (thus making it easier to control camera or subject movement), and that wonderful opportunity to review your photographs and take them again if necessary. And, in general, digital photography allows much more post-photography manipulation, such as correcting exposure and colour balance, than film ever did, assuming you are familiar with computers.

The disadvantage of these modern cameras, and the reason that so many flower photos don't work,

Spring flowers in a Dorset lane – a perfect situation for using a small aperture, allowing as much in focus as possible. *Bob Gibbons*

is that they are likely to take complete control of the focusing, shutter speed and aperture, (unless you actively prevent them) and despite their extreme cleverness, they don't know what you are trying to photograph, or what you want from the picture. I see huge numbers of pictures where the main subject of the photo is totally out of focus, because the camera has 'decided' that it is elsewhere.

So the key to getting many things right is to **take control**. Few amateur photographers want to go back to focusing manually, although this remains the best way in many situations, but there is another way in which you can adapt your photography. Most cameras allow auto-focusing in two or more ways, commonly labelled as 'continuous focus' or 'one shot focus'. The former focuses continuously whenever the shutter button is depressed, which is ideal for active subjects such as birds in flight; the

latter finds a point of focus when you depress the shutter and holds it as long as you keep the button half-depressed. Then the trick is to focus on the part of the subject that is important to you, then recompose *whilst holding the button half-depressed and not moving towards or away from the flower* and take the picture. Some cameras allow you to select where the active focus area is, others default to the centre. It does not matter which you use as long as the camera is not making the choice. Some smartphones and cameras allow you to touch the screen at the point on which you want in focus, making it easier still.

### Understanding aperture

It is a great start getting the key parts in focus (and you might be amazed how many are not), but, of course, this isn't everything. Perhaps, surprisingly, something that hugely affects the final photograph is the aperture at which it is taken (these are the f numbers, varying from about f2.8 to f22, with the larger numbers representing smaller apertures). This controls the amount of light that reaches the sensor, but it also greatly affects the amount of the picture in focus; the smaller the aperture (and thus the larger the number) the more of the picture there will be in focus.

So what, you may ask? Well, there are two obvious ways in which you can use aperture to your advantage. Imagine a whole field full of orchids or other choice flowers – you want to show something of what the flowers are like, but also convey the extent and depth of the population. Here a small aperture, the smaller the better (e.g. f22), will allow you to show almost everything in focus. By contrast, there may be occasions when you want to isolate your key subject from the background – a green flower against a green background, or a single spike within a messy, cluttered background. Here, the picture can be improved by using a larger aperture, small enough to get the key subject in focus but large enough to throw the background out of focus (this isn't always possible, but it is something to aim for).

The problem, again, is that many cameras take

*Clinopodium vulgare* (Wild Basil) photographed using a large aperture (f6.3), with enough depth of field to keep the subject sharp, whilst leaving the background out of focus. *Bob Gibbons*

over these decisions for you, and a few, including phone cameras, you just can't over-ride. But, where possible, switch the control dial away from *program(me)* or *fully automatic* to *aperture-priority* mode. This allows you to choose the aperture you want, whilst still getting the correct exposure automatically.

In the next issue, I'll look more closely at how to get good flower pictures using the ability to control the camera's functions.

**Bob Gibbons**

**[bobgibbons@btinternet.com](mailto:bobgibbons@btinternet.com)**



## ADVENTIVES AND ALIENS NEWS 16

COMPILED BY MATTHEW BERRY

From time to time in this column, it has been my sombre duty to report the probable loss of an alien species from a site where it had seemed established, and whither botanists made pilgrimages to gain first-hand experience of it. The latest casualty would seem to be *Pilosella* × *floribunda* (Irish Fox-and-cubs), which records showed had not been seen in its classic New Forest site for a significant period. A very thorough and deliberate search carried out in 2018 by Martin Rand, Mike Shaw and Eric Clement, failed to turn up any trace of it.

A few well-documented exceptions notwithstanding, it is a given that the days of wool alien hunting as a time-consuming botanical hobby are well and truly over. Certainly the ‘golden age’ has passed, but might an occasional ‘gold rush’ still be possible? A letter from Gordon Hanson (dated 14th April 2018) opened my eyes to the extraordinary persistence of species introduced in this way. He has been making annual visits to fields in the Flitwick area of Bedfordshire (v.c.30), a well-known wool alien ‘hot spot’ in the past, since 1970. As recently as 2012 he was finding such delights as *Sisymbrium irio* (London Rocket) (10 plants), and *Erodium botrys* (Mediterranean Stork’s-bill) (10 plants), as well as huge numbers of *Datura stramonium* (Thorn Apple), *Galinsoga quadriradiata* (Gallant Soldier) and *Solanum physalifolium* var. *nitidibaccatum* (Green Nightshade) (c.10,000 plants each). A few years before that and *Chenopodium probstii* (Probst’s Goosefoot), *Datura ferox* (Angel’s-trumpets), *Erodium brachycarpum* (Hairy-pitted Stork’s-bill) and *Xanthium spinosum* (Spiny Cocklebur) were among his finds. Naturally, the pickings are becoming thinner and thinner with each year that passes, but the very fact that Gordon was even considering a return visit in 2018 must surely be of significance.

Is it possible that growers ever experimented with shoddy and abandoned the practice before botanists, even local ones, became aware of the fact? Either way, it could then be only a matter of time before one of these ‘inactive’ sites, known or unknown, remembered or forgotten, gets disturbed in the ‘right’ way and some lucky botanist is given the pleasurable challenge of a

wool alien bonanza!

2018 was an excellent year for *Cyperus eragrostis* (Pale Galingale) in v.c.14 (E. Sussex), with new records for tetrads TQ31J, TQ32I, TQ50W, TQ60C and TV59Z, in addition to the plant recorded at Forest Row (see v.c.14). No doubt it has been an equally successful, if temporary, colonist of gutters, twittens, wall bases and mown verges in at least the surrounding vice-counties. It will surely have to give up its appellation of ‘rare alien’ in the next edition of Poland & Clement (2009).

Although not mentioned in any previous edition of Stace’s *New Flora*, the garden annual *Gypsophila muralis* (Annual Gypsophila) is being sold under a number of more appealing names, and two recent records (see vcc13 and 69) hint encouragingly at what might be a tendency to stray (and its seeds do have very small tubercles which might assist to this end). It is a low-growing, small-flowered, wiry-stemmed plant, and in small quantity it would be surprisingly easy to overlook.

**V.c.6 (N. Somerset)**

*Oryzopsis miliacea* (Smilo-grass). Bath (ST74866388), 27/2/2018, H. Crouch & D. Green (comm. H. Crouch): 12 clumps along alley between back gardens of Shakespeare Avenue and Kipling Avenue, Bear Flat. All spread from a planted specimen in a bed outside one garden. Second record for v.c.6, and the first since 1978. A native of the Mediterranean. ‘A casual of wool, tips, wasteland, docks and bird seed; possibly a garden escape...’ (Ryves *et al.*, 1996). Far less likely as a wool or dock alien now, its status as a garden escape can no longer be doubted. Ryves *et al.* (1996), fig. 17; Clement *et al.* (2005): 385.

**V.c.9 (Dorset)**

*Pinus parviflora* Siebold & Zucc. (Japanese White-pine). North of Wareham (SY87669280), 8/5/2018, D. Leadbetter: seedlings in an old arboretum at Sugar Hill. ‘Now a wild location’ with ‘many unusual shrubs and trees...some of which have seeded’. Native to Japan and Korea, a tree to 25m tall, with a conical crown and bark which, at maturity, is dull grey and fissured. The leaves consist of bundles of

five somewhat twisted needles, with a triangular cross-section and single vascular bundle (c. 40mm × 0.9mm), the cones are subsessile and more or less ovoid. The yellow-brown colour and densely pale yellow pubescence of the mature branchlets are also important characters. Introduced in China, where it is a common street tree in some cities.

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

*Inula racemosa* Hook.f. (Pushkarmool). Gladices (SZ478798), 7/2018, P. Stanley: as well as being scattered generally around the farmyard (near the hamlet of Pyle), there are also two plants in an overgrown hedge, and one in a field entrance. It seems to have been recorded here previously as *I. helenium* (Elecampane). Recognised by its narrow racemose inflorescences (cf. wide and corymbose in *I. helenium*). Putative hybrids of intermediate appearance have already been observed in Belgium. See Adventives & Aliens News 15.

#### V.c.11 (S. Hants)

*Matteuccia struthiopteris* (Ostrich Fern). Swaythling area (SU45091537), 10/5/2018, P. Budd & D. Leadbetter (comm. D. Leadbetter): c. 120 shuttlecocks in Marlhill Copse. See v.c.17. Known here for some years, as for the next species.

*Celastrus orbiculatus* (Oriental Bittersweet). Swaythling area (SU4508415424), 10/5/2018, P. Budd & D. Leadbetter (comm. D. Leadbetter): several and perhaps spreading, Marlhill Copse. A native of China, and seemingly of little value as a garden plant, although escapes from cultivation account for all of the British records. It probably hardly ever produces its yellow three-valved capsules in this country (feedback please); in fact, it might often fail even to produce its cymes of inconspicuous flowers. A deciduous, clambering, twining shrub with alternate, serrate leaves, it has become a highly invasive alien species in much of eastern North America. It is somewhat heterophyllous, with leaves which are more or less orbicular with retuse tips, and others with distinctly acuminate tips. The classic British location is at Shottermill (v.c.17), where it is extant (pers. comm. E.J. Clement).

*Camassia leichtlinii* (Baker) S. Watson (Great Camas). Southampton (SU4280315881), 10/5/2018, P. Budd



*Pinus parviflora*, Wareham, v.c.9. D. Leadbetter



*Matteuccia struthiopteris*, Swaythling, v.c.11. D. Leadbetter



*Camassia leichtlinii*, Southampton, v.c.11. D. Leadbetter

& D. Leadbetter (det. E.J. Clement): three white-flowered plants at Daisy Dip by Copperfield Road. A genus of bulbous perennials (Asparagaceae) with



*Gypsophila muralis*, Chichester, v.c.13. M. Shaw

inflorescences a raceme, non-compressed filaments, fruits a capsule, leaves all basal, and tepals free and three-veined. In *C. leichtlinii*, a garden plant native to western North America, the flowers vary from white to pale blue. *C. quamash* (Common Camas) has also been recorded. Its fruiting pedicels are erect to incurving, with the capsules often appressed to the rachis (cf. erecto-patent in *C. leichtlinii*); and its tepals are long-persistent on the fruiting racemes (cf. shed as capsules develop in *C. leichtlinii*).

#### V.c.12 (N. Hants)

*Anemone ranunculoides* (Yellow Anemone). Hurstbourne Tarrant (SU38645304), 2017, P. Billingham: established in a field, shown to Dawn Nelson by Peter on 24/3/2017. A Eurasian native, fairly commonly cultivated, it can become naturalised in woods and other moist places. Clement *et al.* (2005): 13.

*Veronica austriaca* (Large Speedwell). Basingstoke (SU60724891), 22/8/2017, I. Ralphs: in a small trackside glade, near Woodbury Road, Hatch Warren. A mound-forming perennial up to 0.5m, native to Europe and south-west Asia, with narrow, opposite, long-pedunculate, axillary racemes of many, rather large (c. 1cm across), bright blue flowers, and sessile

ovate-lanceolate stem leaves with serrate margins. The calyces have (usually) five very unequal lobes and are c. half the length of the corollas. The stems are hairy all the way around, the capsule is longer than wide.

Most British records refer to ssp. *teucrium* (to which the preceding description applies); at least some leaves are deeply pinnatifid in ssp. *austriaca*. The Eurasian *V. prostrata* L. (Prostrate Speedwell) is superficially similar, but its leaves have recurved margins (cf. flat in *V. austriaca*) and it is usually much shorter. There are or have been a number of well-established populations, e.g. in S. Lancs (v.c.59) at Hightown dunes and Hall Road (Blundellsands), where it was extant at least as recently as 2012 and 2007 respectively (pers. comm. Phil Smith).

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

*Gypsophila muralis* L. (Annual Gypsophila). Chichester (SU8502906708), 1/9/2018, N. & E. Sturt (det. M. Berry/conf. M. Shaw): one plant under a big Beech at edge of Sweet Chestnut coppice, in park opposite entrance to Brandy Hole Lane, Broyle Copse. In full flower on 2/9. The first Sussex record. See v.c.69.

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

*Gaura lindheimeri* Engelm. & A. Gray (Lindheimer's Beeblossom). Eastbourne Old Town (TV59609977), 7/7/2018, M. Berry (conf. E.J. Clement): one plant between paving and brick skirting of wall, self-sown from a garden some 5m distant, Gore Park Road. Widely grown in a multiplicity of colour forms, this is the only time my street botanising has turned up an authentic wilding. The first Sussex record for this native of Texas. The genus should probably be merged into *Oenothera*, from which it was separated for having fruits which are a one-seeded nut, rather than a many-seeded capsule, as in *Oenothera s.s.*, *Clarkia* etc. Gardeners might reasonably protest that plants of *Oenothera* and those of *Gaura* just look different, no explanation (or merging) necessary!

*Solanum nigrum* ssp. *schultesii* (Black Nightshade).

Newhaven (TQ4534701413), 23/8/2018, M. Berry (conf. E.J. Clement): one plant on east side of earth bank alongside newly made road, east of the Ouse and south of the A259. In leaf dissection and stem indumentum, it very closely resembled John Norton's Gosport plants (see Adventives & Aliens News 13). Other interesting aliens recorded from this site in



*Datura innoxia*, Newhaven, v.c.14. M. Shaw

2018 included *Mirabilis jalapa* (Marvel-of-Peru), *Chenopodium hybridum* (Maple-leaved Goosefoot), *Atriplex hortensis* (Garden Orache), *Fagopyrum esculentum* (Buckwheat), *Abutilon theophrasti* (Velvetleaf), *Thlaspidanthra dubia* (Manchu Tubergourd), *Brassica juncea* (Chinese Mustard), *Nicandra physalodes* (Apple-of-Peru), *Solanum laciniatum* (Kangeroo Apple), *S. physalifolium* var. *nitidibaccatum* (Green Nightshade), *S. rostratum* (Buffalo-bur), *Datura innoxia* (Recurved Thorn-apple) (see below), *D. stramonium* (Thorn-apple) and *Guizotia abyssinica* (Niger).

*Datura innoxia* Mill. (Recurved Thorn-apple). Newhaven (TQ4541601184), 18/7/2018, M. Berry (conf. E.J. Clement): one plant on west side of earth bank alongside newly made road, east of the Ouse and south of the A259. The name is misspelt '*Datura innoxia*' on a number of reputable botanical websites and even in the normally impeccably spelt Clement & Foster (1994)! The sub-entire leaves are soft and slightly sticky to the touch, due to the presence of numerous long, gland-tipped hairs. They have asymmetrical bases and smell strongly of peanut butter. The corollas are 15-20cm long, white when open (very pale yellow when furled) and with an

apparently ten- to twelve-lobed limb. The flower buds (i.e. the calyces just before the corolla is exerted) are long, fat and cigar-shaped (cf. the shorter, narrower fluted flower buds of *D. stramonium*). The sharp-spined fruits are rounded, downy (glandular), recurved at maturity and irregularly dehiscent. The seeds are brown. For an excellent and wide-ranging *Datura/Brugmansia* key, members should refer to pp. 54-57 of *BSBI News* 82. Apart from a few post-2000 records from the London area, e.g. on tipped soil in a maintenance area at Hampton Court (TQ1768) (v.c.21) in August 2011 (pers. comm. G. Hounsome), it was a wool alien, recorded as *D. meteloides* DC. in Worcestershire (v.c.37) in 1957; and Lousley's 1938 Hythe Quay (v.c.19) record of *D. metel* L. was also this species. The first Sussex record.

*Dracunculus vulgaris* (Dragon Arum). Coldean (TQ3364208234), 18/4/2011, A. Spiers: garden throw-out(?) in Coldean Wood.

*Cyperus eragrostis* (Pale Galingale). Forest Row (TQ42523512), 11/7/2018, B. Scott: on gravel outside telephone exchange, Hartfield Road. Clement *et al.* (2005): 374.



*Ruta graveolens*, Dorking, v.c.17. M. Shaw

#### V.c.17 (Surrey)

*Dicksonia antarctica* (Australian Tree-fern). Windlesham (SU94586412), 20/4/2017, G. Hounsome: one plant in woodland on east side of high fence. Plant c. 2m wide by 1m tall, but 'trunk' prostrate.

*Matteuccia struthiopteris* (Ostrich Fern). Hindhead (SU86233615), 22/12/2016, E.J. Clement & G. Hounsome: two patches c. 3m in diameter and one smaller one nearby, on the Surrey side of the county boundary stream in extremely boggy ground. Also a similar patch on the v.c.12 (N. Hants) side at SU86223611. Clement *et al.* (2005): 4. See v.c.11.

*Ruta graveolens* (Common Rue). Dorking (TQ1686149319), 1/7/2018, M. Shaw (comm. M. Shaw): one good-sized plant on wall on north side of Dene Street, Cotmandene; also non-flowering plants in pavement cracks over a 20m stretch. Self-sown from raised garden above wall. First recorded from this site by Steven Ettlinger in 2011. A strong-smelling sub-shrub from the Mediterranean (Rutaceae) with glaucous lobed leaves, 4- or 5-merous flowers (15-20mm across) of widely-spaced yellow petals with entire or inconspicuously toothed margins and

obviously four- or five-lobed capsules. *Ruta montana* (L.) L. has narrower leaf lobes and smaller (c. 10mm across) flowers in denser terminal clusters. It has been available from garden suppliers in the past, but does not seem to be at present.

*Mawranthemum paludosum* (Annual Marguerite). Hindhead Golf Course (SU86353754), 23/5/2017, E.J. Clement & G. Hounsome: two plants at the foot of a pile of soil by the footpath just north of the practice range. See Adventives & Aliens News 1.

*Dracunculus vulgaris* (Dragon Arum). Woking (SU99105842), 8/6/2017, G. Hounsome: in scrub on the south bank of Basingstoke Canal. Here since at least 2007, with three flowering stems in 2017. A foetid garden plant (Araceae) of dramatic appearance, native to southern Europe – see Stace (2010). Another aroid, *Sauromatum venosum* (Aiton) Kunth (Voodoo Lily), a native of temperate and tropical Asia and Africa, received the following extraordinary promotion in a recent catalogue of Plant World Seeds: '...this exotic and tropical looking plant will do well in most sunny British gardens. In late spring alien looking green stems appear covered in black spots, then large fleshy



*Gnaphalium pennsylvanicum*, Rugby, v.c.39. D. Long



*Smyrnium perfoliatum*, Formby, v.c.59. P.H. Smith

leaves appear before the flowers later in the year.' When it escapes (and there is at least one record in the DDb), it could very well be mistaken for *D. vulgaris*, the main difference being that the lower part of the spathe is tubular in *Sauromatum*, while in *Dracunculus* the margins of the spathe are not fused, but free and overlapping. It would also seem that in *Dracunculus* the inside of the spathe is uniformly chocolate-purple, whereas in *Sauromatum* it is chocolate-purple-blotched. See v.c.14.

#### V.c.24 (Bucks)

*Lepidium virginicum* (Least Pepperwort). Great Horwood (SP77073119), 7/7/2018, A. McVeigh & J. Carey (det. T. Rich; comm. A. McVeigh): one large plant growing in a gravel soakway at the foot of the porch to main church entrance. The first Bucks record since 1920 and yet another which might have arisen because of the popularity of this species as a cut-/dried-flower in floral arrangements.

#### V.c.39 (Warwickshire)

*Gnaphalium pennsylvanicum* Willd. (Pennsylvanian Cudweed). Rugby (SP50037503), 28/9/2018, D. Long (det. M. Rand/conf. M. Berry; comm. J.

Walton): one plant growing in a pavement crack at the base of a wall, outside Kwik-fit. A weedy annual species of tropical America. *G. coarctatum* Willd. (Elegant Cudweed) and *G. purpureum* are similar but have bicolorous leaves with white-tomentose lower surfaces and the upper surfaces green and more or less glabrous. *G. antillanum* Urb. (Delicate Everlasting) has a more upright habit and less spathulate leaves and bracts, but the species belonging to what might be called the *G. purpureum* group can be difficult to separate. Some authorities would segregate all of the foregoing as *Gamochoaeta*, because they have pappus hairs which are united at the base and fall as units (cf. not united and falling individually in *Gnaphalium s.s.*). A possibly increasing species with a number of recent records, e.g. in v.c.29 (Cambs) in 2017.

#### V.c.59 (S. Lancs)

*Smyrnium perfoliatum* (Perfoliate Alexanders). Formby (SD296070), 26/4/2018, P.H. Smith, P.A. Lockwood & J. Styles: c. 150 flowering plants in a planted woodland near Formby Swimming-baths, where one specimen was noted the previous year. 'The most frequent of 18 associates were *Aegopodium podagraria* (Ground-elder), *Alliaria petiolata* (Garlic Mustard),



*Crinum x powellii* 'Album', Ainsdale, v.c.59. P.H. Smith

*Galium aparine* (Cleavers) and *Urtica dioica* (Stinging Nettle)'. The first vice-county record. While I mentioned that this species has featured in a recently published field guide to invasive plants and animals (see Adventives & Aliens News 14), Phil helpfully points out that it is a species recognised as invasive by British law, having been included in schedule 9 of the Wildlife and Countryside Act 1981 in 2015.

*Crinum x powellii* 'Album' (Powell's Cape-lily). Ainsdale (SD3055011622), 24/8/2018, P.H. Smith: one large flowering individual in an area used for dumping garden waste from nearby housing, Falklands Way dunes. 'A plant of the pink form has been long established at Crosby Coastal Park and is the only one shown on BSBI Maps away from southern, south-east or south-west England. The Ainsdale plant is the white form 'Album''.

#### V.c.69 (Westmorland)

*Gypsophila muralis* L. (Annual Gypsophila). Kendal (SD515930), 2018, A. Boucher (comm. A. Boucher): one plant in paving outside closed shop (Herb. AMB). A branching annual (Caryophyllaceae) from Eurasia, most British records probably originate from gardens. It can be distinguished from *G. elegans* (Annual Baby's-breath) and *G. pilosa* Hudson by its linear leaves of

less than or equal to 3mm width (cf. lanceolate leaves of greater than 3mm width in *G. elegans*/*G. pilosa*). In addition, *G. pilosa* has a hispid middle portion to its stem (cf. minutely pubescent below in *G. muralis*). Both *G. muralis* and *G. pilosa* have pink petals, while *G. elegans* has petals which are white. See v.c.13.

*Cardamine heptaphylla* (Pinnate Coralroot). Helme Bank (SD526887), 2018, A. Boucher (comm. A. Boucher): well naturalised in woodland areas (Herb. AMB). Along with *C. bulbifera* (Coralroot) and a number of other *Cardamine* species with conspicuously toothed leaflets, this was once segregated as a *Dentaria*.

*Saxifraga cymbalaria* (Celandine Saxifrage). Kendal (SD522918), 2017, A. Boucher (comm. A. Boucher): in brickwork of internal wall of road drain, just below surface, Archer's Meadow. A Mediterranean annual with yellow petals (with reddish or darker yellow basal patches), superior ovary, small more-or-less orbicular leaves and a decumbent habit. Probably more frequent in the north and west as a naturalised garden weed, when usually referable to var. *huetiana*, with petals of less than 5mm length. Clement *et al.* (2005): 143. The slight fleshiness of the leaves is difficult to capture in a line drawing.

#### V.c.95 (Moray)

*Aethusa cynapium* ssp. *elata* (Fool's Parsley). Alves (NJ135629), 2016, I. Green: on road verges and in the churchyard. First found in 2016 but not named until summer 2018. The first Scottish record. Formerly *Aethusa cynapium* ssp. *cynapioides*, see Stace (2010). There are as yet very few records for this taxon nationally.

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#### Matthew Berry

Flat 2, Lascelles Mansions, 8-10 Lascelles Terrace, Eastbourne, East Sussex BN21 4BJ

m.berry15100@btinternet.com



## *Persicaria runcinata* discovered in modern-day Lancashire (Mid-west Yorkshire v.c.64)

PETER JEPSON

*Persicaria runcinata* on riverside shingle. Peter Jepson

This article documents my observations of the alien plant *Persicaria runcinata* (Buch.-Ham. Ex D.Don) H.Gross in the upper Dunsop Valley in modern-day Lancashire (Mid-west Yorkshire v.c.64), within the Forest of Bowland Area of Outstanding Natural Beauty. It reports a brief field survey on 1st October 2018.

I first became aware of *P. runcinata* on 2nd September 2011 whilst walking past a remote farmstead (SD 659550) on my return from surveying upland flushes higher up the valley. In the attractive farm garden was growing a plant which, at the time, neither my companion D.S. Bunn nor I recognised. A single plant of the same was also observed several metres outside the garden, across the track and alongside the adjacent river. The plant had distinctive leaves and small pretty heads of pink flowers. I was later able to identify the plant as *P. runcinata* from Phillips & Rix (1991). At the time, I failed to realise that an account of this species having been discovered in the Clyde valley, Lanarkshire v.c.77 in 2001 had been published in *BSBI News* in January 2003 (Wolstenholme & Ellis 2003).

At my Lancashire location in 2011 there appeared

to be only one plant outside the garden. However, on 30th August 2017 E.F. Greenwood copied me into an email regarding a recent field trip in the Dunsop Valley he had made with D.P. Earl and I. Ridge; in this email he mentioned finding a *Polygonum* or *Persicaria* which he could not identify. I was able to confirm their plant was *P. runcinata*, and reminded them that I had notified him about the plant some six years previously. The record had indeed been added to E.F. Greenwood's card index system, but was too late to be included in the *Flora of North Lancashire* (Greenwood, 2012). However, the record failed to be entered onto the digital system, as the species is not included in either Recorder or Mapmate database dictionaries, and in 2011 was no more than a single plant growing just outside a garden. In conversation, it was apparent that by 2017 the plant had spread considerably from the single plant observed in 2011.

With this in mind, in the late summer of 2018, with permission to drive the 4 miles up the private road to reach the farm, I determined to survey the river course to evaluate the spread. On 1st October 2018, I followed the river downstream for some 1.2km until the valley sides became too steep for safe access. The

**Table 1** Populations of *Pericaria runcinata* on a Lancashire river.

Location	Population size (m)	Habitat	Associated species
1	3 x 2	Riverbank; Uppermost population	
2	50 x 2	Riverbank alongside garden	Tall-herb community, <i>Urtica dioica</i> , <i>Heracleum sphondylium</i> , <i>Rumex obtusifolius</i> alongside <i>Alnus glutinosa</i> .
3	4 x 2	Stand above river by parking area	Tall-herb community as above.
4	2 x 1	Vegetated stones and shingle by river	Semi-vegetated shingle, more or less locally dominant with a few tufted grasses.
5	4 x 2	Riverbank	Tall-herb community.
6	5 x 3	Riverbank	Tall-herb community with <i>Salix</i> sp.
7	9 x 4	Flushed slope by river	<i>Juncus effusus</i> community with <i>Sphagnum fallax</i> , <i>Viola palustris</i> , <i>Lotus pedunculatus</i> .
8	1 x 0.5	Riverbank	
9	1 x 1	River edge shingle	Semi-vegetated shingle, more or less locally abundant with a few tufted grasses.
10	1 x 1	Riverbank	Riverbank tall-herbs.
11	1 x 1	Riverbank by small side land drain outlet	Wet flush with <i>Juncus effusus</i> , <i>Chrysosplenium oppositifolium</i> , <i>Stellaria alsine</i> .
12	2 x 1	Riverbank in rush bed	Wet flushed habitat with <i>Juncus effusus</i> , <i>Cardamine amara</i> , <i>Lotus pedunculatus</i> , <i>Chrysosplenium oppositifolium</i> , <i>Filipendula ulmaria</i> .

survey was continued from a location c. 1km further down the valley, by following the river upstream c. 0.3km until a plant of *P. runcinata* was found. The river was then followed downstream for a further 0.5km. Two additional sections of river were surveyed at random still further downstream, which together totalled 0.8km. At each occurrence of *P. runcinata* a grid reference was taken, extent of population estimated

and, where relevant, possible associate species noted (see Table 1).

The population size at the locations varied from a 50m stand along the riverbank adjacent to the garden, to individual plants occupying a 0.5 x 0.5m area. The extent of the spread was as far as a weir some 2.5km down the river from the farmstead source.

A party of experienced field botanists and me, as



*Pericaria runcinata* growing by the river immediately downstream of the garden. Peter Jepson



*Persicaria runcinata*. Peter Jepson

members of the Lancashire Biodiversity Partnership, surveyed the whole length of the valley on 22nd August 2006 and no evidence of *P. runcinata* was noted at the time. Given in 2011 only a single small clump of *P. runcinata* was observed, it may be concluded that the present extent results from a spread over the last seven years. This is surely most alarming!

There appears to be little information over the dynamics of the Clyde Valley population between its discovery in 2001 and the present day. By email, M. Philip (BSBI Recorder v.c.77 Lanarkshire, October 2018) reports that the site was visited a few weeks

previously, as there had been no recent confirmation since the initial find back in 2001. The population was found to 'be in good health and spreading to some extent, but was not rife'; and 'growing among the taller grasses on the margin of a mown park area, close to the riverbank of the Clyde and well away from any buildings or gardens'. Subsequently, he was also able to confirm that no downstream spread of *P. runcinata* has been noted at its Lanarkshire site. From this description it would appear that the Clyde Valley population is a little way from the river. Whilst the Lancashire plants were free flowering, none of the many old capitate inflorescences examined appeared to carry seeds. As all populations were alongside the river, it is suggested that the spread is most likely to be vegetative, with plant fragments carried downstream by storm events.

In addition to *P. runcinata*, other colonising invasive alien taxa arising from the farmstead and colonising along the watercourse include *Alchemilla mollis*, *Lysimachia punctata*, *Geranium* × *oxonianum* and *Mimulus* aggregate. Their recent spread is a serious threat to the scarce native species for which the valley is known.

I wish to acknowledge Clive Stace, Michael Philip, Eric Greenwood and David Earl for their assistance, information and helpful comments, and most particularly the landowner for permission for vehicular access, saving me an eight mile round trip on foot.

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Peter Jepson

[pjepsonecology@btinternet.com](mailto:pjepsonecology@btinternet.com)

## Request for *Aspidistra* plants

It appears that at least five discoveries of *Aspidistra elatior* escapes have been made. But are they reliably named? *A. elatior* is the most commonly sold evergreen, but the similar *A. lurida* was a fairly common houseplant until being overtaken by the new species. If you can send to me a section of rhizome (approx.

8cm) long for growing on, it will allow comparison to be made with its flowers. This may require two growing seasons.

Alison Rutherford

19 South King Street, Helensburgh G84 7DU

## COUNTRY ROUNDUPS – ENGLAND

PETE STROH

I begin the England round-up by stating the obvious. This is the final year of fieldwork for the third Atlas of Britain and Ireland (Atlas 2020). For most, if not all of us, it might even be the final year of recording for a national atlas, ever – certainly there are no plans for a fourth one any time soon! One last chance for this project, then, systematically to compile lists, to search for species not found this century, to explore new areas, and to contribute to plant conservation by adding to the extensive evidence base you have built up about the distribution of our wild flora. England recorders have gathered close to or exceeding one million records each year since 2003 – quite incredible, and impressively consistent. I did wonder how many miles had been walked collecting all those records. Perhaps 2020 will be the start of an obesity crisis for botanical recorders, but I somehow doubt it, as BSBI Council is currently putting together post-Atlas plans

*Scorzonera humilis*. Bob Gibbons



– and you can be certain that it will involve getting outside and identifying plants. That is, after all, what you are exceptionally good at doing.

There have been a number of ‘glamour finds’ since the September News was published, but I wanted to focus first on a county rarity that might not raise so much as one hair of an eyebrow in many areas, but is as gold in a local context. *Calluna vulgaris* (Heather) is up there with *Bellis perennis* (Daisy) and *Taraxacum* agg. (Dandelion) – excluding micro-species! – when it comes to recognisable plants for those who enjoy the outdoors, but do not necessarily pay close attention to the flora they are walking past. However, *C. vulgaris* was a casualty of heathland destruction in the southern and eastern lowlands in the 20th century, to the extent that it is now ‘Near Threatened’. In Cambridgeshire, *C. vulgaris* was once present in 10 hectads.

By 1970, that number was down to five. In 2000, the total count was just a handful of plants at three sites, and since 2006 it has been known from only one – Gamlingay Cinques, which lies on the Cambridgeshire Greensand. The last plant here died a few years ago. But following targeted disturbance work in the area where the last plant was seen, there are now lots of young *C. vulgaris* plants, and the imminent Cambridgeshire Flora can include some (relatively) good news. Populations of local rarities are often kept going by well-planned intervention, and I find this example very heartening, not least because it demonstrates the resilience of plants. It also neatly highlights how important dynamism is (whether it be man-made or natural, and from micro- to macro-scale) for plant conservation.

Perhaps the most surprising find that has come to my attention is technically not in England, and was discovered two years ago, but it is certainly worth mentioning here, especially as my new job title takes in both England and the Channel Islands. Whilst leading an identification course at L’Anresse Common, Guernsey, Jane Gilmour spotted a flower that she did not recognise (rare for Jane). It turned out to be *Scorzonera humilis* (Viper’s-grass). This is a very rare species in Britain, with just two sites in Glamorganshire, and two in Dorset. The Guernsey site is



**Left** *Eriophorum latifolium*. Pete Stroh **Right** *Alchemilla monticola*. Peter Jepson

well-botanised, in part because it is home to a population of *Anacamptis laxiflora* (Loose-flowered Orchid). However, it can be very hard or impossible to find *Scorzonera* when not in flower, even when actively searching, which probably explains it being overlooked. It is not known how the plants arrived at the site – of course they may have been present for a very long time – but perhaps the most plausible route is via seed from northern France, carried on the wind.

Back to the mainland, and Sussex delivered not one but two notable finds in 2018. The first, in East Sussex, produced the first county record since 1999 for the ‘Endangered’ *Scleranthus annuus*, and to add a cherry on

top, it was determined as ssp. *polycarpus*, which is thought to be much the rarer of our two subspecies. And, in West Sussex, David Streeeter, leading a field trip with the Sussex Flora Group, found the Nationally Scarce *Bunium bulbocastanum* (Great Pignut) on the South Downs near Brighton; a remarkable discovery and the first south of the Thames. In Middlesex, 2018 was a good year for pondweeds, with the first records of *Potamogeton perfoliatus* (Perfoliate Pondweed) and *P. trichoides* (Hairlike Pondweed) for over 40 years and 20 years respectively. It will certainly be worth grapnelling the county's canals to see if more populations (and species) can be found.

Moving northwards, the sharp eyes of Ros Tratt and Phil Eades spotted a healthy population of *Eriophorum latifolium* (Broad-leaved Cottongrass) during a survey of Spout Moss in the Staffordshire moorlands. This lovely sedge had not been seen in the county since the 19th century. The site is owned by the Peak District National Park Authority and is botanically rich, with springs which feed into flushes and mosaics of wet heath and fen meadow vegetation. In Lancashire, a new site for the ‘Endangered’ *Alchemilla monticola* was discovered by Peter Jepson, and later determined in the field by Mark Lynes, on a roadside above Belmont in the West Pennine

Moors. This is a significant southerly extension of the known range, and it is tempting to think that it just might be elsewhere.

Not wishing to step on Matt Berry's toes, but I did also want to mention a few aliens that may be either overlooked, and/or have the potential to spread to new areas. Following prompting by Ken Adams, botanists in Surrey started looking for *Chenopodium strictum* (Striped Goosefoot) in autumn 2018. Ken reported an explosion of records in Essex, with a closer check of 'odd' *C. album* (Fat-hen) plants often revealing a red-striped stem and leaves that are not mealy and tend to be spear-shaped and entire. Ann Sankey circulated Ken's description of the species to Surrey recorders and the following day two of them reported it in different parts of the county. One had found it in his vegetable garden and the other a small patch of tall plants on the narrow verge of a country lane. Both were later determined by John Akeroyd as *C. strictum*. Since then, it has been found in a range of sites from a rural arable field to slightly scruffy urban areas, sometimes on imported soil. Coincidentally, the same day as Ann's email arrived, I received

a message from Anne Haden in Jersey to say that three '8ft tall' *C. strictum* plants had been found for the first time on the island at St Peter's parish dump near the airport. Definitely one to look out for this year.

In Cornwall, Ian Bennallick, David and Anita Pearman, and Tina Nightingale recorded *Carex ursinata* (syn. *Uncinia uncinata*) as a first wild record for Britain and Ireland. The sedge, which resembles *C. remota* (Remote Sedge) but with reddish leaves and hooked glumes, was found on a streamside walk at St Nectan's Glen, and also naturalised on steps in woodland from planted flowerbeds at the Hermitage by St Nectan's Kieve. They noted that it was spreading, no doubt due to the hooked subtending glumes attaching to animals and/or walkers. Sedges and grasses are popular garden plants, and as such it is worth looking out for escapes, and also examining them in garden centres (perhaps complemented with a cream tea). In fact, Alan Leslie tells me he has found a number of interesting weeds in pots within the grounds of garden centres, which is of great interest when it comes to ascertaining the source of populations that

have already, or may later, find their way out into the 'wider countryside'. For example, Alan lists Cambridgeshire street records for two small prostrate alien spurges, *Euphorbia maculata* (see p. 63) and *E. prostrata*, and *Amaranthus blitum*, all of which he had recently found in garden centre pots, mostly for palms, which almost certainly have come in from Italy.

Thanks to all who have sent me information, and apologies for not having the space to include them all. You might not be aware that many counties have their own website with lists of interesting and unusual plant finds. There are too many to name here, but the map on the main page of the BSBI website, or the link to the 'local botany' section, are good places to start. The websites also often advertise details about local botany groups and field meetings. Many have weekly outings throughout the spring and summer months, perfect for that last year of Atlas recording. Did I mention it is the final year?

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**Pete Stroh**  
England Officer  
[peter.stroh@bsbi.org](mailto:peter.stroh@bsbi.org)

## COUNTRY ROUNDUPS – SCOTLAND

### IAN STRACHAN

The Scottish Botanists' Conference (SBC) in November was, with 175 people attending, possibly the largest gathering of botanists ever held in Scotland. Jointly run by the

BSBI, the Botanical Society of Scotland and the Royal Botanical Garden Edinburgh (RBGE), this event is the 'successor' to the Scottish Annual Meeting. The presentations and exhibition

abstracts can be seen on the SBC page of the BSBI website, together with a 'virtual exhibition' of many of the exhibits and posters. The talk by Professor Richard Ennos entitled 'When will

we ever learn – a history of tree disease’ was riveting and is well worth a look.

The mini-workshops were the highlight of the day for many. Topics included conifers, horsetails, grasses, native oaks, the Vegetative Key and the BSBI database. One of the most popular workshops involved looking at ‘species pairs’ in the herbarium. The RBGE herbarium is a superb resource and botanists are encouraged to make use of it; visits can be arranged via the RBGE website.

There were plenty of exciting plant finds last year, some of which were exhibited at the SBC. Here are a few highlights.

On a visit to Morton Lochs at Tentsmuir in August, Sandy Edwards found a small specimen of *Bidens cernua* (Nodding Bur-marigold) – the first Fife record for several decades. Luke Gaskell found a single plant of *Isatis tinctoria* (Woad) on a disturbed

road side near Philphaugh Farm, Selkirk. He suggests that it was possibly derived from long-buried seed. This is only the third Scottish record for this striking archaeophyte since the last Atlas. Just north of the border, Jeff Waddell with his botany group discovered a large colony of *Equisetum hyemale* (Rough Horsetail) along the west bank of the Jed Water, in a forested area south-east of Southdean. This is only the second extant site in Roxburgh-shire.

In August, Chris Miles found two new populations of *Hierochloa odorata* (Holy-grass) along the edge of the Black Esk, in Dumfriesshire. *H. odorata* has one previously known population in the county, 35km away at the back of the merse at Caerlaverock NNR, where Chris found it in 1993. It is known from only 18 hectads in Britain and one in Ireland. This stretch of the Black Esk also supports

other interesting species, including *Equisetum variegatum* (Variegated Horsetail) and small populations of *Eleocharis mamillata* ssp. *austriaca* (Northern Spike-rush).

*Chaenorhinum minus* (Small Toadflax) is a spring-germinating annual of open habitats on well-drained, often calcareous, soils. This year I discovered it near Roy Bridge on disturbed ground beside the West Highland Line, the scenic railway linking Glasgow to Fort William and Mallaig. This is the first record for Westerns and only the fourth record in the Highlands in the last 20 years. An archaeophyte that was once a familiar weed of farmland in the lowlands, it has declined in many areas due to agricultural intensification and it is now more likely to be found along railways and in railway yards.

However, railways may not be as interesting as they used to be. Brian Ballinger presented

The 2018 Scottish Botanists’ Conference was well supported, with 175 people attending. *Jim McIntosh*





*Phyllodoce caerulea*. Jim McIntosh

an exhibit at the SBC about the flora of railway stations in Easter Ross. The 13 stations were visited between May and August, twice in 2001 and twice in 2018. All vascular plants in publicly accessible areas were noted. In 2001, 654 records were made of 203 species. In 2018, 458 records were made of 137 species, a substantial reduction; 96 species recorded in 2001 were not refound in 2018, and in 2018, 30 species were found not seen in the previous survey. During this time, rail services have increased and there has been an increased use of herbicides, as well as the development and fencing off of some areas. Brian observed that wild flowers have flourished in disused goods yards and car parks in the past, but these habitats have become less favourable in recent years. Since 2000 new or first recent records for Easter Ross have been made on stations for species including *Orobanche minor* (Common Broomrape), *Sherardia arvensis* (Field Madder) and *Crassula tillaea* (Mossy Stonecrop). Although management of stations sites is necessary, it would be great if some wildflower sites were left undisturbed.

The BSBI has been helping the Millennium Seed Bank, Kew, to collect seed. Kew's ambitious target is to collect seed of all native UK species by 2020. In Scotland, RBGE staff have been successfully using BSBI data to identify the most suitable seed-collection sites. Jim McIntosh was also given the task of collecting *Phyllodoce caerulea* (Blue Heath) seed, which is particularly difficult because, apart from the Sow of Atholl site, where the population is too small to collect seed from, it grows in very remote places. In late August he walked to a distant col to the north of Ben Alder, a 22-mile round-trip, only to find the populations in full flower with fruits only just beginning to develop. So, a further marathon trip was arranged in late October, but amazingly, even then, the populations were still flowering and much of the fruit seemed immature. A limited collection of the most mature fruits was made anyway, and we are anxiously waiting news from Kew to find out how good the seed is.

The EU Regulation on invasive alien species identifies 23 plant species whose potential adverse impacts are such that concerted action across Europe is required.

As well as placing restrictions on keeping and selling these plants, the Regulation requires governments to consider how best to manage them within their territory. The Scottish Non-Native Species Action Group has identified a Prevention List of species not yet established in the wild in Scotland and likely to become invasive. It has also identified a short-list of established species as Management Priorities, which can be controlled effectively.

A poster at the SBC highlighted six of these species as priorities for recording in Scotland. Of these, *Ludwigia grandiflora* (Water Primrose) and *Myriophyllum heterophyllum* (Variable-leaved Water-milfoil) have not yet been recorded in Scotland; *Hydrocotyle ranunculoides* (Floating Pennywort) and *Myriophyllum aquaticum* (Parrot's Feather) have been recorded in a very limited number of locations and have been or are in the process of being eradicated; but two species, *Lysichiton americanus* (American Skunk-cabbage) and *Gunnera tinctoria* (Giant-rhubarb), are already established in certain areas. Botanists can help with national surveillance efforts by being on the lookout for these species. Any records submitted to the BSBI database, Scotland's Environment Website or iRecord will be assessed by SNH and SEPA, enabling an appropriate response.

**Ian Strachan, Chair, BSBI Committee for Scotland**  
[imstrachan55@gmail.com](mailto:imstrachan55@gmail.com)

## COUNTRY ROUNDUPS – IRELAND

## MARIA LONG

In my last piece I focused very much on aspects of education, training and engagement, so for this piece, I am going to put my focus squarely on interesting plant finds and botanical highlights from across Ireland and Northern Ireland during the past year. These notes were collated for publication here as well as in the 'Vascular plants' section of 'Biodiversity Tales' in the National Biodiversity Data Centre magazine *Biodiversity Ireland*. Let's begin up in Down!

Graham Day, VCR for Co. Down, notes that the first of his monthly meetings, along the Connswater greenway in Belfast, resulted in records for *Poterium sanguisorba* (Salad Burnet) and the Irish non-native *Galium album* (Hedge Bedstraw). On his second monthly outing, along the Granite Trail by Newcastle, the group turned up *Crassula tillaea* (Mossy Stonecrop) and *Tellima grandiflora* (Fringecups),

both non-natives which seem to be increasing in frequency. Disappointingly, Graham reports that the historic stand of *Arbutus unedo* (Strawberry-tree) by the Glen River seems now to be reduced to a single tree.

In June, Roy Anderson found *Papaver nudicaule* (Iceland Poppy), possibly a first Irish record, on a landfill site in Newtownards. In July, *Epipactis helleborine* (Broad-leaved Helleborine) was found on a trip to the Edith Of Lorne glen, near Crawfordsburn. During the summer, *Crambe maritima* (Sea Kale) was reported on the Ulster BSBI Botany Group facebook pages at several sites around the Co. Down coast. The beautiful *Mertensia maritima* (Oysterplant) has returned to the Bloody Bridge coast path after an absence of some years. *M. maritima* was also recorded in Donegal by local VCRs Mairéad Crawford and Oisín Duffy on Inishowen as part of a

BSBI recording weekend.

Paula O'Meara, joint VCR for Wexford, let us know about two of her recent favourite finds, a Victorian update, and a new species for Wexford, and, indeed, Ireland: 'On 19th September I found a real rarity for Wexford, *Erigeron acris* (Blue Fleabane). It formed a small patch on waste ground beside a housing estate in Enniscorthy. The last record in that 10km square was in 1866, when it was the first county record. The tiny alien *Euphorbia maculata* (Spotted Spurge) was found on a traffic island at Ballymoney Lower on 27th August. There are not many records for this species in the UK, and this is the first in Ireland. Might be one to watch out for.'

In June, Rory Hodd and Maria Long had the pleasure of seeing *Polystichum aculeatum* (Hard shield-fern), *P. lonchitis* (Holly fern), and the uncommon hybrid between them *P. x illyricum*, all in

**Left** *Mertensia maritima*, Co. Donegal. *Oisín Duffy*. **Right** *Euphorbia maculata*, Co. Wexford. *Paula O'Meara*





**1** *Polystichum x illyricum*, Co. Donegal. Maria Long **2** *Trichomanes speciosum*, Kerry. Rory Hodd  
**3** *Ophioglossum azoricum*, Co. Cork. Cliona Byrne **4** *Hammarbya paludosa*, Co. Kerry. John Diggin  
**5** *Polygonum viviparum*, Co. Donegal. Rory Hodd

close proximity at Muckish Gap in Co. Donegal. This is one of only four post-2000 records for this taxon for all of the UK and Ireland. Historically, its only sites in Ireland

are two nearby locations at Glenade, in Co. Leitrim. In other fern news, the gametophyte of *Trichomanes speciosum* (Killarney Fern) was re-found at a number

of locations, including in Wicklow and on Clare Island, as well as on Bulbin Mountain, new to East Donegal. A highly unusual new site in calcareous woods was

discovered for the sporophyte near Killarney.

Rory, joint VCR for North and South Kerry, and leader of the inimitable 'Rough Crew' (botanists who climb mountains or sail to islands to make lists of plants – get in touch if you want to hear more!), reports on some other key finds of the year for him: 'We found *Ophioglossum azoricum*, Small Adder's-tongue, on Dursey Island. This species is new to Co. Cork, and was a very nice find, not least because of its tiny size (see photo with sheep dropping for scale!). Another highlight was re-finding the exceedingly rare *Polygonum viviparum* (Alpine Bistort) on Bulbin on Inishowen, not seen at this location since 1991. The best botanical find of the year in Kerry was made by John Diggin, who found *Hammarbya paludosa* (Bog Orchid) near Glenbeigh, the first county record since before 1970. What a find, and well done and

thanks to John who clearly has a great eye judging by the amount of rare and scarce plants he finds!'

In Kilkenny, VCR Roger Goodwillie reports that his highlights included finding an acre of *Festuca altissima* (Wood Fescue) standing over a carpet of Bluebells in a rocky wood near Castlecomer. Also finding *Carex muricata* in a roadside bank, another site for *Equisetum x trachyodon* (an uncommon hybrid horsetail) by a stream and the non-native *Kickxia elatine* (Sharp-leaved Fluellen) in a parched field of corn. There were also such plants as *Osmunda regalis* (Royal Fern) and *Lysimachia vulgaris* (Yellow Loosestrife) in unexpected places, and so too for the non-natives *Anisantha diandra* (Great Brome) and *Picris hieracioides* (Hawkweed Oxtongue).

Two final notes. Staff at the National Botanic Gardens, Dublin, noticed an unusual flower in April 2018, which

turned out to be *Gagea lutea* (Yellow star-of-Bethlehem). This species is uncommon in the UK and unknown in the wild in Ireland. While this is the first time it has been noted in the Botanic Gardens, it is likely to be a very old introduction. It was subsequently spotted by some eagle-eyed members of the 'Dublin BSBI Local Group' a few weeks later at a second location in the gardens.

Lastly, Robert Northridge found *Pyrola minor* (Common Wintergreen) in Leitrim, in July, in what he describes as a 'scrubby birch wood, trampled by cattle, near a bulldozed bog'. This was the first record in the vicinity since the 1800s. So you never know what you'll find until you look!

**Maria Long**  
BSBI Ireland Officer  
[maria.long@bsbi.org](mailto:maria.long@bsbi.org)

## COUNTRY ROUNDUPS – WALES CYMRU

### JULIAN WOODMAN

I would like to introduce Barbara Brown, the new BSBI officer for Wales. The following information from Barbara gives an insight into her background and skills. Barbara will be supporting the vice-county recorders (VCRs) in Wales and encouraging recording amongst the wider membership of BSBI in Wales: 'I am stepping into the role of Wales Officer for the BSBI, although it will be hard to follow the great work done by my predecessors Paul Green and Polly Spencer Vellacott. I have

lived in Wales, on and off, for over a decade now, having first been sent here as an Information Officer to RSPB South Stack, Anglesey, in 1998. This was followed by a stint at RSPB Ynys-hir and a role initially as Tutor and then Senior Tutor for FSC Rhyd y creuau at Betws y Coed. I was pleased to have the chance to come back to Wales as OPAL Community Scientist for South Wales, where I helped a wide range of audiences learn more about the natural environment

and take part in citizen-science surveys on everything from earthworms, pollinators and lichens to tree diseases.

'Most recently, I have been working for the Radnorshire Wildlife Trust at Gilfach Nature Reserve, where I worked with and trained up volunteer plant surveyors, as well as obtaining Natural Resources Wales consent for the collection of *Vicia orobus* (Wood Bitter-vetch) and *Trollius europeus* (Globeflower) seeds.

'As a partly intentional side

effect of surveying boundaries for a QGIS map, the Gilfach volunteer rangers and I collected a lot of data on plant and fungi distribution on the reserve, which I used to create QGIS distribution maps and inform the conservation management process. These were particularly helpful in showing the distribution of *Vicia orobus* at Gilfach, and considering if there was a case for introducing it to new areas.

'In my spare time I have been taking part in Plantlife's Cennad apprentice scheme, which has helped me to learn a lot more about lichens and biological recording. This project was run by Tracey Lovering of Plantlife Cymru and it trained a cohort of people from a wide range of backgrounds, including artistic, scientific and professional. We had quarterly training sessions in different habitats across Wales, and mostly focused on lichens which grow on trees.

'I hope to bring my teaching background to the Wales Officer post to deliver entry level botany sessions based on the 'Pocket Guide to Wildflower Families' approach which has had success in Scotland. I will also be arranging intermediate and advanced level training for VCRs and members, as well as working to promote botany and the central role of plants in the web of life.'

Many of the recorders in Wales are continuing to 'square bash' and 'site bash' with vigour for the Atlas. Many of the reports, or links to blogs, for 2018 can be seen in the Wales section on the BSBI website (<https://bsbi.org/wales>). There is also a link on this page



x *Conyzigeron stanleyi*. Barry Stewart

to back issues of the *BSBI Welsh Bulletin* where there are fuller reports of the latest discoveries. The following are some snippets from these.

A new location for *Stellaria nemorum* (Wood Stitchwort) in the northern part of Monmouthshire, away from its stronghold in the lower Wye Valley. What subspecies it is still has to be ascertained as both visits were unlucky in not finding any ripe seeds. Both *Pyrola minor* (Common Wintergreen) and *P. rotundifolia* (Round-leaved Wintergreen) continue to turn up on new sites, usually coal spoil and sometimes new forestry, in Monmouthshire and Glamorgan. Tim Rich, with the help of Angus Tillotson and Libby Houston, has been contracted by Natural Resources Wales to pin down, accurately, locations for the rare and sometimes endemic *Sorbus* (whitebeam) species on the Welsh side of the Wye Valley. This work has involved some difficult terrain

requiring roped access; if only the difficulty just involved the sheer aspect of the cliffs, as it is difficult to avoid a wasps' nest when you are on the end of a rope! Barry Stewart came across the rare fleabane hybrid x *Conyzigeron stanleyi* (*Conyza floribunda* x *Erigeron acris*) at Burry Port in Carmarthenshire.

Moving north, the Anglesey Flora Group continue to turn up some interesting finds, including *Atriplex praecox* (Early Orache) on the northern shore of the Menai Strait (found by Ivory Rees opposite the site where he found it on the south side in Caernarvonshire). *Baldellia ranunculoides* ssp. *repens* (Lesser Water-plantain) could still be found this year at its only Welsh (and British?) sites, near Mynachdy, Anglesey, but other associates at one of the sites had apparently been lost.

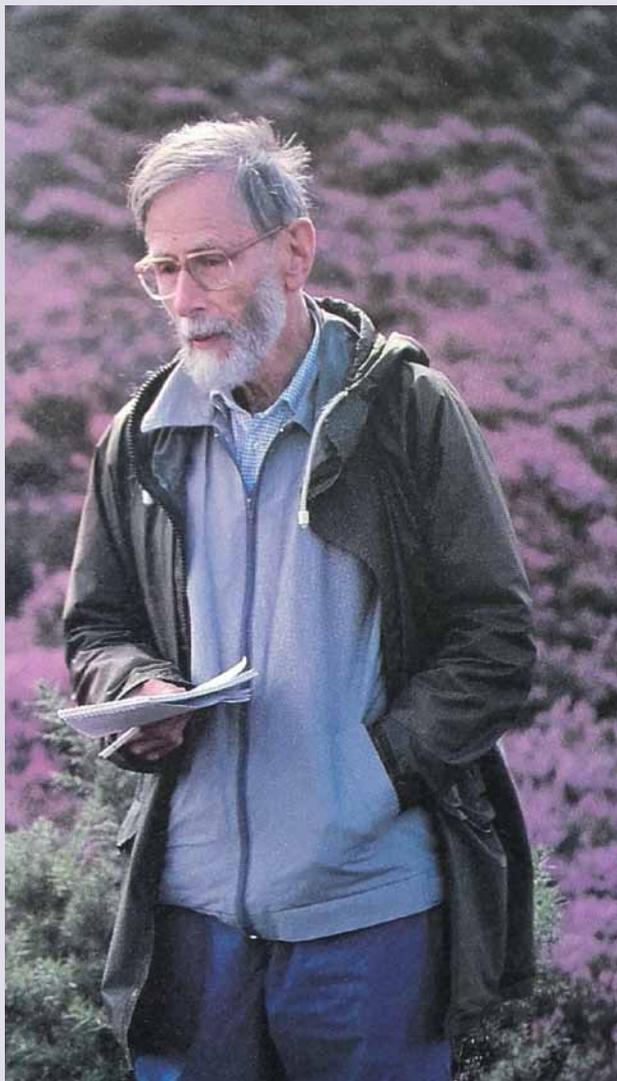
**Julian Woodman**  
[juwood66@gmail.com](mailto:juwood66@gmail.com)

## OBITUARIES

## CHARLES HENRY GIMINGHAM (1923–2018)

On his 90th birthday, in 2013, the Heather Trust toasted Charles Gimingham as ‘the founder of much of our knowledge of heathland ecology, and the man who inspired generations of ecologists’. That seems to be a fair summary of the career of one of Britain’s best-known plant ecologists, one remembered with affection, as well as awe, by his many students and colleagues. I first met Charles in 1977 after arriving in Aberdeen as the new young Assistant Regional Officer in the Nature Conservancy Council. I was responsible for nature reserves in North-east Scotland and Charles had suggested setting up some monitoring plots in one or two of them. Knowing his reputation as an authority on heaths and heather moors, the author of the standard text on the subject, and, as Magnus Magnusson later expressed it, as something of ‘a living legend’, I felt slightly nervous. I needn’t have done. Charles Gimingham was always approachable, generous with his time, and helpful and engaged in his advice. Then in his mid-50s, he was a neat, slender, and dignified figure with spectacles, short brown hair and a matching beard, and a thoughtful, precise, slightly hesitant way of speaking. He was modest, rather shy, and, for an ecologist, surprisingly practical-minded. You sensed that he was, in every way, a *good* man. His students loved him. At one point they wore T-shirts with the slogan ‘Prof Gim Rules OK’. It was funny because Charles had such a quiet, modest presence.

When Charles was himself a student, at Cambridge during the Second World War, plant ecology was still in its infancy. His chief mentor was his father, Conrad Theodore Gimingham, who was an entomologist and director of plant pathology at the Ministry of Agriculture’s lab in Harpenden. Charles was born on 28th April 1923 and educated at Gresham’s School in Norfolk where he won an open scholarship to Emmanuel College, Cambridge. Choosing botany as his final year subject in the Natural Science course, he graduated with a first in 1944. After a year as a research assistant at London’s Imperial College, Charles joined the staff of Aberdeen University, at first as a research assistant but very soon, after the completion of his



Charles Gimingham in 1993. *Des Thompson*

PhD, as a lecturer in the Department of Botany. He remained there for the rest of his life. In 1948 he married Elizabeth Caroline Baird, daughter of the Minister of St Machar’s Cathedral in Aberdeen, with whom he had three daughters, Alison, Anne and Clare.

At first Charles taught all kinds of botanical subjects, including agricultural botany, as well as his father's discipline, plant pathology. He led field courses to various places in eastern Scotland until the department acquired its own field studies centre in Sutherland. He also helped to set up a Masters course in ecology at the university. His research interests were at first very broad and included saltmarshes, sand dunes and bryophytes. Gradually they began to focus on that quintessential landscape of north-east Scotland, heather moorland. By the 1960s, heather moors were in decline, partly through neglect, partly through inappropriate management, which robbed the soil of its fertility and promoted coarse grass at the expense of heather.

Charles Gimingham's studies of the biology and ecology of heather, and its regenerative capacity, contributed to better moorland practice in the form of longer burning cycles which also tended to maximise biodiversity. His work lies at the heart of *The Muirburn Code* (2017), a Scottish government document which sets out the law and best practice for land managers. His book, *Ecology of Heathlands* (1972), became the standard university text, and was followed in 1975 by *Introduction to Heathland Ecology* and, in 1992, by *The Lowland Heathland Management Handbook*. Another key work was his monograph on *Calluna vulgaris* (Heather), published in 1960 in the *Journal of Ecology's* Biological Flora series.

Charles took a six-month leave of absence to visit heathland sites in Scandinavia and northern Europe, and help to establish a European Heathland Workshop on management and conservation, which still meets. He also visited Libya, where he studied the ecology of a desert oasis, and met the then King, and Japan, which led to a lifelong interest in Japan's culture and traditions. At home he became Vice-county Recorder for both South and North Aberdeenshire in 1961, serving until 1979 and 1977 respectively. He also

became much involved in conservation management, sitting formally on various local and Scottish boards and committees. His advice was much sought after by such bodies as the Countryside Commission for Scotland, and its successor, Scottish Natural Heritage, and the National Trust for Scotland. He helped to establish the Cairngorms as Scotland's second National Park in 2003, and he edited *The Ecology, Land Use and Conservation of the Cairngorms* (2002).

Charles Gimingham was promoted Senior Lecturer at the university in 1961 and Reader three years later. He was given the honour of a personal chair in 1969. In 1981, he was appointed head of department and Regius Professor (a title dating back to the 15th century). He formally retired in 1988, aged 65, but remained busy in various advisory roles on heritage and conservation bodies. During his long career he served as President of the British Ecological Society and the Botanical Society of Edinburgh. He was made an OBE in 1990, held a higher (ScD) degree at Cambridge, and was a Fellow of the Royal Society of Edinburgh. He was also a long-serving elder at St Machar's Cathedral.

Charles was famously willing to 'get his hands dirty' on fieldwork, sprawling full length in various wet or peaty habitats, lens in hand, and mucking in with the cooking and washing up at the field centre afterwards. One of the outstanding postwar generation of British botanists and ecologists, his influence on the management and preservation of moorland and upland landscapes was great. His name will long be associated with heather and its management.

Charles Gimingham died at Milltimber, near Aberdeen, on 19th June 2018, aged 95. He is survived by his wife and daughters, and by his beloved grandson Jack.

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Peter Marren

## ARTHUR HUGH MILLINGTON SYNGE (1951–2018)

**H**ugh Syngé was not a BSBI member in recent years, but as a plant conservationist he was familiar to many Society members through his European flora work, *Plantlife* and the magazine *Plant Talk*. A conservation pioneer 'before it was profitable

or popular', Hugh was variously director, manager, fund-raiser, consultant, convener, rapporteur, writer and editor. Above all he played a central role in putting plants alongside animals at the forefront of international conservation. Born in Woking, Surrey, on



Hugh Syngé in 2006. *Stephen Durnford*

4th August 1951, his father was Patrick Syngé, author and editor of many Royal Horticultural Society and other horticultural publications. Educated at Rugby School and graduating in horticulture from Wye College, in 1973, Hugh joined the herbarium at the Royal Botanic Garden, Kew, helping Ronald Melville to assemble data for a first plant Red Data Book. Subsequently Gren Lucas and he compiled the 250 case histories of geographically restricted threatened plants that became the seminal *IUCN Plant Red Data Book* (1978).

In the 1980s Hugh continued to work at Kew, designing and developing the IUCN and WWF-International Plants Conservation Programme, part of which today is Botanic Gardens Conservation International (BGCI). An early enthusiast for electronic media, the Threatened Plants Database he set up at Kew was a foundation of the UNEP World Conservation Monitoring Centre in Cambridge. He and Danish botanist Ole Hamann also created, with the World Health Organization, a global medicinal plant conservation programme, and he helped the European Commission draft botanical sections of the

EU Habitats Directive.

In 1990, having failed to obtain a senior post in the USA, Hugh became a freelance consultant. That year he and five others launched *Plantlife*, of which he was the first Secretary to the Board, and he was a prime mover in the conservation network *Planta Europa*. Hard-working, meticulous, reserved, fastidious, even puritanical, he expected high standards of his collaborators and was not always an easy person to work with. He brought to all his projects energy, an incisive intellect and practical output in readable prose, ever ensuring that ‘it is not the beginning, but the continuing of the same unto the end, until it be thoroughly finished, that yieldeth the true glory’.

Hugh liked writing and magazines, and was an expert at creating clear, concise conservation messages. In 1994 he and I founded *Plant Talk* (‘if the plants could talk’), of which he was Director and (from 1999) Editor. This colour-illustrated international quarterly magazine for plants and their conservation was published between 1995 and 2006 and achieved 44 issues. It was widely admired and appreciated but never enjoyed wide enough support from the academic establishment. It made Hugh a master of electronic typesetting, artwork and page layout, and he designed and typeset a number of books, including five BSBI handbooks *Dandelions, Docks and Knotweeds, Evening-primroses, Pondweeds* and *Sea Beans and Nickar Nuts*.

After *Plant Talk*, Hugh returned to a long-held interest in renewable energy to set up Soltrac, a solar energy power company. He later convened and chaired Nadder Community Energy, using solar energy income to assist his local community of Tisbury and district in Wiltshire. A keen gardener, and latterly cook, like his father he specialised in growing lilies and other bulbs. Devoted to his many projects and busy with a worldwide web of colleagues and friends, he did not marry.

In 2007 *Plantlife* presented him with their Award for Lifetime Achievement in conservation and BBC Wildlife magazine voted him one of the UK’s 20 most influential conservationists. He died at his Wiltshire home of aggressive bone cancer on 4th August 2018, his 67th birthday.

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**John Akeroyd**

## ANTHONY WARREN SMITH (1929–2018)

Tony Smith was born in Bedford on 22nd November 1929, the oldest of four children.

His mother kindled his interest in the natural world and she would have known flower names. He went to school in Bedford and left to join the railway, which he had loved since his first train journey at an early age. After National Service with the RAF he returned to the railway, and on completing his training he went to several little stations including Aspatria in Cumberland (as it was then), serving as Station Master in at least three different places. In 1956 he married Elizabeth Ann Houldey in Rugeley, Staffordshire, where Liz lived, and they had two children. Working in railway offices, timetables were his great love, an interest which continued later on Arran with input into the bus timetables. This tied in with his love of making lists, listing flowers, birds, everything, even lists of lists!

On retirement from Western Region after 35 years with the railway, he joined a nature society in Bath and Avon. The Avon Wildlife Trust were carrying out verge surveys at the time and they sent Tony out into the country to record roadside flowers, which appealed to his love of making lists. Liz accompanied him at first as she knew more about flowers at that time, but he soon took over. She recalls that Tony was always interested in all aspects of nature but he didn't really study flowers until he retired.

In 1986, not long after moving to Whiting Bay on the Isle of Arran, Tony went to Brodick Castle to meet head gardener Derek Warner, and there he was introduced to Tony Church, who was soon to become the local Vice-county Recorder. He lived in Lochranza at the opposite end of Arran, and the two Tonies between them set about systematically recording the island for the first time. Many botanists had visited Arran on holiday, but most had been content to record *Mertensia maritima* (Oysterplant) and the endemic *Sorbus* (whitebeam) species. The two co-authored a checklist of the flora at hectad scale in 1990, which has since been kept up to date by successive revisions. As a result of their labours, Arran was well represented in the *New Atlas* (2002). After this, Tony Church retired from the recordership, leaving Tony Smith in sole charge of Arran botany. He refused any formal post, and after

I took over as Clyde Islands recorder he continued to resist my efforts to have him appointed joint recorder.

Living on Bute, I had little opportunity to spend time on Arran, and most of the Arran fieldwork fell to Tony. His broad interest in natural history gained him many contacts around the island. Apart from plants, music was his great interest, and he was a gifted teacher. As well as piano, he coached four choirs to festival standard, which kept him very busy at certain times of the year. This further extended his range of acquaintances, and along with his invariably pleasant and courteous manner ensured that he was always welcome to botanise in places where others might have been less well received. The Forestry Commission even allowed him to plant his favourite tree (*Abies forrestii*) at several sites on their land.

Once I had persuaded him that all records were useful to BSBI (and not merely new hectad records), I would receive an annual bundle of 40–50 recording cards from the sites he had visited throughout the year. Tony never used a computer, but he kept meticulous lists from all his sites. These usually coincided with monads except where topography dictated otherwise (one favourite fragment of ravine woodland fell into four tetrads!), and covered nearly all of Arran except the mountains. Tony had a small number of regular botanising companions with whom he shared his ever-widening store of wisdom, notably Robin Whitlaw, Alan McBain and most recently Sarah Cowan, to whom now falls the task of carrying Arran botany forward. Sarah remembers that he had a sweet tooth, and would share around Twix bars at the end of each outing.

Tony's particular botanical interests included ferns (he led a number of meetings of the British Pteridological Society when they visited Arran), *Atriplex* (he was the first to demonstrate the presence of *longipes* hybrids in the Clyde area) and willows, as he wrestled with the multitude of hybrid forms which Arran presented. He paid close attention to sedges and grasses and took a particular interest in areas of clear-fell sitka spruce, observing the vegetational succession when these remained unplanted for many years, as often happened in Arran at that period. His enthusiasm for conifers led him to make a complete

inventory of all the kinds planted in Brodick Castle grounds. But he drew the line at coastal casuals, and would march deliberately past some odd-looking horticultural alien, saying he did not wish his lists to be mistaken for a nurseryman's catalogue. Despite this, his own garden was a glorious mixture of Arran plants, native or otherwise, where another of his enthusiasms, hybrid docks, had a prominent place.

During his 30 years of active botanising on Arran he contributed over 58,000 records to the BSBI database, the majority of these after Tony Church's retirement. But no less significant were the insights he passed on with inexhaustible patience to many (including myself). He would encapsulate the jizz of a plant in a few well-chosen words, and it would be remembered. He wrote a series of articles on trees for

the local paper, the *Arran Banner*, and he led botanical walks for the National Trust for Scotland, for schools and for local natural history groups.

Tony died 'of old age' on 10th September 2018 and is buried in Lamlash cemetery, a regular recording site where he and Alan found the pretty, pale blue flowers of *Pratia pedunculata* (the first record for v.c.100) in 2009. He is survived by his grown-up children, Alison and Aidan, both living in Arran, and his wife Liz, to whose care he devoted much time in his last years.

I thank Tony Smith's widow Liz, Tony Church and Sarah Cowan for contributions to this obituary.

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Angus Hannah

## OBITUARY NOTES

Since we compiled the last Obituary Notes, news has reached us of the death of the following members or former members. We send our sympathy to all their families and friends. Obituaries of Tony Smith and Hugh Synge are included in this issue of *BSBI News*, and we hope to publish obituaries of Gill Gent and Geoffrey Wilmore in the future.

**Mr R.L. Bland** of Bristol, a member for six years.

**Mr D.H. Colville** of West Byfleet, Surrey, a member for 25 years.

**Mrs G.M. Gent** of Wellingborough, Northamptonshire, a member for 72 years and sole or joint Vice-county Recorder for Northants for 48 years.

**Mr M. Howells** of Swansea, a member for 23 years.

**Mrs E.E. Marper** of Wigton, Cumbria, a member for almost 36 years.

**Ms U. McDermott** of Carrick-on-Suir, Co. Waterford, a member for 12 years.

**Mr A.W. Smith** of the Isle of Arran, a member between 1985 and 2015.

**Mr A.H.M. Synge** of Tisbury, Wiltshire, a member in the 1970s who subsequently worked for the Society on several BSBI handbooks.

**Dr J.C. Underhill-Day** of Wareham, Dorset, a member for 25 years.

**Mr G.T.D. Wilmore** of Keighley, West Yorkshire, a member for 33 years and Vice-county Recorder for South-west Yorkshire for 22 years.

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**Chris D. Preston, Obituaries Editor**

19 Green's Road, Cambridge CB4 3EF

[cdpr@ceh.ac.uk](mailto:cdpr@ceh.ac.uk)

assisted by the Membership Secretary, Gwynn Ellis



# Annual Summer Meeting King William's College, Isle of Man (v.c.71), 16th–23rd July

JONATHAN SHANKLIN

The 2018 Annual Summer Meeting was based at King William's College at Castletown, Isle of Man. Several people commented that the old school buildings had a striking resemblance to Hogwarts. However, whilst botanical and bryological training was on offer, skills in wizardry were not. The meeting was a joint one with the British Bryological Society, although botanists outnumbered bryologists. A full report on the bryological results will appear in *Field Bryology* in due course.

We were welcomed on arrival by the local organiser, Philippa Tomlinson and her team of helpers. Almost as soon as we had found our rooms it was time for the first excursion: a visit to the nearby Langness Peninsula, which, although walkable, we drove to so that we would have more time there. Conveniently, the car park was just at the northern edge of a monad, simplifying the recording. For many, the coastal heath brought species not seen in their local county, for example *Chrythmum maritimum* (Rock Samphire) and *Scilla verna* (Spring Squill).

During the week, we had two coach trips to sites of special interest, mixed with days of recording in smaller groups. The first of the coach trips headed

The Isle of Man coastline. *L. Gravestock*

for The Ayres NNR in the far north of the island. This is a coastal dune site, and whilst the vegetation was mostly burnt brown in the drought there was a dune slack with a drying pond that had several interesting plants. The bryologists were impressed with *Riccia cavernosa*, whilst the botanists admired *Gnaphalium uliginosum* (Marsh Cudweed) and *Veronica scutellata* (Marsh Speedwell). A sedge by the pond was initially identified as *Carex elata* (Tufted-sedge), but there were stomata on both surfaces, raising the possibility of it being the hybrid with *C. nigra* (Common Sedge). Sedge referee Mike Porter later confirmed this conclusion when he received the specimen. Curiously, the *C. elata* parent has not yet been recorded from the Isle of Man and the nearest location for it is some 90km away on the Westmorland coast. Also, at The Ayres we saw the island's eponymous plant, *Coincya monensis* ssp. *monensis* (Isle of Man Cabbage). In the afternoon we headed south to see some wonderful hay meadows, with the highlight plant being *Carum verticillatum* (Whorled Caraway).

The second coach trip took us to two contrasting



A coach party on the second day at Ballachurry Meadows. M. Sheehy-Skeffington

sites. First stop was an old mining 'dead', essentially the spoil from former lead-mining operations. Although the vegetation was again expected to be burnt brown, no sooner had we left the coach than we stumbled across *Ophioglossum vulgatum* (Adder's-tongue) and then the even more exciting *Botrychium lunaria* (Moonwort). For the afternoon our target was the coastal section of Glen Maye, with one party making a relatively easy descent down to the beach, and the other group a more vigorous walk along the coastal path. Some of this party made an even more demanding descent down a steep slope at Traie ny Volain to a sea-cave with wonderful growths of *Adiantum capillus-veneris* (Maidenhair Fern).

Using a different strategy, our day at the Curraghs saw the group split into four teams, each assigned a different quadrant of the site to record. The Curraghs is a glacial depression, where peat

*Coincya monensis* spp. *monensis*. K. Imms



*Adiantum capillus-veneris* and *Eupatorium cannabinum* (Hemp-agrimony). J. Shanklin

bogs formed and the peat was later cut for turf. When the cutting ceased the bog became re-wetted with subsequent growth of carr, now including quite dense patches of *Myrica gale* (Bog-myrtle). Some meadows continued to be cut for hay for a while, and in the 1930s the Government tried to grow *Phormium tenax* (New Zealand Flax), some of which remains. Many of the meadows are becoming overgrown, but some are still cut for hay and these are quite diverse. A relict peat-cutting pond (dry on our visit) had patches of *Hypericum elodes* (Marsh St John's-wort) and semi-tussocks of *Carex diandra* (Lesser Tussock-sedge) round the margin. For many the highlight was seeing naturalised Red-necked Wallabies (*Macropus rufogriseus*), long escaped from the nearby zoo.

The other days were spent in small groups recording tetrads, although on occasion it took nearly all day just to do a monad. Each group had different experiences, with some opting for rough ground, which was rarely very rough, but often uneven and uphill, with others getting more level ground to explore. The idea was to mix up the groups with participants of different skill levels in each, and vary the groups each day so that everyone would learn different tips. This turned out rather harder to put into practice, but made for enjoyable days out. It also produced records of new species for the island, with recorders from other counties able to spot species that are often cryptic. One example was *Lemna gibba* (Fat Duckweed), which has a flat form common in the Fens, which, when held up to the light and inspected with a hand lens, shows large central cells. Because it is not 'fat' it has widely been recorded as *Lemna minor* (Common Duckweed), so northern recorders in particular may want to look more closely at their duckweeds.



Searching for plants among some old lead-mining spoil heaps. L. Gravestock

On return from the day out, there was sometimes an opportunity for a quick id session, but more often this had to wait until after dinner or after the evening talk. We had one of the school classrooms for these sessions, and, with identification books, several experts and some microscopes, we were able to determine many specimens that puzzled us in the field. The bryologists in particular needed the microscopes to see the tiny details of leaves or tubers that were critical for identification. For most of the vascular plants a hand lens was sufficient, but a stereo-microscope helped to see some of the finer details.

Philippa Tomlinson organised an informative range of evening talks. We started with Andree Dubbledam setting the scene and speaking about the varied habitats on the island, illustrated with some of the species that we might find. Jonathan Shanklin, who had spent the northern winter at Halley station in Antarctica (no flora at all), spoke about the Flora of Antarctica and South Georgia. This ranged quite widely to include the Flora of the neighbourhood of Llandudno at the end of the 19th century, the Falklands, and an update on Antarctic ozone depletion and climate change. Aline Thomas gave a talk about the Areas of Special Scientific Interest on the island and how they were designated. Laura McCoy, curator of Natural History at the Manx Museum, told us all about the recent discovery of a skeleton of a Giant Deer on the northern coast of the Isle of Man in a Characeous

Marl. The talks series concluded with one by Philippa Tomlinson about some of the recent studies of post-glacial fossil pollen on the island and how it illustrated different plant communities over time.

Data entry for the meeting is still in process, but we can draw some conclusions from the records entered into my MapMate database. The 30 participants between them made well over 2,000 records of 489 species from 14 tetrads. Many cards had at least one post-2000 hectad record, and quite a few included plants rare in the vice-county. Some had new post-2000 county records, but how many actual county records were made will require further verification by the county recorder.

The most frequently reported species were completely different to the most frequent ones at the previous Annual Summer Meeting in Flintshire. The Isle of Man top three were *Anthoxanthum odoratum* (Sweet Vernal-grass), followed by *Holcus lanatus* (Yorkshire-fog) and *Agrostis capillaris* (Common Bent), whilst Flintshire had *Urtica dioica* (Common Nettle), followed by *Dactylis glomerata* (Cock's-foot) and *Ranunculus acris* (Meadow Buttercup). Species with a MapMate 'status' seen during the week included *Spergula arvensis* (Corn Spurrey) [Vulnerable], *Mentha pulegium* (Pennyroyal) [Endangered] and *Stachys arvensis* (Field woundwort) [Near Threatened].

Thanks to all the participants and to the local team, the Annual Summer Meeting was a really enjoyable experience (although occasionally stressful for the organisers!). It made a contribution to recording in the Isle of Man for Atlas 2020 and brought other benefits, too. The participants were able to learn from each other, to see species that were new to them and gain a little bryological knowledge. There was the opportunity to socialise, particularly over the evening meal. The 2019 Annual Summer Meeting will be based at FSC Malham Tarn, where we will be enjoying some of the well-known local flora, and exploring under-recorded tetrads in the neighbourhood for a final Atlas 2020 push.

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#### Jonathan Shanklin

Hon. Field Meetings Secretary, 11 City Road,  
Cambridge CB1 1DP  
[jdsh@bas.ac.uk](mailto:jdsh@bas.ac.uk)

## REVIEWS



### The Field Key to Winter Twigs

a guide to native and planted deciduous trees, shrubs and woody climbers (xylophytes) found in the British Isles.

John Poland  
Botanical Society of Britain and Ireland, 2018  
256pp. 38 colour plates. £20 pbk  
ISBN 978-0-956014-41-2

As the full title indicates, this book covers the great majority of woody species found wild or in cultivation in Britain and Ireland, including many found only in gardens or arboreta. The key is illustrated with beautiful and accurate line drawings by Robin Walls,

showing features of twigs, buds and stem sections, and photographs by Philip Tomkinson and Kevin Widdowson, giving the user ample opportunity visually to check the results of using the keys. Unusually, the keys sometimes end in triplets (or more) rather than couplets, and the overall layout is partly alphabetic and partly based on abbreviations of the generic name. In practice, the keys are designed for ease of use and the group headings often contain references to 'spot characters' designated by numbers. These are shortcuts to identification, and should be consulted before starting the relevant key.

The 12-page introduction is a *tour de force*, providing everything from references to previous publications on the subject, to how to distinguish prickles, spines and thorns (based on their position and on how they are modified from branches, leaves and stipules). Bud morphology is treated in great detail, as it provides many of the characters by which genera and

species can be told apart.

The book is intended to be a companion volume to *The Vegetative Key to the British Flora* by the same author, which should be consulted for identifying non-flowering herbaceous plants. Because of the specialist nature of the material in this new key, great care has been taken to describe each twig in detail, and there are many features that one would not normally encounter in a traditional Flora. The lists of unusual characters, occupying pages 173 to 200, begin with a 'contents page', but some of the lists are quite long and would perhaps have benefited from a different approach such as a 'formula key'.

The author admits in the preface to having learnt many new characters in the process of writing this book. By sharing this expertise with the reader, he has provided a powerful tool that enables even the novice to achieve success in identifying trees and shrubs in winter.

**John Edmondson**  
**a.books@mac.com**

## BOOK NOTES

#### The Greenwood Trees: history, folklore and uses of Britain's trees

C. Hart-Davies  
Two Rivers Press, 2018  
120pp. £15.99 pbk  
ISBN 978-1-909747-40-1

By the author of *A Wild Plant Year*, this companion volume focuses on the folklore and cultural history of Britain's trees, including some introductions. It is illustrated by Christine

Hart-Davies' own watercolour paintings, seen also in the *Collins Wild Flower Guide*.

#### Oxfordshire's threatened plants

S.E. Erskine, H.J. Killick, C.R. Lambrick & E.M. Lee  
Pisces Publications, 2018  
154pp. £18.95 pbk  
ISBN 978-1-874357-84-1

A collaboration between three field botanists and the Thames Valley Records Centre has produced this exemplary guide

to the rare and scarce species of plants in Oxfordshire (both v.c.23 and the administrative county). Detailed records, with six-figure grid references, are cited and many of the species are illustrated with colour photographs. Dot distribution maps incorporate a natural areas background.

**John Edmondson**  
**a.books@mac.com**

## NOTES

## FROM THE COMPANY SECRETARY

This report has been prepared by Delyth Williams, Honorary General Secretary. A new Company Secretary was appointed on 23rd November 2018, and the BSBI is very pleased to welcome and introduce Steve Gater to this post.

Steve has much experience of governance and is a trustee on several charities, including Durham Wildlife Trust. Following a very long gestation period, retirement has enabled him to get serious about his interest in botany. Easy access to the wonderful flora of Upper Teesdale and Durham's magnesium limestone is a delight, but you will see him elsewhere at BSBI events, so have a word when you do.

#### Annual General Meeting of Botanical Society of Britain and Ireland – 17th November 2018

The fifth AGM of the Botanical Society of Britain and Ireland was held in the Lecture Theatre, Faculty of Health and Social Care, Edge Hill University, Ormskirk, Lancashire, in association with the 2018 Annual Exhibition Meeting. Ian Denholm chaired the AGM, with contributions from Delyth Williams and Julie Etherington. The Chair thanked the officers, staff and especially the very many volunteers for their support of BSBI

and its work during the year under review. The minutes of the 4th AGM were approved.

A summary of the formal business of the AGM is given below. The full minutes (draft until approval at the next AGM) are available for download on the BSBI website.

#### Annual Report and Accounts – 31st March 2018

The financial report and accounts distributed as part of the Annual Review in the membership mailing with the September 2018 edition of *BSBI News* were in a summarised format. The full Annual Report and Accounts, from which the summary was compiled, were distributed in paper form at the AGM after publication on BSBI's website two months earlier.

The Annual Report and Accounts had been approved by the Board and by the Independent Examiners, without qualification, on 18th September 2018. BSBI had net assets of £953,919 as at 31st March 2018 (prior year: £1,003,319). Delyth Williams presented the accounts, drawing attention to a significant reduction in the operating deficit, attributable to a restored income stream, fundraising and various measures of cost reduction.

The members present adopted

the accounts and re-appointed the Independent Examiners, WMT of St Albans, and authorised the Trustees to fix their remuneration.

#### Board of Trustees

Paul Bisson, Chris Cheffings, Mick Crawley and Sarah Whild retired by rotation and were re-elected to the Board to serve for a further term.

The Board has 11 members who serve as Company Directors and Charity Trustees.

#### BSBI President

Chris Metherell, President of BSBI, indicated his wish to retire at the 2019 AGM.

Members elected Lynne Farrell as President-elect. A brief profile is included in the 2018 AGM agenda and minutes.

#### Council

Mary Dean, Trevor James, Liz Lavery and John Swindells retired by rotation as members of Council. Mary Dean, Liz Lavery and John Swindells were elected to serve a further term. Trevor James indicated his wish to retire from Council. Max Brown was elected as a new member of Council. A brief profile was included in the 2018 AGM agenda and minutes.

*By Order of the Board*  
Delyth Williams  
31st December 2018

## FUNDRAISING FOR ATLAS 2020

## JANE HOULDSWORTH

Members will remember that in the September 2017 issue of *BSBI News* there was a piece by several authors describing the use BSBI has made of the many donations, bequests and grants it has gratefully received over the years. It also called attention to the need to raise further funds necessary

to deliver Atlas 2020, particularly with regards to the staff time required for data management, analysis and interpretation.

A leaflet appealing for donations was included with each copy of *BSBI News* and cited the target of raising £75,000 over several years in order to build on the amazing volunteer effort of our members. We are very aware that without your hard work, especially in collecting and collating records in recent years, Atlas

2020 simply could not happen.

I am very pleased to report that progress towards reaching this sum is currently at the £45,000 mark, thanks to a combination of donations and grants from members, supporters and charitable trusts. This is absolutely fantastic as it brings us nearer to achieving our aims for Atlas 2020.

There is, however, still a way to go. We are continuing to work hard to seek further contributions from charitable trusts and we are also asking members to please consider two requests:

- Can you help BSBI to distribute Atlas 2020 appeal leaflets far and wide? Please get in touch with me if you think you can help.
  - Are you able to donate to Atlas 2020? BSBI is very grateful for all donations, whether large or small. You can donate right now at <https://bsbi.org/appeal>.
- A huge thanks to all of you who have already contributed.

**Jane Houldsworth**  
BSBI Head of Operations  
[jane.houldsworth@bsbi.org](mailto:jane.houldsworth@bsbi.org)

## BSBI DIARY 2019

Saturday 19 January	Committee for Ireland	Glasnevin, Dublin
Tuesday 29 January	Meetings and Communications	London
Tuesday 29 January	Records and Research	London
Thursday 7 February	Training and Education	The Gateway, Shrewsbury
Thursday 14 February	Publications	London
Tuesday 19 February	Council	Linnaean Society, London
Saturday 23 February	Committee for Wales	Aberystwyth
Tuesday 19 March	Board of Trustees	Brewin Dolphin Offices, London
Tuesday 19 March	Board of Trustees' Investment Committee	Brewin Dolphin Offices, London
Saturday 30 March	Irish Spring Conference	Glasnevin, Dublin
Friday 5 April	Committee for Scotland	Perth
Tuesday 21 – Thursday 23 May	Welsh AGM & Summer Meeting	Llanelli
Tuesday 4 June	Board of Trustees	Linnaean Society, London
Saturday 13 – Friday 19 July	Annual Summer Meeting	Malham Tarn
w/c Monday 9 September	Board of Trustees	tbc
w/c Monday 9 September	Board of Trustees' Investment Committee	tbc
Friday 13 September	Committee for Scotland	Perth
Saturday 21 September	Irish AGM	Glasnevin, Dublin
Tuesday 8 October	Records and Research	London
Saturday 2 November	Scottish AGM and Botanists' Conference	Royal Botanic Gardens, Edinburgh
November	AEM & AGM	tbc
Spring 2020	Recorders' Conference	tbc

**Delyth Williams, Honorary General Secretary**

## LONG-STANDING MEMBERS

We would like to offer our congratulations to the following who joined the BSBI in 1958 and who will therefore have been members for 60 years by the end of 2018: Dr T.T. Elkington, Mr. D.A.J. Hunford, Prof D.H. Lewis, Mr D.J. McCosh, Dr T.D. Pennington, Mr M.J.C. Read, Prof C.A. Stace.

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## PANEL OF REFEREES AND SPECIALISTS

### JEREMY ISON

Please note the following changes to the Panel of Referees and Specialists. For full details see the *2019 BSBI Yearbook*, which also includes updated contact details and requirements in terms of specimens, etc.

*Quercus*: **Dan Crowley** has joined **Douglas McKean** as Referee for oaks.

*Salicornia* and *Sarcocornia*: **Paul Green** will referee these genera for Ireland (v.cc. H1–H40).

*Calystegia*: **Mark Carine**.

*Veronica hederifolia* agg. and *Juncus bulbosus* agg.:

**Michael Wilcox** will referee these jointly with **Peter Benoit**.

*Hieracium*: **Brian Burrow** and **Mike Shaw**, the latter for v.cc.9–17 only.

*Hedera*: **Alison Rutherford** has retired, and this post is now vacant.

*Heracleum*: **Richard Lansdown**.

Maritime Drift Seeds: **Declan Quigley** is replacing **Charles Nelson**.

Interpretation of Botanical Nomenclature: **Margot Souchier**.

If possible, please contact the Referee by email first and check in the *Yearbook* for the correct postal and email addresses, which may not be the same as in the membership list.

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**Jeremy Ison**

[jeremyison@gmail.com](mailto:jeremyison@gmail.com)

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## PANEL OF VICE-COUNTY RECORDERS

### PETE STROH

I regret to report the death of three long-standing VCRs. Geoffrey Wilmore retired as Recorder for **South-West Yorkshire** (v.c.63) in 2015 after a glittering 22 years of voluntary service. He leaves a lasting botanical legacy via the knowledge he passed on to those who continue to document and help conserve the flora of the county, and the publication of two books (*Alien Plants of Yorkshire*; *South Yorkshire Plant Atlas*).

Gill Gent was VCR for **Northamptonshire** (v.c.32) from 1965 to 2004 and was co-author, with Rob Wilson, of two county Floras. I loved chatting with Gill, a self-effacing, generous person who knew the county's flora inside out, and it is more than unfortunate that Northamptonshire has lost two of its most knowledgeable botanical recorders in 2018, following the death earlier this year of Rob.

Maria Long writes: 'We are also sorry to hear of the recent death of Seán Howard, who was VCR for **Co. Longford** (v.c.H24) from 1992 to 2015. Seán made a very valuable contribution to our understanding of the botany of Co. Longford through his MSc thesis published in 1986, *The Flora of Longford*. The flora was scanned as part of a recent project between BSBI, volunteer Shane Brien, and the National Botanic Gardens, and can be accessed here: <http://botanicgardens.ie/2017/08/01/flora-of-county-longford/>.'

In **Guernsey** (v.c.113), Jane Gilmour has stepped down from the role of VCR after five years in post. Jane's crowning achievement was the *Checklist of Guernsey Plants*, written with Rachel Raby, which documents all species recorded on the island, with

notes about their habitat, distribution and abundance. Helen Litchfield takes over from Jane as the new VCR. Many thanks to Helen for volunteering and making the transition so smooth, and to Jane for all her valuable work.

In **County Durham** (v.c.66), John Durkin has retired after 11 years in post, and is succeeded by Keith Robson. John has made an enormous contribution to recording in the county, not least in training up so many excellent botanists, and we thank him sincerely for all the time, effort and expertise he brought to the role. Many thanks also to Keith, who, I note, has been an active recorder for some time, amassing over 30,000 botanical records for the Atlas.

In Ireland, there are two new joint Recorders in **Leitrim** (v.c.H29): Eamon Gaughan and Aoife Delaney. I say new, although Eamon and Aoife have been testing the waters this year as 'VCRs in training', and have in total contributed more than 40,000 records to the DDb, so it is great to know that they have decided to take up the role on a more official basis, and thanks to both.

Carl Farmer has stepped down from his role as VCR in **Argyll** (v.c.98) after ten years in post, meaning Gordon Rothero is the sole Recorder for the county. Thank you to Carl for his exemplary work for the BSBI, and for the excellent plant identification website (<http://www.plant-identification.co.uk/skye/>) that continues to be incredibly useful for those botanising in the north and west. Argyll is beautiful and diverse, but also a very large and, in parts, mountainous county, and as such we are seeking someone to assist Gordon with recording duties.

Two, or more, VCRs per county is fast becoming the norm, and in **Flintshire** (v.c.51), Gail Quarty-Bishop has volunteered to become co-Recorder with Emily

Meilleur, who has been in post since 2009. Thanks to both Gail and Emily.

In **Banffshire**, Andy Amphlett has been VCR since 2001 and has made a significant contribution, including a near complete digitisation of historic records, sterling work with the validation of records on the DDb, and the creation of an Excel format county Checklist & RPR taxon list, not to mention the collection of many thousands of new records. Andy is now looking for someone to take over from him as VCR.

Taking in all of the above, this means that there are VCR vacancies for seven vice-counties: East/West Sussex; Argyll (joint), Banffshire, Berwickshire; Co. Longford; Co. Louth. If you are interested in more details about what is involved, please do get in touch with the relevant Country Officer, or contact me at the email address given below.

**Pete Stroh**  
[peter.stroh@bsbi.org](mailto:peter.stroh@bsbi.org)

## BSBI PHOTOGRAPHIC COMPETITION 2018

### JIM MCINTOSH

We are pleased to announce the winners of the 2018 BSBI Photographic Competition. The two categories were 1) Plants & People and 2) Plants & Pollinators. Thirty-two members contributed a total of 74 entries; 27 in the first category and 47 in the second. Natalie Harmsworth, the competition organiser, did a great job in printing and mounting the photographs. They formed a dazzling display at the Scottish Botanists' Conference, in Edinburgh, in November, where the two winning images were chosen by popular vote.

The winner chosen in the Plants & People category was entitled 'Learning from Mum – Hannah's meadow, Teesdale' by Heather Kelly, and the winner in the Plants & Pollinator category was entitled 'Argogorytes wasp on Fly Orchid (*Ophrys insectifera*), Wakerley Wood, Northamptonshire' by Pete Stroh. Congratulations to Pete, but especially to Heather for winning a prize in the competition for the second year in a row. Some eyebrows were raised by the fact that a staff member of the BSBI won the competition. Therefore, to ensure probity we have amended the

Learning from Mum – Hannah's meadow, Teesdale.  
 Heather Kelly



rules so that volunteers organising the competition and BSBI staff are ineligible in future! The winners each received a £25 book token kindly donated by Summerfield Books.

Apologies to those at the Annual Exhibition Meeting at Edge Hill University, Ormskirk who were looking forward to seeing the Photographic Competition display. I had planned to mount it there

Argogorytes wasp on *Ophrys insectifera* (Fly Orchid), Wakerley Wood, Northamptonshire. Pete Stroh



but injured myself just before I was due to travel and couldn't make it. However, the photographs have all been uploaded to the BSBI's flickr account (Search for 'BSBI flickr').

We are very grateful to all those who entered or voted in the competition, to Summerfield Books who provided the prizes, and to Natalie Harmsworth for organising the competition.

## BSBI PHOTOGRAPHIC COMPETITION 2019

With Atlas 2020 fieldwork in its final year, now would be a good time to capture photographs that will help illustrate the various Atlas 2020 outputs. These could be photographs that could be used, for example, on the species pages of the new Atlas 2020 website, which capture the key features, or essence, of any plant species found in the wild. We are also looking for images of species where there is an interesting story to tell, such as the rapid spread of an alien species. So, once again, we are calling on you to take your cameras and seek out the most striking images you can find.

This year the BSBI Photography Competition's two categories will simply be: 1) Native plants; 2) Alien plants.

Normal BSBI recording rules apply: the species may be any native or alien flowering plant, conifer, fern, horsetail, clubmoss or stonewort growing in the wild (anywhere outside private gardens). The competition is open to all amateur photographers, but excluding BSBI staff and those involved in the competition's organisation. Photographs must be taken in Britain

or Ireland, but do not have to be taken in 2019. You may enter up to two images per category, but you do not have to enter both categories. The winners will be selected by a popular vote of those attending the Scottish Botanists' Conference in 2019.

- 1 The competition is now open for entries. Deadline for entries is Friday 18th October 2019. Please send your entries to Natalie Harmsworth (natann29@freeuk.com) by that date.
- 2 Please submit the largest possible files sizes, although files over 10MB should be sent via Dropbox and not by email.
- 3 Please entitle photographs using this format exactly: Common name (Scientific name) location by photographer's name and competition category (Native or Alien), e.g. 'Early Pampas-grass (*Cortaderia richardii*), Caithness by John Smith\_Alien.jpg'
- 4 Copyright in the images will remain with the photographer. However, the BSBI claims the right to exhibit the entries, and to use them to further its aims generally and to promote the BSBI and its photography competition. This includes publishing them in its publications, on the BSBI website or social media (photographs will be credited).
- 5 The BSBI also claims the right to edit or use images in combination with others. Good luck!

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**Jim McIntosh**  
BSBI Scotland Officer  
[jim.mcintosh@bsbi.org](mailto:jim.mcintosh@bsbi.org)

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## BSBI RECORDERS' CONFERENCE 2018

### LOUISE MARSH

On Friday 12th October, 69 botanists assembled at FSC Preston Montford, in Shropshire, for the first day of the 2018 BSBI Recorders' Conference. Over the course of the long weekend they were able to enjoy 11 talks, 13 workshops or drop-in sessions and a field session to road-test John Poland's *Field Key to Winter Twigs* which was then at proof stage. Annoyingly, the weather on Sunday morning was extremely wet and windy so the field session, originally scheduled for a nearby site, was held in the grounds at Preston Montford and as soon as the botanists were all wet through they had the option to take specimens indoors for keying out. Nobody seemed to mind very much as they had enjoyed such a great weekend!

You can get an idea of the weekend's delights by

visiting the Recorders' Conference webpage, from which you can download pdfs of all the talks and many of the hand-outs. Feedback from delegates suggests that some of the weekend's particular highlights were Ken Adams' talk on Creating ID resources; Tim Rich of *Plant Crib* fame on 'Some new Gentianaceae taxa' and Geoffrey Hall, Vice County Recorder for v.c.55 on 'Citizen Science: dealing with the deluge'.

Workshops included Geoffrey Kitchener on docks, Matt Parratt on *Abies*, Tim Rich (again!) on identifying dandelions and David Earl on identifying brambles. All these accomplished trainers made delegates feel that they could really start getting to grips with such difficult plant groups.

Delegates also found time during the weekend



Fred Rumsey explaining the finer details of identifying duckweeds at the Recorders' Conference. *Louise Marsh*

to share images and comments on social media. Botanists across the country who had been unable to attend expressed their thanks that they were able to follow the action electronically. You can see all the comments and images here: <https://twitter.com/search?f=tweets&vertical=default&q=%23bsbirecordersconference&src=typd>



Matt Parratt's workshop on *Abies*. *Louise Marsh*

The next Recorders' Conference is scheduled for spring 2020; details will be published in *BSBI News* nearer the time.

**Louise Marsh, BSBI Communications Officer**  
[louise.marsh@bsbi.org](mailto:louise.marsh@bsbi.org)

## BSBI ANNUAL EXHIBITION MEETING 2018

### LOUISE MARSH

On Saturday 17th November 2018, BSBI broke with tradition and headed northwards to Edge Hill University (EHU) in Ormskirk for our Annual Exhibition Meeting (AEM) and AGM, usually held in the south or the Midlands. This year EHU launched a new BSc in Plant Sciences, alongside its popular BSc in Biology, so we invited staff, students and alumni to visit the AEM, exhibit and offer talks.

#### Exhibits

There were 44 exhibits to enjoy – a record number! – including seven by EHU students or alumni, on subjects ranging from ferns of South Lancashire to clonal diversity in British populations of *Carex salina* (Saltmarsh Sedge). We also welcomed first-time exhibitors from across the country: Debbie Alston's poster looked at the current status of *Polemonium caeruleum* (Jacob's-ladder) in the Peak District; Liam Taylor of 'Caring for God's Acre' had a display about the Beautiful Burial Grounds Project; PhD student Ciara Sugrue's poster looked at dune slack

communities and climate change; David Morris exhibited a poster about the Oxfordshire Fens Project; and members of the Wild Flower Hour team exhibited a poster about this very popular social media initiative.

The BSBI stand featured posters about Atlas 2020, the BSBI Summer Meeting, the New Year Plant Hunt and the National Plant Monitoring Scheme. Visitors enjoyed browsing Summerfield Books' pop-up bookshop and taking part in John Poland's Winter Twig ID Quiz. There were also five fully-booked behind-the-scenes tours of EHU's newly-opened Tech Hub, with its Scanning Electron Microscope and plant physiology research laboratory.

#### Talks

Visitors enjoyed talks from eight speakers. In the morning, EHU staff and alumni told us about the North West Rare Plants Initiative, vascular epiphyte assemblages, long-term change and connectivity in meadows and lime trees. After lunch, Prof Paul Ashton, EHU's Head of Biology and our host for the



Delegates at the Annual Exhibition Meeting enjoying some of the exhibits. *Ciara Sugrue*

day, gave an inspirational talk about training the next generation of botanists; and BSBI staff and officers talked about the 2018 BSBI Summer Meeting on the Isle of Man, the Mayo Recording Event and Atlas 2020. The AGM was held in between the talk sessions.

At this, Ian Denholm talked about the year's successes and a new President-elect was voted in. Lynne Farrell was unanimously elected to take over as BSBI President after next year's AGM.

**If you missed the meeting...**

All these presentations and some of the exhibits are available to download from the Annual Exhibition Meeting page on the BSBI website: <http://bsbi.org/annual-exhibition-meeting>.

Thanks go to Kylie Jones, Ciara Sugrue and Ellen Goddard of BSBI's Meetings & Communications Committee who worked with EHU staff and alumni, particularly Paul Ashton, Mary Dean, Josh Styles, Ashley Lyons and Claire Lane, and students Jenni Clayton, James Oliver and Alfie Russell, to deliver such a successful event. Kylie and Mary also chaired the talk sessions. We are indebted to our hosts, Edge Hill University, who very kindly made the venue available to us free of charge, and to all our exhibitors, speakers and visitors who contributed to the day's resounding success.

**Louise Marsh, BSBI Communications Officer**  
[louise.marsh@bsbi.org](mailto:louise.marsh@bsbi.org)

## MARSH BOTANY AWARD 2018

In 2018 the Marsh Botany Award was awarded to Libby Houston (below). This award recognises an individual's lifetime achievement and outstanding contribution in the field of botanical research and conservation.

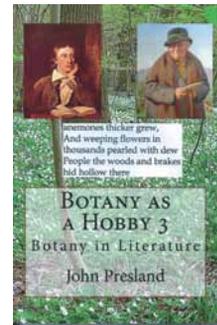
Libby is a poet, botanist and rock-climber, based in Bristol where she is a research associate at the University. She has been especially associated with the flora of the Avon Gorge and more recently the *Sorbus* (whitebeams) of the region. An unusual hybrid, *Sorbus x houstoniae* (Houston's Whitebeam), which she discovered, was named after her by fellow *Sorbus* aficionado, Tim Rich. She was a co-author, with Tim, of the 2010 monograph, *Whitebeams, Rowans and Service Trees*, published by the BSBI. Well done, Libby.

Helena J. Crouch



## BOTANY AS A HOBBY 3: BOTANY IN LITERATURE

BSBI member John Presland has published the third book in a series which explores botany wherever it impinges on our lives. This one describes the relationships between botany and literature. It covers literature in a very broad sense, from scientific writing to flights of fancy. The early part of the book is an account of how plants and the communities to which they belong are presented in literature, and how they are used for wider purposes, such as morality, religion and politics, and how the uses of plants feature. Later chapters describe how botany is portrayed in poetry and novels. Numerous photographs are included to help bring the literary words to life. It is hoped that the book will draw literature lovers to botany and plant lovers to literature. The book is available only through Amazon.



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