

BSBI News

April 2010

No. 115



Edited by Trevor James & Gwynn Ellis



Fumaria parviflora (see p. 31)



Fumaria purpurea, with foliaceous bracts inset
(see p. 31)



Fumaria reuteri (see p. 30)



Fumaria vaillantii with twin flower on lower
pedicel (see p. 32)

All *Fumaria* plants cultivated at Llanynis (v.c.42). Photos A.G. Shaw © 2010

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Cover picture – *Fumaria occidentalis* cultivated at Llanynis (v.c.42). Photo A.G. Shaw © 2010 (see p. 30)

Notes from the Receiving Editor

TREVOR JAMES, 56 Back Street, Ashwell, Baldock, Herts., SG7 5PE;
(Tel.: 01462 742684; email: trevorjjames@btinternet.com)

This issue of *BSBI News* you will find is rather large! This is owing to the fact that, with the change-over from *Watsonia* to the forthcoming *New Journal of Botany*, there is an inevitable hiatus, as well as a slight shift in the nature of material that is being published in the latter, resulting in the appearance on our doorstep (or email inbox!) of a range of articles that might formerly have been submitted to *Watsonia*. We are trying to accommodate what we can in this bumper issue, and hope that things 'settle down' again shortly.

With this change in publications, we have also had to re-visit our thinking about what can be accepted, and what may have to be left out. As a result there have been a few changes. Firstly, we regret to have had to close the long-running *Botany in Literature* feature that many may have enjoyed over the years, and we extend our thanks to Margot Souchier for her contributions over that time. This was announced in the last issue, but I would like to re-iterate this here.

Another change, which has been met with some discussion, has been the decision to move the Field and other Meeting Reports from *News* into a re-considered *Year Book* for the Society. In fact, this reverses a process that occurred many years ago. The *Yearbook* (note subtle name change) henceforth will also house formal Obituaries of members, as perhaps a more appropriate place than a 'newsletter' (if that is really what *News* is!). These had formerly appeared in *Watsonia*, but the new journal, with a broader readership (we hope), is not considered by the editors to be the place for them. Short notices about the death of members, of course, will still appear in *News* as before.

Notes for contributors

I will take this opportunity to set out some guidelines for contributors to *News*, over and above what we have said repeatedly before – that articles need to be submitted to the Receiving

Editor, preferably electronically (but I can type up limited copy when necessary).

Electronic contributions should, if possible, be in WORD format, as simple text, without fancy formatting. The simpler the better. We prefer to receive things in straightforward Times New Roman, 10 point type, with no formatting other than indications of where italics are required. 'Bold' should be avoided, but if you want to emphasise something, underline it. Tables and diagrams can be submitted as part of the text, or separately (either embedded in WORD, or as separate JPEG or PowerPoint files. Photographs are welcome, preferably as high quality JPEG format as possible. I can accept upwards of 7 megabyte files over the Internet, so that should not present a problem. Please make sure we know the name of the person whose photo it is, for due acknowledgement, and have copy for the caption that you want to include. If possible, do not embed photos in text (although I am able to sort this out if it is a problem). If you are submitting hard copy diagrams or drawings, these can be scanned and returned (please include return postage!).

As for what sort of material we are going to include – *BSBI News* will remain focused on current activity concerning botany in Britain and Ireland. We aim to make the journal inclusive, so welcome short articles from beginners or other members, not just academics/professionals. We also welcome short notes on associated topics, such as computing for botany etc., where these are not too long or technically complex. Main articles and notes should be composed at the level at which *News* is aiming – scientifically accurate and proficient, but not necessarily academic in style or content. For the current issue, we are publishing a few articles that might be regarded as of greater overall importance than might previously have been the case – such as papers on new species to the U.K., or articles proposing (minor) taxonomic changes. We

are happy to take these, although if your intended contribution is concerning a scientific study of more than just local context, or is about taxonomic matters of more than just minor importance, we would suggest these need to be contributed, in the first instance, to the *New Journal of Botany*. Where we feel that submitted material ought to go there, we may get back to you to suggest this. As the *NJB* is a refereed journal, unlike much of the material that gets into *News*, you need to bear this in mind. Papers for the *NJB* also need to be composed in an appropriate way, and will almost certainly need one or more revisions before acceptance.

Finally, there has been some discussion in the Society about the potential for *BSBI News* to become more ‘outward-looking’, perhaps more ‘modern’ in style. After debate, the Society has so far decided to keep it much as it is in content and form, with the thought that it is, primarily, the place where members (academic as well as amateur) meet to tell others about their findings, or suggest new ideas. As such, it has (we feel) an important role to play in the Society, which would be different, if it were a journal for ‘others’ as well. But, please let us know what you think.

EDITORIAL

TREVOR JAMES (Receiving Editor), 56 Back Street, Ashwell, Baldock, Herts., SG7 5PE
(Tel.: 01462 742684; trevorjames@btinternet.com)

GWYNN ELLIS (General Editor), 41 Marlborough Road, Roath, Cardiff, CF23 5BU
(Tel.: 02920 496042; rgellis@ntlworld.com)

The last item to be finished for *BSBI News* is always the Editorial. Not just because I [*GE*] always leave things to the last minute (I kid myself that I work better under pressure) but also because I never really know how much space I have to fill until everything else is finalised. It also enables me to respond to last minute items. This time I was fortunate in that details of two websites landed in my email tray at the beginning of January that deserve at least a mention in *News* and they will be found at the end of this editorial.

Yearbook 2011

Observant readers will have noted the change in size and name of this year’s *Yearbook* and, as Trevor has mentioned above, there is also a change in content with Field and other Meeting Reports being transferred from *News*, and Obituaries from the old *Watsonia*.

Because the latter at least deserve to be published in a less ephemeral publication than the old *Year Book* the size and name have been changed in the hope that members will consider this the start of a new journal that deserves to be kept on a book shelf rather than consigned to the paper bin.

List of Members

Another consequence of the change to the *Yearbook* is that a complete list of members will

now be published as a separate booklet once every two years with the first being distributed with the April 2011 issue of *BSBI News*.

Ranunculus ×hiltonii

We are grateful to Dr Gerald Legg of the Booth Museum of Natural History for the following information on a specimen of this hybrid found in their herbarium.

Label details: ‘Copthorne Common E. Sussex. T Hilton May 1897; *Ranunculus hiltoni* H & J Groves (R. *lenormandi* & *peltatus*) for full description see Journal of Botany April 1901 London CaT 8th ed.’

For further information on this specimen or on Hilton’s herbarium contact:

gerald.legg@brighton-hove.gov.uk

BSBI News indexer wanted

With the much lamented retirement of George Hutchinson we are in desperate need of a volunteer to assist with the production of indexes to *BSBI News*. If you would like to give it a try or would like more information on what it entails please email or write to the General Editor.

Where are they now

The following fully paid-up members have upped sticks without leaving a forwarding address. If you know of any of their present whereabouts please let me know [*GE*]

Mr I W Craft, 1 Station Close, Riding Mill,
Northumberland, NE44 6HE
Mr C Dixon, 29 Abbey Grange, Newtongrange,
Midlothian, EH22 4JR
Miss H L Fletcher, 29 Falcon Close, Droitwich,
Worcs., WR9 7HF
Ms M M Haigh, 8 Burnland Terrace, Hexham,
Northumberland, NE46 3JJ
Mrs M E Heywood-Waddington, Brook House,
Oldwood Road, St Michael's, Tenbury Wells,
Worcs, WR15 8TG
Prof D H Lewis, Dept of Animal & Plant Science,
The University, Alfred Denny Buildings,
Western Bank, Sheffield, S10 2TN
Mrs M G Thornton, 9a Miller Road, Luncarty,
Perth, Scotland, PH1 3UR
Miss B Williams, 31 Chelsham Road,
Stockwell, London, SW4 6NR

Apologies to the authors of several interesting papers that, for reasons of space, have had to be held over to the next issue.

The two items to land in my email tray were:

The Plant List <http://theplantlist.org/>

This is a working list of all known plant species. Version 1 aims to be comprehensive for species of Vascular plant (flowering plants, conifers, ferns and their allies) and of Bryophytes (mosses and liverworts).

The Plant List provides the Accepted Latin name for most species, with links to all Synonyms by which that species has been known. It also includes Unresolved names for which the contributing data sources did not contain sufficient evidence to decide whether they were Accepted or Synonyms. It includes 1,040,426 scientific plant names of species rank. Of these 298,900 are accepted species names. It also contains 620 plant families and 16,167 plant genera.

Plantfinder:

<http://dbiodbs.units.it/carso/cercapiante01>

– Images and local names of vascular plants: of more than 7.600 species and 60.000 HD pictures of Italian plants.

This gallery contains the images of vascular plants used for the creation of interactive keys by Project *Dryades*, the Italian branch of the European Project KeyToNature, coordinated by the Department of Life Sciences of the University of Trieste. Most of the pictures are original, and refer to both spontaneous and cultivated plants occurring in Italy. The gallery is also available as an application for the iPhone.

Both these sites have a lot to offer and are well worth investigating.

Marsh Botany Award

We would like to congratulate Rose Murphy, the worthy winner for 2010.

The award is run in association with the Royal Botanic Gardens, Kew, and was started in November 2000. The award recognises an individual's lifetime achievement and outstanding contribution in the field of botanical conservation.

Previous winners have been:

2009 – Lynne Farrell
2007 – Nick Stewart
2006 – Nick Legon and Alick Henrici
2005 – Alan Showler
2003 – David Holyoak
2002 – David Pearman
2001 – Rosemary FitzGerald

DIARY

N.B. These dates are often supplementary to those in the 2011 Calendar in *BSBI Yearbook 2011* and include provisional dates of the BSBI's Permanent Working Committees.

27 Jan	Records Committee, London	9 Mar	Database Sub-committee, Leicester
2 Feb	Meetings Committee, London	23 Mar	Council, London
9 Feb	Training & Education, Shrewsbury	14 May	Scottish Committee, Edinburgh
16 Feb	Publications Committee, London	18-19 June	AGM & Spring Conference, Galway, Ireland
23 Feb	Executive Committee, London	18 June	Council, Galway, Ireland
25 Feb	Committee for Wales, Aberystwyth		
5 Mar	Scottish Committee, Edinburgh		

NOTES

Alopecurus aequalis at the Great Fen, Huntingdonshire

PETE STROH, 14 Rushmere Close, Islip, Northamptonshire, NN14 3LG; (p.stroh@anglia.ac.uk).
MICK BURTON, 11 The Paddock, Alconbury, Cambridgeshire, PE28 4WS

The Great Fen is a landscape-scale wetland restoration project which will eventually cover a c.30km² area. The main goal of the project is to connect two fenland National Nature Reserves (NNR): Holme Fen and Woodwalton Fen. Most of the land in between the two NNRs is ex-arable with modified soils and hydrology. Nonetheless, some ex-arable areas within the project boundary still contain some of the deepest peat in lowland England (c.4-5 metres). The gradual restoration from ex-arable to wetland habitats by Natural England and the Wildlife Trust involves a variety of measures, ranging from minimal intervention with water controls and extensive grazing, through to more intensive management including creating scrapes, sowing grass seed mixes, applying herbicide and cutting and gathering vegetation.

Alopecurus aequalis (Orange Foxtail) is a rare species within Huntingdonshire (v.c.31), its known distribution in recent times limited to a few scattered locations within Woodwalton Fen NNR (Broughton, 2010). When in flower it is a particularly striking grass due to its bright orange or golden yellow anthers, (see inset photo on inside back cover) which distinguish it from the ‘dirty orange’, dull-coloured anthers of *Alopecurus geniculatus* (Marsh Foxtail). Closer examination also reveals much shorter awns than *A. geniculatus* (Davis, 2008), hence the common name in the United States of “Shortawn Foxtail”. Vegetatively, *A. aequalis* can be distinguished by ligule characteristics (Poland & Clement, 2009) and its (usually) annual habit. Both species may be found in similar freshwater wetland habitat, especially the open muddy areas of summer drawdown zones, and the two species will occasionally hybridise (*A. ×haussknechtianus*) (Cope & Gray, 2009).

In June 2010, I was contacted by MB and told that he had discovered what he thought to be

A. aequalis in a drawdown zone within an ex-arable area of the Great Fen (‘Darlows Farm’) adjacent to Woodwalton Fen. Identification was rapidly confirmed by a site visit the following day. Sample material was not difficult to find, as the species was liberally distributed across three fields and in one location was abundant over an area of c.40m², making it easily the largest known population of this species in Huntingdonshire. The grass was found within drawdown zones which had been ‘weed wiped’ the previous year to knock back the abundance of *Juncus effusus* (Soft Rush). A known population of the grass was subsequently located within Woodwalton Fen NNR, some c.500 metres to the east of the ex-arable population (see photo on inside back cover). The species persists on a c.10 × 4 metre area of raised soil, thought to be the by-product of mechanical workings following the creation of a new Mere. For much of the winter and spring, the site is under water before being exposed in early-mid summer.

A list of associated species for both sites was collected (Table 1, p. 7), along with soil samples taken from directly beneath the plants at a depth of c.10cm (the most active rooting zone in ‘wet grasslands’). Soil samples were analysed at the University of Cambridge by an undergraduate student, following kind permission from Dr Steve Boreham, in order to determine key characteristics. MAVIS (Smart, 2000) was used to interpret vegetation data. The species assemblage from the NNR roughly equated to NVC community S24c *Phragmites australis*-*Peucedanum palustris* tall-herb fen, *Symphytum officinale* sub-community, whereas the Darlows Farm assemblage strongly resembled MG13 *Agrostis stolonifera* – *Alopecurus geniculatus* grassland. Species common to both sites formed the basis for NVC community S19c *Eleocharis palustris* swamp, *Agrostis stolonifera* sub-community. Bare ground was frequent (i.e. 11-30%)

at both sites at the time of survey. Three of the associate species found on the Darlows Farm site (*Bidens tripartita* (Trifid Bur-marigold), *Rumex maritimus* (Golden Dock) and *R. palustris* (Marsh Dock)) are rare for v.c.31 (Broughton, 2010), and like *A. aequalis* are associated with drawdown vegetation. The pH, % water and % total organic matter of the soil were similar for both locations, but the nitrate value was higher for the NNR site and the phosphate value higher for the Daelows Farm location (Table 2, p. 8). Based on EC (conductivity) values, both sites qualify as “eutrophic”. Whilst high EC and phosphate values are to be expected for ex-arable soil, the elevated results for EC for an ‘intact’ NNR give cause for concern, although it is important to state that the soil sample taken was small and may not be representative of the wider locality.

There is very little in the published literature about the phytosociology of *A. aequalis*, with most studies tending to focus on its persistence as an ‘arable weed’ (Masao, 1961; Morishima & Oka, 1980). However, a study in eastern Asia examining the natural succession of wetland vegetation following agricultural abandonment found *A. aequalis* (Sobol.) var. *amurensis* (Komar.) to be the dominant grass of young abandoned paddy fields. The grass was able to persist within a cropping regime due to its annual life history and ability to complete its life cycle prior to rice planting (Chang-Soek *et al.*, 2002). We find it unlikely that the grass persisted vegetatively at Darlows Farm when under an intensive arable cropping regime, and it has not been found on the field margins in the current survey, so is unlikely to have colonised from the field edge. It is just possible that seed may have survived in the soil, as the species forms a long-term persistent seed-bank (Thompson *et al.*, 1997). Indeed, studies by Tsuyuzaki (1994), following the volcanic eruption of Mount Usu in northern Japan, demonstrated that *A. aequalis* can germinate from topsoil which was buried under three metres of volcanic deposits for five years.

In our opinion, however, the close proximity to the NNR population and the similar conditions at both sites strongly point towards

dispersal as the most likely mechanism for the presence of the grass on the restoration land. Drawdown zones make ideal habitat for wading birds, particularly Common Snipe (*Gallinago gallinago*) which are known to frequent both *A. aequalis* locations, as the soft bare mud offers ideal conditions for probing for food in the summer months. It is possible that unintentional transfer of seed or vegetative fragments came about through epizoochory (on birds’ feet or feathers) or endozoochory (through bird droppings). It follows that the presence of more drawdown zones within the Great Fen may offer the potential for the establishment of a sustainable meta-population of *A. aequalis* plants alongside other uncommon drawdown species.

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Table 1: Associated species at the National Nature Reserve (NNR) and Darlows Farm (DF). The DAFOR scale was used as an abundance measure (D = 71-100%, A = 31-70%, F = 11-30%, O = 4-10%, R = 0-3%). Species in bold were found at both locations.

Species	NNR	DF
<i>Agrostis stolonifera</i>	O	F
<i>Alopecurus aequalis</i>	F	A
<i>Alopecurus geniculatus</i>	-	R
<i>Bidens tripartita</i>	-	R
<i>Cirsium arvense</i>	R	R
<i>Eleocharis palustris</i>	O	R
<i>Galium uliginosum</i>	R	-
<i>Hydrocotyle vulgaris</i>	R	-
<i>Juncus articulatus</i>	F	F
<i>Juncus bulbosus</i>	O	-
<i>Juncus effusus</i>	-	O
<i>Juncus subnodulosus</i>	O	-
<i>Lycopus europaeus</i>	O	R
<i>Lythrum salicaria</i>	-	R
<i>Mentha aquatica</i>	O	-
<i>Persicaria maculosa</i>	-	F
<i>Phragmites australis</i>	O	-
<i>Ranunculus flammula</i>	-	R
<i>Ranunculus sceleratus</i>	O	R
<i>Ranunculus trichophyllus</i>	R	-
<i>Rorripa palustris</i>	R	R
<i>Rumex crispus</i>	-	R
<i>Rumex maritimus</i>	R	R
<i>Rumex palustris</i>	O	O
<i>Senecio vulgaris</i>	R	-
<i>Schoenoplectus tabernaemontani</i>	-	R
<i>Symphytum officinale</i>	R	-
<i>Typha latifolia</i>	-	R
<i>Veronica catenata</i>	O	-
Bare ground	F	F

Table 2: Key characteristics for soil taken directly beneath *Alopecurus aequalis* at the NNR and Great Fen

Site	pH	EC	Nitrate	Phosphate	%Water	%total organic
NNR	6.48	1972	3.29	0.32	78.04	85.88
GF	6.62	1260	1.02	0.68	67.02	83.29

Utricularia bremii Heer ex Koell. in the New Forest

MARTIN RAND, 21 Pine Road, Chandlers Ford, Eastleigh, Hampshire, SO53 1LH;
(vc11recorder@hantsplants.org.uk)

I first became aware that *Utricularia bremii* (New Forest Bladderwort) might be a Hampshire plant when I was wrong-footed by a message from Ted Pratt: “Tell me where I can see this thing!”. Ted had been a more diligent reader of his newly arrived “Big Stace” (edition 3) than I. Clive Stace was able to put me in touch with the original finder, Andy Smith. Andy is a Bournemouth resident, a cultivator of carnivorous plants and a botanical illustrator. Examples of his work can be seen in the sumptuous, recently published two-volume global conspectus *Carnivorous plants and their habitats*, by Stewart McPherson.

Andy had first found the population in the early 1990s, and went to look at it in several subsequent years. It varied greatly in quantity and in flowering performance from year to year, not flowering at all in many years. It had an exceptional year in 2008, putting up around 200 flowering spikes, and he was able to present a detailed set of photographs to Andreas Fleischmann of the University of München and Dr. Jan Schlauer of the University of Tübingen, who confirmed the identification.

U. bremii is growing in a spot that has been passed countless times by botanists, myself among them, at Woodfidley Passage, Denny Lodge (v.c.11) (SU3405). It occupies a short stretch of bog dyke close to the footbridge carrying the path from Beaulieu Road across the Bishop of Winchester’s Purlieu. The dyke is artificially deepened and its sides are unstable, so lone visiting is not recommended if you intend to make a close inspection. Andy is convinced that it is not a deliberate introduc-

tion: apparently there is just one commercial grower (in the Czech Republic), who only began to cultivate it after its discovery here, and a very few people who have it in cultivation in the British Isles, largely from Hungarian and Czech material.

We visited the site together in August 2010. The plant did not flower this year, but there was a reasonable amount of vegetative material. The site itself is not under threat of destruction - the drainage activity which led to the construction of the dyke and the degradation of a large part of this mire system in earlier decades has now been discontinued, and is being reversed. The track across the mire is a popular walk for dog-owners and others. Several people have seen dogs being allowed and even encouraged to bathe in the stretch of dyke, which is the first open water of any depth after leaving the nearest car park. While the mechanical churning is unlikely to threaten the plant, an increase in turbidity might.

U. bremii is perhaps a rare plant, the authorities mentioned above citing only about a score of extant sites in Europe. Although Rich & Jermy (1998) give it as a “widespread European species”, Fleischmann (2010) considers it endangered. There are modern records from just four départements of France, and none from the Benelux countries. Tantalisingly, one of the historic sites that was probably closest to ours is that recorded in the Forêt d’Orléans, in old marl-pits at Saran (Loiret), noted in Boreau (1857). The Forêt d’Orléans was an ancient hunting forest which, by the middle of the 18th century, had fallen into disuse and whose administration

was corrupt. Government inspectors of the time noted ‘abuses’ of the land which, at least in part, were probably not that different from the commoning practices so prized and defended in the New Forest. But large tracts were destined for a future as plantation woodland in the mid-19th century. Saran is now a largely built-up suburb of Orléans.

Many of the distinguishing characters of *U. bremii* and *U. minor* (Lesser Bladderwort) overlap at the lower end of their range, and they are best distinguished on flowering characters. *U. bremii* can have more than six flowers in the inflorescence, with the corolla greater than 8mm, a rather deeper yellow than *U. minor*, with a broader lower lip whose sides are not reflexed when fully developed (see Colour Section, Plate 4). The spur of *U. bremii* is said by Sell & Murrell (2009) and by Rouy (1909) to be longer (3–4mm) than that of *U. minor*, but there is disagreement among several authors about its size and shape and this is perhaps best not taken as a reliable character. Vegetatively *U. bremii* is said to be more robust, with longer and more numerous leaf-segments, but at the lower end the two taxa overlap completely. Certainly, material examined at the New Forest site could not be reliably distinguished on leaf measurements or segment counts. A feature not generally mentioned in the literature is the abundance of traps, but the New Forest plants seem to be significantly better provided with traps than any *U. minor* from the area (see Colour Section, Plate 4).

The taxonomy of *U. bremii* raises questions. There is general agreement that it is a critical taxon and that intermediates with *U. minor* occur. Hall (1939) examined the earlier evidence for *U. bremii* in Britain, which included a specimen from Titchfield in v.c.11, and decided that there was no basis for its inclusion on the British list. A hybrid origin

has been suggested, but hybridisation experiments in aquatic *Utricularia* are notoriously difficult. Lubomir Adamec in the Czech Republic has been trying without success for some years, but he has claimed to propagate *U. bremii* from seed, whereas others have stated that it is sterile. Since most of the aquatic species of *Utricularia* regularly abort or fail to fruit at all, this is not such a stark contradiction as it seems. Andreas Fleischmann has also reported on the difficulties of DNA diagnosis on an Internet forum (www.epukforum.com).

It will clearly be worthwhile looking out elsewhere in the New Forest and in other parts of the country for this plant, which is easy to overlook most of the time. A wider distribution might lend credence to the idea of this as a native species.

Acknowledgements:

I am grateful to Clive Stace and Andy Smith for their help, and to Andy Smith and Stewart McPherson for widening my horizons in the world of vegetable carnivory.

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Mire and wet heath restoration and management in Burnham Beeches, Buckinghamshire, results in the return of plant species absent for many decades.

ANGUS R. WESTGARTH-SMITH, *Institute for the Environment, Brunel University, Uxbridge, Middlesex, UB8 3PH*; (angus.westgarth-smith@brunel.ac.uk)

ANDY MCVEIGH, *Buckinghamshire County Council, Environment Group, Annexe A, County Hall, Aylesbury, Buckinghamshire, HP20 1UY*; (amcveigh@buckscc.gov.uk)

HELEN J. READ, *The City of London, Burnham Beeches, Hawthorn Lane, Farnham Common, Slough, SL2 3TE*; (helen.read@cityoflondon.gov.uk)

Burnham Beeches is a 220ha Site of Special Scientific Interest and National Nature Reserve in south Buckinghamshire, 40km west of London. It is a Special Area of Conservation under the European Union Habitats Directive. Burnham Beeches has been owned and managed by the Corporation of London since 1880 and is named after the ancient pollarded *Fagus sylvatica* (Beech) trees.

Until the middle of the 20th century the south-eastern part of Burnham Beeches included an area of heath and mire. Grazing ceased in 1920 and the area reverted to secondary woodland, consisting of *Betula pendula* (Silver Birch), *Quercus* spp. (oak) and *Pinus sylvestris* (Scots Pine). Restoration of the heath and mire commenced with the felling of secondary woodland in 1988, and the re-introduction of grazing from 1992. Burnham Beeches now has about 5ha of mire and wet heath.

In July 2009, one of us (AW-S) found two *Drosera intermedia* (Oblong-leaved Sundew) plants growing on the edge of the wet heath restoration site, and in July 2010, eight Oblong-leaved Sundew plants were counted by HJR in the same location (see Colour Section, Plate 4). *D. intermedia* was last recorded at Burnham Beeches in 1966 and *D. rotundifolia* (Round-leaved Sundew), which has not yet reappeared, was last recorded in 1971. Sundews are insectivorous plants with leaves covered in sticky hairs used to trap insects. Presumably various factors may have played a part in the germination of these seeds: the restoration of the site as a heath, a wet summer, and perhaps slight

disturbance of the soil by a tractor. Disturbance of the soil surface promotes *Calluna vulgaris* (Heather) germination and perhaps also Sundew germination.

As well as Oblong-leaved Sundew, mire and wet heath restoration has resulted in the reappearance in Burnham Beeches of four other plant species: *Anagallis tenella* (Bog Pimpernel) (see Colour Section, Plate 4), *Hypericum elodes* (Marsh St John's-wort), *Osmunda regalis* (Royal Fern) and *Eriophorum angustifolium* (Common Cottongrass), which have been absent for between 13 and 77 years (see table 1, p. 11). While it is possible that the seeds for these plants (or spores, in the case of Royal Fern) arrived recently through wind dispersal or being carried by animals or people, it is probably more likely that they have germinated from seeds at least 13-77 years old, which gives an indication of how long they can remain dormant in the seed bank. There must, however, be a finite time that seeds can remain viable in the soil, so there is an urgent need for habitat restoration, before they lose the ability to germinate.

Several other species of plant have been historically recorded from Burnham Beeches, but have not been seen in recent years (see table 2, p. 11). The heath and mire continue to be managed by summer grazing with cattle and ponies. Scrub is cleared when necessary; small soil scrapes are made in the dry heath to encourage *Calluna* regeneration and small 'peat cutting' will be trialled in the wetter areas to see if this encourages *Drosera*. It is hoped that this ongoing management may lead to the discovery of these species, as well as

enabling those species that have reappeared to thrive.

The reappearance of Sundew plants as a result of habitat restoration and management is a great achievement and hopefully they will grow each year. However, if they do not keep reappearing each year then the population of dormant Sundew seeds in the seedbank is probably small, at least 44 years old, and probably gradually ceasing to be viable. Can

a few tiny Sundew plants reappearing result in a large enough input to the seed bank to maintain a viable population for the future, particularly when the probability of germination might just be dependent on a tractor being driven over a very tiny area containing seeds in a year that is unusually wet?

Reference:

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Table 1. Plants that have reappeared on the Burnham Beeches mire and heath.
*recorded in Druce, 1926

English name	Latin name	Last seen	First seen - recent years
Many-stalked Spike-rush	<i>Eleocharis multicaulis</i>	pre-1926*	1990
Bog Pimpernel	<i>Anagallis tenella</i>	pre-1926*	2002
Royal Fern	<i>Osmunda regalis</i>	pre-1926*	2003
Oblong-leaved Sundew	<i>Drosera intermedia</i>	1966	2009
Common Cottongrass	<i>Eriophorum angustifolium</i>	1971	2003
Marsh St John's-wort	<i>Hypericum elodes</i>	1976	1989

Table 2. Plants previously recorded on the Burnham Beeches mire and heath that have not yet reappeared, but which may respond to habitat management. *recorded in Druce, 1926

English name	Latin name	Last seen
Marsh Clubmoss	<i>Lycopodiella inundata</i>	pre-1926*
Deergrass	<i>Trichophorum germanicum</i>	pre-1926*
Bog Asphodel	<i>Narthecium ossifragum</i>	1959
White Beak-sedge	<i>Rhynchospora alba</i>	1959
Round-leaved Sundew	<i>Drosera rotundifolia</i>	1971

Red Arum

ANTONY GALTON, 34 Prospect Park, Exeter, EX4 6NA

Edward Pratt asks (*BSBI News*, 115) if anyone has experience of the unusual red form of *Arum maculatum* photographed by Gabrielle Jarvis. The accompanying photograph (see Colour Section, Plate 3) shows a rather simi-

lar, though less brightly-coloured plant, which I found growing on the cliffs above Weston Mouth, East Devon, in May 2006. I never supposed it to be anything other than *Arum maculatum*, but it is certainly unusual.

Population structure and conservation of *Genista anglica* (Petty Whin) at a restored humid heathland site

PETER A. VAUGHAN, 26 Middle Mead, Hook, Hampshire, RG27 9NX;
(peter@vaughan46.freeserve.co.uk)

Introduction

Genista anglica (Petty Whin) is a small native spiny shrub associated with humid/wet heathland and acid grassland (Preston *et al.*, 2002). It is a member of the Fabaceae (pea) family. There has been a very substantial decline in records of this species in recent years in England and southern Scotland (Preston *et al.*, 2002; Botanical Society of the British Isles, 2009). It is included as a “near threatened” species in the latest UK Vascular Plant Red Data List (Cheffings & Farrell, 2005). This decline is associated with a loss of its habitat, due to agricultural improvement, the cessation of grazing leading to succession to scrub and woodland, or other management changes such as drainage (Preston *et al.*, 2002; Bowen, 2000).

The decline in the number of sites at which *G. anglica* is found is also reported in the county floras for Berkshire (Crawley, 2005) and Dorset (Bowen, 2000), and the species is no longer found in Oxfordshire (Killick, 1998). The species has declined across Hampshire (Brewis *et al.*, 1996) where, apart from the New Forest, it is now largely confined to the north-eastern heathlands of the county. *G. anglica* is present at Bartley Heath, a nature reserve in northern Hampshire (see Colour Section, Plate 3), where my casual observations had suggested that it was associated with a power line corridor.

The primary aim of the present study was to obtain a total enumeration of the *G. anglica* population at Bartley Heath and to note the position of each plant in order to investigate whether there was indeed an association with the power line corridor. A secondary aim was to measure the size of each plant and, using size as a proxy for age, and morphological features, attempt to assign them to age/stage categories. This would indicate whether, under the current conservation management regime on the site, new plants had been able to

establish or whether the population was restricted to older plants.

The autecology of *Genista anglica*

A search of the U.K. and international scientific literature, using the online databases available via the Oxford University library and the Royal Botanic Gardens, Kew indicates that, apart from being widely listed as a component of heathland flora, *G. anglica* has only sparse mention, indeed only eight articles with *Genista anglica* in the title were found (only one in English). These were concerned with taxonomic studies, the occurrence of the species in parts of Spain and Germany, and the extraction of rutoside (a flavonoid). This low level of published information may be because the species has not been of economic interest and has neither been sufficiently abundant nor (hitherto) rare to attract great attention.

While there appears to be a lack of detailed autecological information on *G. anglica*, and in particular no detailed description of its growth and development, some basic data on its U.K. ecological range is provided in Preston *et al.* (2002), in which it is described as being found in “relatively humid grass heaths and around the drier fringes of bogs” in lowland areas and in “heathy, damp, unimproved pastures” in uplands; and as being predominately a lowland species but found at up to an altitude of 730m in the Scottish highlands. Further brief data on its range, size, life-form and Ellenberg values are listed in Hill *et al.* (2004) and Fitter & Peat (1994), which can be summarised as: native to Europe and Africa; a perennial, woody plant with chamaephyte and phanerophyte life-forms; height typically between 10 and 50cm, with an extreme maximum of 100cm; no vegetative spread; insect pollinated; seeds germinate in the summer and have only a transient presence in the seed bank; Ellenberg indicator value for light (L) = 9, i.e. mostly found in full sun

(shade intolerant); Ellenberg indicator value for moisture (F) = 5 (moist site indicator – plant “mainly on fresh soils of average dampness”); Ellenberg indicator value for reaction (R) (acidity) = 3 (plant mainly on neutral soils but exceptionally also on “nearly neutral” ones); Ellenberg indicator for nitrogen (N) (a general indication of soil fertility) = 2 (infertile site indicator); Ellenberg indicator for salt tolerance (S) = 0 (absent from saline sites). Behrends *et al.* (2008), in a report on a habitat management project in Schleswig-Holstein, Germany, noted that *G. anglica* plants were not grazed by cattle and that the species could readily germinate in poached ground.

Bartley Heath Nature Reserve

Bartley Heath is situated on the edge of the Thames Basin, near Hook, in north-east Hampshire (v.c.12) (SU7353), at an altitude of 70 - 75m above sea level. It is a 51ha area of level, common land owned by Hampshire and Isle of Wight Wildlife Trust and forming part of the Hook Common and Bartley Heath Site of Special Scientific Interest. The site's geology is low level terrace deposits (valley gravel) (British Geological Survey, 1980) and the habitat type is secondary woodland with areas of wet heathland and acid grassland (English Nature, 1992).

This area of common land had previously been used for grazing by commoners and was formerly open heathland (as shown in old Ordnance Survey maps of the area), but that ceased with the construction of the M3 motorway in 1971, after which almost all of the former heathland area underwent succession to Birch *Betula pendula* scrub (Hampshire Wildlife Trust, 2008), although electricity companies undertook work to maintain overhead power line corridors crossing the site, where scrub growth was regularly cut back to maintain access and prevent vegetation reaching the live cables. In the early 1990s the Wildlife Trust cut back scrub on parts of the site to re-create open areas and grazing was reintroduced, using ponies. Now maintained as a public access nature reserve, management of the site by the Trust continues

to involve grazing by ponies and, since February 2008, Highland cattle (wild grazing mammals, Roe Deer and Rabbit, are also present), but periodic removal of Birch by volunteers is also required to prevent scrub re-establishing.

The largest individual area that was cleared of scrub is approximately 5ha in size. *Calluna vulgaris* (Heather) and the rare *Gentiana pneumonanthe* (Marsh Gentian), which had almost disappeared from the site when it had reverted to scrub, have become re-established across this clearing (Vaughan, 2008). In terms of the National Vegetation Classification of habitat types (Rodwell, 1991), the 5ha area would appear to most closely correspond to H3 Dwarf Gorse – Bristle Bent grass heath (humid heathland). *G. anglica* is present in this largest clearing, although not in other parts of the Reserve. There is a major high-voltage overhead power line which crosses the clearing with a single, large electricity pylon in the centre. The clearing is also crossed by a smaller, low-voltage overhead power line which is carried on wooden poles.

Methodology

G. anglica is a somewhat inconspicuous plant for most of the year and is often partially hidden by surrounding vegetation (e.g. *Molinia* (Purple Moor-grass) tussocks). However it is in bloom for a three week period around the end of April/beginning of May and its bright yellow flowers at that time stand out against the other vegetation on the site, and make the plant easy to find (most other yellow-flowered species on the site, including *Ulex minor* (Dwarf Gorse) are not in bloom then and the grasses have yet to reach their full height). Once the flowers have been sighted confirmation of the species is straightforward due to the plant's distinctive leaf shape and pattern (see Colour Section, Plate 3).

A survey was done on 3rd May 2009. The largest clearing in Bartley Heath was visually searched with the help of volunteers from the Hampshire Flora Group. All the *G. anglica* plants found across the survey area were recorded. The survey methodology was to walk in a line of eight people spaced 2m apart,

across the southernmost section of the survey area in an east-north-east direction, and repeat, after moving northwards, in the opposite direction until the whole site had been covered. The positions of individual plants were recorded as eight figure (10m) O.S. grid references, determined using a handheld Garmin “Etrex” GPS device.

The maximum height and width of individual plants were measured. Note was made of whether they were single or multi-stemmed. Plants were also examined for whether any stems or branches lacked both leaves and flowers, and for each an estimate was made of the percentage of the total visible structure that was bare of these features, recorded as “% bare branches”.

Results

Thirty individual plants were found within the survey area. There was a wide range of heights (22 - 81cm) and widths (11 - 170cm), with only a relatively weak correlation between these two variables ($r = 0.565$). The mean height of the population was 48cm and the median was 50cm. The mean width was 82cm and the median was 81cm.

A number of growth stages were observed. Plants appeared to grow first as a single vertical stem of up to 40cm height/horizontal spread, and then to develop up to four further stems with lateral-branches. As plants grew bigger they would develop up to eight main stems, which would tend to be decumbent, resulting in a predominantly lateral rather than vertical spread of the plant. Several of the larger plants appeared to be senescent (more than 50% bare branches), and overall presented as a sparse outer ring of leaved branches, with a few flowers, growing out of a centre of bare stems and branches that were largely overgrown by other heathland plants. There was no evidence that individual plants had been grazed by any of the stock animals or wild mammals on the site.

The predominantly lateral growth of *G. anglica* at Bartley Heath indicated that width rather than height would be the appropriate measure of the overall size of individual plants. Plant widths, together with (for

smaller plants) whether they were single or multi-stemmed and (for larger plants) the percentage of bare stems, were used to assign individuals to morphological stage classes (Table 1). The spatial distribution of the population is shown in Figure 1.

Discussion

The morphological stage classes adopted in Table 1 follow the apparent life-cycle of *G. anglica* at Bartley Heath, and can be used as a rough indicator of the relative ages of the plants. They broadly correspond to the life cycle phases of two other comparable woody heathland shrubs, *Calluna vulgaris* and *Ulex europaeus* (Gorse), as described by Symes & Day (2003); i.e. pioneer (small and small single-stemmed), building (medium), mature (large) and degenerate, albeit that at Bartley Heath *G. anglica* is largely present as individual plants rather than the closed stands typically formed by the other two species.

The Bartley Heath *G. anglica* population had relatively few young plants. It is possible that some of the smallest plants may have been under-recorded, particularly if they lacked the species' distinctive flowers, but provided that was not a source of major bias, then it would appear that the species has had limited opportunities for new plants to establish on the site.

Figure 1 shows a clustered spatial distribution for the total *G. anglica* population at Bartley Heath, with a marked concentration to the west of the large central electricity pylon. Most of the individual plants were next to rutted tracks and footpaths in that area, and in particular along the main access route to the pylon which runs slightly to the south of the high voltage power line from the western boundary of the reserve. Within the different morphological stages there was a marked clustering of degenerate plants, which were all located to the west of the pylon, around the main access route.

Conclusion

Power line corridors have been cited as having beneficial effects for the conservation of plants: they may provide suitable habitat niches in otherwise unfavourable surroundings, as well as connectivity (dispersion

routes) between otherwise separated areas (Gustafsson & Hansson, 1997). At Bartley Heath the requirement for power companies to maintain access to the central pylon and high voltage power line (and another low voltage power line that crosses the site) has resulted in a corridor of periodically disturbed habitat, in which the succession of heathland to scrub has been prevented by cutting vegetation and by the occasional movement of heavy vehicles (with the use of the resultant track by walkers in the meantime). When most of Bartley Heath became scrubbed-over in the decades prior to the 1990s, this corridor would have remained as (relatively) open ground. This would have provided suitable refuge habitat for the shade intolerant *G. anglica*, and areas of bare ground in which the species could germinate. The clustering of large, degenerate plants, which are assumed to be the oldest in the population, in the most disturbed area to the west of the central pylon, is consistent with the species being able to persist in that area of the power line corridor when conditions elsewhere on Bartley Heath had become unfavourable (an alternative possibility is that *G. anglica* had not been previously present on the site but seeds were unintentionally brought in on the wheels etc of the heavy plant used to service the power line).

The (less tight) clustering of the total population around the same area to the west of the central power line, with only relatively few plants found in other parts of the survey area, despite the whole site having been cleared of scrub over fifteen years ago and subsequently maintained as open land, suggests only limited ability for this species to (re)colonise apparently suitable habitat. Over the same period other heathland species have become re-established over the whole of the 5ha clearing, including *G. pneumonanthe* and *C. vulgaris*, however they, unlike *G. anglica*, would have been able to remain dormant in the soil over long periods (as underground storage organs or in the seed bank (Symes & Day, 2003)).

The future conservation of *G. anglica* at Bartley Heath would appear to require the maintenance of an area of disturbed land, and,

fortunately, this is guaranteed for the foreseeable future due to the presence of the power line. The spread of the species to other parts of the reserve might be encouraged by manually spreading seed from the current plants into areas of deliberately disturbed ground.

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Figure 1: Spatial distribution of *Genista anglica* individual plants at Bartley Heath, plotted using Ordnance Survey Coordinates (SU square)

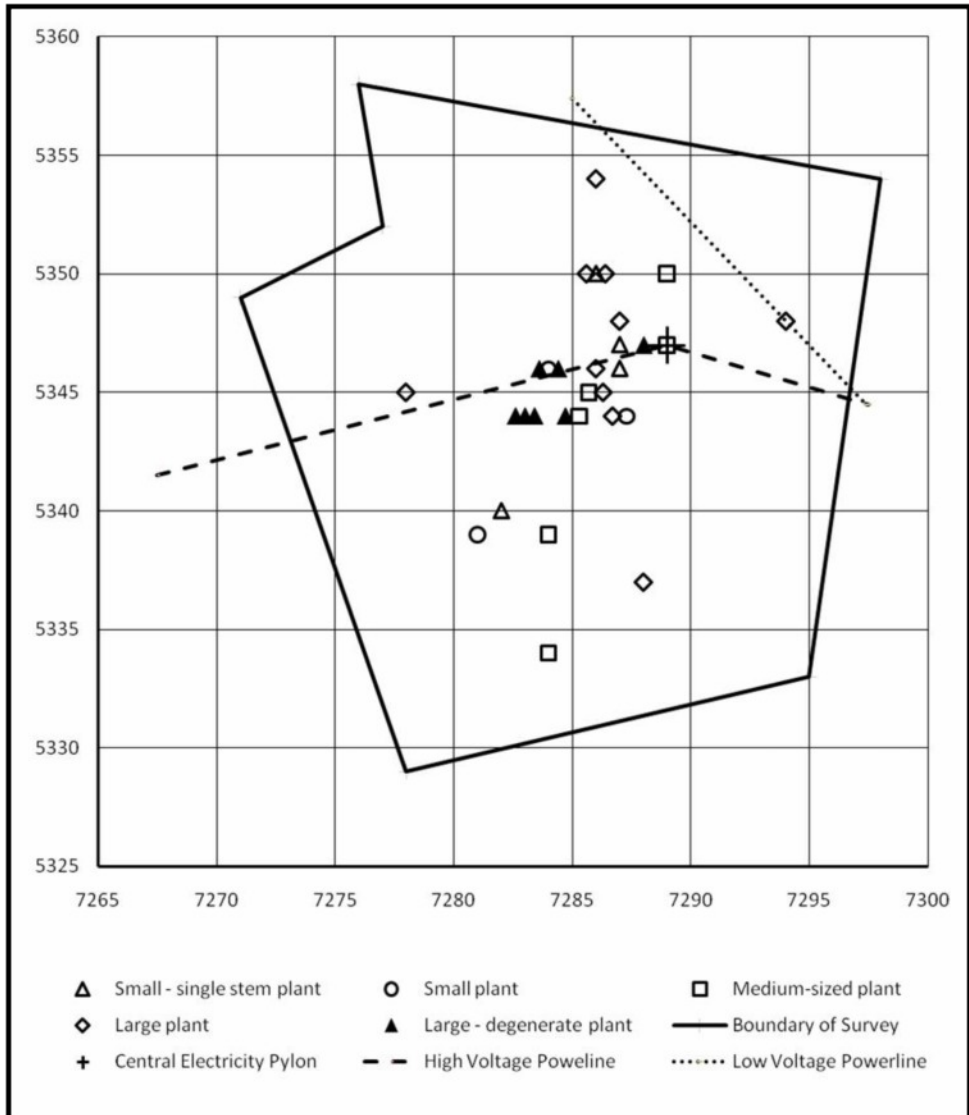


Table 1. Numbers of plants of *Genista anglica* in different morphological stage classes at Bartley Heath

Morphological stage	Number of plants in the Bartley Heath population
Small –single stem plants <40cm wide	4
Small (multi-stem) plants <40cm wide	3
Medium sized plants 40 to 70 cm wide	6
Large plants >70 cm wide, with <50% bare branches	10
Large degenerate plants >70cm wide, with >50% bare branches	7
Total number of plants	30

Wild flower twitching

COLIN JACOBS, 12 Grove Road, Beccles, Suffolk, NR34 9RB

I recently received communication from a member who lives in North Yorkshire asking to accompany me in the Waveney area of Suffolk, where I live and work, for a day's 'plant twitching'. As nature guiding is one side of my ecology consultancy business, I offered him a day on 7th September 2010. Thankfully, after the previous evening's rain and strong winds, we met in fine weather outside my home. A week before I was sent a letter with a considerable wish list and thought that we could get a few.

First we walked onto Beccles Common to see the abundant *Impatiens parviflora* (Small Balsam), still in flower, with many fruits, which pleased my guest, as he studied the features and took a voucher. Next we looked at the fruits of *Rosa spinosissima* × *R. canina* = *R. ×hibernica*, first located in 2001 by the Lowestoft Field Club. Passing a few non-flowering *Rubus laciniatus* (Cut-leaved Bramble), we walked back to the car and went off to Weybread Churchyard for the large patch of *Aristolochia clematitis* (Birthwort), and then to Mettingham Churchyard for several *Dipsacus pilosus* (Small Teasel).

Our next stop was a bit scary, as it was a small plant growing in a road drain right on the brow of Haddiscoe Road Bridge in

Norfolk (just). Our target here was a local rarity *Brassica juncea* (Chinese Mustard). There were both flowers and fruits, showing the parentage, as it is derived from the hybrid between *B. nigra* × *B. rapa* (Black Mustard × Wild Turnip). *Buddleja globosa* (Orange-ball-tree) was on my new friend's list, but the very big specimen in a Corton hedgerow just north of Lowestoft sadly produced nothing but vegetative characters for my guest.

Now one thing that the BSBI maps are good at is locating good places for alien plants and garden escapes, along with some new arrivals. From my Kessingland Wild Flower Society meeting I was able to show my fellow member *Ulmus ×vegeta* (Huntingdon Elm), *Allium neapolitanum* (Neapolitan Garlic), both *Conyza canadensis* (Canadian Fleabane) and the new arrival in Kessingland *C. sumatrensis* (Guernsey Fleabane). A surprise not seen on my previous field trip was *Callistephus chinensis* (Chinese Aster) growing in a pavement crack along Church Road in Kessingland.

It was not what I normally do on a nature guiding trip, but it was good to travel about and tick off old favourites and even find very new ones.

Northern Yellow-cress (*Rorripa islandica*) discovered new for Warwickshire

BRIAN LANEY, 5 South Close, Long Buckby, Northamptonshire, NN6 7PX;
(Brian.laney@gmail.com)

After finding *Rumex palustris* (Marsh Dock) new for Warwickshire at Draycote Water (SP461699) in 2000, I decided to look at the reservoirs in Warwickshire to see if I could find more, as well as anything else of interest. As I did not know all the reservoirs in the county, my work colleagues at the ecology consultancy I work for, Ecoline, were very helpful in suggesting ones I should try. One I had not been to plant-hunting before was Earlswood Lakes, south of Solihull (SP113742). I went to look at the site on 14th September 2010. Sadly there was no drawdown to speak of on my visit and it did not look suitable for Marsh Dock. However, I noticed one bank section had a thin concrete edge with a strong vertical corrugated metal support to stop embankment erosion caused by fluctuating water levels of the lake close to the nearby minor road. All along the lake edge here there is a row of small sections of concrete edge with the vertical corrugated metal support connected to it. A small part of this metal support is visible above the water line. A number of plants were growing out of the concrete edge, such as *Scutellaria galericulata* (Skullcap), which was well in flower; but then an unexpected plant turned up. In all there were five plants of *Rorripa islandica* (Northern Yellow-cress), of which one, the largest plant, had distinct drooping seedheads. The rest of the plants were rosettes with one of the specimens coming into flower and starting to develop fruiting heads. All the plants were growing on or between one of the small jutting out sections of the concrete edge by the water's edge at SP1131974363. (See Colour Section, Plate 1).

Northern Yellow-cress is a species I remember seeing before at two known localities in Somerset and Scotland. The thing I remember especially from the Somerset locality, Clathworthy Reservoir (ST041314) was the distinct drooping seedheads, and that is what stuck in

my mind when I found especially the fruiting plant at Earlswood Lakes.

So how did the plant get into Warwickshire? There are a number of possible ways that Northern Yellow-cress could have arrived at Earlswood Lakes, such as bird movement and migration between water bodies including various reservoir sites, fishermen who fish between different water bodies around the UK, or introduction of fish from another part of the UK. Earlswood Lakes is a popular site for fishermen.

The following day I contacted Steven Falk (author of *Warwickshire wildflowers*, 2009) who is trying to photograph some of Warwickshire's rare and scarcer plants and I knew he must not miss the opportunity to see this species. I also contacted Dr Tim Rich about the find, to whom I sent a voucher specimen, to be 100% sure my identification was correct.

Both Dr Tim Rich and Paul Stanley mentioned that this discovery is the most easterly site for the species to date in the U.K. This find, I am sure, has now opened up a gateway for fellow botanists to search further east, north and south of my recent discovery to check drawdown zones and concrete edges of reservoirs in their counties. This discovery of Northern Yellow-cress in Warwickshire has now gone onto the Warwickshire Museum 'Twitter' site, so even the rest of the world knows about it!

I must thank my work colleagues Ian Tanner, Steve Lane and Camille Newton for suggesting reservoirs to try, Paul Stanley for his continued help and support as well as his ever growing enthusiasm, Dr Tim Rich for confirming the specimen, and last but not least Steven Falk and Jon Bradley for putting the find onto the Warwickshire Museum 'Twitter' site.

Probable first record for *Equisetum telmateia* × *E. arvense* (*Equisetum* × *robertsii*)

B.A. 'JESSE' TREGALE, 24 Ashbourne Drive, Bradford, West Yorkshire, BD2 4AQ

Clive Stace, in his *New flora of the British Isles* (3rd edition, 2010) says: “*Equisetum* × *robertsii* ... found in Anglesey in 1992...”. But the first official record for *Equisetum* × *robertsii* was Traeth Lligwy Anglesey in 2000, recorded as new to science (Dines & Bonner, *Watsonia*, 24 (2002)). It is possible the earlier date refers to my finding, which I determined to be *Equisetum arvense* × *E. telmateia* at Traeth Lligwy in 1992, details of which M. Wilcox passed on to several botanists concerned after its official discovery in 2000.

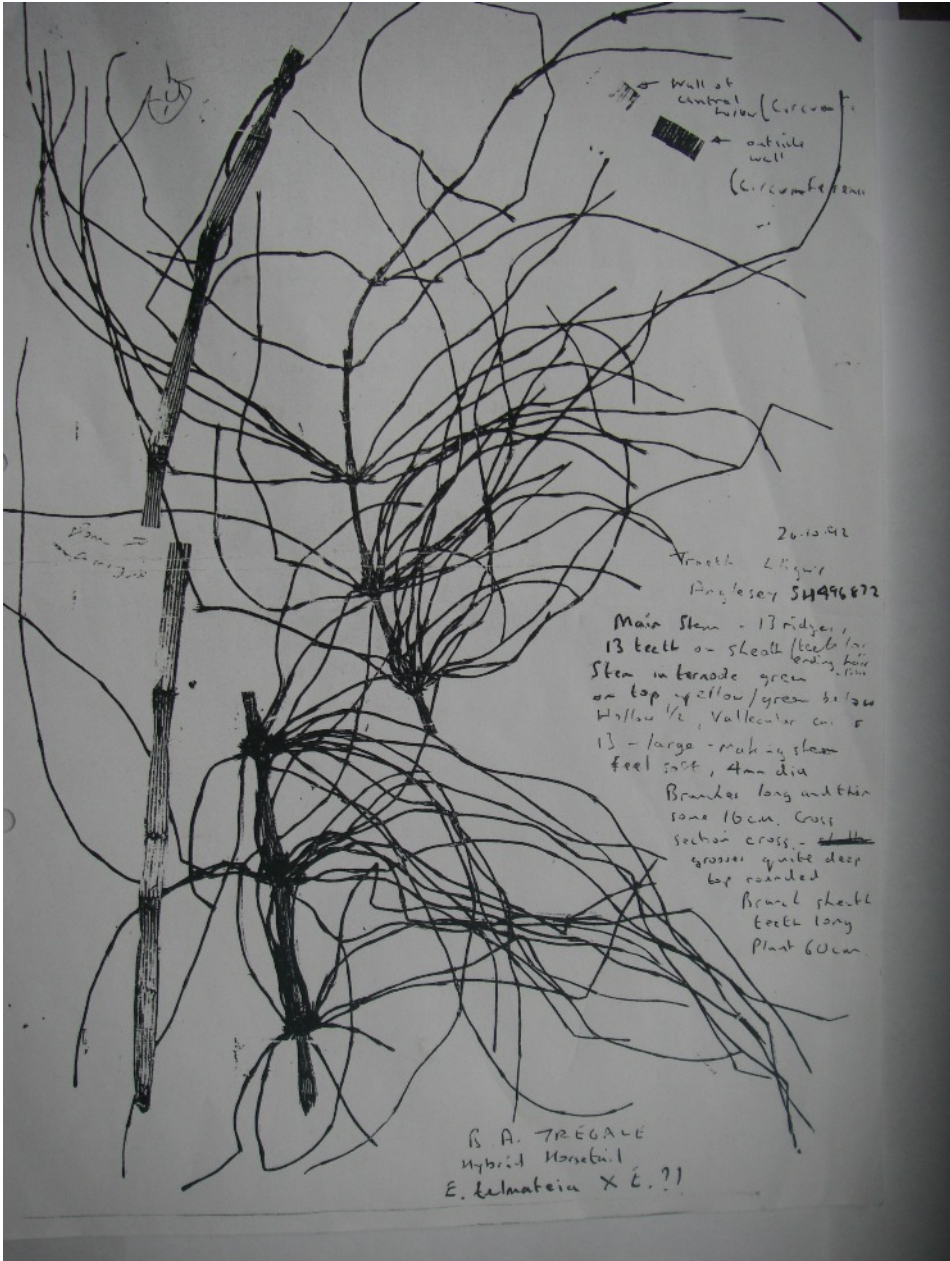
In October 1992 we were staying with my sister-in-law, Bridget Harris, who was studying botany at Bangor University, and we decided to have a family day out on Anglesey. We stopped at Traeth Lligwy to give the dog a run on the dunes. By a mere coincidence the Traeth Lligwy dunes was one of the few sites in Britain for rare *Equisetum* × *font-queri*, the hybrid between Marsh and Great Horsetail. I had brought my newly acquired *The ferns of Britain and Ireland* by Chris Page (paper-back edition) with me to Wales, which has good illustrations of this distinctive hybrid, and as we walked along the dunes with our dog, I checked all the horsetails. I had no luck, but just as we were turning back I decided to check the wooded area inland from the dunes in one last effort to find the hybrid horsetail. Inside the wood I found some *Equisetum arvense* (Field Horsetail) and a patch of *Equisetum telmateia* (Great Horsetail). Some of the *E. telmateia* did not look typical: they had the white stems of the *E. telmateia* but had rather thin stems, so I gathered three stems to look at later, in the hope they were non-typical *Equisetum* × *font-queri*. When I returned home to Bradford I examined the horsetails and two turned out to be white-stemmed *Equisetum arvense* – the whiteness due to the plants growing in the shade of the wood or possibly the lateness of the season, but one seemed to be intermediate between *Equisetum*

telmateia and *Equisetum arvense*. When I showed my good friend Brian Byrne the specimen we were both convinced it must be *Equisetum telmateia* × *E. arvense*. From my notes written on my photocopy of my specimen and letter which I sent to Prof C. Page it showed: “The plant was 60cm tall, main stem 4mm diameter with 13 ridges and a central hollow ½ of the diameter, internodes green, with 13 sheath teeth ending hair-like as in *E. telmateia*, long branches up to 16cm, branch cross-section cross-shaped, with deep grooves at the base like *E. arvense*”. It seemed almost certainly to be the hybrid *Equisetum telmateia* × *E. arvense*. We became rather excited when we realised it was not mentioned in Page or Stace’s *New flora of the British Isles* and thought this horsetail must be new to Britain, or even new to science. But then we found in Stace’s *Hybridization and the flora of the British Isles* (1975): “*Equisetum telmateia* × *E. arvense* = *E.* × *dubium* Dostal has been reported from Cz”, and I later found it recorded in Simpson’s *Flora of Suffolk* (1982). So it appeared my plant was not new to science or new to Britain but never-the-less an exciting find, and I duly sent the specimen to Prof. Page for verification where unfortunately it went astray. After communications with Prof Page and sending him a photocopy of my specimen he replied: “very interesting, gather some more material”. Unfortunately Anglesey is a long way from Bradford and my sister-in-law had left Bangor so I never had the opportunity to return until after 2001.

In 2001 I heard that *Equisetum* × *robertsii* had been found at Traeth Lligwy, Anglesey, new to science. It seems the record in Stace (1975) was never confirmed and the Suffolk plant was *E. arvense*: “...plants with white patches on the stem have been confused with the rare hybrid with *E. telmateia* (*E.* × *robertsii*), which has not been found in Suffolk” (*A flora of Suffolk*, M. Sanford, 2010).

I did eventually find the *Equisetum* × *font-queri* I had been seeking at Traeth Lligwy in 1992, but not until 1999, again when visiting Bridget, who was now in Sligo. This was the first record for *Equisetum* × *font-queri* in Ireland (*BSBI News*, 89), and later I also

returned to Traeth Lligwy and found the *Equisetum* × *font-queri* I had been seeking a short distance past the wood where I had found the *Equisetum* × *robertsii*.



Equisetum × *robertsii* – photocopy of specimen from Traeth Lligwy, Anglesey, 1992 B.A.Tregale

Hybrid rushes in the U.K. – sterility and fertility

MICHAEL WILCOX, 32 Shawbridge St., Clitheroe, BB7 1LZ; (michaelpw22@hotmail.com)

The number of hybrid rushes in the U.K. is debatable. Table 1 (p. 24-25) is a list of known and potential hybrids, which is taken from Stace (2010) and Kirschner, *et al.* (2002a, b). Relating to this is a problem of whether some are sterile (completely) or of low fertility (partially fertile). There are conflicting aspects in the two works cited above. In this article, it seeks to clarify that conflict in a small way, and comments on one or two specific hybrids; and details are reported here of fertility levels of a specific rush hybrid that is said to be “completely sterile” which is endemic to the U.K., (*J. balticus* ssp. *balticus* × *J. inflexus* ssp. *inflexus*).

Firstly, from Table 1 a number of hybrids have either not been demonstrated from the wild nor shown to exist experimentally, and these can mainly be ignored for the purposes of this article. However, a few are known to occur here and one or two other potential ones may exist. In general, relating to fertility, hybrid rushes are either said to be “completely sterile” or of “low fertility” (Stace, 2010).

Of those in the U.K., the only one I have seen so far that seems to be completely sterile is *Juncus alpinoarticulatus* × *J. articulatus* (*J. alpiniformis* Fernald (*J. ×buchenau* Dörf. non Sved.)). Further work may show that it has low fertility, (Stace, 2010). It does occur in v.c.64 at Great Close Mire, Malham, with both parents, where it appears to be sterile, but further study is required. This is probably the most southerly record in the U.K. (M. Wilcox & B.A. Tregale, SD9066, 30/09/07, det. MW).

As noted in Table 1, some hybrids here and elsewhere are said to be sterile to low fertility (and up to 50% fertile, see *J. acutus* hybrids). Though the U.K. has no hybrids involving *J. acutus* or *J. maritimus* (i.e. with each other, as these are the only two species in section *Juncus* in the U.K.) there are two separate sheets, one from Ireland and one from Wales, (LIV and MANCH) with an odd plant which could potentially be their hybrid. Further

investigation and a site visit to at least one of these sites is required to at least see if either of these plants can be re-located. Some hybrids clearly have varying degrees of fertility at least. However, in the U.K. *J. ×kern-reichgeltii* appears to be an introgressive hybrid ranging from partially fertile to more-or-less fully fertile hybrids, sometimes making identification of the parental taxa difficult in a few cases. A more detailed study of this hybrid is given in Wilcox (2010).

Other taxa seem to have low fertility. *Juncus ×surrejanus* (*J. articulatus* × *J. acutiflorus*) is said to be seed sterile and rarely formed in Kirschner *et al.* (2002a). However, Stace (2010) shows it to be of ‘low fertility’. It has clearly been demonstrated on several occasions that *J. ×surrejanus* plants (2n=60) are of low fertility (Blackstock & Roberts, 1986; Zandee, 1981). Furthermore, Blackstock & Roberts (1986) grew 31 seeds from 11 hybrid plants, the hybrid being confirmed by chromosome counts. I believe that this hybrid rush is extremely common and that *Juncus acutiflorus* is uncommon (possibly being hybridized out in many places), and further evidence is required to establish its status. From a preliminary study by the author, there is some anatomical evidence to support the ‘mainly hybrid’ theory, but good fertile *J. acutiflorus* has been difficult to come by. See below, for further discussion on this hybrid/species.

One of the hybrid rushes here in the U.K. that is said to be “completely sterile” is *Juncus balticus* × *J. inflexus* (Stace, 2010, 1975, 1972) (originally found near Freshfield, South Lancs., by D.E. Allen, c.1952, now gone from there). However, a more detailed study of this hybrid has revealed it is of low fertility (see Tables 2 & 3 (p. 26 & 27)). Also it has been found that the clone occurring at Lytham St. Anne’s (v.c.60) has a number of differences from those found in south Lancashire (v.c.59). For details of locations see Smith (2006). (While not yet having a binomial, it has been

proposed but not yet published (pers. comm., C.A. Stace) and it is not pre-empted here). The main differences between the clones are given in Table 3 (p. 27). It is considered here that there are enough differences between the Lytham clone and those in south Lancashire to suggest that it may have been a reciprocal hybrid. However, it is equally possible that it may just be the way the genes formed in the hybrid on separate occasions (pers. comm., C.A. Stace). Regardless of this, these differences are significant enough to consider these two variants of the hybrid at the varietal level. The reasons for this are:

1. That it is possible it arose independently as a reciprocal cross, the Lytham clone possibly with *J. balticus* as the female parent and the south Lancs. plants, *J. inflexus* as the female parent;
2. This appears to be expressed in two variants of the hybrid, see Table 3 for details;
3. It may give more conservation status to this very rare endemic rush; and
4. Both these variants grow true from seed.

The varietal names are given here:

Juncus balticus × *J. inflexus* var. *lythamensis*
 Wilcox (after the place it occurs): short suberect inflorescence (1.3-5.5cm, average 3.2cm long) dark tepals, pith ±solid, grows true from seed (see Table 3 & photo, p. 26).

Juncus balticus × *J. inflexus* var. *allenii*
 Wilcox (after D.E. Allen, the original finder of the Freshfield clone). Longer (occasionally suberect) branches (range: Ainsdale, 2.5-13.8cm; Birkdale, 2.9-14.5cm, average, both: 6.7cm long (some extremely long, one branch was 31.5cm)), pale tepals often becoming scarious, with more or less interrupted pith, grows true from seed (see Table 3 & photo, p. 26).

The names can be disputed but I felt that the differences should be recognised and can be accepted or dismissed accordingly by subsequent authors. The fertility of this hybrid is such that it can be considered of 'low fertility'. Garden-grown plants from seed (from the Birkdale plant) have a similar fertility to the main clonal patches. However, in the wild, the Birkdale patch produces more seed than the

others. See Table 2 (p. 26). It is not known why but unusually this clone in the wild has a gall (a fungus or other agent) which needs identifying. It does not occur in any of the other patches of the hybrid. More details are given in an unpublished report to Natural England and the Fylde Council (not finished at the time of writing) (Wilcox, 2010).

Further study will be carried out next year to include the levels of fertility in *J. balticus* × *J. effusus* (*J. ×obotritorum*) which also has some seeds but was not included here. This latter hybrid has a different stem anatomy from *J. balticus* × *J. inflexus*. The *J. balticus* □ *J. inflexus* hybrid has larger cells (than the rest of the smaller epidermal cells, in transverse section) over where the subepidermal sclerenchyma would be in *J. inflexus*, and only forms low ridges without the sclerenchyma in this hybrid. *J. □obotritorum* has small even cells around the epidermis (and no subepidermal sclerenchyma as well), with other small differences.

It is clear that there are some conflicting reports regarding hybrid rushes and the levels of fertility they show. However, it seems that many of the hybrids exhibit some fertility, which may be less in some years than others and between hybrids. Some hybrids need to be confirmed either experimentally and or from wild plants otherwise they can only be speculated and not accepted (e.g. *Juncus compressus* × *J. gerardii*, an unlikely hybrid because the parental taxa would rarely if ever meet, generally having different habitats, though both can occur on road verges and other places not considered usual etc.) and I believe *J. compressus* is over-recorded. Even some of the parental taxa need to be studied and or confirmed, such as *J. acutiflorus*, as it may be that in this case the species is uncommon to rare in some places. While confirming the hybrid, studies like Blackstock & Roberts (1986) did not confirm the parental taxa by chromosome counts, but they did confirm that seeds can be grown from *J. ×surrejanus* hybrid (called *J. ×montserratensis* in Kirschner *et al.* (2002a) but the type specimen

is said to be *Juncus articulatus* (pers. comm., C.A. Stace)).

I have seen very few fertile-looking *Juncus acutiflorus*-like plants. However, some recent plants from Ted Pratt in Dorset showed highly fertile plants. These plants need confirming as the species by chromosome counts rather than just being accepted at the present time, although in the field this is what one would call some of them; others had hybrid qualities. One interesting problem with these plants is that I have been looking at some anatomical aspects but found it difficult to find ‘genuine’ fertile *J. acutiflorus* in order to get started. However, this year Nick Millar (Suffolk) sent me one such plant and I looked at its anatomical aspects. It clearly seemed to have differences from *J. articulatus*. The latter seems to have fairly uniform characters.

In hindsight, it was noted that there are two subspecies mentioned in Kirschner *et al.* (2002a) for *J. acutiflorus*, and a cell character was given as part of their separation: “ssp. *acutiflorus* having all epidermal cells $\leq 2 \times$ as long as wide, (the other ssp. *rugosus* does not occur in the U.K. It may be a distinct species or hybrid)”. The Suffolk plant had this small cell character and another two characters (relating to the walls and the size/shape of the stomata) which are different from *J. articulatus*. Ted’s plants had anatomical characters of plants which would be considered hybrids (with intermediate anatomical qualities, cells and stomata) with cells 3-5 times longer than wide (or more in some cases), but with wide variation, which leaves us with a dilemma. Either most of our plants are hybrids (including some highly fertile ones) or many also include sterile to low fertility *J. acutiflorus* (yet the hybrid has been shown to be at least sterile to low fertility from limited numbers)? A study of cells and stomatal characters needs to be coupled with chromosome counts to be of much use; although the cells and stomata can be studied in the next few years, which may eventually help.

This study of hybrid rushes and their parental taxa shows that hybridity in plants is not straightforward and is not just a matter of

sterile versus fertile for species or hybrids. Pollen often stains 100% in the hybrids, so there are other mechanisms which halt most of the fertilization process, but it is obviously not total in rushes. While it may be that some species (e.g. *J. acutiflorus*) may not often reach the fruiting stage in this country, it seems more likely that it is mostly a variable hybrid dominating large areas through its vigorous rhizomatous growth. Hybrids such as *J. balticus* \times *J. inflexus* (var. *lythamensis* and var. *allenii*) and the levels of fertility noted here, show there are still things to be learned in a fairly well studied group. While fertility is not high and the seeds are unlikely to find a niche in the wild, these seeds are viable, producing phenotypes exactly like their (hybrid) parents and in having the same low levels of fertility. Also if *J. acutiflorus* was shown to mainly be a hybrid, this has implications for conservation. Like some other genera (e.g. *Rumex*), how do we assess, manage and conserve a species prone to hybridization, (if that is the case)?

Acknowledgement:

Thanks to C.A. Stace & P. Oswald; to Natural England and Annie Ancell, Lancashire Dunes Project Officer for permission to collect material of *J. balticus* \times *J. inflexus*; Ted Pratt, Nick Millar, Margaret Bradshaw, and others who have sent material previously.

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Table 1. Hybrid rushes in the U.K.(or potential hybrids not known in U.K., in square brackets []). Those asterisked * are from information in Kirschner *et al.* (2002a, b). General status is given.

[Potential] hybrid	Level of sterility	U.K. status
1. [<i>J. bufonius</i> × <i>J. ranarius</i>]*	Said to be intermediate and sometimes partly sterile.*	Possible but not known in the U.K., and unlikely to be detected in the field.
2. <i>J. compressus</i> × <i>J. gerardii</i>	Not known. Only artificial hybridization may show this. Any suspected plants would need a chromosome count.	Reported from Britain, France & Germany. An unlikely hybrid with no real evidence and specimens are said to most likely be either parent. Habitats different and unlikely to be detected in the field.
3. [<i>J. balticus</i> ssp. <i>balticus</i> × <i>J. filiformis</i>]*	Variouly formed capsules, said to have 0-5 seeds. Propagation from seed and or backcrossing has not been proved.*	Not known in the U.K. Unlikely to meet as different habitats.
4. <i>J. balticus</i> ssp. <i>balticus</i> × <i>J. inflexus</i> ssp. <i>inflexus</i>	Variouly formed capsules, said to be completely sterile, but average c.0-5 seeds (sometimes more) in a few capsules (see Table 3). Grows true from seed.	Known only from (originally Freshfield, near Formby) now Ainsdale, Birkdale (v.c.59)and Lytham St. Anne's (v.c.60). See Smith (2006) for location details.
5. <i>J. conglomeratus</i> × <i>J. effusus</i>	Clearly an introgressive hybrid with varying levels of fertility (Wilcox, 2010)	Scattered but common in places and under recorded, some are difficult to identify due to introgression.
6. <i>J. conglomeratus</i> × <i>J. inflexus</i>	Not known.	This hybrid has never been demonstrated in the wild or experimentally.
7. <i>J. effusus</i> × <i>J. inflexus</i>	Low fertility. Seeds are produced and capable of growing to full sized plants with low fertility.	Widely scattered in the U.K., possibly declining and/or under recorded.
8. <i>J. pallidus</i> × <i>J. inflexus</i>	Not known.	Reported as casual, extinct in U.K. (not confirmed?)
9. <i>J. pallidus</i> × <i>J. effusus</i>	Not known.	Reported as casual, extinct in U.K.* (apparently not confirmed and/or doubted in Stace (1975)

10. [<i>J. acutus</i> hybrids]* (see text also)	Reported with two species elsewhere (<i>J. acutus</i> × <i>J. heldreichianus</i> (Greece) and <i>J. acutus</i> × <i>J. littoralis</i> (Italy, Greece and Israel), both 100% pollen staining, and 0-33% and 0-50% fertile – no mention of chromosome numbers or confirmation).	<u>In U.K., two plants, one from Ireland and one from Wales, look unusual and could be <i>J. acutus</i> × <i>J. maritimus</i> and given fertility noted here, it maybe possible. A visit to at least one of the sites is required to see if this odd plant can still be found.</u>
11. <i>J. alpinoarticulatus</i> × <i>J. articulatus</i>	Thought to be sterile or possibly low fertility.	Rare in the U.K., and often difficult to identify. Most southerly site is Great Close Mire, Malham (v.c.64), with both parents.
12. [<i>J. alpinoarticulatus</i> × <i>J. acutiflorus</i>]*	Reported from Europe – said to be sterile, spreading by rhizomes.	Not likely in the U.K. and needs confirmation from elsewhere. Seems unlikely.
13. [<i>J. articulatus</i> × <i>J. bulbosus</i>]*	Said to be 2n=60.	Reported from ‘NE Skåne, S. Halland, Sweden’. Illustration in Kirschner* could be a form of <i>J. ×surrejanus</i> and the chromosome number would be same! Very unlikely here (see <i>J. ×surrejanus</i>)
14. <i>J. acutiflorus</i> × <i>J. articulatus</i>	According to Kirschner* seed-sterile and rarely formed. Shown to be partially fertile in the U.K. (see text). Hybrid grows from seed with low fertility (Blackstock & Roberts, 1986).	I believe this is very common in the U.K. and that <i>J. acutiflorus</i> is uncommon to rare. Further evidence is required to show one way or the other which is the case (see text).
15. [<i>J. biglumis</i> × <i>J. triglumis</i>]*	Not known.	Unlikely and not known in the U.K.
16. [<i>J. biglumis</i> × <i>J. castaneus</i>]*	Not known. This requires experimental evidence.	Unlikely and not known in the U.K.

*Missing from Table 1 are: *J. acutiflorus* × *J. subnodulosus*, apparently from the Isle of Wight, 1924, E. Drabble (BM), (see Stace ,1975 and Kirschner *et al.*, 2002a); and *J. articulatus* × *J. subnodulosus*, apparently reported for Hungary, Budapest (Kirschner *et al.*, 2002a). Both are improbable hybrids without experimental evidence and are likely to be a form of one of the parents mentioned.

Table 2. Fertility in *Juncus balticus* × *J. inflexus*. Number of flowers, capsules, seeds and % of seeds from 100 stems each.

Characters (totals)	Lytham Clone	<i>Juncus balticus</i>	<i>Juncus inflexus</i>	Ainsdale Clone	Birkdale Clone	Birkdale Garden grown
No. flowers	2013	1472	6731	2805	2948	1241
No. capsules with seeds	15	NC	NC	16	104	11
No. seeds	33	NC	NC	41	639	50
% from no. of capsules with seed	0.75	NA	NA	0.6	3.53	0.9
% from total no. of flowers	1.64	NA	NA	1.5	21.7	4



Juncus balticus × *J. inflexus* var. *lythamensis*.
Dark flowers, short inflorescence (average c.3cm), darker green stems, ± solid pith.
Photo M. Wilcox © 2010



Juncus balticus × *J. inflexus* var. *allenii*.
Usually very pale flowers, long inflorescence
branches frequent (average c.7cm), paler
green stems especially below, ± interrupted
pith. Photo M. Wilcox © 2010

Table 3. Characters of *Juncus balticus*, *J. inflexus*, and their hybrid with the Lytham clone considered distinct from the Ainsdale/Birkdale clone. Averages are given from 100 stems. Similarities columns (A/B) show affinities with either parent – Column A shows how the Lytham Clone is closer to *J. balticus* and column B shows how the Ainsdale/Birkdale Clone is closer to *J. inflexus*; both grow true from seed. AV= Average. Plants from seed were like those of Ainsdale.

Character	Lytham clone differences	<i>J. balticus</i>	A. Similarities to 'balticus'	B. Similarities to 'inflexus'	<i>Juncus inflexus</i>	Ainsdale clone differences	Birkdale clone differences
Av. total inflorescence length (cm)	3.2cm not very variable short.	2.6cm not very variable short.	Short inflorescence Only slightly longer.	Longish but very variable in length with some very long branches.	5cm variable but usually loose.	6.7cm variable loose with some very long branches.	6.7cm extremely variable loose with some very long branches.
Av. bract length (cm)	18.3	12.4	Usually long.	Very variable.	14.3	19 (2.5-3)	10.7 (10.5-11)
Av. bract length/ inflorescence length ratio	5.7 (5-6)	4.8 (4-5)	High bract/ inflorescence ratio.	Low bract/ inflorescence ratio.	2.96 (2.5-3)	2.8 (2.5-3)	1.6 (1.5-2)
Stem length (cm)	94.1	53.9	Some hybrid vigour but shorter than the other clone.	Hybrid vigour much more robust than either parent.	94.4	108.7	137.7
No. flowers.	20.1 (low range)	14.7 (low range)	Relatively low number of flowers.	Relatively high number of flowers.	67.3	28.1 (high range)	29.5 (high range)
Fertility	Sterile or a few seeds. Grows true from seed.	Usually fertile.	Some seeds are viable.	More seeds found (in Birkdale clone). Many seeds are viable.	Usually fertile.	Sterile or few seeds are viable.	Partial fertility – grows true from seed.
Pith	Solid	Solid	Solid	Interrupted	Interrupted	(partially) interrupted	(partially) interrupted
Stem character	Mid-deep green. Dull, sometimes greenish/taupeous tinge.	Deep green. Slightly dull to slightly shiny.	Deeper green becoming pale orange brown near the cataphylls and beyond.	Paler bright green often slightly shiny. Often very pale at and beyond the cataphylls.	Pale grey green due to glaucous mature.	Paler bright green often slightly shiny – often very pale at and beyond the cataphylls.	Paler bright green often slightly shiny – often very pale at and beyond the cataphylls.
Stem ridging	Weakly ridged.	Not ridged.	Weakly ridged.	Scarcely to weakly ridged.	Distinctly ridged.	Scarcely to weakly ridged.	Scarcely to weakly ridged.
Teasels	Dark brown.	Dark brown.	Dark brown.	Pale brown-fawn.	Brown-fawn.	Fawn-pale.	Fawn-pale.

New native taxa found on the Isle of Man (v.c.71)

B.A. 'JESSE' TREGALE, 24 Ashbourne Drive, Bradford, BD2 4AQ

In August 2009, whilst recording tetrads for the new 'Flora of the Isle of Man' with my father-in-law John Harris, I collected a number of specimens of putative *Juncus* \times *surrejanus* (Sharp-flowered \times Jointed Rush) from various sites. These were later determined by Michael Wilcox and myself as all *Juncus* \times *surrejanus* and were sent to Clive Stace for confirmation. These were all returned confirmed as *Juncus* \times *surrejanus* except one specimen which he had determined as *Juncus subnodulosus* (Blunt-flowered Rush). It seems we had mistaken a plant of *J. subnodulosus* for *J.* \times *surrejanus*. *J. subnodulosus* is a plant neither of us knew well at the time and we did not think to check for it as it is unknown on the island. It is, however, listed in D.E. Allen's *Flora of the Isle of Man*, Appendix 1: 'Species and subspecies which may well occur on the Isle of Man'.

On 29th August 2010 John and I revisited the site after again obtaining permission from the farmer who owns the field: The Bee-Hive Dub, Loughcroute (SC378393). We wanted to make sure this was the correct site, as there was a possibility that specimens had been muddled up; to make sure it was not introduced, as the farmer has introduced some Bulrushes into a small pond in the field; and to estimate the population.

On the path to the field we found some *Juncus articulatus* (Jointed Rush), and on the edge of the field a small patch of *J.* \times *surrejanus*. Within a couple of metres of this we found the *J. subnodulosus*, which extended in a massive stand throughout the one acre field, being the dominant species in at least 50% of the field, with many thousands of fruiting heads. Associated species were *Schoenus nigricans* (Black Bog-rush), *Achillea ptarmica* (Sneezewort), *Eupatorium cannabinum* (Hemp-agrimony), *Lotus pedunculatus* (Greater Bird's-foot-trefoil), *Lythrum salicaria* (Purple Loosestrife), *Molinia caerulea* (Purple Moor-grass) and *Succisa pratensis* (Devil's-bit Scabious). The size of the stand and the dominance of *J. subnodulo-*

sus in this field seems to establish that this is a native population, probably missed due to few botanists visiting the site and the similarity of this field to many other nearby fields dominated not by *J. subnodulosus* but by large stands of the common *Juncus acutiflorus*/*J.* \times *surrejanus*. The adjacent fields look similar and in one John remembers seeing a good population of Black Bog-rush. These are also private but we hope to obtain permission next year to visit them and hopefully find more of the *J. subnodulosus*.

John and I visited the Ayres on the 26th June 2010 and found a couple of patches of a hybrid violet, *Viola* \times *intersita* (Common Dog-violet \times Heath Dog-violet) near Rue Point (NX404031) (see Colour Section, Plate 4). I saw this hybrid for the first time at three different sites on Anglesey in June. It forms large distinctive domed shaped mounds and is sterile. Flowers and dead flowers are quite numerous but seed capsules, if formed, are very small, with no or very small abortive (white) seeds. When we checked in D.E. Allen's *Flora of the Isle of Man* we found it mentioned under *Viola canina*, that its hybrid with *V. riviniana* should be looked for especially on the Ayres. Another patch of this hybrid was found on the Ayres near the Ayres Plantation on an unsuccessful search for *Hottonia palustris* (Water Violet) with Andree Doubledam, the main organiser of the new Isle of Man Flora. Also here in a small wet dub was a patch of a sedge species, which I could not identify. It looked like *Carex acuta* (Slender Tufted-sedge), which would have been new to the island, but did not quite match. A sample was taken and M. Wilcox identified it as *Carex acuta* \times *C. nigra* (Slender Tufted Sedge \times Common Sedge), due to abundant stomata on both leaf surfaces. Later it was agreed/confirmed, though still with some reservation by Mike Porter who commented: 'not the usual form but cannot be anything else'. Further material is being grown on to check this identity.

Varieties of flowers in *Kickxia spuria*

ANDREW SHAW, *Gofynne, Llanynis, Builth Wells, Powys, LD2 3HN;*
(andrewgshaw@hotmail.com)

I have been growing *Kickxia spuria* (Round-leaved Fluellen) in my garden for many years. This year I observed the same peloric flowers that Trevor James and Laura Gravestock described in the last edition of *BSBI News* (115: 41). I have submitted a few photos that show a range of flower types (see Colour Section, Plate 3). My plants (at least five of which have peloric flowers) show a wide range of variation that includes:

- 1 Flowers with four short spurs arranged in a ring around the base of a long corolla tube; the corolla tube with four lobes, all of which have purple coloration.
- 2 Flowers with five short spurs arranged in a ring around the base of a long corolla tube; the corolla tube with five lobes, all of which have purple coloration.
- 3 Flowers with five short spurs arranged in a ring around the base of a long corolla tube; the corolla tube with five lobes, three of which have purple coloration.
- 4 Flowers with five short spurs arranged in a ring around the base of a long corolla tube; the corolla tube with five lobes, none of which have purple coloration.
- 5 Flowers with six short spurs arranged in a ring around the base of a long corolla tube; the corolla tube with six lobes, all of which have purple coloration.
- 6 Flowers with six short spurs arranged in a ring around the base of a long corolla tube; the corolla tube with six lobes, none of which have purple coloration.
- 7 Normal flowers but with two spurs.
- 8 Normal flowers but with three spurs.

All the peloric plants also have normal flowers.

P.S. On the afternoon of 17th November 2010 I was in Churston Ferrers, Brixham, Devon (v.c.3), undertaking winter bird surveys of arable field margins. As well as finding lots of Cirl Buntings I also found a couple of *Kickxia spuria* plants. Both these plants had peloric flowers as well as normal flowers. The peloric flowers comprised a range of types just like the ones on my cultivated plants here in Wales.

Peloric variety of *Kickxia spuria*

EDWARD PRATT, *7 Bay Close, Swanage, Dorset, BH19 1RE*

Further to the article in *BSBI News* 115: 41, my article on this in *BSBI News* 91: 32, with colour photographs, was, of course, long before Trevor James's time as Receiving Editor. The situation in Purbeck in 2007 was also summed up in Pratt (2008) p. 190 (which Trevor, and Laura Gravestock, might like to purchase from the publisher before it goes out-of-print!). It

only needs to be added that it has since been extirpated(!) in the proper sense of the word, in its site at Durlston – by the re-building of the wall to which reference was made.

Reference:

PRATT, E.A. (2008). *The wild flowers of the Isle of Purbeck, Brownsea and Sandbanks*. Brambleby Books, East Hyde, Beds., LU1 3TU

[These two responses to the previous article demonstrate that peloria in these plants is more frequent, perhaps, than has been supposed. I take Ted's riposte at my failure to find his article with the humour in which it was submitted! However, the range of forms

demonstrated by Andy Shaw's note show that any simple view of the cause(s) of this phenomenon is inadequate. It is tempting to think that climatic conditions this year may have contributed to its appearances. *T.J.*]

Cultivating fumitories

ANDREW SHAW, *Gofynne, Llanynis, Builth Wells, Powys, LD2 3HN;*
(andrewgshaw@hotmail.com)

Over the last couple of years I have grown all the British fumitories. The following note is a summary of my observations.

Fumaria capreolata (White Ramping-fumitory) – Ponsanooth, Cornwall (v.c.1a)

Fumaria capreolata is very easy to grow. Seventy fruits were harvested from wild plants in August 2009 and were sown a couple of weeks later. Thirteen had germinated by the beginning of November. All these autumn germinating seedlings died over the winter and none managed to produce a flower. The next flush of germination occurred between the end of February and the middle of March the following year, when a further twenty-three fruits germinated, all of which grew into large flowering plants. The remaining thirty-four fruits had not germinated by the end of October 2010. In cultivation *Fumaria capreolata* readily produces a second generation of flowering plants.

In a greenhouse environment *Fumaria capreolata* may not always develop the typical arcuate-recurved pedicels and the flowers may not flush pink with age. Sepal shape always remains constant.

Fumaria occidentalis (Western Ramping-fumitory) – St. Mary's, Scilly (v.c.1b) (see Front Cover)

Only a small number of fruits germinate in the first year of planting. I was lucky that two fruits I collected in the Scilly Isles in April 2008 germinated 14 months later. Fruits collected from plants in Padstow and Hayle have been sitting in pots for 24 months and 15 months respectively without a single fruit germinating. Of 50 fruits harvested from cultivated plants in August 2009 and planted a couple of weeks later, one germinated in mid-December and subsequently died in cold weather. The main germination period occurred between the end of March and the end of April 2010, when nine fruits germinated. The remaining 40 fruits had not

germinated by the end of October 2010. When a large number of fruits is planted a small proportion will germinate to produce a second generation of late summer flowering plants.

Fumaria bastardii (Tall Ramping-fumitory) – East Glamorgan (v.c.41)

Of 30 fruits harvested from cultivated plants in August 2009 and planted two weeks later, seven germinated between the end of February and the middle of March the following year. The remaining 21 fruits had not germinated by the end of October 2010. Occasionally a few fruits will germinate the same year they fall from the mother plant but here in mid-Wales these seem to germinate quite late in the season and die in cold weather before they have managed to set seed.

Fumaria reuteri (Martin's Ramping-fumitory) – Lake Allotments, Isle of Wight. (v.c.10) (see photo on inside front cover).

Of 10 fruits harvested from wild plants in August 2009 and planted a couple of weeks later, three germinated within two weeks of planting but died in cold weather before they had managed to set seed. A further two fruits germinated in early March the following year and grew into massive plants. Readily produces a second generation of flowering plants.

37 fruits of an unusual looking *Fumaria*, tentatively identified as *Fumaria reuteri*, were collected from Kirkcudbrightshire (v.c.73). These fruits were harvested in July 2009 and were planted four weeks later. Three fruits germinated in October and one fruit germinated in December. All the seedlings were killed off in early winter by prolonged cold weather and never managed to reach flowering stage. A second flush of germination occurred at the end of October 2010, when four fruits germinated. At the time of writing these had not reached flowering stage.

Fumaria muralis (Common Ramping-fumitory) – Llanynis, Powys (v.c.42)

A regular weed in my garden but never abundant and not present every year. Usually occurring on bare ground under old hedges or as a weed of disturbed ground.

An agriculturally improved grassland near to where I live was ploughed up in 1991 prior to the creation of a commercial Christmas tree plantation. The year after ploughing large numbers of *Fumaria muralis* and *Fumaria officinalis* plants appeared. Speaking with local landowners, I discovered that this field was last ploughed during the 1950s, when it was used to grow cereal crops.

Fumaria purpurea (Purple Ramping-fumitory) – Orkney (v.c.111) (see photo on inside front cover).

Cultivating *Fumaria purpurea* is extremely easy. Of 50 fruits harvested from cultivated plants in August 2009 and planted at the beginning of September 2009, 37 had germinated by the end of October. A further nine fruits germinated between the end of February and the middle of March the following year. It is often assumed that this species has a long-lived seed bank but perhaps this isn't the case. Without a doubt the hardiest of the fumitories, with seedlings and young plants surviving outside in mid-Wales through one of the hardest winters in living memory.

Foliaceous bracts are commonly seen on late flowering second generation plants (see photo on inside front cover). Foliaceous bracts are usually present throughout the raceme. The lower bracts are always the longest and can extend to over 10cm in length. The shape of foliaceous bracts varies with size but those that extend to more than the length of the pedicel and flower usually develop a long slender neck that has a deformed ladle-shaped leaf at the end. In a greenhouse environment, flowers often lack colouration and can superficially resemble *Fumaria capreolata*, especially when all the pedicels are arcuate-recurved. The wings of the upper petals can sometimes be lower than the keel, a feature usually associated with *Fumaria capreolata*. Sepal shape always remains constant.

Fumaria purpurea quickly became a weed in my greenhouse and garden. It's hard to believe that such a persistent weed in cultivation has declined so markedly over parts of its former range. Perhaps this could be attributable to a short-lived seed bank, which prevents the species from 'sitting out' periods of unfavourable habitat conditions.

Fumaria officinalis (Common Fumitory) – Llanynis, Powys (v.c.42)

A weed in my garden; some years abundant, other years completely absent. As described above, this species occurred with *Fumaria muralis* in a ploughed field near to where I live and had almost certainly germinated from dormant seed that was at least 40 years old.

Fumaria densiflora (Dense-flowered Fumitory) – Botley's Farm, Downton, South Wiltshire (v.c.8)

My first batch of fruits, from Royston, Cambridgeshire, were sown in October 2008. Two fruits germinated a few weeks later but died in the early part of the winter before they had set seed. The remaining fruits had not germinated by the end of October 2010. I also obtained fruits from the Isle of Wight. These were planted in March 2010 and none had germinated by the end of October 2010. I eventually had to make a special trip down to Wiltshire to obtain some fresh material. I found many dozens of *Fumaria densiflora* plants growing with other weeds along arable field margins. Typical associates included *Fumaria officinalis*, *Kickxia spuria*, *K. elatine* and *Papaver hybridum*. Only one generation per year observed.

Fumaria parviflora (Fine-leaved Fumitory) – Royston, Cambridgeshire (v.c.29) (see photo on inside front cover)

Of 50 fruits harvested from cultivated plants in August 2009 and planted a couple of weeks later 20 germinated between the middle of February and the end of March the following year. Interestingly 50 fruits originating from the same August 2009 cultivated plants but not planted until June 2010 produced no seedlings at all by the end of October 2010. Perhaps fruits need to over-winter outside before they

will germinate. Only one generation per year observed.

Fumaria vaillantii (Few-flowered Fumitory) – Royston, Cambridgeshire (v.c.29) (see photo on inside front cover).

Approximately 20 fruits were sown in October 2008. The first germination occurred 17 months later. The main germination period was the first two weeks of March, when eight fruits germinated. A single fruit germinated one month later in mid April. Many of my cultivated plants have twin flowers on the lower pedicel, something I have not observed in the other *Fumaria* species. A few of my greenhouse grown plants also developed foliaceous-type bracts on the lower pedicels. Only one generation per year observed.

Cultivation

The small *Fumaria* species, including *F. vaillantii*, *F. parviflora* and *F. densiflora*, can be grown very successfully in quite small plant pots. The larger species, including *F. purpurea*, *F. capreolata*, *F. occidentalis* and *F. reuteri*, will only grow into enormous plants if they are given very large plant pots. Simply scattering fruits outside is not advisable when only a few are available. In a greenhouse fruits are safe from all manner of pests and plants will grow extremely fast in the warm conditions. Fumitories need full light. Plants grown on a window ledge usually become weak and weedy. A number of the *Fumaria* species are restricted to very specific

soil types. In cultivation this is not important. The more fertile the soil and the bigger the plant pot then the larger the *Fumaria* plants.

I have noticed that *Fumaria* plants grown late in the season often develop a whitish mould that covers the leaves. The lower leaves are attacked first but the mould gradually spreads until the entire plant is affected, and at this point the plants stop growing and eventually die. The mould does not occur on any of the other plants growing in my greenhouse.

Anyone taking up my fumitory offer (see p. 79) should get themselves a copy of Rose Murphy's excellent *Fumitories of Britain and Ireland* (BSBI Handbook 12). This little book will guide you through the key identification features of the plants that you are cultivating. Once you have grown them all side-by-side you will discover that not only are fumitories quite beautiful plants, but they are actually not that difficult to identify (although identifying some subspecies and varieties can give even the most hardened *Fumaria* enthusiast a headache!).

Acknowledgements:

A number of members went on special excursions to collect fruits for me; others gave guidance on where to search for rare species. Special thanks to Mark Kitchen, Alan Leslie, Rose Murphy, Rosemary Parslow, Colin Pope, Martin Rand, Tim Rich & Nick Stewart.

Pushing up a restricted number of Daisies

MARTIN RAND, 21 Pine Road, Chandlers Ford, Eastleigh, Hants., SO53 1LH;
(vc1recorder@hantsplants.org.uk)

I had resolved that I wouldn't take the thread on extinction terms any farther, but the arguments in Professor Bateman's article in *BSBI News*, 115 seem to me so extraordinary, and his proposals so likely to increase confusion, that I find it impossible to resist the temptation.

I had hoped that we had disentangled the two separate issues raised by his original article, that of regionality of extinction and that of certainty of extinction. However it seems he considers the

alternative terms presented are all "options" that cover the same point, and goes on to argue against them as such. So let me try again to tease them apart.

I accept that existing words are used in scientific contexts with additional or refined meanings, and that 'extirpation' is one that some workers have used in this way – I acknowledged as much in my article (Rand, 2010). But the fact that the practice is sometimes acceptable, and

usually preferable to an obscure neologism, does not sanction indiscriminate use. If I talk about the ‘colour’ or ‘charm’ of subatomic particles I can be fairly sure that my listeners will not be troubled by thoughts of ethnicity or personality traits. My objection to the use of ‘extirpation’ is that it is already in use with a rather different meaning in the field of discourse with which we are concerned. Prof. Bateman cannot rewrite the standard English dictionaries, or change historical usage, or easily re-educate his public to a new and incompatible definition.

The argument that extirpation is an acceptable term (for regional extinction) because most extinctions can be ascribed to human causes seems to me a very weak one. In the first place, ‘most’ is not good enough. It entails bringing an inaccuracy into the terminology in some cases. Secondly, the discontinuation of an uneconomic grazing regime, or the building of a hard defence against future sea-level rise, are not the directed and purposive activity that ‘extirpate’ will call to mind for most people – let alone the more diffuse agents and effects of global climate change.

Prof. Bateman claims that (under my terms) “‘Extinct’ is no longer an absolute term describing a unique event”; but in fact it never was. Here is the OED again: “(of a species etc.) no longer surviving in the world at large or in a given locality”. Nor is this just a matter of refining the vulgar understanding. The IUCN paper previously cited (Gardenfors *et al.*, 2001) promotes the term ‘Regionally Extinct’ and eschews all use of ‘Extirpated’. The IUCN/SSC Guidelines for re-introductions (1995) make an explicit distinction between the two terms as applied to a local territory: “...an attempt to establish a species in an area which was once part of its historical range, but from which it has been extirpated or become extinct”.

I am at a loss to understand the argument that is being made about the intractability of terms such as ‘Local’ or ‘Regional Extinction’, as if these could actually be made to convey separate and absolute meanings in the abstract. My point was only that the context in which the term ‘Extinct’ is being used must always be made clear. For Gardenfors this means that for ‘Extinct’, as for any other IUCN Threat Status

where ‘Regionally’ is to be used, then the territory defining the region must be rigorously defined. Indeed it would be invalid to use any IUCN status term otherwise – just as it is invalid to conflate status categories from several regions by some sort of creative accounting process, without going back to the base data. There is no possibility of building a hierarchy using terms such as ‘Local’ or ‘Regional’, let alone inferring what type of boundary delimits their territory. In any case, I do not see that any objection made on those grounds is any better answered by the term ‘Extirpated’ – unless Prof. Bateman has managed to come up with a definition of ‘Locally’, ‘Regionally’ or ‘Nationally Extirpated’ that achieves this. Surely, as soon as we are talking in non-global terms, we all face the same problem of defining those terms. Having a separate word that firmly implied ‘Globally’ would only address one small aspect of the problem.

Finally, to return to the separate issue of whether a species is extinct, defunct, vanished, gone to meet its Maker, or merely taking a bit of a rest on the bottom of its cage: I plead guilty to coming up with feeble alternatives for “might come back if we’re lucky”. Just after posting the last article, it occurred to me that the way I would unconsciously translate the French ‘*disparu*’ whilst reading was: ‘GONE’. Apart from brevity, this has the merit that it can be spoken in tragic or sepulchral tones if the prospect of reappearance is slim. But as one of my correspondents pointed out, perhaps the least problematic and certainly the most informative line to take is: ‘*Last recorded 1956*’.

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Searching the *BSBI News* back catalogue with Google

OLIVER PESCOFF, 21 Compton Street, Walkley, Sheffield, S6 5BP; (o_pescotto@yahoo.com)

Given the wealth of fascinating information available in the back catalogue of *BSBI News*, readers with internet access may find the following technique for searching the online archive useful: go to Google, but instead of typing your search terms into the usual box, choose 'Advanced search' (in small type to the right-hand side of the main search box). Under 'Need more tools?', type 'http://www.watsonia.org.uk' in the 'Search within a site or domain' box, also change the 'File type' box to 'pdf'. Then type your search terms as you require them into one of the three boxes at the top of the page. Although this technique will probably not return all the true hits perfectly, possibly due to character recognition problems, it

does seem to be a reasonable way of searching the online material. For example, a search on the BSBI Literature Database for *Serapias* yields five references; the above Google technique yields nine, including the two *BSBI News* hits from the BSBI Literature Database.

[Members may like to know that a cumulative index to *BSBI News* (issues 1 to 110) is in preparation and will be available on the BSBI website by the time you read this. Not intended for publication in printed form, it is in computer generated alphabetical order which treats punctuation as characters, resulting in a slightly odd order in some cases!. *GE*]

Some uses for open-source GIS in botanical recording

OLIVER PESCOFF, 21 Compton Street, Walkley, Sheffield, S6 5BP; (o_pescotto@yahoo.com)

Recently, several articles in this newsletter have highlighted the ease with which amateur and professional botanists can use web-based Geographical Information Systems (GIS) to assist with either accurately recording plant populations, or for displaying information in map form for themselves or for presentation.

Whilst some people may desire little other than an accurate grid reference, or a quick check of vice-county for a particular point, others who enjoy experimenting with computer software, or who need to use it in their work, may be interested to learn about the free, open-source GIS software, Quantum GIS (qGIS) (www.qgis.org). Often I find that, in the context of software, many people interpret 'free' to mean 'inferior', or even, 'likely to destroy my computer'. Hopefully I can put minds to rest in this respect, as qGIS is used by professionals at a variety of organisations, including the Swiss Canton of Solothurn, where it is used to handle information on the service and infrastructural requirements of 250,000 people. qGIS is very much the equal of the so-called professional packages of

ArcGIS and MapInfo, except that it is completely free!

Quantum GIS might be useful for the botanical recorder in several ways. It is possible to quickly convert Shapefiles (a file format used by ArcGIS) into KML files for viewing in Google Earth (GE), where the satellite photo backdrop makes it easy to interpret boundaries with high precision, assuming of course that the boundary data are accurate. This is useful because much information is available online in the form of Shapefiles. For example, the NBN have freely available vice-county boundary data for personal use, which can be easily downloaded and converted for viewing in GE. The government website MAGIC (www.magic.gov.uk) also hosts a variety of Shapefiles & MapInfo TAB files providing the boundaries of ancient woodlands, National Nature Reserves and a large variety of other land designations and descriptions. These can also easily be converted for viewing in GE. In addition to conversions for GE, data can also be exported for viewing on GPS units, using GPS eXchange format. MapInfo TAB files

from MAGIC can be converted to the MapInfo MIF format using the free conversion program 'MITAB', available at <http://mitab.maptools.org>. As MIF files can be imported into MapMate, this should be especially useful for plotting reserve or habitat boundaries from MAGIC on MapMate distribution maps. Other possibilities exist, and as with other free, open-source software such as Firefox or OpenOffice, Quantum GIS seems likely to become ever more useful and widely used.

I have written a short and hopefully simple guide for performing these tasks. It can be found at <http://sacrevert.blogspot.com/2010/10/creating-your-own-watsonian-vc-kml.html>. Please don't hesitate to email me should you have any questions, or if you require some assistance. Please also remember that data from the NBN or MAGIC sites will be subject to certain restrictions on distribution.

The variant *Ophrys apifera* var. *atrofuscus* found in Dorset

NAOMI BAILEY, 52 Goldcroft Avenue, Weymouth, Dorset, DT4 0ES

On 13th June 2008, I found an abnormal *Ophrys apifera* (Bee Orchid) with a dark brown labellum growing on a damp verge at the side of a path in Weymouth, Dorset (v.c.9). The plant was growing in isolation from the nearest *O. apifera*. Instead of the typical markings on the labellum, this plant had a plain red-brown labellum. Markings were completely absent (see photo on back cover).

On 19th June 2009 I found the abnormal *O. apifera* flowering again. There were four flowers on the spikelet. Two metres away I found a second abnormal plant with two flowers on the spikelet. I investigated the site again the following year and found a spikelet with two flowers on 18th June 2010. Again two metres away there was a second plant with a total of eight flowers on the spike. Approximately two metres away on the opposite side of the path a third plant was found with three flowers on the spike.

The site of the plants is on damp verges by a path with typical wetland plants such as *Iris pseudoacorus* (Yellow Iris), *Lythrum salicaria* (Purple Loosestrife), *Filipendula ulmaria* (Meadowsweet), *Melilotus officinalis* (Ribbed Melilot) and *Salix* sp. (Willow) nearby. The path is surrounded on both sides by a shallow eutrophic lake. *O. apifera* was first recorded on the site as a whole in 2006, with a record count in 2009 of 31 plants. Other orchids on the site are *Dactylorhiza*

praetermissa (Southern Marsh-orchid), *Anacamptis pyramidalis* (Pyramidal Orchid) and a solitary *Dactylorhiza fuchsii* (Common Spotted-orchid).

As the markings on this *Ophrys apifera* were abnormal, I undertook some research to establish its distribution. The only description I could find was in David Lang's book *Britain's orchids* where it is named as a variety called *Ophrys apifera* var. *atrofuscus*. This variety had first been discovered in Sussex in 2001 and reported in *BSBI News* with a picture; although it may have previously occurred in Herefordshire (v.c.20) and may have since occurred in Leicestershire (v.c.55). The plants at Weymouth are the first record for Dorset.

Internet searches revealed several references, which use the name *Ophrys apifera* var. *fulvafusca* rather than *atrofuscus*, but I have not found this name mentioned in any literature to date. The status of the name *fulvafusca* is currently unclear.

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Atypical *Calystegia soldanella* (Sea Bindweed) with white flowers

IVOR & JANE REES, *Carreg y Gad, Llanfairpwll, Anglesey, LL61 5JH*; (ivorrees@hotmail.com)

Calystegia soldanella (L.) R. Br. (Sea Bindweed) plants with white flowers have been found at Morfa Abererch, on the south coast of the Llyn Peninsula (Caernarvonshire, v.c.49) (see Colour Section, Plate 1). They normally have pink flowers with white stripes. The fleshy leaves are distinctive in shape from other white flowered *Calystegia* spp. widespread in Britain and they occupy a different habitat (Brummitt, 1998). Dr R.K. Brummitt (pers. comm.) advised that he was not aware of previous records of this atypical colour form from the British Isles, but in Japan a white form was formally described as *Calystegia soldanella* f. *albiflora* (Makino) Hara. The trinomial is appropriate for the white flowered form found on the Welsh coast. Photographs and specimens from Morfa Abererch have been lodged in the Kew herbarium.

Two discrete colonies of white flowered *C. soldanella* were first noticed on 19th June 2010. They were about 1km apart on the seaward face of a sand dune ridge, mid way along the 5km beach between Pwllheli and Pen-ychain. The larger colony, at SH405359, spread for c.45m along the dune, while the other was a small patch at SH415357. Normal pink flowered plants were intermingled with the white colonies.

Among slight differences, the white form had more flowers per unit area and on each stem than adjacent pink ones. Leaf shapes of both forms were similarly reniform, but, measured across the greatest width after flattening, leaves adjacent to white flowers were often about half the size of those in the normal pink form (c.20 mm versus c.40 mm). The white corollas seemed to be more nearly circular in outline and more delicate. However many photographs from across the world shown on various websites suggest that corolla shape in the normal colour form is variable.

C. soldanella has a very wide geographic distribution, occurring on both sides of the Atlantic and Pacific Oceans as well as in

Australasia (Ridley, 1930). The seeds can float in the sea for one and a half years with a significant proportion capable of germinating after six months in seawater (Ridley, 1930). This allows drift dispersion for colonisation of distant shores and was postulated to account for less genetic diversity across the European range compared to several other sand beach species, where differences fitted separation of Pleistocene glacial refugia (Arafeh & Kadereit, 2006).

White flowered *C. soldanella* were found in the Pontevedra region of northwest Spain a century ago and called f. *albiflora*, but without a formal description (Merino, 1906). Intermittent stranding of items drifted over long distances has been recorded at several places along the Welsh side of St George's Channel (Rees & Southward, 2009). This included identifiable wreckage from a yacht that drifted from off north-west Spain to North Wales in less than three months (Brown, 1991). Rees & Southward (2009) reviewed evidence for oceanographic conditions intermittently causing items on the sea surface to be blown offshore from north-west Spain and then to be carried far to the north by a combination of baroclinic currents and wind drift. Several unusually large mass stranding events of open ocean marine organisms such as *Vellela vellela* (By-the-wind-sailor) happened in Wales during the early 2000s. Although the origin of the white flowered *C. soldanella* colonies at Morfa Abererch is unknown, a credible hypothesis is that seeds may have drifted from a distant location. This could have been the same part of north-west Spain where f. *albiflora* had been noted by Merino (1906).

Acknowledgement:

We are most grateful to Dr R.K. Brummitt for much advice on the taxonomic nomenclature for the white form and literature on occurrences around the world.

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Juncus acutiflorus

MIKE WILCOX, 32 Shawbridge Street, Clitheroe, BB7 1LZ; (michaelpw22@hotmail.com)

The differences between *Juncus acutiflorus* and its hybrid *J. ×surrejanus* (and occasionally the other parent, *J. articulatus*) can cause problems of identification. In a preliminary study of general morphology the main problems often arise when *J. acutiflorus* or *J. acutiflorus*-like plants appear partially or more or less fully sterile, (are these hybrids or are they the species *J. acutiflorus* but just sterile?). The hybrid is said to have low fertility on occasion (Stace, 2010), suggesting there could be back-crossing preventing clear identification. However, a brief look at some anatomical aspects suggests that there are some useful differences between the two parent taxa (noted above) and, in what appear to be good hybrids, it appears to be relatively intermediate in some respects but more material is needed.

Therefore, these anatomical aspects will be looked at in more detail this year (and perhaps beyond) in order to provide more evidence for identification purposes. I would be grateful for anyone recording to provide material (particularly later in the season from about the end of July onwards) regardless of whether it

is thought to be either *J. acutiflorus* or potential *J. ×surrejanus* (the latter less important, as it is easy to get hold of sterile plants). If anyone wanted to send a bit of *J. articulatus* that would be OK too. Of particular interest will be good fruiting material of *J. acutiflorus* as there is no problem finding more or less sterile material, especially here and elsewhere I have seen, though this is welcome too. Any sterile and partially fertile material can then be assessed based on 'good' material of this rush (if it can be obtained). There is a desperate lack of fertile material. Plants can be fresh or pressed from the top to about the second leaf down the stem, and as many as you wish – if lots from many different areas/tetrads, please send in one go towards the end of the season to save on postage and returns if required, best folded to fit A4. Other rushes (from anywhere in the world) and hybrids welcome.

Reference:

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Taraxacum limbatum H. Dahlstedt (Bordered Dandelion), new to the British Isles

CLAUDIA FERGUSON-SMYTH, *Beach House, The Green, Kilmoluaig, Isle of Tiree, PA77 6XB*
 A. JOHN RICHARDS, *High Trees, South Park, Hexham, NE46 1BT*

Since the publication of ‘*Dandelions of the British Isles*’ (Dudman & Richards, 1997), rather few taxa have been added to the British and Irish lists. A few new endemic taxa have been recognised, and two of these have been published, *Taraxacum ronae* (Margetts, 2007) and *T. amarellum* (Kirschner & Stepanek, 1998). A few probable neophytes have also been added, for instance a single record of *T. grootii* van Soest. However, there has been a notable absence of new species occurring in quasi-natural habitats that are also known outside these islands.

One of us (CF-S) now lives on the Isle of Tiree in the Inner Hebrides (v.c.103). She is undertaking a detailed study of the *Taraxacum* growing there, and brought herbarium material and photographs to AJR for identification. Amongst this were several specimens of a very handsome member of *Taraxacum* section *Erythrosperma* (H. Lindb.) Dahlst.. At first it appeared from photographs that the ligules were essentially yellow outside, lacking stripes or dark teeth, but in most the stripe is in fact present, although a very pale silvery grey in colour. This apparent lack of a ligule stripe, only known in *T. luteum* Haworth & Richards amongst British and Irish species, distracted AJR at first. However, his attention was soon drawn to the involucre. These were notably glaucous and pruinose with very distinct white borders and well-marked violet corniculations. The styles were clear yellow and bore pollen, and the achenes a dark chestnut colour and about 3mm in length. This combination of characters was not known amongst British and Irish species.

The involucre reminded AJR of a species he had seen in many sites in eastern Sweden and the Baltic, *T. limbatum* Dahlst., and a comparison with Dahlstedt’s description, authentic herbarium material, and an excellent set of field photographs by Thomas Brandt-Pedersen (authenticated by Hans Øllgaard)

confirmed this tentative diagnosis. The Tiree material differs from Scandinavian plants only in the paler ligule stripes, which are a mid to light grey in colour in typical material.

Many features of the Tiree material reminded AJR of Scottish collections which had initially been named *T. gotlandicum* (Dahlst.) Dahlst.. The latter species can be easily distinguished from *T. limbatum* by having green petioles and dark ligule teeth. Through the kindness of authorities at NMW and CGE, some of these specimens have been reviewed. Plants from v.c.94 (Inchroy, NJ1808, limestone rocks east of the lodge, M. McC. Webster 19827, 13.6.1982, NMW) and v.c.109 (Reay, dunes, Sandside, NC96, A McG. Stirling and A.G. Kenneth, 3.6.1973, NMW) proved to be *T. limbatum*, showing darker grey ligule stripes similar to Scandinavian material. However, material from v.c.90 (Monifieth) does seem to agree with *T. gotlandicum*. Currently, *T. limbatum* is known from v.c.c.94, 103 & 109 in the British Isles. The word ‘limbatum’ means ‘bordered’, referring to the conspicuously and beautifully white-bordered exterior bracts. Thus, the English name ‘Bordered Dandelion’ seems appropriate (see photos on back cover).

Outside the British Isles, *T. limbatum* also occurs in calcareous localities, including shell-sand grassland. Its distribution includes almost all the Baltic coasts, most of Denmark and Norway, north to the Bergen region. There it is a common and widespread species in suitable habitats, familiar to Taraxacologists. As it has been found in Scotland in semi-natural habitats similar to those within Scandinavia, it is assumed to be native in Scotland too. Most dandelions that we consider to be introduced or adventive are weedy species typical of ruderal habitats where they are very likely to undergo long-distance dispersal by man. Most species classified in section *Erythrosperma* grow in semi-natural habitats such as

species-rich limestone grassland and sand-dune grassland, where they are much less likely to encounter agencies which promote assisted travel. When they are found in such habitats in regions consistent with their presumed native range, they are usually considered to be of natural occurrence there too.

On Tiree, *T. limbatum* was found at NL994427 above a small bay called Port Ulbhadh. It occurs in sandy grassland above a small bay with a long list of associates, including *Armeria maritima* (Thrift), *Atriplex glabriuscula* (Babington's Orache), *Honckenyia peploides* (Sea Sandwort), *Cakile maritima* (Sea Rocket), *Anthyllis vulneraria* (Kidney Vetch), *Polygonum oxyspermum* (Ray's Knotgrass), *Plantago maritima* (Sea Plantain), *P. coronopus* (Buck's-horn Plantain), *Potentilla anserina* (Silverweed), *Daucus carota* (Wild Carrot), *Galium verum* (Lady's-bedstraw), *Thalictrum minus* (Lesser Meadow-rue) and *Tripleurospermum maritimum* (Sea Mayweed).

At present, with just three known Scottish localities, *T. limbatum* must be considered rare and possibly threatened within the British Isles. The localities in Banff and Caithness should be revisited, and the species should be sought for in similar habitats, particularly in northern Scotland.

A full description follows, made on fresh material by CF-S.

Small to medium-sized *perennial herb* with a stock-like rhizome. *Leaves* fairly numerous, spreading to erect, without leaf spots, 60-170 × 20-45mm, slightly hairy above, somewhat heterophyllous, mid green with a thin reddish edge, mid-rib rose-purple above. Lateral leaf-lobes 4-7, narrow, regularly spaced, distal margin ± entire or with a few small filiform teeth on proximal lobes. Interlobe edges crispate with some interlobe blotches, ± dentate. Terminal lobe triangular-sub-sagittate

with an acute tip, ± entire, sometimes narrowing semi-abruptly to the apex. Petiole ± unwinged, narrow, dark rose outside inner leaves, but white to light rose outside outer leaves.

Scapes 3-6, 45-200mm, suffused purple at the base, greenish distally, arachnoid-hairy below capitulum.

Outer involucre bracts spreading, acute, giving a stellate involucre, 5-7 × 2-3mm, whitish green on the inner surface, pale glaucous green outside, pruinose, with well delineated, distinct white to pink borders. Tips markedly suffused violet, apex strongly corniculate.

Capitulum 30-40mm in diameter, opening to a flattish shape in profile. *Ligules* – medium yellow, tinged orange with a very pale grey stripe on most outer ligules, a few concolorous. A darker line of pigment can be seen on the outer edge of the ligule stripe. Ligule teeth yellow but slightly darker than the ligules. *Styles* exerted, yellow, *Pollen* present.

Achenes dark chestnut in colour. Achene body 2.9 × 0.7mm with long, fine spines confined to the shoulders of the achene body below the cone in two - three closely spaced rows. Cone 0.6mm. Rostrum 7.3mm. Pappus 14.5mm in diameter, whitish.

T. limbatum is characterised by the markedly white-bordered, spreading, pale, pruinose bracts with marked violet corniculae, grey ligule stripes without dark ligule teeth, regularly lobed leaves, yellow polliniferous stigmas and chestnut achenes.

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A seeded capsule of the Irish Lady's-tresses orchid

FRANK HORSMAN, 34 Tindill Road, Balivanich, Isle of Benbecula, HS7 5LF;
(frankh2@hotmail.com)

Seeding in *Spiranthes romanzoffiana* Cham. (Irish Lady's-tresses), is apparently virtually non-existent in the British Isles. Horsman (2005) refers to a total of only four field examples of seeding in the British Isles, all in Ireland. Because of recent work there is some doubt about the record by John Heslop-Harrison (1953): "...there are few years when it [*S. romanzoffiana*] sets seed in Northern Ireland...". The doubt arises because, subsequently, on very careful examination of capsules which appear to have set seed, no fertilised seed has been found. Thus, there are only three definite field records for the seeding of this orchid in the British Isles, all in Ireland, namely, those of R.W. Butcher (1961), Raymond Piper (see Horsman, 2005) and Darach Lupton (Gulliver *et al.*, 2006). The Butcher and Piper cases are dealt with in Horsman (2005). In 2003 Lupton (Gulliver *et al.*, 2006) "...collected 46 seeds from a single plant growing on the southern shore of Lough Conn in Co. Mayo – the seeds were found in dried dehisced material, but appeared to have originated from just two capsules...".

This was the situation until 2010 when I discovered a seeded capsule of this orchid in the field (see Colour Section, Plate 4). I found it at Griminish in the west of the Isle of Benbecula (v.c.110). I discovered this site in 2008. Is it mere coincidence that just up the road Steve Duffield of South Uist discovered a new site in 2009 (the subject of a later article)? This site exploded into 589 flowering plants in 2010, making it the largest population of flowering plants of this orchid in the British Isles yet found!

Despite intensive work on *S. romanzoffiana* by several workers in recent years, the reason(s) why this orchid apparently sets so

little seed in the British Isles is still not known. In North America seed set in this species is normal. Is this a further pointer to this species being an introduction from North America and not a native of the British Isles?

Forrest (2001) found that in populations of *S. romanzoffiana* north of the Isle of Colonsay in the Inner Hebrides (v.c.102) it appears that sexual reproduction is taking place: "...despite the lack of seed set". Populations on Colonsay and to its south, including Ireland, appear to be reproducing vegetatively. That three examples of seed set have been found in Ireland is not, of course, statistically valid.

Members are requested to report to the author any cases of seed set they find in this orchid, with a photograph, please.

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Trientalis europaea in the Outer Hebrides

FRANK HORSMAN, 34 Tindill Road, Balivanich, Isle of Benbecula, HS7 5LF;
(frankh2@hotmail.com); PAUL A. SMITH & LYN LOWE

Every county has its little unsolved botanical mysteries, and one of these in v.c.110 lay in the shape of a letter from Lynne Farrell to Andrew Currie in 1984, reporting a possible record for *Trientalis europaea* (Chickweed-wintergreen) by Sarah Fowler in South Uist, a species not known in the Outer Hebrides. In the late 1990s Paul A. Smith (joint recorder for v.c.110) visited the site with Glenda Orledge, but the area was partly burnt, and after a short visit the plant was not found.

In 2009 FH inquired about another unconfirmed report of *Trientalis* from North Uist, and PAS passed on the South Uist details. FH visited the South Uist site at East Gerinish on 10th June 2009. Nothing was found at the site given from memory. However, it was observed that a hillock just north of the given site might be worth working. 'I found approximately 100 plants in full bloom, much to PAS's surprise!' Photographs were taken (see Colour Section, Plate 3). The plant was growing in young bracken and low heather. This habitat is repeated throughout the Outer Hebrides so more sites should be found.

The unconfirmed N. Uist record seems to be one of these. In 2003 Lyn Lowe of North Uist found it at an isolated site. Her description follows:

"I found the flower in 2003. Originally I thought April, but now can say with certainty that it was after 12th May and before 24th June – this is because of other dates recorded in my sketch book. It was in a lonely area that Brian and I visit from time to time when meandering over the moors south of Loch Scadavay towards Loch Eport, mainly bird-watching but, for me, also checking lochs for Black Throated Divers.

In 2003, I happened to be scrambling along a grassy track (sheep/deer) on a steep loch-side bank, when I came across a pretty white flower. Normally I would have had an idea as to what it was because, in

addition to becoming accustomed to wild flowers here in the Uists, I had in earlier days been a keen gardener and was familiar with many species, but I knew that I had never seen anything like this before. Vaguely it reminded me of a Snowdrop. I did not have a camera with me at the time so, as soon as I was able to do so, I sketched it from memory although I could not with certainty recall the leaves.

I had searched through many botanical books, but was not able to decide upon any satisfactory identification, so was delighted when, in about 2008, Frank expressed curiosity about my sketch and suggested that it was Chickweed-wintergreen. However, from book illustrations alone, I remained unsure and so Frank suggested visiting a site he knew of where there was a host of these beautiful plants and I immediately recognised them without doubt to be the same as the single one I had found all those years ago.

In 2009 I revisited the area with the specific intention of locating the plant and photographing it but it was nowhere to be found. I last returned there on 14th June 2010, but significant areas of bracken had been recently burnt and there was no trace of it, nor much else.

I shall certainly make efforts, and already have plans, to revisit the area at the appropriate time at some future date".

Although *Trientalis* is widespread in Scotland, it appears to have a predominantly eastern distribution (see the Maps Scheme web pages), and it belongs to the Eurosiberian eastern limit category, which also indicates a continental range. In the Hebridean islands it is known only from several sites on Mull (v.c.103), and curiously not from Skye, so its appearance in v.c.110 is more surprising. It is, however, found in more oceanic localities in Orkney and Shetland.

New names and taxa in the third edition of Stace – part 2

BOB ELLIS, *11 Havelock Road, Norwich, Norfolk, NR2 3HQ*
 DAVID PEARMAN, *'Algiers', Feock, Truro, Cornwall, TR3 6RA*

This article compliments that in *News* **115**, September 2010, and presents, **for hybrids**, tables of changes in nomenclature between the second and third editions of Clive Stace's *New Flora of the British Isles* (table 1) and new taxa covered in the third edition (table 2). A brief list of taxa that are no longer in the main

entries is also given (table 3). A spreadsheet version of these tables will be available for download from the BSBI web site (www.bsbi.org.uk) with an additional column to allow sorting in systematic order.

Only taxa included in the main entries are considered here.

Table 1: Changes in nomenclature (in alphabetical order of the name in edition 2)

In column 2 the changes are shown in bold face. Column 3 indicates where there is just a change in the binomial (B+ added, B- removed and BC changed).

Edition 2	Edition 3		Notes
<i>Aconitum</i> × <i>cammarum</i> (<i>A. napellus</i> × <i>A. variegatum</i>)	<i>Aconitum</i> × <i>stoerkianum</i> (<i>A. napellus</i> × <i>A. variegatum</i>)	BC	
<i>Agrostis capillaris</i> × <i>A. castellana</i> = <i>A. × fouilladei</i>	<i>Agrostis capillaris</i> × <i>A. castellana</i> = <i>A. × fouilladeana</i>	BC	
<i>Agrostis stolonifera</i> × <i>Polypogon monspeliensis</i> = × <i>Agropogon littoralis</i>	<i>Agrostis stolonifera</i> × <i>Polypogon monspeliensis</i> = × <i>Agropogon lutosus</i>	BC	
<i>Artemisia vulgaris</i> × <i>A. verlotiorum</i>	<i>Artemisia vulgaris</i> × <i>A. verlotiorum</i> = <i>A. × wurzellii</i>	B+	
× <i>Asplenophyllitis confluens</i> (<i>Phyllitis scolopendrium</i> × <i>Asplenium trichomanes</i>)	<i>Asplenium</i> × <i>confluens</i> (<i>A. scolopendrium</i> × <i>A. trichomanes</i>)		
× <i>Asplenophyllitis jacksonii</i> (<i>Phyllitis scolopendrium</i> × <i>Asplenium adiantum-nigrum</i>)	<i>Asplenium</i> × <i>jacksonii</i> (<i>A. scolopendrium</i> × <i>A. adiantum-nigrum</i>)		
× <i>Asplenophyllitis microdon</i> (<i>Phyllitis scolopendrium</i> × <i>Asplenium obovatum</i>)	<i>Asplenium</i> × <i>microdon</i> (<i>A. scolopendrium</i> × <i>A. obovatum</i>)		
<i>Avena fatua</i> × <i>A. sativa</i>	<i>Avena fatua</i> × <i>A. sativa</i> = <i>A. × hybrida</i>	B+	
<i>Brachyglottis</i> 'Sunshine'	<i>Brachyglottis</i> × <i>jubar</i> (? <i>B. laxifolia</i> × <i>B. compacta</i>)	BC	
<i>Carex binervis</i> × <i>C. viridula</i> (ssp. <i>oedocarpa</i>) = <i>C. × corstorphinei</i>	<i>Carex binervis</i> × <i>C. demissa</i> = <i>C. × corstorphinei</i>		
<i>Carex distans</i> × <i>C. viridula</i> (ssp. <i>brachyrrhyncha</i>) = <i>C. × binderi</i>	<i>Carex distans</i> × <i>C. lepidocarpa</i> = <i>C. × luteola</i>		
<i>Carex divulsa</i> × <i>C. remota</i> = <i>C. × emmae</i>	<i>Carex divulsa</i> ssp. <i>divulsa</i> × <i>C. remota</i> = <i>C. × emmae</i>		
<i>Carex echinata</i> × <i>C. curta</i> = <i>C. × biharica</i>	<i>Carex echinata</i> × <i>C. canescens</i> = <i>C. × biharica</i>		
<i>Carex flava</i> × <i>C. viridula</i> = <i>C. × alsatica</i> (<i>pro parte</i>)	<i>Carex flava</i> × <i>C. demissa</i> = <i>C. × alsatica</i>		
<i>Carex flava</i> × <i>C. viridula</i> = <i>C. × alsatica</i> (<i>pro parte</i>)	<i>Carex flava</i> × <i>C. lepidocarpa</i> = <i>C. × pieperiana</i>		
<i>Carex hostiana</i> × <i>C. viridula</i> = <i>C. × fulva</i> (<i>pro parte</i>)	<i>Carex hostiana</i> × <i>C. demissa</i>		
<i>Carex hostiana</i> × <i>C. viridula</i> = <i>C. × fulva</i> (<i>pro parte</i>)	<i>Carex hostiana</i> × <i>C. lepidocarpa</i> = <i>C. × fulva</i>		

Edition 2	Edition 3		Notes
<i>Carex hostiana</i> × <i>C. viridula</i> = <i>C.</i> × <i>fulva</i> (pro parte)	<i>Carex hostiana</i> × <i>C. oederi</i> = <i>C.</i> × <i>appelliana</i>		
<i>Carex lachenalii</i> × <i>C. curta</i> = <i>C.</i> × <i>helvola</i>	<i>Carex lachenalii</i> × <i>C. canescens</i> = <i>C.</i> × <i>helvola</i>		
<i>Carex laevigata</i> × <i>C. viridula</i> (ssp. <i>oedocarpa</i>)	<i>Carex laevigata</i> × <i>C. demissa</i>		Probable error
<i>Carex muricata</i> × <i>C. divulsa</i>	<i>Carex muricata</i> ssp. <i>pairae</i> × <i>C. divulsa</i> ssp. <i>divulsa</i>		
<i>Carex otrubae</i> × <i>C. divulsa</i>	<i>Carex otrubae</i> × <i>C. divulsa</i> ssp. <i>divulsa</i>		
<i>Carex paniculata</i> × <i>C. curta</i> = <i>C.</i> × <i>ludibunda</i>	<i>Carex paniculata</i> × <i>C. canescens</i> = <i>C.</i> × <i>ludibunda</i>		
<i>Carex pseudocyperus</i> × <i>C. rostrata</i> = <i>C.</i> × <i>justi-schmidtii</i>	<i>Carex pseudocyperus</i> × <i>C. rostrata</i>	B-	
<i>Centaurea</i> × <i>moncktonii</i> (<i>C. jacea</i> × <i>C. nigra</i>)	<i>Centaurea</i> × <i>gerstlaueri</i>		Includes crosses between <i>C. debeauxii</i> , <i>C. nigra</i> or their hybrid with <i>C. jacea</i>
<i>Cerastium alpinum</i> × <i>C. arcticum</i>	<i>Cerastium alpinum</i> × <i>C. nigrescens</i>		
<i>Cerastium arcticum</i> × <i>C. fontanum</i> = <i>C.</i> × <i>richardsonii</i>	<i>Cerastium nigrescens</i> × <i>C. fontanum</i> = <i>C.</i> × <i>richardsonii</i>		
<i>Chenopodium carinatum</i> × <i>C. cristatum</i> = <i>C.</i> × <i>bontei</i>	<i>Dysphania carinata</i> × <i>D. cristata</i> = <i>D.</i> × <i>bontei</i>		
× <i>Conyzigeron huelsenii</i> (<i>Erigeron acer</i> × <i>Conyza canadensis</i>)	× <i>Conyzigeron huelsenii</i> (<i>Erigeron</i> <i>acris</i> × <i>Conyza canadensis</i>)		
× <i>Cupressocypris leylandii</i> (<i>Cupressus</i> <i>macrocarpa</i> × <i>Chamaecyparis</i> <i>nootkatensis</i>)	× <i>Cuprocyparis leylandii</i> (<i>Cupressus</i> <i>macrocarpa</i> × <i>Xanthocyparis</i> <i>nootkatensis</i>)		
× <i>Dactyloдения st-quintinii</i> (<i>Gymnadenia conopsea</i> × <i>Dactylorhiza fuchsii</i>)	× <i>Dactyloдения st-quintinii</i> (<i>Gymnadenia borealis</i> × <i>Dactylorhiza fuchsii</i>)		
× <i>Dactyloдения varia</i> (<i>Gymnadenia</i> <i>conopsea</i> × <i>Dactylorhiza purpurella</i>)	× <i>Dactyloдения varia</i> (<i>Gymnadenia</i> <i>borealis</i> × <i>Dactylorhiza purpurella</i>)		
× <i>Dactyloдения vollmannii</i> (<i>Gymnadenia conopsea</i> × <i>Dactylorhiza incarnata</i>)	<i>Gymnadenia borealis</i> × <i>Dactylorhiza</i> <i>incarnata</i>		
× <i>Dactyloglossum viridella</i> (<i>Coeloglossum viride</i> × <i>Dactylorhiza</i> <i>purpurella</i>)	× <i>Dactyloglossum viridellum</i> (<i>Coeloglossum viride</i> × <i>Dactylorhiza</i> <i>purpurella</i>)	BC	
<i>Dactylorhiza fuchsii</i> × <i>D. incarnata</i> = <i>D.</i> × <i>kerneriorum</i>	<i>Dactylorhiza fuchsii</i> × <i>D. incarnata</i> = <i>D.</i> × <i>kerneriorum</i>	BC	
<i>Dactylorhiza fuchsii</i> × <i>D. majalis</i> = <i>D.</i> × <i>braunii</i>	<i>Dactylorhiza fuchsii</i> × <i>D. kerryensis</i>		
<i>Dactylorhiza fuchsii</i> × <i>D. traunsteineri</i>	<i>Dactylorhiza fuchsii</i> × <i>D. traunsteinerioides</i>		
<i>Dactylorhiza incarnata</i> × <i>D. majalis</i> = <i>D.</i> × <i>aschersoniana</i>	<i>Dactylorhiza incarnata</i> × <i>D. kerryensis</i>		
<i>Dactylorhiza incarnata</i> × <i>D. traunsteineri</i> = <i>D.</i> × <i>duffii</i>	<i>Dactylorhiza incarnata</i> × <i>D. traunsteinerioides</i>		
<i>Dactylorhiza maculata</i> × <i>D. majalis</i> = <i>D.</i> × <i>dinglensis</i>	<i>Dactylorhiza maculata</i> × <i>D. kerryensis</i> = <i>D.</i> × <i>dinglensis</i>		

Edition 2	Edition 3		Notes
<i>Dactylorhiza maculata</i> × <i>D. traunsteineri</i> = <i>D. ×jenensis</i>	<i>Dactylorhiza maculata</i> × <i>D. traunsteinerioides</i>		
<i>Dactylorhiza praetermissa</i> × <i>D. traunsteineri</i>	<i>Dactylorhiza praetermissa</i> × <i>D. traunsteinerioides</i>		
<i>Dactylorhiza purpurella</i> × <i>D. majalis</i>	<i>Dactylorhiza purpurella</i> × <i>D. kerryensis</i>		
<i>Dahlia pinnata</i>	<i>Dahlia</i> × <i>hortensis</i>		Dahlia now referred to this taxon
<i>Dryopteris filix-mas</i> × <i>D. affinis</i> ssp. <i>affinis</i> = <i>D. nothosp.</i> × <i>complexa</i>	<i>Dryopteris filix-mas</i> × <i>D. affinis</i> = <i>D. ×complexa</i> (s.s.)		
<i>Dryopteris filix-mas</i> × <i>D. affinis</i> ssp. <i>borreri</i> = <i>D. nothosp.</i> × <i>critica</i>	<i>Dryopteris filix-mas</i> × <i>D. borreri</i> = <i>D. ×critica</i>		
<i>Dryopteris filix-mas</i> × <i>D. affinis</i> ssp. <i>cambrensis</i> = <i>D. nothosp.</i> × <i>contorta</i>	<i>Dryopteris filix-mas</i> × <i>D. cambrensis</i> = <i>D. ×convoluta</i>		
<i>Dryopteris filix-mas</i> × <i>Dryopteris affinis</i> = <i>D. ×complexa</i>	<i>Dryopteris filix-mas</i> × <i>Dryopteris affinis</i> agg. = <i>D. ×complexa</i> agg.		
<i>Elytrigia atherica</i> × <i>E. juncea</i> = <i>E. ×obtusiuscula</i>	<i>Elytrigia atherica</i> × <i>E. juncea</i> = <i>E. ×acuta</i>	BC	
<i>Elytrigia repens</i> × <i>E. atherica</i> = <i>E. ×oliveri</i>	<i>Elytrigia repens</i> × <i>E. atherica</i> = <i>E. ×drucei</i>	BC	
<i>Epilobium ciliatum</i> × <i>E. brunnescens</i>	<i>Epilobium ciliatum</i> × <i>E. brunnescens</i> = <i>E. ×brunnatum</i>	B+	
<i>Epilobium ciliatum</i> × <i>E. palustre</i>	<i>Epilobium ciliatum</i> × <i>E. palustre</i> = <i>E. ×fossicola</i>	B+	
<i>Epilobium montanum</i> × <i>E. brunnescens</i>	<i>Epilobium montanum</i> × <i>E. brunnescens</i> = <i>E. ×confusilobum</i>	B+	
<i>Epilobium montanum</i> × <i>E. ciliatum</i>	<i>Epilobium montanum</i> × <i>E. ciliatum</i> = <i>E. ×interjectum</i>	B+	
<i>Epilobium montanum</i> × <i>E. roseum</i> = <i>E. ×mutabile</i>	<i>Epilobium montanum</i> × <i>E. roseum</i> = <i>E. ×heterocaule</i>	BC	
<i>Epilobium obscurum</i> × <i>E. brunnescens</i>	<i>Epilobium obscurum</i> × <i>E. brunnescens</i> = <i>E. ×obscurescens</i>	B+	
<i>Epilobium obscurum</i> × <i>E. ciliatum</i>	<i>Epilobium obscurum</i> × <i>E. ciliatum</i> = <i>E. ×vicinum</i>	B+	
<i>Epilobium palustre</i> × <i>E. brunnescens</i>	<i>Epilobium palustre</i> × <i>E. brunnescens</i> = <i>E. ×chateri</i>	B+	
<i>Epilobium parviflorum</i> × <i>E. ciliatum</i>	<i>Epilobium parviflorum</i> × <i>E. ciliatum</i> = <i>E. ×floridulum</i>	B+	
<i>Epilobium roseum</i> × <i>E. ciliatum</i>	<i>Epilobium roseum</i> × <i>E. ciliatum</i> = <i>E. ×nutantiflorum</i>	B+	
<i>Epilobium tetragonum</i> × <i>E. ciliatum</i>	<i>Epilobium tetragonum</i> × <i>E. ciliatum</i> = <i>E. ×mentiens</i>	B+	
<i>Erica mackaiana</i> × <i>E. tetralix</i> = <i>E. ×stuartii</i>	<i>Erica mackayana</i> × <i>E. tetralix</i> = <i>E. ×stuartii</i>		
<i>Euphrasia anglica</i> × <i>E. vigursii</i>	<i>Euphrasia officinalis</i> × <i>E. vigursii</i>		
<i>Euphrasia arctica</i> × <i>E. tetraquetra</i> = <i>E. ×pratiuscula</i>	<i>Euphrasia arctica</i> × <i>E. tetraquetra</i>	B-	
<i>Euphrasia confusa</i> × <i>E. foulaensis</i>	<i>Euphrasia confusa</i> × <i>E. foulaensis</i> = <i>E. ×atroviolacea</i>	B+	
<i>Euphrasia nemorosa</i> × <i>E. micrantha</i>	<i>Euphrasia nemorosa</i> × <i>E. micrantha</i> = <i>E. ×areschougii</i>	B+	

Edition 2	Edition 3		Notes
<i>Euphrasia rostkoviana</i> × <i>E. rivularis</i>	<i>Euphrasia officinalis</i> × <i>E. rivularis</i>		
<i>Euphrasia rostkoviana</i> / <i>anglica</i> × <i>E. arctica</i>	<i>Euphrasia officinalis</i> × <i>E. arctica</i>		
<i>Euphrasia rostkoviana</i> / <i>anglica</i> × <i>E. confusa</i>	<i>Euphrasia officinalis</i> × <i>E. confusa</i>		
<i>Euphrasia rostkoviana</i> / <i>anglica</i> × <i>E. micrantha</i>	<i>Euphrasia officinalis</i> × <i>E. micrantha</i>		
<i>Euphrasia rostkoviana</i> / <i>anglica</i> × <i>E. nemorosa</i>	<i>Euphrasia officinalis</i> × <i>E. nemorosa</i> = <i>E. ×glanduligera</i>		
<i>Fallopia japonica</i> × <i>F. baldschuanica</i>	<i>Fallopia japonica</i> × <i>F. baldschuanica</i> = <i>F. ×conollyana</i>	B+	
<i>Festuca arundinacea</i> × <i>F. gigantea</i>	<i>Schedonorus arundinaceus</i> × <i>S. giganteus</i> = <i>S. ×fleischeri</i>		
<i>Festuca arundinacea</i> × <i>Lolium multiflorum</i>	<i>Schedonorus arundinaceus</i> × <i>Lolium multiflorum</i> = <i>×Schedololium krasanii</i>		
<i>Festuca arundinacea</i> × <i>Lolium perenne</i> = <i>×Festulolium holmbergii</i>	<i>Schedonorus arundinaceus</i> × <i>Lolium perenne</i> = <i>×Schedololium holmbergii</i>		
<i>Festuca gigantea</i> × <i>Lolium perenne</i> = <i>×Festulolium brinkmannii</i>	<i>Schedonorus giganteus</i> × <i>Lolium perenne</i> = <i>×Schedololium brinkmannii</i>		
<i>Festuca pratensis</i> × <i>F. arundinacea</i>	<i>Schedonorus pratensis</i> × <i>S. arundinaceus</i> = <i>S. ×aschersonianus</i>		
<i>Festuca pratensis</i> × <i>F. gigantea</i>	<i>Schedonorus pratensis</i> × <i>S. giganteus</i> = <i>S. ×schlickumii</i>		
<i>Festuca pratensis</i> × <i>Lolium multiflorum</i> = <i>×Festulolium braunii</i>	<i>Schedonorus pratensis</i> × <i>Lolium multiflorum</i> = <i>×Schedololium braunii</i>		
<i>Festuca pratensis</i> × <i>Lolium perenne</i> = <i>×Festulolium loliaceum</i>	<i>Schedonorus pratensis</i> × <i>Lolium perenne</i> = <i>×Schedololium loliaceum</i>		
<i>Galium verum</i> × <i>G. mollugo</i> = <i>G. ×pomeranicum</i>	<i>Galium verum</i> × <i>G. album</i> = <i>G. ×pomeranicum</i>		
<i>Gentianella amarella</i> × <i>G. anglica</i>	<i>Gentianella amarella</i> × <i>G. anglica</i> = <i>G. ×davidiana</i>	B+	
<i>Hebe ×franciscana</i> (<i>H. elliptica</i> × <i>H. speciosa</i>)	<i>Veronica ×franciscana</i> (<i>V. elliptica</i> × <i>V. speciosa</i>)		
<i>Hebe ×lewisii</i> (<i>H. salicifolia</i> × <i>H. elliptica</i>)	<i>Veronica ×lewisii</i> (<i>V. salicifolia</i> × <i>V. elliptica</i>)		
<i>Hyacinthoides non-scripta</i> × <i>H. hispanica</i>	<i>Hyacinthoides non-scripta</i> × <i>H. hispanica</i> = <i>H. ×massartiana</i>	B+	
<i>Juncus alpinoarticulatus</i> × <i>J. articulatus</i> = <i>J. ×buchanaui</i>	<i>Juncus alpinoarticulatus</i> × <i>J. articulatus</i> = <i>J. ×alpiniformis</i>	BC	
<i>Lavandula ×hybrida</i>	<i>Lavandula</i> <i>angustifolia</i>		Garden Lavender now referred to as this taxon
<i>Leontodon hispidus</i> × <i>L. saxatilis</i>	<i>Leontodon hispidus</i> × <i>L. saxatilis</i> = <i>L. ×vegetus</i>	B+	
<i>Narcissus pseudonarcissus</i> × <i>N. cyclamineus</i>	<i>Narcissus ×monochromus</i> (<i>N. pseudonarcissus</i> × <i>N. cyclamineus</i>)	B+	
<i>Nothofagus obliqua</i> × <i>N. nervosa</i>	<i>Nothofagus obliqua</i> × <i>N. alpina</i> = <i>N. ×dodecaphleps</i>		

Edition 2	Edition 3		Notes
× <i>Orchiaceras bergonii</i> (<i>Orchis simia</i> × <i>Aceras anthropophorum</i>)	<i>Orchis simia</i> × <i>O. anthropophora</i> = <i>O. ×bergonii</i>		
<i>Orchis laxiflora</i> × <i>Orchis morio</i> = <i>O. ×alata</i>	<i>Anacamptis laxiflora</i> × <i>A. morio</i> = <i>A. ×alata</i>		
<i>Orchis mascula</i> × <i>O. morio</i>	<i>Orchis mascula</i> × <i>Anacamptis morio</i> = ×<i>Anacamptorchis morioides</i>		
<i>Philadelphus ×virginalis</i>	<i>Philadelphus</i> ' Virginalis Group '		<i>P. ×virginalis</i> is included
<i>Polystichum setiferum</i> × <i>P. munitum</i>	<i>Polystichum setiferum</i> × <i>P. munitum</i> = <i>P. ×lesliei</i>	B+	
<i>Populus ×canadensis</i> '178'	<i>Populus ×canadensis</i> ' Casale 78 '	BC	
<i>Potamogeton ×zizii</i> (<i>P. lucens</i> × <i>P. gramineus</i>)	<i>Potamogeton ×angustifolius</i> (<i>P. lucens</i> × <i>P. gramineus</i>)	BC	
<i>Potentilla crantzii</i> × <i>P. neumanniana</i>	<i>Potentilla crantzii</i> × <i>P. tabernaemontani</i>		
× <i>Pseudadenia schweinfurthii</i> (<i>Pseudorchis albida</i> × <i>Gymnadenia conopsea</i>)	<i>Pseudorchis albida</i> × <i>Gymnadenia borealis</i>		
<i>Rheum ×hybridum</i>	<i>Rheum ×rhabarbarum</i>	BC	
<i>Rorippa ×sterilis</i> (<i>R. officinalis</i> × <i>R. microphyllum</i>)	<i>Nasturtium ×sterile</i> (<i>N. officinale</i> × <i>N. microphyllum</i>)		
<i>Rosa arvensis</i> × <i>R. canina</i> = <i>R. ×verticillacantha</i>	<i>Rosa arvensis</i> × <i>R. canina</i> = <i>R. ×irregularis</i>	BC	
<i>Rosa arvensis</i> × <i>R. rubiginosa</i> = <i>R. ×consanguinea</i>	<i>Rosa arvensis</i> × <i>R. rubiginosa</i> = <i>R. ×gallicoides</i>	BC	
<i>Rosa pimpinellifolia</i> × <i>R. caesia</i> = <i>R. ×margerisonii</i>	<i>Rosa spinosissima</i> × <i>R. caesia</i> = <i>R. ×margerisonii</i>		
<i>Rosa pimpinellifolia</i> × <i>R. canina</i> = <i>R. ×hibernica</i>	<i>Rosa spinosissima</i> × <i>R. canina</i> = <i>R. ×hibernica</i>		
<i>Rosa pimpinellifolia</i> × <i>R. mollis</i> = <i>R. ×sabinii</i>	<i>Rosa spinosissima</i> × <i>R. mollis</i> = <i>R. ×sabinii</i>		
<i>Rosa pimpinellifolia</i> × <i>R. rubiginosa</i> = <i>R. ×biturigensis</i>	<i>Rosa spinosissima</i> × <i>R. rubiginosa</i> = <i>R. ×biturigensis</i>		
<i>Rosa pimpinellifolia</i> × <i>R. sherardii</i> = <i>R. ×involuta</i>	<i>Rosa spinosissima</i> × <i>R. sherardii</i> = <i>R. ×involuta</i>		
<i>Rosa pimpinellifolia</i> × <i>R. tomentosa</i> = <i>R. ×coronata</i>	<i>Rosa spinosissima</i> × <i>R. tomentosa</i> = <i>R. ×andrzejowskii</i>		
<i>Rosa sherardii</i> × <i>R. mollis</i>	<i>Rosa sherardii</i> × <i>R. mollis</i> = <i>R. ×perthensis</i>	B+	
<i>Rumex aquaticus</i> × <i>R. obtusifolius</i> = <i>R. ×platyphyllos</i>	<i>Rumex aquaticus</i> × <i>R. obtusifolius</i> = <i>R. ×platyphyllos</i>	BC	
<i>Rumex cristatus</i> × <i>R. palustris</i>	<i>Rumex cristatus</i> × <i>R. palustris</i> = <i>R. ×akeroydii</i>	B+	
<i>Rumex hydrolapathum</i> × <i>R. obtusifolius</i> = <i>R. ×lingulatus</i>	<i>Rumex hydrolapathum</i> × <i>R. obtusifolius</i> = <i>R. ×weberi</i>	BC	
<i>Rumex patientia</i> × <i>R. conglomeratus</i>	<i>Rumex patientia</i> × <i>R. conglomeratus</i> = <i>R. ×philpii</i>	B+	
<i>Salix caprea</i> × <i>S. lapponum</i> = <i>S. ×laestadiana</i>	<i>Salix caprea</i> × <i>S. lapponum</i> = <i>S. ×canescens</i>	BC	
<i>Salix lapponum</i> × <i>S. arbuscula</i> = <i>S. ×pseudospuria</i>	<i>Salix lapponum</i> × <i>S. arbuscula</i> = <i>S. ×pseudoglauca</i>	BC	



Calystegia soldanella f. *albiflora* at Morfa Abererch (v.c.49), comparison with normal.
Photos: L. Jane Rees © 2010 (see p. 36)



Rorippa islandica habitat



Rorippa islandica whole plant



Rorippa islandica close up

All *Rorippa* photos taken at Earlswood Lake (v.c.38). B. Laney © 2010 (see p. 18)



Two views of the flower of Indian Balsam



Indian Balsam flowers with parts of petals removed to reveal male (l) and female (r) parts fully



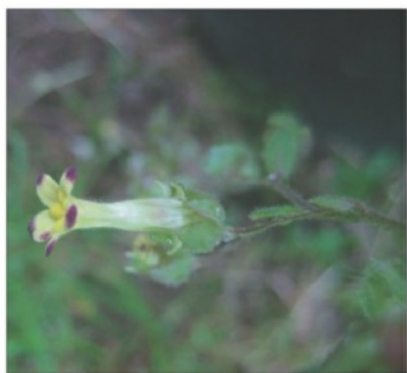
Flowers of Indian Balsam at staminal (l) & ovarian (r) stages



Indian Balsam fruits before dehiscence (l) and after (r)



All Indian Balsam photos taken by J. Presland © 2010 (see p. 60)



Kickxia spuria with peloric variation 2



Kickxia spuria with peloric variation 4



Kickxia spuria with peloric variation 6



Kickxia spuria with peloric variation 7

Kickxia spuria plants cultivated at Llanymys (v.c.42). All photos A.G. Shaw © 2010 (see p. 29)



Genista anglica in situ Bartley Heath in May with flower & leaf detail inset. Photos Peter Vaughan © 2009 (see p. 12)



Trientalis europaea at East

Gerinish, South Uist (v.c.110).

Photo Steve Duffield © 2009

(see p. 41)



Arum maculatum at Weston Mouth,

East Devon. Photo A. Galton

© 2006 (see p. 11)



One of the *Drosera intermedia* (Oblong-leaved Sundew) plants found growing in Burnham Beeches.
Photo Andy McVeigh © 2009 (see p. 10)



Anagallis tenella (Bog Pimpernel) photographed in Burnham Beeches.
Photo City of London © 2003 (see p. 10)



Viola xintersita at Rue Point (v.c.71) in June 2010
Photo B.A. Tregale © 2010 (see p. 28)



Utricularia bremii foliage,
Woodfidley Passage, 2008



Utricularia bremii flower,
Woodfidley Passage, 2008
All *Utricularia* photos taken in New Forest (v.c.11) © A. Smith (see p. 9)



Utricularia minor flower, Acres
Down, 2010



A seeded capsule of *Spiranthus romanzoffiana*, Benbecula (v.c.110).
Photo B. Lowe © 2010 (see p. 40)

Edition 2	Edition 3		Notes
<i>Salix myrsinifolia</i> × <i>S. phylicifolia</i> × <i>S. myrsinites</i>	<i>Salix myrsinifolia</i> × <i>S. phylicifolia</i> × <i>S. myrsinites</i> = <i>S. ×blyttiana</i>	B+	
<i>Salix myrsinifolia</i> × <i>S. phylicifolia</i> × <i>S. repens</i>	<i>Salix myrsinifolia</i> × <i>S. phylicifolia</i> × <i>S. repens</i> = <i>S. ×lochsiensis</i>	B+	
<i>Salix repens</i> × <i>S. arbuscula</i>	<i>Salix repens</i> × <i>S. arbuscula</i> = <i>S. ×lyonensis</i>	B+	
<i>Salix repens</i> × <i>S. lapponum</i> = <i>S. ×pithoensis</i>	<i>Salix repens</i> × <i>S. lapponum</i>	B-	
<i>Salix ×sericans</i> (<i>S. viminalis</i> × <i>S. caprea</i>)	<i>Salix ×smithiana</i> (<i>S. viminalis</i> × <i>S. caprea</i>)	BC	Note potential confusion
<i>Salix ×smithiana</i> (<i>S. viminalis</i> × <i>S. cinerea</i>)	<i>Salix ×holosericea</i> (<i>S. viminalis</i> × <i>S. cinerea</i>)	BC	Note potential confusion
<i>Sorbus aria</i> × <i>S. torminalis</i> = <i>S. ×vagensis</i>	<i>Sorbus ×tomentella</i> (<i>S. aria</i> × <i>S. torminalis</i>)	BC	
<i>Sorbus aucuparia</i> × <i>S. intermedia</i>	<i>Sorbus aucuparia</i> × <i>S. intermedia</i> = <i>S. ×liljeforsii</i>	B+	
<i>Symphytum</i> ‘Hidcote Blue’	<i>Symphytum ×hidcotense</i> (<i>S. grandiflorum</i> × ? <i>S. uplandicum</i>)	BC	Includes ‘Hidcote Pink’
<i>Ulex europaeus</i> × <i>U. gallii</i>	<i>Ulex europaeus</i> × <i>U. gallii</i> = <i>U. ×breoganii</i>	B+	

Table 2: New taxa in Edition 3 (in alphabetical order).

Edition 3	Notes
<i>Agrostis capillaris</i> × <i>A. canina</i>	Not confirmed
<i>Alnus incana</i> × <i>A. cordata</i>	Since 2007
<i>Calamagrostis stricta</i> × <i>C. scotica</i>	Might occur
<i>Carex aquatilis</i> × <i>C. acuta</i>	
<i>Carex distans</i> × <i>C. demissa</i>	
<i>Carex distans</i> × <i>C. oederi</i> = <i>C. ×gogeliana</i>	
<i>Carex otrubae</i> × <i>C. spicata</i> = <i>C. ×hausknechtii</i>	
<i>Carex recta</i> × <i>C. nigra</i> = <i>C. ×spiculosa</i>	
<i>Carex riparia</i> × <i>C. rostrata</i> = <i>C. ×beckmanniana</i>	Since 1992
<i>Carex saxatilis</i> × <i>C. lepidocarpa</i> = <i>C. ×marshallii</i>	Refound 2002 (previously 1925)
<i>Carex vulpina</i> × <i>C. otrubae</i>	Probable
<i>Centaurea nigra</i> × <i>C. debeauxii</i>	
<i>Centaureum littorale</i> × <i>C. pulchellum</i> = <i>C. ×aschersonianum</i>	Since 2008
<i>Cochlearia pyrenaica</i> × <i>C. officinalis</i>	Possible in 1893 (<i>sic</i>)
<i>Coeloglossum viride</i> × <i>Dactylorhiza praetermissa</i>	Not confirmed
<i>Crataegus monogyna</i> × <i>C. rhipidophylla</i> = <i>C. ×subsphaerica</i>	
<i>Crocoshmia masoniorum</i> × <i>C. ×crocoshmiflora</i>	
<i>Crocoshmia paniculata</i> × <i>C. pottsii</i>	See note in text re <i>C. paniculata</i>
× <i>Dactylodenia evansii</i> (<i>Gymnadenia borealis</i> × <i>Dactylorhiza maculata</i>)	
× <i>Dactylodenia heinzliana</i> (<i>Gymnadenia conopsea</i> × <i>Dactylorhiza fuchsii</i>)	
× <i>Dactylodiosmum guilhotii</i> (<i>Coeloglossum viride</i> × <i>Dactylorhiza incarnata</i>)	Not confirmed

Edition 3	Notes
<i>Dactylorhiza purpurella</i> × <i>D. ebudensis</i>	
<i>Dactylorhiza purpurella</i> × <i>D. traunsteinerioides</i>	Not confirmed
<i>Dicentra formosa</i> × <i>D. eximia</i>	No definite records from the wild
<i>Dryopteris oreades</i> × <i>D. affinis</i>	Since 2006
<i>Dryopteris oreades</i> × <i>D. borneri</i>	Since 2005
<i>Dysphania pumilio</i> × <i>D. carinata</i> = <i>D. ×christii</i>	
<i>Elaeagnus macrophylla</i> × <i>E. pungens</i> = <i>E. ×submacrophylla</i>	
<i>Epilobium hirsutum</i> × <i>E. obscurum</i> = <i>E. ×anglicum</i>	Since 2003
<i>Epilobium lanceolatum</i> × <i>E. brunnescens</i> = <i>E. ×cornubiense</i>	Since 1995
<i>Epilobium montanum</i> × <i>E. palustre</i> = <i>E. ×montaniforme</i>	Since 1996
<i>Epilobium montanum</i> × <i>E. pedunculare</i> = <i>E. ×kitcheneri</i>	Since 1996
<i>Epilobium parviflorum</i> × <i>E. brunnescens</i> = <i>E. ×argillaceum</i>	Since 2002
<i>Epipactis helleborine</i> × <i>E. leptochila</i> = <i>E. ×stephensonii</i>	Unconfirmed
<i>Equisetum arvense</i> × <i>E. telmateia</i> = <i>E. ×robertsii</i>	Since 1992
<i>Equisetum fluviatile</i> × <i>E. pratense</i> = <i>E. ×mchaffieae</i>	Since 2003
<i>Equisetum ramosissimum</i> × <i>E. variegatum</i> = <i>E. ×meridionale</i>	Since 2000
<i>Erigeron acris</i> × <i>Conyza sumatrensis</i>	
<i>Euphrasia arctica</i> × <i>E. confusa</i> × <i>E. micrantha</i>	
<i>Euphrasia arctica</i> × <i>E. frigida</i>	
<i>Euphrasia arctica</i> × <i>E. nemorosa</i> × <i>E. confusa</i>	
<i>Euphrasia arctica</i> × <i>E. nemorosa</i> × <i>E. micrantha</i>	
<i>Euphrasia arctica</i> × <i>E. ostefeldii</i>	
<i>Euphrasia arctica</i> × <i>E. rotundifolia</i>	
<i>Euphrasia cambrica</i> × <i>E. ostefeldii</i>	
<i>Euphrasia campbelliae</i> × <i>E. micrantha</i>	
<i>Euphrasia confusa</i> × <i>E. cambrica</i>	
<i>Euphrasia confusa</i> × <i>E. frigida</i> × <i>E. scottica</i>	
<i>Euphrasia frigida</i> × <i>E. ostefeldii</i> = <i>E. ×eurycarpa</i>	
<i>Euphrasia nemorosa</i> × <i>E. confusa</i> × <i>E. scottica</i>	
<i>Euphrasia nemorosa</i> × <i>E. heslop-harrisonii</i>	
<i>Euphrasia nemorosa</i> × <i>E. marshallii</i> × <i>E. micrantha</i>	
<i>Euphrasia rivularis</i> × <i>E. confusa</i> × <i>E. scottica</i>	
<i>Euphrasia tetraquetra</i> × <i>E. marshallii</i>	
<i>Euphrasia vigursii</i> × <i>E. micrantha</i>	
<i>Filipendula</i> × <i>purpurea</i> (<i>F. camtschatica</i> × <i>F. sp.</i>)	
<i>Geranium</i> × <i>cantabrigiense</i> (<i>G. macrorrhizum</i> × <i>G. dalmaticum</i>)	<i>G. dalmaticum</i> not in wild
<i>Gymnadenia conopsea</i> × <i>Dactylorhiza purpurella</i>	Not confirmed (see × <i>Dactylodenia varia</i>)
<i>Gymnadenia densiflora</i> × <i>Dactylorhiza fuchsii</i>	
<i>Gymnadenia densiflora</i> × <i>Dactylorhiza praetermissa</i>	
<i>Hypericum undulatum</i> × <i>H. tetrapterum</i>	Since 2006
<i>Juglans regia</i> × <i>J. nigra</i> = <i>J. ×intermedia</i>	Might occur in wild
<i>Ligustrum</i> × <i>vicaryi</i> (<i>L. vulgare</i> × <i>L. ovalifolium</i> ‘Aureum’)	

Edition 3	Notes
<i>Ludwigia</i> × <i>kentiana</i> (<i>L. palustris</i> × <i>L. repens</i>)	
<i>Malva sylvestris</i> × <i>M. neglecta</i> = <i>M.</i> × <i>decipiens</i>	Since 2007
<i>Malva</i> × <i>clementii</i> (<i>M. olbia</i> × <i>M. thuringiaca</i>)	
<i>Miscanthus</i> × <i>giganteus</i> (<i>M. sinensis</i> × <i>M. sacchariflorus</i>)	
<i>Myosotis secunda</i> × <i>M. stolonifera</i>	Since 2004
<i>Narcissus</i> × <i>bernardii</i> (<i>N. poeticus</i> × <i>N. hispanicus</i>)	
<i>Narcissus</i> × <i>boutignyanus</i> (<i>N. poeticus</i> × <i>N. moschatus</i>)	
<i>Narcissus</i> × <i>cyclazetta</i> (<i>N. tazetta</i> × <i>N. cyclamineus</i>)	
<i>Narcissus</i> × <i>dichromus</i> (<i>N. moschatus</i> × <i>N. cyclamineus</i>)	
<i>Narcissus</i> × <i>intermedius</i> (<i>N. tazetta</i> × <i>N. jonquilla</i>)	
<i>Narcissus</i> × <i>taitii</i> (<i>N. triandrus</i> × <i>N. pseudonarcissus</i>)	Since 2005
<i>Ophrys sphegodes</i> × <i>O. fuciflora</i> = <i>O.</i> × <i>obscura</i>	Since 1828 (<i>sic</i>)
<i>Orchis purpurea</i> × <i>O. anthropophora</i> = <i>O.</i> × <i>meilshheimeri</i>	Since 1998
<i>Orchis purpurea</i> × <i>O. simia</i> = <i>O.</i> × <i>angusticruris</i>	Since 2006
<i>Persicaria</i> × <i>fennica</i> (<i>P. alpina</i> × <i>P. weyrichii</i>)	
<i>Philadelphus</i> ‘Lemoinei Group’	
<i>Platanthera bifolia</i> × <i>Gymnadenia borealis</i>	Since 1998, possible
<i>Poa infirma</i> × <i>P. annua</i>	Since 2003, confirmation required
<i>Potamogeton polygonifolius</i> × <i>P. berchtoldii</i> = <i>P.</i> × <i>rivularis</i>	Since 2005
<i>Potentilla erecta</i> × <i>P. reptans</i> = <i>P.</i> × <i>italica</i>	
<i>Primula</i> × <i>pruhonicensis</i> (<i>P. vulgaris</i> × <i>P. juliae</i>)	
<i>Prunus cerasifera</i> × <i>P. spinosa</i> = <i>P.</i> × <i>simmleri</i>	Since 2006
<i>Pterocarya</i> × <i>rehderiana</i> (<i>P. fraxinifolia</i> × <i>P. stenoptera</i>)	
<i>Rosa obtusifolia</i> × <i>R. sherardii</i>	Since 1998
<i>Rosa spinosissima</i> × <i>R. rugosa</i>	Since 1997, now doubts about identity
<i>Rumex conglomeratus</i> × <i>R. rupestris</i> = <i>R.</i> × <i>rosemurphyae</i>	Since 1995
<i>Rumex crispus</i> × <i>R. obovatus</i> = <i>R.</i> × <i>bontei</i>	
<i>Rumex cristatus</i> × <i>R. patientia</i> ssp. <i>orientalis</i> = <i>R.</i> × <i>xenogenus</i>	Since 2000
<i>Rumex frutescens</i> × <i>R. crispus</i> = <i>R.</i> × <i>mirabilis</i>	Since 2002
<i>Rumex palustris</i> × <i>R. maritimus</i> = <i>R.</i> × <i>henrardii</i>	Since 1994
<i>Rumex patientia</i> × <i>R. crispus</i> × <i>R. obtusifolius</i>	Since 2006
<i>Salix aurita</i> × <i>S. lapponum</i> × <i>S. herbacea</i>	Since 1998
<i>Salix aurita</i> × <i>S. repens</i> × <i>S. lapponum</i>	Since 1995
<i>Salix caprea</i> × <i>S. cinerea</i> × <i>S. repens</i> = <i>S.</i> × <i>permixta</i>	Since 2004
<i>Salix caprea</i> × <i>S. myrsinifolia</i> × <i>S. phylicifolia</i> = <i>S.</i> × <i>meikleana</i>	Since 1996
<i>Salix cinerea</i> × <i>S. myrsinifolia</i> × <i>S. phylicifolia</i>	Since 2000
<i>Salix lapponum</i> × <i>S. myrsinites</i> × <i>S. herbacea</i>	Since 2002
<i>Salix myrsinifolia</i> × <i>S. arbuscula</i>	
<i>Salix myrsinifolia</i> × <i>S. phylicifolia</i> × <i>S. arbuscula</i>	Since 2000, needs confirmation
<i>Salix purpurea</i> × <i>S. viminalis</i> × <i>S. repens</i>	Since 2000
<i>Salvia</i> × <i>sylvestris</i> (<i>S. pratensis</i> × <i>S. nemorosa</i>)	
<i>Sedum</i> ‘Herbstfreude’ (<i>S. spectabile</i> × <i>S. telephium</i>)	Mentioned in ed. 2 under <i>S. spectabile</i>

Edition 3	Notes
<i>Sorbus aria</i> × <i>S. bristoliensis</i> = <i>S. ×houstoniae</i>	
<i>Sorbus aria</i> × <i>S. eminens</i> = <i>S. ×robertsonii</i>	
<i>Sorbus aria</i> × <i>S. porrigentiformis</i> = <i>S. ×avonensis</i>	
<i>Sorbus aucuparia</i> × <i>S. leyana</i> = <i>S. ×motleyi</i>	
<i>Sorbus aucuparia</i> × <i>S. scalaris</i> = <i>S. ×proctoris</i>	
<i>Symphoricarpos</i> × <i>doorenbosii</i> (<i>S. albus</i> × <i>S. ×chenaultii</i>)	
<i>Symphytum asperum</i> × <i>S. caucasicum</i>	Since 1994, <i>S. ×uplandicum</i> perhaps a more likely parent
<i>Symphytum</i> × <i>norvicense</i> (<i>S. asperum</i> × <i>S. orientale</i>)	Since 1999
<i>Trichophorum cespitosum</i> × <i>T. germanicum</i> = <i>T. ×foersteri</i>	
<i>Ulex gallii</i> × <i>U. minor</i>	Possibly occurs
<i>Verbascum bombyciferum</i> × <i>V. nigrum</i>	
<i>Verbascum bombyciferum</i> × <i>V. phlomoides</i>	
<i>Verbascum nigrum</i> × <i>V. speciosum</i>	Since 2001
<i>Verbascum phlomoides</i> × <i>V. pulverulentum</i> = <i>V. ×murbeckii</i>	Since 2000
<i>Verbascum phoeniceum</i> × <i>V. nigrum</i> = <i>V. ×ustulatum</i>	
<i>Verbascum virgatum</i> × <i>V. nigrum</i>	Since 2001
<i>Verbascum virgatum</i> × <i>V. pulverulentum</i>	Since 2001
<i>Viola lutea</i> × <i>V. arvensis</i>	

Table 3: Taxa in Edition 2 but excluded from Edition 3

Extensive research in connection with the forthcoming Hybrid book has meant re-examination and often re-determination of historic specimens. The following combinations are no longer deemed to occur in Britain and Ireland, though some do occur elsewhere in Europe.

Edition 2	Notes
<i>Carex laevigata</i> × <i>C. pallescens</i>	
<i>Euphrasia campbelliae</i> × <i>E. scottica</i>	
<i>Euphrasia foulaensis</i> × <i>E. ostensfeldii</i>	
<i>Euphrasia rostkoviana</i> × <i>E. anglica</i>	
<i>Euphrasia rostkoviana</i> × <i>E. scottica</i>	
<i>Euphrasia tetraquetra</i> × <i>E. ostensfeldii</i>	
<i>Oenothera biennis</i> × <i>O. cambrica</i>	Still mentioned in text
<i>Oenothera glazioviana</i> × <i>O. cambrica</i> = <i>O. ×britannica</i>	Still mentioned in text
<i>Quercus cerris</i> × <i>Q. robur</i>	
<i>Rosa multiflora</i> × <i>R. rubiginosa</i>	Marked as error in edition 2
<i>Rosa pimpinellifolia</i> × <i>R. agrestis</i> = <i>R. ×caviniacensis</i>	
<i>Salix myrsinifolia</i> × <i>S. herbacea</i> = <i>S. ×semireticulata</i>	
<i>Salix lapponum</i> × <i>S. reticulata</i> = <i>S. ×boydii</i>	
<i>Salix phylicifolia</i> × <i>S. lapponum</i> = <i>S. ×gillottii</i>	
<i>Salix phylicifolia</i> × <i>S. myrsinites</i> = <i>S. ×notha</i>	
<i>Sorbus aria</i> × <i>S. rupicola</i>	
<i>Sorbus porrigentiformis</i> × <i>S. torminalis</i>	
<i>Sorbus rupicola</i> × <i>S. torminalis</i>	

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References:

- STACE, C.A. (1997). *New flora of the British Isles* (2nd Ed.). Cambridge University Press, Cambridge.
- STACE, C.A. (2010). *New flora of the British Isles* (3rd Ed.). Cambridge University Press, Cambridge.

New names and taxa in the third edition of Stace – part 1 Correction and further work

BOB ELLIS, *11 Havelock Road, Norwich, Norfolk, NR2 3 HQ.*
DAVID PEARMAN, *'Algiers', Feock, Truro, Cornwall, TR3 6RA.*

We have spotted one error in the September 2010 article - *Lycopodium lagopus*, in the additions, should be marked 'native'.

For the additional Aliens in Stace 3, DAP is preparing a draft covering the first dates in

cultivation and first dates in the wild. This will complement those used in the *Atlas* (which have been heavily revised since). We intend to update the booklet covering all of these in 2011.

Vascular plant Red Data List for Great Britain: a summary of year 5 amendments, covering years 3, 4 and 5 (2008-10) of the annual amendments process

SIMON J. LEACH, *Natural England, Riverside Chambers, Castle Street, Taunton, Somerset TA1 4AP.*
(simon.j.leach@naturalengland.org.uk)

KEVIN J. WALKER, *BSBI Plant Unit, c/o 97 Dragon Parade, Harrogate, North Yorkshire HG1 5DG.*
(kevinwalker@bsbi.org.uk)

Following publication of year 1 and year 2 amendments (Leach, 2007, 2010), the Species Status Assessment Group for vascular plants has now agreed a number of 'year 5' changes to the *Red Data List* covering years 3, 4 and 5 of the annual amendments process (2008-2010 inclusive). These are being submitted to JNCC to be incorporated into the master list on the JNCC website. A copy of the revised *Red Data List*, including the Waiting List, will also shortly be available to download from the BSBI website. A summary of the main changes is given below.

The amendments fall into three categories: (a) nomenclatural changes; (b) amendments and additions to the Main List; (c) amendments and additions to the Waiting List. It

should be noted that in every case of a threat status being revised, or a new threat status assigned, this has been done by applying the same IUCN threat criteria (IUCN, 2001, 2003) used to compile the original *Red Data List*. In the following account, threat status categories are abbreviated as follows: EX extinct, CR critically endangered, EN endangered, VU vulnerable, NT near threatened, DD data deficient, LC least concern (= not threatened). For definitions, see Cheffings & Farrell (2005).

Nomenclature

We have updated the nomenclature used in the *Red Data List* to bring it in line with the names in the third edition of Stace's *New flora of the British Isles* (2010). As a result, anyone searching for *Arabis glabra* (EN) could be surprised

to find it ‘missing’ from the Main List – but, rest assured, it is still there, now under the guise of *Turritis glabra* (Tower Mustard). Those of us brought up on CTW and Keble Martin will find many of the name changes strangely comforting – for example *Carex viridula* ssp. *oedocarpa* (LC) is, once again, *Carex demissa* (Common Yellow-sedge), while *Potentilla neumanniana* (LC) has happily reverted to *P. tabernaemontani* (Spring Cinquefoil). But there is much discomfort to be had too: *Festuca pratensis* (Meadow Fescue) (LC) and *F. arundinacea* (Tall Fescue) (LC) have become *Schedonorus*, for example, while *Leontodon autumnalis* (Autumn Hawkbit) (LC) is now *Scorzonerooides*. We do not list these changes here, but readers requiring further detail are referred to the article in the last *BSBI News* (Ellis & Pearman, 2010).

In addition, a number of native/archaeophyte species previously listed at the species level are now thought to comprise both native/archaeophyte and neophyte subspecies. As far as possible we have amended entries for these species in the *Red Data List* to make it clear that the threat assessment applies to the native/archaeophyte subspecies only. Thus, for example, following the taxonomic treatment in Sell & Murrell (2009), *Apium graveolens* now appears on the Main List as (the native) *A. graveolens* ssp. *graveolens* (Wild Celery), to make it clear that the alien ssp. *dulce* (Celery) and ssp. *rapaceum* (Celeriac) have been excluded from the assessment. We decided to make these changes even where Sell & Murrell (2009) and Stace (2010) differ in the taxonomic rank they assign to the taxa concerned; for example, in the case of *A. graveolens*, Stace (2010) gives the alien taxa as varieties, not subspecies.

Main List

There are 39 changes to the Main List: three taxa are removed to the Waiting List, 11 are given revised threat statuses, and 25 are added for the first time. In alphabetical order, these amendments and additions are as follows:

- *Arenaria norvegica* ssp. *anglica* (English Sandwort) (previously NT) has undergone a recent substantial population decline (K.

J. Walker, pers. obs.). The total population size of this endemic taxon in the 1990s ranged from a few hundred to around 4000 plants; since 2000, however, no more than 300 plants have been recorded in any one year, suggesting a sustained decline, probably due to a run of very dry springs and early summers. Its threat status is thus amended to EN.

- *Asplenium fontanum* (previously not listed) is added to the Main List as EX. When it was last recorded in GB is uncertain, but it is included in the forthcoming check-list of the British Pteridological Society as a native, being now regarded as an extinct ‘natural colonist’ from southern Europe. (Stace (2010) lists it as an introduction.)
- *Carex salina* (Saltmarsh Sedge). An extensive search of west coast Scottish salt-marshes suggests that this sedge may well be restricted to a single site, Loch Duich (Dean *et al.*, 2008). Previously not listed, it is added to the Main List as VU.
- *Cerastium arcticum* (previously NT) and *C. nigrescens* (previously EN) are combined by Stace (2010) within a single species, *C. nigrescens* (Arctic Mouse-ear). As such, the threat status NT now applies to *C. nigrescens*, which, apart from plants on Shetland, comprises populations previously named *C. arcticum* (now *C. nigrescens* var. *laxum*). The Shetland ‘*nigrescens*’ is reduced to varietal rank (*C. nigrescens* var. *nigrescens*), although Stace considers that it “...might be better as a subspecies”. On the strength of this last remark – and the fact that it is a Shetland endemic – we have, for now, added var. *nigrescens* to the Waiting List rather than remove it altogether.
- *Dryopteris affinis* agg. The range of variation within the *Dryopteris affinis* group has been greatly clarified in recent years, with a number of taxa now recognised. In line with the treatment in Stace (2010), the following are added to the Main List: *Dryopteris affinis* (Golden-scaled Male-fern) ssp. *affinis* (LC), *D. affinis* ssp. *paleaceolobata* (LC), *D. borrieri* (Borrer’s

- Male-fern) (LC), *D. cambrensis* (Narrow Male-fern) ssp. *cambrensis* (LC), *D. cambrensis* ssp. *pseudocomplexa* (LC) and *D. pseudodisjuncta* (DD).
- *Epipogium aphyllum* (Ghost Orchid) (previously EX) is now amended to CR following its well-publicised rediscovery in Herefordshire (Garner, 2010).
 - *Gentianella uliginosa* (Dune Gentian) (previously VU) is removed to the Waiting List following Sell & Murrell's view that it is best regarded as a variety (var. *uliginosa*) of *Gentianella amarella* ssp. *amarella* (Autumn Gentian). It joins *Gentianella anglica* (Early Gentian), which, although treated as a species by Stace (2010), is also considered by Sell & Murrell (2009) to be a variety (var. *praecox*) of *G. amarella*.
 - *Hieracium* species. As a result of detailed population surveys, the threat assessments for four taxa are amended as follows: *Hieracium arranense* (Arran Hawkweed) (previously LC) is amended to EN (Rich & McCosh 2008), *H. pseudoleyi* (Purple-flushed Hawkweed) (previously EN) is amended to VU (Sawtschuk, McCarthy & Rich 2008), *H. sannoxense* (Sannox Hawkweed) (previously EN) is amended to CR (Rich & McCosh 2008), and *H. vagicola* (Tutshill Hawkweed) (previously EN) is amended to CR (Sawtschuk & Rich 2008).
 - *Illecebrum verticillatum* (Coral-necklace) (previously VU) is amended to EN due to a marked decline in number and size of populations within what is now considered to be its highly restricted native range in Cornwall and Devon (Pearman 2008). The expanding populations in the New Forest, and records elsewhere in England, are specifically excluded from this revised threat assessment.
 - *Lycopodium lagopus* (Hare's-foot Club-moss) (previously DD) is removed to the Waiting List while outstanding taxonomic issues are resolved.
 - *Papaver bivalve* ssp. *hybridum* (Violet Horned-poppy), an archaeophyte formerly occurring in East Anglia, was overlooked by Cheffings & Farrell (2005). It is apparently extinct, even as a casual, so is now added to the Main List as EX.
 - *Polygala amarella* (species as a whole) (Dwarf Milkwort) is amended in light of detailed surveys showing that both northern and southern populations have undergone a recent marked decline. Previously LC, the species as a whole is amended to EN. The two infraspecific taxa – not recognised in Stace (2010) – are added, for now, to the Waiting List pending further work to clarify their taxonomic rank. It is worth noting, however, that northern populations (ssp. *amarella*) have been assessed as EN while those in the south (ssp. *austriaca*) are probably CR (F.J. Rumsey pers. comm.).
 - *Sorbus* species amended following a thorough reappraisal of their populations (Houston, Robertson & Rich, 2008, Rich *et al.*, 2010) are as follows: *S. bristoliensis* (Bristol Whitebeam) and *S. eminens* (Round-leaved Whitebeam) (both previously EN) are amended to VU, while *S. wilmottiana* (Wilmott's Whitebeam) (previously CR) is amended to EN.
 - *Sorbus* species included in Rich *et al.* (2010) which are now added to the Main List are as follows: *S. admonitor* (Watersmeet Whitebeam), an English endemic, is added as EN (Rich & Cann 2009); *S. cambrensis* (Welsh Whitebeam), a Welsh endemic, is added as EN (Rich & Proctor, 2009); *S. cheddarensis* (Cheddar Whitebeam), an English endemic, is added as CR (Houston *et al.*, 2009); *S. cuneifolia* (Llangollen Whitebeam), a Welsh endemic, is added as VU (Rich & Proctor, 2009); *S. eminentiformis* (Doward Whitebeam), an English-and-Welsh endemic, is added as EN (Rich & Proctor, 2009); *S. eminentoides* (Twin Cliffs Whitebeam), an English endemic, is added as CR (Houston *et al.*, 2009); *S. leighensis* (Leigh Woods Whitebeam), an English endemic, is added as EN (Rich, Harris & Hiscock 2009); *S. margaretae* (Margaret's Whitebeam), an English endemic, is added as EN (Rich & Proctor, 2009); *S. parviloba*

(Ship Rock Whitebeam), an English endemic, is added as CR (Rich *et al.*, 2009); *S. rupicoloides* (Gough's Rock Whitebeam), an English endemic, is added as CR (Houston *et al.* 2009); *S. saxicola* (Symond's Yat Whitebeam), an English endemic, is added as CR (Rich *et al.*, 2009); *S. stenophylla* (Llanthony Whitebeam), a Welsh endemic, is added as EN (Rich & Proctor, 2009); and *S. stirtoniana* (Stirton's Whitebeam), a Welsh endemic, is added as CR (Rich & Proctor, 2009). In addition, three *Sorbus* hybrids are added as CR, the English endemics *S. ×houstoniae* and *S. ×robertsonii* (Rich, Harris & Hiscock, 2009), and the Welsh endemic *S. ×motleyi* (Rich & Proctor, 2009).

Waiting List

The Waiting List remains an important repository for taxa where a proper threat assessment is presently hampered by a lack of distributional data, or where taxonomic issues or questions of native/alien status are yet to be resolved. This time around, 49 taxa are added to the Waiting List. On the whole these are poorly recorded and/or taxonomically questionable native subspecies recognised by Stace (2010) and/or Sell & Murrell (2009). Amongst these additions, however, are some potentially significant 'new' taxa, plus several that previously appeared either on the Main List (the Shetland *Cerastium nigrescens*, *Gentianella uliginosa* and *Lycopodium lagopus* (noted above), and *Vicia sativa* ssp. *nigra* and ssp. *segetalis* (see below)), or Parking List¹ (*Anthyllis vulneraria* ssp. *corbieri*). In alphabetical order, the more significant additions to the Waiting List may be summarised as follows:

- *Anthyllis vulneraria* (Kidney Vetch) ssp. *corbieri*. In the past there has been much disagreement over the taxonomic merits of this subspecies; previously placed on the Parking List on the strength of Rich (2001), it is now added to the Waiting List

as both Sell & Murrell (2009) and Stace (2010) recognise it as a subspecies. It would be added to the Main List, except for the fact that (as is the case with ssp. *lapponica*) there is currently insufficient distributional and population data to allow an assessment of threat.

- *Artemisia campestris* (Field Wormwood) ssp. *maritima*. There continues to be debate concerning the native/alien status of this coastal taxon (e.g. Clement, 2006; Twibell, 2007). Previously not listed, we acknowledge that there is mounting evidence – and opinion – to suggest that ssp. *maritima* could be either a long-established (and previously overlooked) native or a recent 'natural colonist'. It was included as 'possibly native' in the Welsh *Red Data List* (Dines, 2008), for which it was assessed as CR. For now, it is added to the Waiting List until further studies of historic records have been carried out, together with a more detailed assessment of how its occurrences in GB fit within its wider European distribution. (We also make it clear in the Main List that the VU threat assessment for *A. campestris* is for ssp. *campestris* only.)
- *Epipactis helleborine* (Broad-leaved Helleborine) ssp. *neerlandica* is added to the Waiting List until molecular analysis has clarified the taxonomic relationship between the plants at Kenfig and populations from mainland Europe (see Lewis, Clark & Spencer, 2009).
- *Equisetum ramosissimum* (Branched Horsetail) (previously regarded as a neophyte and so not listed) is added to the Waiting List following the discovery in NHM of an 18th century specimen collected from Hounslow Heath (M. Spencer & F. J. Rumsey, pers. comm.). Our view, in light of this record, is that its native/alien status warrants further investigation. Stace (2010) reflects this uncer-

¹The 'Parking List' comprises taxa considered for inclusion on the Main List or Waiting List by Cheffings & Farrell (2005), but rejected either on taxonomic grounds (e.g. *Athyrium flexile*, *Epipactis youngiana*) or because they were assumed to be neophytes (e.g. *Gnaphalium luteoalbum*, *Spergularia bocconeii*).

tainty by giving it as “*probably intrd-natd*” (our italics).

- *Lemna turionifera* (Red Duckweed) (previously not listed) is added to the Waiting List while we wait for its native/alien status to be resolved and its distribution better understood.
- *Onobrychis viciifolia* (Sainfoin) ssp. *collina* (previously not listed) is added to the Waiting List until its distributional limits – and magnitude of decline – are better understood, and taxonomic issues resolved. Sell & Murrell (2009) consider this to be the native ssp. in GB; Stace (2010), on the other hand, concludes that “...recognition of separate subspecies is probably not feasible or helpful” while also noting that the limits of its native range are unknown. For now, *Onobrychis viciifolia* (species as a whole) is retained on the Main List as NT.
- *Ornithogalum umbellatum* (Star-of-Bethlehem) ssp. *campestre* (previously not listed) is regarded by some as either an ancient introduction or ‘probable native’ (Stace 2010), at least in parts of eastern England. As such, we have added it to the Waiting List while its native/alien status is thoroughly investigated.
- *Pancratium maritimum* (Sea Daffodil) (previously not listed) is added to the Waiting List as it is presently unclear whether it is turning up in Devon and Cornwall as an alien, or as a ‘natural colonist’ arriving there by means of seed transported on ocean currents.
- *Polygonum oxyspermum* (Ray’s Knotgrass) ssp. *oxyspermum*. There are a number of old records of this subspecies from eastern Scotland, and it is now thought likely that it may have been a ‘natural colonist’, seed being transported by sea from native populations in the Baltic (Stace, 2010). Previously not listed, it is added to the Waiting List until old records can be examined and its current status clarified.
- *Utricularia bremii* (New Forest Bladderwort) (previously not listed) is thought to

be restricted to the New Forest, where it was first recorded in the 1990s (Stace, 2010). However, the existence of several putative old records from elsewhere in GB, plus the fact that the identity of the New Forest material is far from straightforward, has led us to add this species to the Waiting List while further investigations are carried out.

- *Vicia sativa* (Common Vetch) ssp. *sativa* and ssp. *nigra* (both previously LC on the Main List) are removed to the Waiting List, where they join ssp. *bobartii*, *segetalis* and *uncinata*. *Vicia sativa* (species as a whole) remains as LC on the Main List.

Acknowledgements:

The present note is written on behalf of the vascular plants Species Status Assessment Group, coordinated by BSBI and including representatives from the Biological Records Centre (CEH), BSBI, Countryside Council for Wales, Natural England, Natural History Museum, Plantlife and Scottish Natural Heritage. Our thanks to Trevor Dines, Lynne Farrell, Andy Jones, David Pearman, Robin Payne, Chris Preston, Fred Rumsey and Ian Taylor for comments on the draft.

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A new Flora of RHS Wisley, Surrey (v.c.17) and the host range of *Lathraea clandestina* L.

JAMES ARMITAGE, RHS Garden Wisley, Woking, Surrey, GU23 6QB

In September 1910 a list of the ferns and flowering plants recorded at and around the Royal Horticultural Society Garden, Wisley was printed in the *Journal of the RHS Gardens Club*. Entitled ‘The Wisley Flora’, the work is little more than a register of names, with very limited notes on location and abundance, but it offers a tantalising connection to an Edwardian landscape rich in wild flowers.

The idea of comparing the vegetation of the site a hundred years ago with that of today inspired Barry Phillips of the RHS Plant Sciences Department and myself to prepare a modern flora of the Wisley Estate, and in November 2010 *Wild flowers of Wisley: a centenary flora* was published. This volume contains a catalogue of all the records (of which we are aware) of wild and naturalised plants made for the land owned by the RHS at Wisley, garnered from the original Flora, other published works, herbarium specimens and a new survey of the site.

As might be expected, the story that is revealed is, in part, one of loss. Since 1910, 102 of a total of 650 native species have disappeared, including such rarities as *Arnoseris minima* (Lamb’s Succory), *Dianthus deltoides* (Maiden Pink) and *Anacamptis morio* (Green-winged Orchid), and many others have seen a heavy reduction in numbers. But the news is not all bad. Healthy populations of *Fallopia dumetorum* (Copse Bindweed), *Vicia lathyroides* (Spring Vetch) and *Cuscuta europaea* (Greater Dodder) can still be found, and recent records include *Neottia nidus-avis* (Bird’s-nest Orchid) and *Poa infirma* (Early Meadow-grass). In all, 322 acres are dealt with in the book, of which 198 are accounted for by the Garden itself. Compiling a Flora of such a heavily cultivated site presents a number of difficulties in deciding what to record, and also some rare opportunities for study. Featured in the work is an appendix listing around 200 species of cultivated ornamental which have been noted reproducing by seed.

Many other alien plants which have more completely broken the boundaries of cultivation are to be found in the main catalogue. Included in this latter category is *Lathraea clandestina* (Purple Toothwort).

Like its native relative, *Lathraea squamaria* (Toothwort), *L. clandestina* is a holoparasite, receiving the totality of its nourishment from its host. It is found in the wild in Belgium, France, Spain and Italy and its host range appears mainly to be species of *Salix* (willows), *Populus* (poplars) and *Alnus* (alders). It spreads by seed, which is propelled considerable distances by explosive pods, and, as it is frequently found by watercourses, probably also by pieces of detached root, washed downstream to lodge on some unfortunate host and found a new colony. It has been grown in Britain since the 1860s, if not before, and some time prior to 1908 was deliberately introduced to Coe Fen in Cambridgeshire (v.c.29), where a population can still be found (Druce, 1909). Atkinson (1996) provides a useful list of UK sites where the plant has been recorded.

Notes accompanying specimens held at the Herbarium of the University of Reading suggest that outside cultivation in the British Isles *L. clandestina* occurs on at least *Salix*, *Populus*, *Alnus*, *Corylus* (hazels) and *Ulmus* (elms). However, when records from within gardens are added, a much greater list of host taxa can be made. Between them, Fay (2010) and Atkinson (1996) list *Acer* (maples), *Alnus*, *Carpinus* (hornbeams), *Buxus* (Box), *Corylus*, *Metasequoia* (Dawn Redwood), *Rhododendron* (rhododendrons), *Taxus* (yews), *Gunnera* (giant-rhubarbs), *Juglans* (walnuts), *Cercidiphyllum* (Katsura), unnamed species of bamboo and, more cautiously, *Crataegus* (hawthorns), *Pinus* (pines), *Betula* (birches), *Ilex* (hollies) and *Fagus* (beeches). Other records are for *Styphnolobium japonicum* (syn. *Sophora japonica*) (Pagoda-tree) and *Magnolia* × *veitchii* (Veitch’s Hybrid Magno-

lia) at Nymans Gardens in West Sussex (Roy Lancaster, pers. comm.), while Rouy (1909) lists *Crithmum maritimum* (Rock Samphire), *Vitis* (Vine), *Euonymus* (spindles), *Rubus* (brambles), *Cornus* (dogwood), *Arum* (lords-and-ladies) and *Ornithogalum* (stars-of-Bethlehem) as hosts in France. John Anderson, in a letter to *The Garden*, is definite as to the occurrence of purple toothwort on *Betula* at Mount Usher in County Wicklow, Ireland and also gives *Cordyline australis* (Cabbage-palm), *Nyssa sylvatica* (Black Gum), *Kniphofia caulescens* (Lesotho Red-hot-poker), *Podocarpus salignus* (Willow Podocarp) and *Chamaecyparis lawsoniana* (Lawson's Cypress) as hosts.

Chittenden (1933) reports *Lathraea clandestina* as growing at Wisley "under the willow by the pond" and it is likely it was introduced a good many years before that. In 1995 Whiteley *et al.* noted it had spread to *Metasequoia glyptostroboides*, *Betula pendula* (Silver Birch), *Acer saccharinum* (Silver Maple) and possibly *Hibiscus syriacus* (Blue Satin Rose-of-Sharon). In the recent survey it was encountered on *Salix*, *Corylus*, *Metasequoia*, *Ilex* and *Rhododendron*, which feature in the above list, but also on *Erica* (heaths) and *Calluna* (Heather), which I have not found recorded as host plants previously.

As a garden plant *L. clandestina* appears to be a hardy, vigorous, adaptable and fertile species, and its natural distribution suggests Britain might provide conditions conducive to its rapid spread in the wild.

I hope members will keep a sharp eye out for the distinctive violet-purple flowers of *Lathraea clandestina* between the months of January and June, especially beside water and near to old gardens. It would also be of inter-

est to know if anyone can add to the list of host species given here.

Wild flowers of Wisley: a centenary flora, by Barry Phillips and James Armitage, featuring colour illustrations and a foreword by Roy Lancaster, is available from the RHS Bookshop, priced £9.95, ISBN 9781907057137. Tel: 0845 260 4505 or visit: www.rhsshop.co.uk

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Honorary membership

TREVOR EVANS, *'La Cuesta', Mounton Road, Chepstow, Gwent, NP16 5BS*

When I receive BSBI correspondence I usually scan it before turning to the more interesting items. I was surprised to notice in the agenda for the AGM a proposal that I be nominated for Honorary Membership. Thank you Council and members attending the AGM. I should have attended that meeting to show I appreciated the honour, but rail travel from Chepstow is inconvenient, and my reduced driving distance caused me to chicken out. More recently Richard Pryce's praise as my proposer published in *BSBI News* made me feel more guilty.

My botanical enthusiasm took off only after my small-part involvement with Max Walters and Franklyn Perring's first *Atlas of the British flora*. I knew the English names of wild plants but nowhere near all their Latin names. By the end of that project I had remedied that. I had always had great admiration for Gregor Mendel and Charles Darwin and was not happy until I saw the wonders of the Galapagos. David Attenborough is also inspirational, but Max and Franklyn were the first to inspire me in the BSBI. Many were to follow. This is not an inclusive list and doesn't necessarily include many friends, but may I say a thank you to all, including the following that have helped me: Charles Hubbard, who kindly helped my grasses identification; Dick David and Arthur Chater who put me straight on sedges; John Richards, who started off my year with the correct way to press fleshy plants so that they resembled living ones when properly pressed, and not so successfully to name much over 50% of dandelions correctly; Eric Clements' aid when Autumn in the 1970s brought its spectacle of flowering aliens to Newport Docks and adjacent rubbish tip (now a grassed-over long mound); Clive Stace, his effect on me is always close at hand (but before I buy its 3rd edition, is the 4th edition in hand?); kind Gwynn Ellis for teaching me how to send in

records to the Welsh Bulletin in an orderly, structured fashion, and for his dedication to the running of the BSBI; Mary Briggs, a notable secretary before him I thank her for introducing me to wonderful botanical, scenic and geological places where she astounded me with her memory of plant names and where to find them in so many destinations; Mary McCallum Webster's knowledge of alpines and where to find them was also impressive, until the sad loss of memory before her death.

I have noted some up and coming members. I remember in leading a field trip way back I explained how the long hairs on the petioles of large-leaved limes separated it from other British *Tilia* species. Within minutes a couple of young twin boys appeared bearing a lime leaf with a hairy petiole with a question "What about this then?" It briefly crossed my mind 'cocky little beggars', but no, I was at fault for not warning about hybrids involving *T. platyphyllos*. Ever since, the Green brothers' names regularly crop up – hasn't one just won an award as the most prolific recorder of Irish plants? In 1982 I was leading another meeting along the Wye at the Biblins showing people the hybrid *Stellaria nemorum* ssp. *nemorum* × ssp. *montana* when a young fresh-faced youngster appeared out of the water bearing a collapsed piece of water weed declaring it to be *Elodea nuttalli*. It was!; and not recorded before in v.c35. The person I was told was Tim Rich. His energy since amazes me, and before him, who helped fill *Watsonia*? Another one whose energy seems inexhaustible, whose degree was in zoology but who soaks up knowledge in other disciplines with apparent ease is Stephanie Tyler, who, I hope, will succeed me as Recorder, and do a better job of it.

I am grateful to BSBI and WFS for providing me with many friends whom I hope I have not lost because I have omitted them in my very incomplete list above.

ALIENS

Indian Balsam – triffid or treat?

JOHN PRESLAND, 175c Ashley Lane, Winsley, Bradford-on-Avon, Wiltshire, BA15 2HR

Impatiens glandulifera (Indian Balsam) is currently under attack. It is a plant I love, creating beautiful sweeps of colour from white, through pink to deep purple along waterways, especially along rivers in the West Country. It is native to the Western Himalayas, was introduced into Britain in 1839 and has since spread throughout the British Isles, growing up to 2-3 metres high. Indian Balsam has unfamiliar methods of pollination and seed dispersal, which make it especially interesting (Nienhuis & Stout, 2009; Beerling & Perrins, 1993). The stamens are joined into a box that completely encloses the ovary, style and stigma, which are not receptive until production of pollen has finished, making self-pollination by the same flower almost impossible. When the pollen has been shed, the box falls off, revealing the female parts, which can then be pollinated by pollen from another flower. The pollen is carried mostly by bumblebees, whose backs touch the anthers or stigmas when they visit to obtain nectar from the spur at the base of the flower. After pollination the seed pods swell rapidly and the seeds ripen. The seed pods explode when ripe, throwing the seeds up to 7m from the parent. (These flower and fruit characteristics are shown in the Colour Section, Plate 2). The plant is now well naturalised, particularly along river banks, an environment similar to its native streamsides in the Himalayas. It is an interesting demonstration of how plant colonies and communities can change over time. Mabey (1996) says that the seeds can be eaten and may protect against scurvy. Should we not cherish it?

Rather, it seems, people want to destroy this plant because it is an invasive alien. Mabey (1996) says it can be a “conservationists’ nightmare” and “balsam bashing” parties are

held to keep it in check. Activities of this kind are now very common, with the support of conservation bodies. Plantlife published in 2000 a paper warning us that, after habitat destruction, the spread of invasive species such as Indian Balsam in our countryside is perhaps the most pervasive threat facing our native wild plants. The government, it said, needed to make changes in the law. It needed to update the existing list of species for which release into the wild is an offence, strengthen the law against such release, and give an agency or council responsibility to co-ordinate a control programme. Plantlife were concerned that it was not illegal to introduce the plant into the wild. In 2006 this concern manifested itself in a questionnaire, accompanied by a poster featuring the plant hovering threateningly over an alarmed family and warning that “plant invaders” were “invading a neighbourhood near you!”. Members were asked to look for it and report on it. The Government have responded to this pressure by a 2010 amendment to the Wildlife and Countryside Act 1981, making it illegal to introduce Indian Balsam (among other non-native plants) into the wild.

Interestingly, I have heard of no similar campaign to eliminate Stinging Nettle, another very invasive plant. Oliver (1997) described how, in Wiltshire, it “often formed dense riverbank bands”, infiltrating the aquatic vegetation and sometimes spreading right over the river channel in drier upper reaches. I was recently surprised to find that, on a stretch of river at Bradford-on-Avon, you can’t even study its effect on other plants without a boat because it prevents you from reaching the water’s edge except where gaps have been cut for the fisherman. But it’s a native. So, is the increasingly successful campaign against Indian Balsam a symptom

of a kind of botanical xenophobia, or are there good reasons for it?

Research on Indian Balsam invasion

It hardly seems necessary to quote research showing the prevalence of the plant. It clearly exists in large populations throughout the country. This is not the case everywhere. Oliver's (1997) survey found it was not one of the 40 commonest riverside herbaceous species in Wiltshire, nor one of the commonest non-natives. Indeed, in the places where he recorded in person he did not see it at all. Looking more widely, recent contributions to *British Wildlife* give differing views on how common it is (Pearman & Walker, 2009, 2010; Rand, 2009; Thomas & Dines, 2010). The Plantlife survey found that it was in 197 SSSI units and that Critically Endangered, Endangered, Vulnerable or Near Threatened plants in the Vascular Plants Red List are present on many SSSIs where the balsam is also present (Plantlife, email to author: 2010). Its spread is rapid because each plant can produce 800 seeds, the seeds can be transported by water and they are viable for up to two years. The height of the plant makes it likely to suppress other species. Plainly, it has much potential for being a problem. But that doesn't mean that it is. Is there research to enlighten us?

I have located three relevant papers. Martin & Pysek (2006) report on a study in the Czech Republic which compared invaded (with at least 60% of *I. glandulifera* cover) and nearby uninvaded (1–5% cover) plots in the valleys of six rivers, and uninvaded plots with *Impatiens* seedlings removed, with similar plots where invasion was allowed. No differences of meaningful size were found in either comparison, indicating very little effect of *I. glandulifera* invasion on the community characteristics. In the U.K., Hulme & Bremner (2005) conducted a similar experiment, and found a highly significant increase in species richness and diversity following the removal of *I. glandulifera*. Over the 12 sites, there

was an average increase of four species, with a range up to 15. However, they chose plots that consisted of homogeneous stands of Indian Balsam. The cover varied from 80% to 100%, whereas it reached an average of only 43% in the Czech sites. This may explain the different results. Further, all of the species in the British study are widespread in the U.K. and thus the threat to any individual species from *Impatiens* may be small. Many of the species negatively influenced by *Impatiens* are plants of waste places rather than members specifically of aquatic communities. Furthermore, eight other non-native species occurred in the community and these responded proportionally more to *Impatiens* removal than native species. As a result the proportion of non-native species in removal plots was higher than in invaded plots. Some of these (e.g. *Aegopodium podagraria* (Ground-elder) and *Myrrhis odorata* (Sweet Cicely)) may also exclude native species. Chittka & Schürkens (2001) found that introducing *Impatiens glandulifera* in buckets into patches of *Stachys palustris* (Marsh Woundwort) considerably reduced the number of bumble bee visits to the *Stachys* and the amount of seed set. However, *Stachys palustris* is visited by other insects as well (butterflies for instance), and since it reproduces vigorously by underground stolons, it hardly needs to set much seed.

The results of the three studies combined do not suggest that invasion by Indian Balsam is a major problem for the preservation of native biodiversity. In the light of this conclusion, eradication attempts by nature conservation bodies to preserve biodiversity in affected areas seem questionable. In addition, such control efforts may encourage invasions by other alien species which suppress native plants - or invasive natives for that matter. It seems a better option to look at each locality specifically to see if Indian Balsam is a threat and then consider possible intervention programmes with great care. To investigate the situation in my own

locality, I carried out a survey of the riverside vegetation in my own parish of Winsley, between Bradford-on-Avon and Bath.

Methods

The survey was carried out on all publicly accessible parts of the north to east bank of the River Avon, which forms the border of the Parish of Winsley in Wiltshire. The bank was divided into sections 100 paces long. This produced 37 sections. In each section, the following records were made:

- The number of paces occupied by plants of Indian Balsam. This required some estimation, since single plants often took up less than one pace and occupation was often not exclusive. The aim was to measure the total length in which Indian Balsam was present, measured in paces and disregarding the presence of other species.
- The presence or absence of other species.

There were some complications:

- The bank was sometimes too steep for anything much to grow on it. However, these parts were included.
- Trees and shrubs often prevented other plants from growing at all. These parts were also included.
- An unambiguous line of division between bank and adjacent meadow could not be established precisely. However, the transition was mostly abrupt in terms of slope and, elsewhere, I was guided by the pattern of vegetation's similarity to the more easily demarcated parts.
- A similar difficulty attended the division between bank and open water. I included all plants which were either on the bank or very close to it, excluding only those which were in mid-stream, which were few.

A decision had to be made as to which plants to include. All herbaceous plants were recorded, but not trees and shrubs, since these were hardly likely to be inhibited by Indian Balsam, and not terrestrial grasses,

which were regarded as an intrusion from the adjoining meadow.

When the records had been assembled, a distinction was made between aquatic and terrestrial plants. It has long been recognised that "aquatic" cannot be defined precisely (Preston & Croft, 1997). Here, any species regularly associated with aquatic habitats and thriving better there than in drier locations was called aquatic. Anything else was terrestrial. Thus *Eupatorium cannabinum* (Hemp-agrimony) occurs regularly on river banks, but probably does better in drier paces, so was called terrestrial; while *Tanacetum vulgare* (Tansy) will grow in dry places but is much more common by water in this area, so was called aquatic.

Results

The final measures obtained for each section were:

- Paces occupied by Indian Balsam
- Other species by name, differentiating aquatic and terrestrial
- Number of other species
- Number of other aquatic species

These are entered in Table 1 (see pp. 67&67).

Analysis

The results showed that Indian Balsam occurred in every section but one and, overall, occupied 9% of the total of 2,700 paces. To throw light on the effect of this very prevalent plant on the occurrence of other species, the total number of species was first counted. It amounted to 61 species overall and 25 aquatic species. This allows an immediate conclusion that the presence of Indian Balsam in some quantity did not prevent a wide range of other species from occurring, regardless of whether they were aquatic or terrestrial. Indeed, I observed that other species regularly grew up within space occupied by Indian Balsam. Further, the average number of species per section was 16 (to the nearest whole number), with a range of 10 to 21, and the average number of aquatic species was 8 (to the nearest whole number), with a range of 2 to 11, which led

to similar conclusions. A number of other species were common. Though *Impatiens glandulifera* occurred in the highest number of sections (26), *Urtica dioica* (Common Nettle) occurred in 22; *Lythrum salicaria* (Purple Loosestrife) in 21; *Epilobium hirsutum* (Great Willowherb) and *Lemna* sp. (duckweed) in 20; *Silene dioica* (Red Campion), *Oenanthe crocata* (Hemlock Water-dropwort) and *Phalaris arundinacea* (Reed Canary-grass) in 19; and *Calystegia silvatica* (Large Bindweed) and *Myosoton aquaticum* (Water Chickweed) in 18. Thirteen species occurred in more than half of the sections. Any effect of Indian Balsam, was not, therefore, dramatic.

There could, however, still be an inhibiting effect on the occurrence of other species, which could not be determined by eye or the raw figures. To investigate this, each set of figures was ranked, from a rank of 1 for the most populous section, to 27 for the least. The ranks for Indian Balsam were then compared with those for other species and other aquatic species by calculating a Correlation Coefficient for each comparison. This coefficient has values from +1 to -1. A coefficient of +1 means that all the ranks are the same for both sets of figures, e.g. the same sections are ranked 1 and 27 for both Indian Balsam and all other species, and so on. A coefficient of -1 means that all the ranks are reversed, e.g. Rank 1 for Indian Balsam is Rank 27 for all other species, and so on. It is virtually unknown to arrive at either of these values in practice, so we expect figures somewhere in between. If Indian Balsam is interfering with the growth of other species, the correlation coefficient should be negative. If, for the sake of argument, it were actually promoting the growth of other species, the correlation coefficient should be positive. If there is absolutely no effect either way, it should be zero.

These calculations found a correlation of +0.02 between Indian Balsam and all other species and a correlation of +0.16 between

Indian Balsam and all other aquatic species. These are more or less zero, and suggest that there is no relationship of any consequence between the prevalence of Indian Balsam and the prevalence of other species, regardless of whether they are aquatic or not.

Unfortunately, things are not always as simple as they seem. Most of the sections had a number of trees and shrubs along the bank and these inhibited the growth of both Indian Balsam and other species. The numbers of trees and shrubs would undoubtedly have varied from section to section, though this was not measured. This would tend to produce a positive correlation between Indian Balsam and other species because they were both affected in the same way by the trees and shrubs. It could be, therefore, that the negative correlation we were looking for was reduced by this effect. If there were no trees and shrubs, the correlation may well have been negative. To check on this, a second survey was carried out on stretches free of trees and shrubs. This is described below.

A second survey

The survey was carried out on the stretch of bank occupied by sections 5 to about 25 in the main survey. The bank was divided into sections 50 paces long on parts of the bank without any trees or shrubs. The sections were not continuous, all being interrupted by trees or shrubs. Counting paces and recording were simply suspended when trees or shrubs were present. This produced 12 sections. In each section, the same records were made as in the first study. The results are shown in Table 2 (see p. 68).

Indian Balsam now occupied 27% of the total of 600 paces - almost three times as much as in the main study. This gave it an increased chance of adversely affecting other species. To see if it was, the same calculations were carried out as in the first study, plus a correlation coefficient for Indian Balsam and terrestrial plants, and gave the correlation coefficients:

- Indian Balsam and all other species -0.30
- Indian Balsam and all other aquatic species +0.21
- Indian Balsam and terrestrial species - 0.48

The negative correlation sought was now obtained for all other species, and for terrestrial species, but for other aquatic species it was positive. For practical purposes, this means that increased coverage by Indian Balsam is accompanied by a decrease in the number of terrestrial species but an increase in the number of aquatic species. Could the balsam actually be encouraging the growth of other aquatic plants, rather than interfering with them? Maybe discouraging terrestrial species indirectly helps aquatics by reducing at least that kind of competition. If there is such an effect, it could not be claimed to be large, because the correlation with other aquatic plants was very small.

It may also be worth mentioning that three species were found that were not noticed in the first survey, making the total number of other species in the study 62. One was an aquatic, making the total number of other aquatic species 25.

Conclusions

So, are we to have legal changes making Indian Balsam an illegal immigrant and requiring us to report on it so that it can be uprooted, packaged and sent back to the Himalayas? If so, there should be a clause granting exemption to the stretch of river I studied in Winsley, since no adverse effects on biodiversity could be detected there. Indeed, there are reasons for thinking that it might increase biodiversity. It is, after all, an additional species, and adds to the variety of tall and rapidly spreading species that already exist, such as Great Willowherb, *Sparganium erectum* (Branched Bur-reed) and Common Nettle. Beerling & Perrins (1993) quote evidence of shade tolerance, so it may well provide a flora in areas of river-bank where most other aquatic plants don't grow. My own observations suggest that

some of the huge stands that alarm people may be in such locations. I have raised the possibility that it might discourage terrestrial species to the advantage of aquatic. There is evidence that it provides a plentiful supply of nectar to feed a variety of insect species, and that this attracts insects that could go on to pollinate other aquatic plant species when they have finished with the balsam (Lopezaraiza-Mikel, 2007). Other parts of the plant are also a source of food for insects, including the larvae of the Elephant Hawk Moth *Deilephila elpenor* (Beerling & Perrins, 1993). Where it becomes so invasive that control is necessary, it is worth bearing in mind that it has a shallow root system and can easily be pulled out and that cattle and sheep graze it extensively if given the opportunity. Alternatively, we could look at the suggestion of Hulme & Bremner (2005) that improved river management and reduction in concentration of agricultural fertilisers in aquatic habitats, resulting in a more natural-like character of river banks, could be a preferable option for reducing the prevalence of Indian Balsam.

The study raises the question of why we are against non-natives. All species were probably from elsewhere originally – so why is a recent immigrant persecuted differentially? If the concern is that they are introduced by human beings rather than by some more “natural” means, why do we not also eliminate ancient woodlands, which were mostly planted by humans? Immigrants can increase biodiversity in themselves and they represent the natural course of plant ecology. Should we not be studying them because they are interesting rather than with the aim of destroying them? Native species can be a threat to other species as well as aliens, so should not human intervention to conserve and increase biodiversity focus on species generally, rather than those which came here after an arbitrary date?

I make no claim that the findings above apply anywhere else, but I hope they will encourage people in other areas to carry out

similar investigations there. I would be interested in similar data from other localities, and would be happy to do the calculation on sets of data sent to me by those even more nervous of statistics than myself.

Notes on the statistics

The ranks for Indian Balsam were compared with those for other species and other aquatic species by calculating Spearman's Rank Correlation Coefficient for each comparison. The methodology for this is simple. Various guides to calculating the rank correlation coefficient can be found by searching on the Internet for "Pearson's rank correlation". The Wikipedia offering looks quite helpful on http://en.wikipedia.org/wiki/Spearman%27s_rank_correlation_coefficient. Alternatively, any introductory statistics handbook should include it. It should perhaps be mentioned that, where two or more sections were of equal rank, they were all given the average of the positions they occupied. Thus if two of them came 6th, they were occupying ranks 6 and 7, so were both assigned the average of these two, which is 6.5.

Correlation methods bring a number of problems with them, some relevant to this study and some not. Rather than bore everyone with these, I invite anyone interested to contact me.

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Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	Totals
<i>Lycopus europaeus</i>							/	/	/			/	/	/	/	/	/	/				/	/	/	/	/	/	12
<i>Lythrum salicaria</i>		/		/	/	/	/	/			/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	21
<i>Myosoton aquaticum</i>			/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	18
<i>Nuphar lutea</i>		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	15
<i>Nymphaea alba</i>											/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1
<i>Oenanthe crocata</i>		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	19
<i>Persicaria amphibia</i>					/		/	/																/	/	/	2	
<i>Persicaria hydropiper</i>					/																			/	/	/	3	
<i>Persicaria maculosa</i>																								/	/	/	2	
<i>Phalaris arundinacea</i>			/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	19
<i>Picris echioides</i>															/	/	/	/	/	/	/	/	/	/	/	/	1	
<i>Potamogeton</i> sp.			/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	3
<i>Rubus</i> sp.		/			/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	12
<i>Rumex conglomeratus</i>			/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	5
<i>Rumex obtusifolius</i>											/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	1	
<i>Rumex sanguineus</i>	/				/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	13	
<i>Sagittaria sagittifolia</i>		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	9	
<i>Schoenoplectus lacustris</i>										/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	4	
<i>Scrophularia auriculata</i>			/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	3	
<i>Silene dioica</i>		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	11	
<i>Sinapis arvensis</i>							/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	4	
<i>Solanum dulcamara</i>							/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	3	
<i>Sonchus asper</i>							/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	17	
<i>*Sparganium erectum</i>			/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	2	
<i>Stachys sylvatica</i>																											1	
<i>*Stachys palustris</i>																									/	/	1	
<i>Symphytum officinale</i>			/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	14	
<i>*Tanacetum vulgare</i>							/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	7	
<i>Torilis japonica</i>	/																										1	
<i>Urtica dioica</i>	/		/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	22	
Total other species	10	14	18	16	21	12	17	18	20	19	13	17	16	16	12	21	18	16	13	19	21	11	10	19	12	16	16	
Rank other species	26.5	19	9.5	15.5	2	23	12	9.5	4	6	20.5	12	15.5	15.5	23	2	9.5	15.5	20.5	6	2	25	26.5	6	23	15.5	15.5	
Total other aquatics	2	7	7	8	11	8	11	8	10	8	7	8	7	9	4	9	10	9	5	9	11	6	5	6	8	9	10	
Rank other aquatics	27	19.5	19.5	14.5	2	14.5	2	14.5	5	14.5	19.5	14.5	19.5	9	26	9	5	9	24.5	9	2	22.5	24.5	22.5	14.5	9	5	

Table 2. Indian Balsam coverage and numbers of other species in each 50-pace section * = aquatic

Species	1	2	3	4	5	6	7	8	9	10	11	12	Total
<i>Juglans glandulifera</i> paces	12	13	30	17	22	10	7	11	4	4	18	12	148
<i>Juglans glandulifera</i> ranks	6.5	5	1	4	2	9	10	8	11.5	11.5	3	6.5	
	O	C	C	U	R	R	E	N	C	E	(/)		
* <i>Milium plantago-aquaticum</i>				/						/			2
<i>Angelica sylvatica</i>											/	/	2
<i>Artemisia vulgaris</i>		/								/		/	3
* <i>Sidaea tripartita</i>	/												1
<i>Brassica nigra</i>		/			/	/	/	/	/	/	/	/	10
<i>Calystegia silvatica</i>	/	/	/	/			/	/	/	/		/	9
* <i>Carex acutiformis</i>				/			/						2
<i>Cirsium arietense</i>		/	/										2
<i>Conium maculatum</i>								/	/				2
<i>Dipsacus fullonum</i>									/				1
* <i>Dipsacus pilosus</i>		/		/			/				/		4
* <i>Epilobium kirilowii</i>	/	/	/	/	/	/	/	/	/	/	/	/	11
<i>Epilobium tetragonum</i>												/	1
<i>Eupatorium cannabinum</i>		/		/						/	/	/	5
* <i>Filipendula ulmaria</i>												/	1
<i>Galium album</i>		/											1
* <i>Greenlandia densa</i>												/	1
<i>Hypericum</i> sp.									/				1
<i>Hemulus lupulus</i>		/											1
<i>Lactuca album</i>		/						/	/		/		4
<i>Lapsana comaritis</i>							/						1
* <i>Lemna</i> sp.	/	/	/	/		/	/	/		/	/		9
* <i>Lycopodium europaeum</i>		/	/	/			/			/		/	6
* <i>Lyttrum salicaria</i>	/	/	/		/	/	/	/	/	/	/		10
* <i>Myriophyllum aquaticum</i>	/	/	/	/	/	/	/	/	/	/	/	/	11
* <i>Najas lutea</i>							/	/	/			/	4
* <i>Nymphaea alba</i>								/					1
* <i>Oenanthe crocata</i>		/	/	/	/	/	/	/	/	/	/	/	10
* <i>Parietaria hydrophylla</i>	/												1
<i>Parietaria maculosa</i>	/												1
* <i>Phalaris arundinacea</i>	/	/	/		/	/	/		/	/	/	/	10
* <i>Potamogeton</i> sp.											/		1
<i>Rubus</i> sp.		/						/	/	/			4
<i>Rumex conglomeratus</i>							/						1
<i>Rumex obtusifolius</i>											/		2
<i>Rumex sanguineus</i>		/		/	/		/			/		/	6
* <i>Sagittaria sagittifolia</i>	/												1
* <i>Scheuchzeria palustris</i>											/		1
<i>Silene dioica</i>		/					/	/	/	/			4
<i>Sinapis arvensis</i>		/						/		/			3
<i>Solanum dulcamara</i>	/					/				/			3
<i>Sonchus asper</i>				/	/					/			3
* <i>Sparganium erectum</i>	/	/	/			/	/	/	/	/	/	/	9
* <i>Stachys palustris</i>		/	/										1
<i>Symphytum officinale</i>	/	/	/	/				/		/	/	/	7
* <i>Tanacetum vulgare</i>		/								/		/	3
<i>Urtica dioica</i>	/	/	/	/	/	/	/	/	/	/	/	/	12
Total other species	14	24	12	15	10	10	18	15	15	21	17	18	
Rank other species	9	1	10	7	11.5	11.5	3.5	7	7	2	5	3.5	
Total other aquatics	9	10	9	8	6	7	9	7	7	9	10	9	
Rank other aquatics	5	1.5	5	8	12	10	5	10	10	5	1.5	5	
Total terrestrial	5	14	3	7	4	3	9	8	8	12	7	9	
Rank terrestrial	9	1	11.5	7.5	10	11.5	3.5	5.5	5.5	2	7.5	3.5	

Sedum kamtschaticum var. *ellacombianum* (Praeger) Clausen in Johnston, Pembrokeshire

SAM D.S. BOSANQUET, *Dingestow Court, Monmouth, South Wales, NP25 4DY*;
(s.bosanquet@ccw.gov.uk)

Saturday 3rd September 2006 was wet and unsettled, so I decided to focus my bryophyte recording on my local Milford Haven area in Pembrokeshire. I started in an area of waste ground in the village of Johnston (SM9311), half way between Milford Haven and Haverfordwest (v.c.45). There, amongst the carpets of *Syntrichia* and *Barbula*, scattered *Salix* and *Rubus*, and various bits of metal, was a yellow flowered succulent I didn't recognise. The small colony was scattered over about 3 × 2m and included mature flowering plants with a number of smaller seedlings. It looked relatively well established, albeit presumably casual (see photos on inside back cover).

Initial attempts at identification using Stace (1991) led me to the *Sedum praealtum*/*confusum* species pairs, but the Johnston plant matched neither of them. A better answer was provided by Stace *et al.* (2004): the photo on the CD ROM of *Sedum kamtschaticum* Fischer & C. Meyer was close to mine, although with wider petals and darker green leaves. Clement & Foster (1994) list *S. kamtschaticum sensu lato* and mention *S. ellacombianum* and *S. middendorffianum*, whilst Stace (2004) says that "some or all our plants" are var. *middendorffianum*. Further work was needed.

I took a specimen and photos to Arthur Chater, who had a copy of Stephenson (1994). The illustrations of *S. kamtschaticum* in there looked very different from the Johnston plant, whereas those of *S. ellacombianum* Praeger were clearly the same taxon, marked by its vivid green leaves and orange fruits. This is one of a group of four taxa now treated as varieties of *S. kamtschaticum* that are popular with British gardeners. It originates from Japan, whereas *S. kamtschaticum* comes from

mainland east Asia. *S. hybridum* differs in being evergreen, whilst *middendorffianum* has much narrower, darker green leaves.

There are no previous records of naturalised *S. kamtschaticum s.l.* in Wales according to Clement & Foster and the VCCC. The Johnston *Sedum* indicates that not all of the naturalised *S. kamtschaticum* in Britain is var. *middendorffianum*, although the relative frequency of the varieties remains to be ascertained. A short literature search by E.J. Clement (*in litt.*) revealed only one previous record of var. *ellacombianum* in the British Isles, published as a new county record for Surrey: waste ground by RHS car park, Wisley, Surrey, v.c.17, A.C. Leslie, 1988 (*Newsletter, Surrey Flora Committee*, February 1989, p. 7).

The Johnston site has been earmarked for development for several years, so it seems likely the *Sedum* will be built-over in time.

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Epilobium tournefortii Michalet

MICHAEL WILCOX, 32 Shawbridge St., Clitheroe, BB7 1LZ; (michaelpw22@hotmail.com)

Introduction

At present there are three subspecies recognised in *Epilobium tetragonum* L. (Square-stalked Willowherb). These are: ssp. *tetragonum*, ssp. *tournefortii* (Michalet) Léveillé, and ssp. *lamyi* (F.W.Schultz) Nyman. The differences are outlined in *Flora Europaea* (Raven, 1968), summarised as follows:

- (a) Petals 7-11.5mm: stigma usually elevated above the anthers at anthesis; normally cross-pollinated: ssp. *tournefortii*
 - (b) Petals 2.5-7mm, stigma surrounded by anthers at anthesis; self-pollinated.
- Leaves \pm decurrent: ssp. *tetragonum*.
 Leaves mostly oblong-lanceolate, shortly petiolate, not decurrent: ssp. *lamyi*.

E. tetragonum ssp. *lamyi* is partly considered here but requires more study. It is unlikely to be a useful taxon without detailed study beyond the scope of this one. For some, the only difference is the leaf base character (Feliner, 1996), and it is not recognised in *Flora Iberica* (Feliner, 1997). The presence of glandular or eglandular hairs can be a useful character for separating *Epilobium* species. All three subspecies have only appressed, papillate eglandular hairs (common to most willowherb species) so there is no distinction in that respect. However, Krajsec *et al.* (2006), in comparison with ssp. *lamyi*, suggest ssp. *tetragonum* has hairs in longitudinal lines on the stem (all round in *lamyi*); no hairs on the central vein of the adaxial leaf surface; and none on the leaf margin (present and densely so on the leaf margin in *lamyi* respectively). More recently, Bomble (2008) considers ssp. *lamyi* as a species (*E. lamyi* F.W. Schultz), based on apparent differences in seed sculpturing, but this work also mentions intermediates with *E. tetragonum*! Seed sculpturing is often useful for identification, in combination with other characters (Akbari & Azizian, 2006), but in the three subspecies of *E. tetragonum* the similarities may require

scanning electron microscope (SEM) work to define any subtle differences, and therefore may not be that useful for the field botanist. The subspecies has now been reinstated in Stace (2010). Specimens named '*E. lamyi*' can be found in British herbaria but require careful study. In the past many specimens have been misplaced and look like ssp. *tetragonum*, and others have been found to have glandular hairs on the collar at the base of the sepals, which places them under *Epilobium obscurum* (Short-fruited Willowherb). Very rarely, some are referable to other taxa. However, as *E. tetragonum* ssp. *tournefortii* is not native to Britain, there has been little interest in this taxon until it turned up on the A505 Royston by-pass, Hertfordshire (but v.c.29: Cambridgeshire), found by A.C. Leslie with A. Stevenson 6th August 2007 (Kitchener & Leslie, 2008). This note provides most of the information presently known for ssp. *tournefortii* from various literature sources.

The Royston site was visited by G.D. Kitchener and A.C. Leslie on 12th August 2007, where GDK confirmed it was this subspecies. I visited the site in 2008 with ACL, in the company of B.A. Tregale. The plants were a tall, robust willowherb, which, in its narrow leaves and capsule and sepal indumentum, was similar to *E. tetragonum* ssp. *tetragonum*. The three ssp. of *E. tetragonum* have no glandular hairs, so, unlike other species, there is no difference in this character. However, *tournefortii* clearly had much larger flowers, not unlike those of *E. hirsutum* L. (Great Willowherb), which has a distinct four-lobed stigma. A few flowers were collected to be looked at in more detail at home. Based on these findings a project was initiated, as other interesting characters were found that did not appear to be in the literature. In 2009, a further visit to Royston was made to collect 100 flowers of ssp. *tournefortii* and ssp. *tetragonum*. Flowers of other taxa were collected on a random basis from various populations. Further material of ssp.

tournefortii was obtained from two herbaria, Manchester (**MANCH**) and Edinburgh (**RBGE**), the latter often having some duplicates of the former, representing European specimens, dating back to the 1800s. These were at that time named *E. tournefortii* Michalet. They were mostly in fruit, making it difficult to obtain decent flowers for this study, but still useful nonetheless. A few of the available flowers from **MANCH/RBGE** were soaked and opened up to see what other differences there were between ssp. *tournefortii* and ssp. *tetragonum* (some of the latter were called '*E. lamyi*' but most seemed to fit ssp. *tetragonum*). From present literature, the main difference considered diagnostic for ssp. *tournefortii* is that of anther size, found to be consistent by Feliner (1996, 1997), and this was also confirmed by Kitchener & Leslie (2008) and other sources they mention, with petal sizes second, although Raven (1968) suggested it intergraded with the other two subspecies (yet there is virtually no overlap in Raven's key given above). However, in Kitchener & Leslie (2008) various authors are cited giving a range of petal sizes which, in the main, seem to be larger for *E. tetragonum* ssp. *tournefortii*, than those of *E. tetragonum* ssp. *tetragonum*.

For this study, other characters were noted that appear not to have been studied in any detail before. These relate to the length of the style and the stigma, the relationship between them, and whether or not plants have a hairy style base or not, and also the shape of the stigma. These appear to be important taxonomic features. (In this study, the style is considered to be the whole organ, including the stigma. The Stigma is separated as the receptive organ and the style base as the lower (cylindrical) non-receptive part). Petal and anther sizes were also studied. The presence or absence of hairs on the style base appears to be a character that has received little attention and is only mentioned briefly in the generic descriptions of willowherbs given by Raven (1976). He states a few species have a (distinctly) hairy style base (none are native to Britain), and others, most taxa, are glabrous

(or very rarely having a few hairs). He places no importance on this character. In a British context the species in the genus *Epilobium* are illustrated well in Ross-Craig (1957-59), but none of the illustrations show a style base with hairs on it, suggesting that no British taxa have hairy style bases. *Flora Iberica* (8) (Feliner, 1997) illustrates in detail *E. tetragonum* ssp. *tournefortii* as part of the description for *E. tetragonum*, but ssp. *tetragonum* is not illustrated. This includes a depiction of the whole style separately, and it clearly shows a glabrous style base. This character was looked at in detail for this study as well as the style and stigma sizes (and shape), which appear to be important taxonomic characters.

When using styles, only the difference between plants having a 'club-shaped' stigma (claviform - rarely augmented with small lobes) or a 'four-lobed' stigma (quadrifid) is seen as any use as a starting point for separating taxa in most keys. Confused stigmas and low fertility are attributes of hybrids between species with opposite types of stigma. For hybrids with the same type of stigma, low fertility is important, and then, for both types of hybrid, the importance of the quantity/quality and type of hair present (glandular and/or eglandular) on the sepals, collar and capsule, are useful for determination (Kitchener, 1998).

Methods

Flowers were collected from as many U.K. taxa as possible, particularly those with claviform (club-shaped) stigmas. Up to 100 flowers per taxon were measured where this was possible. The parts measured (usually fresh) were (to the nearest 0.1mm): petal length and width (the whole of the free part); an anther (the least dehisced available); sepals (including the fused base); total length of the style (which includes the stigma); the length of the stigma (the receptive part) and the presence/absence of hairs on the non-receptive part of the style (termed here the style base, to separate it from the total length of the style and the receptive part, the stigma). Dried material, particularly from herbarium sheets, was soaked in hot water to obtain and measure the

parts required. For ssp. *tournefortii*, three sources were used: herbarium material (often depauperate or mostly in fruit), garden-grown plants (in case the wild population failed) and the wild population from Royston; the latter two sources with 100 flowers each. Plants of ssp. *tetragonum* also included garden-grown plants as well as wild plants, but only a total of 100 flowers was used. In those taxa with a four-lobed stigma, the lobes were ‘swept upwards’ in order to measure the total length of the style.

Results

Table 1 (p. 73) shows all taxa where the parts of 100 flowers were measured. This shows significant differences in the characters measured and considered. Species not included were the two subalpine-alpine species, *Epilobium anagallidifolium* Lam. (Alpine Willowherb) and *E. alsinifolium* Vill. (Chickweed Willowherb), and the non-native species *E. pedunculare* A. Cunn. (Rockery Willowherb) and *E. komarovianum* H. Lev. (Bronzy Willowherb), all of which have a claviform stigma. This was due to lack of material. However, all except *E. komarovianum* were viewed - either a few live flowers or herbarium material, though limited in the number of flowers used. Both of the subalpine-alpine species and *E. pedunculare* had glabrous style bases with small flowers, with these taxa being very similar to *E. brunnescens* P.H. Raven & Englehorn (New Zealand Willowherb) in all the characters shown in Table 1. It is assumed that *E. komarovianum* is likely to be very similar to *E. brunnescens* also.

It is clear that all the characters of the two ‘subspecies’ *tournefortii* and *tetragonum* are different. Table 2 (p. 76) summarises these differences, with additional characters that cannot be measured. In this Table it shows that in *tournefortii* the style base is always hairy, with papillate, sub-acute to acute hairs all the way round the cylinder, whereas no hairs were found on any of the ssp. *tetragonum* style bases. This was true of herbarium material for plants named (at the time) ‘*E. tournefortii*’ (e.g. *E. tournefortii*,

Santa Teresa Gallura, par Tempio (Marais de Boncamino), 4th July and 7th August 1881, ex. Charles Bailey); showing plants of European origin had the hairy style base. Similarly, in herbarium material, no hairs were found on the style base in those named *E. tetragonum* or ‘*E. lamyi*’. The hairs on the style base of *tournefortii* ranged from one third the length to the whole length of the style base, although always more densely so in the lower portion (but not on the stigma). The average total length of the style in *tournefortii* was at least a $\frac{1}{3}$ longer than that of ssp. *tetragonum* (Tables 1 & 2). Also, importantly, the stigma was not only a different shape in general, but also a significant difference was noted when it was compared to the total length of the style. Table 2 shows that the stigma in ssp. *tetragonum* takes up approximately half or usually more than half the total length of the style, so that it appears to have a short style base. However, *tournefortii* shows that the total length of the style is approx 3.5 \times longer than the actual stigma so that the stigma is usually only about $\frac{1}{3}$ the total length. The shape of the stigma is mostly long club-shaped in ssp. *tetragonum* (like a ‘baseball-bat club’ - generally parallel-sided, see Ross-Craig (1957-59) for a reasonable drawing), and the club in *tournefortii* tends to be much broader at the top than the base where it narrows into the style base.

It was also noted that the stigma of the two taxa occasionally had some lobe development. In ssp. *tetragonum* it was usually two slightly longer lobes on one side and two shorter ones on the other side, although they are both often very short and not really visible to the naked eye. Similarly, lobes can be found in *tournefortii*, but there are usually only two or three broad lobes, which are short. When pulled apart, the lobes of ssp. *tetragonum* did so very easily, producing four longish lobes, very narrow and straight, which showed that it is longer than the style base; whereas those of *tournefortii* tended to split only part way and into two broad lobes or two broad lobes and a smaller lobe.

Table 1: *Epilobium* species: range and average measurements for 100 flowers of each taxon. Taxa in italics with a claviform stigma, in plain text with a quadrifid stigma.

Taxon	Petal L Range + (Av) mm	Petal W Range + (Av) mm	Style range Total L + (Av) mm	Stigma L Range + (Av) mm	Av Ratio Style L + Stigma L	Sepal L Range + (Av) mm	Anther L Range + (Av) mm	Condition of style base: hairs present (P) absent (A) or occasional (A†)
*Garden grown ** Herbarium MANCH (Wild = Royston plants)								
<i>E. tournefortii</i> (Wild)	10 – 15 (12.3)	6 – 9 (7.6)	9 – 11.7 (10)	2 – 3.5 (3)	3.33	8 – 10 (8.9)	1.5 – 2.5 (2.1)	P – always distinct
<i>E. tournefortii</i> *	12 – 25 (15.7)	7 – 12.5 (10)	7 – 13.3 (11.4)	2.5 – 5.3 (4)	2.85	9 – 14 (11.4)	1.5 – 2.7 (2.2)	P – always distinct
<i>E. tournefortii</i> **	9 – 14 (12.2)	6.5 – 10 (8)	7.5 – 12 (10.5)	2 – 4.2 (3.1)	3.39	<i>n/a</i>	2 – 2.9 (2.3)	P – always distinct
<i>E. tournefortii</i> Wild + * + ** ÷ 3 (Average)	13.4	8.5	10.6	3.4	3.19	10.2	2.2	P – always distinct
<i>E. tetragonum</i>	6 – 9 (7.8)	4 – 5.6 (5)	5 – 6.8 (5.8)	3 – 4.2 (3.5)	1.65	5 – 7 (6.1)	0.7 – 1.2 (1)	A – none found
<i>E. obscurum</i>	5 – 7 (6.4)	2.4 – 4.6 (3.6)	3.8 – 6.5 (5.1)	1.5 – 2.6 (2.3)	2.25	4 – 6.3 (5.6)	0.5 – 0.9 (0.6)	A – none found
<i>E. roseum</i>	4 – 7 (5.9)	2.5 – 4 (3.2)	3.5 – 4.5 (4)	1 – 1.6 (1.4)	2.93	4 – 7 (5)	0.5 – 0.7 (0.6)	A – none found
<i>E. palustre</i>	6 – 8.7 (7.6)	3.5 – 4.6 (4)	5.8 – 7 (6.6)	1 – 2.3 (1.7)	3.91	5 – 6.5 (5.6)	0.7 – 1 (0.8)	A† – 16% sparse, 2-10 hairs
<i>E. ciliatum</i>	5 – 8 (6)	2.5 – 4.3 (3.2)	3.5 – 5.3 (4.5)	1 – 2.2 (1.5)	3.01	4 – 6.5 (4.8)	0.6 – 0.9 (0.6)	A – none found
<i>E. brumescens</i>	3 – 5 (4)	1.7 – 3.2 (2.2)	2.7 – 4 (3.3)	0.7 – 1.2 (1)	3.16	2.5 – 3.8 (3)	0.3 – 0.5 (0.3)	A – none found
<i>E. montanum</i>	7 – 12 (9.8)	4 – 8.1 (6.1)	5 – 9.5 (7.8)	1.2 – 2.6 (1.8)	4.31	5 – 9 (7)	0.6 – 1.3 (0.9)	A† – 14% very few, sparse
<i>E. lanceolatum</i>	5.5 – 7.5 (6.8)	3 – 4 (3.3)	4.7 – 6.6 (6.3)	1.5 – 2.5 (2.2)	2.85	5 – 6.1 (5.8)	0.8 – 1.5 (1.1)	P – always distinct
<i>E. parviflorum</i>	7 – 11.5 (8.5)	4 – 6.5 (4.7)	4.5 – 6.8 (5.6)	1.4 – 3 (2.2)	2.59	5.1 – 7.8 (6.1)	0.5 – 0.9 (0.8)	A – none found
<i>E. hirsutum</i>	13 – 19.5 (16.4)	12 – 16.5 (14)	12 – 17.5 (13)	3 – 6.5 (3.7)	3.72	9 – 14.5 (10.8)	1.8 – 3 (2.2)	A† – 8% very few, sparse

The characters of club size and presence or absence of hairs on the style base is also useful for other species with a 'club-shaped' stigma, as they all generally have a glabrous style (when hairs are present they are usually very few and very scattered, see Table 1). However, *Epilobium lanceolatum* Sebast. & Mauri (Spear-leaved Willowherb) was found to (always) have a distinctly hairy style base and, rarely, the hairs extended up the whole length and became adpressed to the middle of the undersides of the stigma lobes on a few styles. However, this species has a four-lobed stigma and is unlikely (with its long-petiolate leaves) to be confused with any other, except perhaps hybrids with this taxon. A specimen was received as '*E. lanceolatum*', but was determined here as a hybrid with another four-lobed taxon, *E. montanum* L. (Broad-leaved Willowherb) and interestingly it was found that some hairs (but still distinct, being all the way round the style base) had been retained on most of the style bases.

The petals in *tournefortii* are significantly different mainly in two ways. Tables 1 & 2 show that the average length in *tournefortii* (13.4mm - taken from all three sources, which was greater even in depauperate herbarium material) is significantly greater than the average length in ssp. *tetragonum* (7.8mm). Even the range (including some depauperate flowers) did not overlap with *tetragonum*. Moreover, the average width is a useful character in combination as it shows the average width in *tournefortii* (8.5mm) to be similar to the average petal length of ssp. *tetragonum*, maintaining a distinct difference. This study also found that the anther sizes were consistently larger in *tournefortii* (average 2.2mm) than in ssp. *tetragonum* (average 1mm) (Tables 1 & 2). The anthers in the flowers of *tetragonum* were almost always attached to the stigma, showing it to be predominantly a self-pollinator, whereas those of *tournefortii* were usually not attached to the stigma (more or less always remaining below it) suggesting an out-crosser, as previous studies had shown (e.g. Feliner, 1997; Kitchener & Leslie, 2008).

Discussion

It is interesting that no British taxon has been described as having a hairy style base and is not illustrated as such in any work on our flora (e.g. Ross-Craig, 1957-59). This study found that *E. lanceolatum* clearly had a distinctly hairy style base in all flowers studied and suggests that this may be useful in detecting hybrids with this taxon, as they were found (all the way round) on the style bases of a hybrid with *E. montanum*. Moreover, this seems to be a useful taxonomic character, as it is briefly mentioned for other species in Raven (1976) with the majority of species having a glabrous style base (or rarely with a few hairs), so those that always have a distinct hairy style base are different from those without. The taxa studied here show this to be true for British species, as the majority were glabrous (rarely some with a few hairs) and, more importantly, no hairs were found on the style base of ssp. *tetragonum*, whereas those of *tournefortii* always had a very distinct hairy style base, which consisted of the typical *Epilobium* papillate (non-glandular) hairs found on other parts of *Epilobium* species, although many species have some glandular hairs present as well. As with a few taxa in Britain (see Table 1), occasional hairs can be found on the style bases, and Raven (1976) says that *E. tetragonum* can have a few hairs occasionally, but was unsure if this included all three subspecies. None were seen in this study.

Characters relating to flower sizes, particularly the length and width of the petals in *tournefortii* show that it is distinct from *tetragonum*. The size, ratio of stigma to style length and shape of the stigma have been shown to be significantly different from those of *tetragonum*, and partly useful in separating other taxa also. The study further found that the anthers of *tournefortii* were consistently larger than those of *tetragonum*, as found in previous studies, and that it is predominantly an out-crosser (rare in *Epilobium*, but occurring in *E. hirsutum* in the U.K. context), compared with the predominant self-pollination in *tetragonum*, which is typical of most species. The characters that these two taxa do

have in common, such as the narrow, more or less parallel leaves, and only appressed, white, non-glandular, papillate hairs on the capsules, hypanthia and sepals, make them superficially similar, whereas there are far more differences separating them than previous studies have shown. Raven (1968) suggested that ssp. *tournefortii* intergraded with the other two subspecies, but even including old herbarium material of European origin, often with depauperate flowers, no intermediates were detected. An intermediate mentioned in Kitchener & Leslie (2008) suggested a hybrid with *E. tetragonum*. Having seen this material the main measurements fell within *E. tetragonum* ssp. *tetragonum*. However, there was evidence of a distinctly hairy style base on a couple of the few flowers that remained (it was more or less in fruit), suggesting it may have been a hybrid. Some evidence suggested that it had some flattened seeds, but it is very unlikely it was an F1 hybrid. The rather small remaining flowers were not enough to go on, but it is clear that it is at least possible this was a hybrid backcross.

The characters studied provide consistent differences, which show *tournefortii* to be a very different taxon from ssp. *tetragonum*. Therefore from these results it suggests '*E. tetragonum* ssp. *tournefortii*' should be considered a distinct taxon, reverting to its original name: *Epilobium tournefortii* Michalet. The characters used in this study also suggest that they are useful taxonomic features, which help to separate other taxa from each other and may in turn help to distinguish some hybrids. Perhaps experimental hybridisation using *E. tournefortii* (crossed with the other species in our flora, particularly with *E. tetragonum*) might be useful to see if the hairs are retained on the style base (as in the case of the *E. lanceolatum* hybrid mentioned above) and to see levels of fertility, as some taxa show higher levels of fertility than others. Whether this is due to backcrossing (with a semi-fertile hybrid) or not is uncertain at present. Further study might be useful.

Acknowledgements:

Thanks to Dr. Alan Leslie and Geoffrey Kitchener, Edward Pratt, and other botanists; and to staff at **MANCH** and **RBGE**.

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Table 2: Main differences between *Epilobium tetragonum* and *E. tournefortii*

Character	<i>E. tetragonum</i> – average size given	<i>E. tournefortii</i> – average size given
Petal length	7.8mm	13.4mm
Petal width	6mm	8.5mm
Total length of style including stigma	5.8mm	10.6mm
Length of stigma	3.5mm	3.4mm
Total style ÷ stigma length	1.65	3.19mm
Length of sepals	6.1mm	10.2mm
Length of anthers	1mm	2.2mm
Style hairs	None found on style base	Always present for 1/3 length on style base (all round) or more
Stigma shape	Narrow oblong (like baseball bat)	Twice as broad at top as at base (± wedge-shaped)
Breeding system	Inbreeding – frequent (self-pollination)	Outcrossing – frequent (cross-pollinated)

Focus on *Apium leptophyllum* (Pers.) F.Muell. ex Benth.

ERIC J. CLEMENT, 54 Anglesey Road, Gosport, Hampshire, PO12 2EQ

Slender Celery receives a very brief mention in Stace's *New flora* (2010), and a full description appears in Sell & Murrell's *Flora*, vol. 3 (2009). Both works define the genus *Apium* as consisting of "biennial or perennial herbs", but this species is always a small, erect, much-branched annual – not helpful!

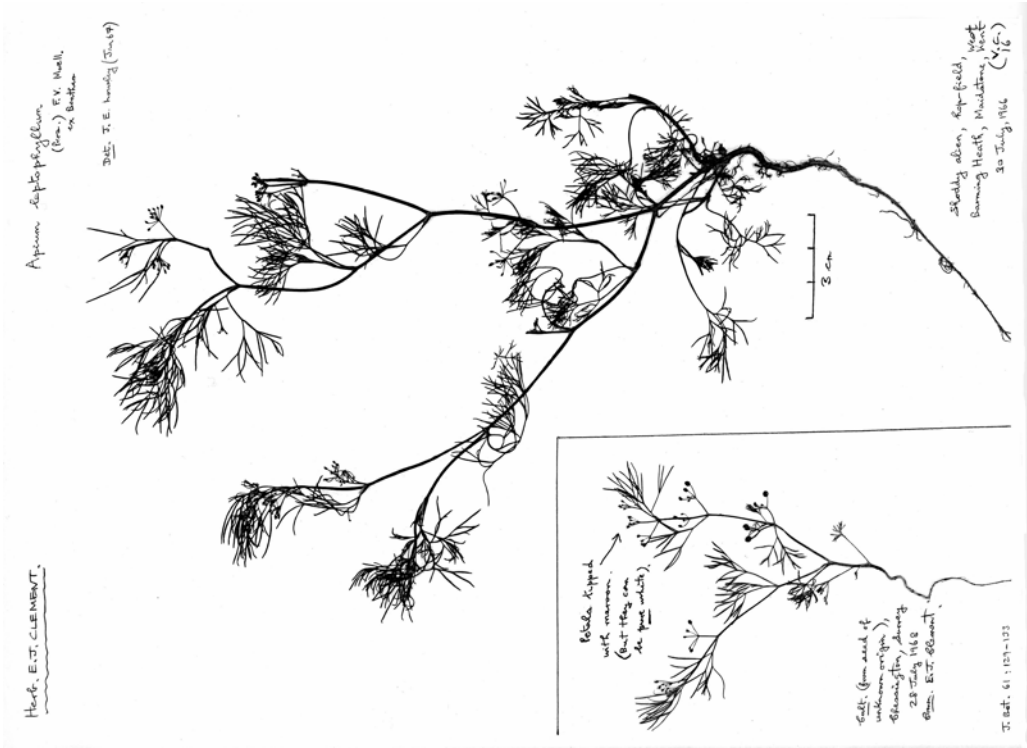
Recent records are few in number, A7 but it was once a regular incomer, appearing mainly at docks, flour mills, and in wool-alien fields. There are now records from at least v.cc. **6, 12, 16, 17, 28, 30, 33, 34, 37, 41, 61, 63, 79/80, 91/93 & 95**. The earliest record that I can trace is from "near Aberdeen" in 1907 (*Annals Scot. N.H.* (1908): 58).

The late Dr H. Heine told me (back in 1980) that it was "a long-established weed in the Jardin des Plantes in Paris, mainly along the edges of footpaths, and resisting for many years treatment with herbicides." I would expect to find it, similarly, somewhere in southern England. Mervyn Southam (MJS) has had it self-seeding in his last three gardens

(Bucks and Hants), but it never escaped to form a county record.

A search for recent British records nearly drew a blank – and I did hunt under its synonym *Cyclosporum leptophyllum* (this is the original, and mandatory generic spelling – see under the appendix: *Nomina generica conservanda et rejicianda* of the Botanical Code (ICBN) – whereas most (?) books misspell it as '*Ciclospermum*'). Not so, the majestic J.-P. Reduron's *Umbellifères de France*, v. 1-5 (2007-2008) – see v. 2: 955-959 for a full treatment – nor the voluminous *Flora Iberica* **10**: 275-276 (2003). Both works also provide good illustrations.

During this autumn, Mervyn (MJS) had the gross misfortune to need a hip replacement operation, which was successful, but it has left him with a degree of dementia. Together, we recently determined a tiny 2010 specimen as this species; but, alas, the collection details have been mislaid. Two other records remain intact (and others probably lie unfound and



Apium leptophyllum, Barming Heath (v.c.16). Photocopy of voucher specimen in **Hb EJC**



Prunus mahaleb, Girsby (v.c.62). Photocopy of voucher specimen in herb. V. Jones

mis-determined in herbaria under *Coriandrum sativum* or *Trachyspermum ammi*):

v.c.16 (W. Kent). Wool alien in hop field, Barming Heath, Maidstone, July 1966. E.J. Clement (**Hb EJC**) (first record for Kent?)

v.c.95 (Moray). Weed in tree container, B&Q store, Elgin, Aug., 2010. I.P. Green. (**NMW**).

Can't figure it all out? Then the annexed photocopy of the v.c.16 'voucher' (see p. 77) should help (but where have all our BSBI artists gone?).

No future for *Prunus mahaleb* L. in Britain?

ERIC J. CLEMENT, 54 Anglesey Road, Gosport, Hampshire, PO12 2EQ

After Eric Philp's *Atlas of the Kent flora* (1982) featured the record for St Lucie Cherry as "well established on railway banks in the Longfield-Southfleet area TQ/56Z, 66E and 67A, with dozens of plants, from young seedlings to mature trees", I expected lots more records to appear. This has yet to happen, although our *New atlas* (2002) did achieve *in toto* hits for 13 10km squares – if you can read the CD! It was first found at Longfield by J. R. Palmer in May 1970. E.G. Philp's *A new atlas of the Kent flora* (2010) tells us that it is now reduced from four tetrads to just two, a decrease in frequency common to hundreds of other species in the county.

M. Briggs' *Sussex plant atlas supplement* (1990) gives a list of "additional" aliens, but it does not mention this species – although a voucher was missed in **OXF** (v.c.14. Ditchling, 1957, Dr H.J.M. Bowen). Could it still be in this adjacent county?

When not in flower, this small tree could easily be passed over as *Prunus cerasus* (Dwarf Cherry) or the like – but not if you actively have the *Vegetative key* (2009) in your custody ('Pocket Poland' solves so much!). Like Stace's *New flora* (2010), it also gives a very useful line drawing. In contrast,

the paintings in both the much-acclaimed C. Johnson's *Tree guide* (2004) and D. More and J. White's *Cassell's trees* (2003) I find misleading, as does Vince Jones (VJ). Maybe they portray the floriferous cultivar 'Pendula'? Compare these with the appended photocopy of an herbarium specimen, courtesy of VJ. Indeed, this voucher constitutes the only 'new' record that I have encountered:

v.c.62. (N.E. Yorks). Single bush in lane hedgerow, N. of Hall Farm, Girsby, 10th May 2010 (MZ35760925). V. Jones. (**Hb VJ**).

Note that the specimen has the characteristic 3-10 flowers (later, fruits) on pedicels of length c.10mm, arranged in short, corymbose racemes, which terminate short, lateral, leafy shoots. The Girsby plant was consistently 4-5 flowered per inflorescence.

This tree was once extensively cultivated in France for the cherry-pipe industry. Pipe-smokers were once a feature of the BSBI too. The thin and bitter flesh of this cherry has never attracted anyone! But, who can find this tree – in late May flowers offer the best opportunity.

REQUESTS & OFFERS

Seeds from Ware – 2010 collections

GORDON HANSON, 1 Coltsfoot Road, Ware, Herts., SH12 7NW

Please enclose suitable labelled small packets and S.A.E. for anything required.

Alcea setosa – Turkey

Allium cernuum – cult.

Ambrosia artemesiifolia – Canada

Arabis glabra – Herts.

Bulbinella angustifolia – Madeira

Centaurea cyanus – birdseed

Chenopodium giganteum – birdseed

Cistus incanus – Turkey

Cotoneaster armenus – cult.

Dipsacus laciniatus – Yorks

Glycyrrhiza yunnanensis – cult.

Mestoklema tuberosum – cult.

Nicandra physalodes – birdseed

Onopordon algeriense – Turkey.

Opopanax hispidus – Turkey

Phytolacca acinosa – cult.

Rumex rupestris – Anglesey

Salvia verbenaca – Turkey

Seseli elatum – Slovakia

Silene catholica – Worcs

Sonchus palustris – Kent

Stipa cernua – USA

Thalictrum lucidum – cult.

Trifurcia lahue – Argentina

Verbascum lydiium – Kos

Verbascum thapsus – USA

Xanthium canadense – Canada

Gofynne seed list 2011

ANDREW SHAW, Gofynne, Llanynis, Builth Wells, Powys, LD2 3HN;
(andrewgshaw@hotmail.com)

A small quantity of seed from any of the following is available upon receipt of a s.a.e.:

Fumaria bastardii – Glamorgan (v.c.41)

Fumaria capreolata – Ponsanooth, Cornwall (v.c.1a)

Fumaria densiflora – Downton, South Wiltshire (v.c.8)

Fumaria muralis – Llanynis, Brecknock (v.c.42)

Fumaria occidentalis – St. Mary's, Scilly (v.c.1b)

Fumaria officinalis – Llanynis, Brecknock (v.c.42)

Fumaria parviflora – Royston, Cambridgeshire (v.c.29)

Fumaria purpurea – Orkney (v.c.111)

Fumaria reuteri – Lake Allotments, Isle of Wight (v.c.10)

Fumaria vaillantii – Royston, Cambridgeshire (v.c.29)

Spare BSBI publications for disposal

MARGARET PERRING, 130 Judkin Court, Heol Tredwen, Cardiff, CF10 5AX;
(margaretdperring@tiscali.co.uk)

Regretfully, I find I must dispose of the following fairly recent BSBI journals to free up some much needed shelf space in my small flat. Rather than skip them I wonder if any member could make use of them for the cost of postage only? If so please contact me by email or post.

BSBI News Jan 2006 to Sept 2010; **101-115** plus indexes.

Watsonia Vols.: **26** (3 & 4); **27** (1-4); **28** (1-2) and indexes.

BSBI Welsh Bulletin Jan 2008 to May 2010

BSBI Annual Review 2006-2009

BOOK NOTES

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

The following titles are to be reviewed in forthcoming issues of *New Journal of Botany*. Also included are brief notices of books that are not being given a full review (marked *).

ATHERTON, I., BOSANQUET, S. & LAWLEY, M. (eds.). *Mosses and liverworts of Britain and Ireland – a field guide*. Pp. 848, colour photographs & drawings. British Bryological Society, Plymouth. 2010. £24.95. ISBN 978 0 9561310 1 0. Plastic covers.

*BECK, HOWARD. *Wild flowers of Yorkshire*. Crowood Press, Ramsbury. 2010. £12.99. ISBN 978 1 84797 164 7. p/b.

A photographic guide to the wild flowers of Yorkshire, covering over 400 species (with c. 300 photographs) and arranged according to flower colour, thereby assisting identifications by non-specialists.

BLACKSTOCK, T.H. ET AL. *Habitats of Wales: a comprehensive field survey, 1979-1997*. University of Wales Press, Cardiff. 2010. £55. ISBN 978 0 7083 2257 4. h/b.

*BRECKLE, S.-W. & RAFIQPOOR, M.D. (with contributions by I.C.Hedge and H.Freitag). *Field guide: Afghanistan - flora and vegetation*. Scientia Bonnensis. 2010. Price not stated [mainly distributed free of charge to schools, universities and institutions in Afghanistan]. ISBN 978 3 9407663 0 4.

After a general introduction to the geography and vegetation of Afghanistan, the main part is divided into two sections: Special Part (35 pp.) on systematics, morphology, floristic research & herbaria, collecting & photographing plants, and references) and Pictorial Part (640 pp.) giving descriptions and photographs (both of habitats and in close-up) of a selection of c.1,200 species from the rich flora of the country. The book concludes with a glossary of terms and indexes in English and Dari (Afghan Persian) plus a taxonomic index and a note on the authors. This very commendable project has

been supported (*inter alia*) by the Academy of Science and Letters, Mainz; the Nees Institute, Bonn; the Institut für Geographie, Giessen; the German Academic Exchange Service; and the Royal Botanic Garden Edinburgh's Sibbald Trust.

CHATER, ARTHUR O. (with contributions from D.E. Allen, C.D. Preston and P.A. Smith). *Flora of Cardiganshire*. The Author, Aberystwyth. 2010. £40. ISBN 978 0 9565750 0 5. h/b.

JAMES, TREVOR J. *Flora of Hertfordshire*. Hertfordshire Natural History Society, 2009. £49.50. ISBN 978 0 9521685 8 4. h/b.

MABEY, RICHARD. *Weeds: how vagabond plants gatecrashed civilisation and changed the way we think about nature*. Profile Books, 2010. ISBN 978 1 84668 076 2. Price £15.50. p/b.

*NEWTON, ADRIAN. *Biodiversity in the New Forest*. Pisces Publications, Newbury. 2010. £17. ISBN 1 874357 42 1. p/b.

An account of the plants and animals of conservation importance in the National Park. With contributions by a range of specialists, it draws attention to the special character of the area, moulded by its long history from medieval times as a royal hunting forest.

*OXLEY, VALERIE. *Botanical illustration*. The Crowood Press, Marlborough. 2008. £19.99. ISBN 978 1 870492 23 2. p/b.

An experienced teacher and practitioner of botanical illustration, the author covers a wide range of styles and techniques, and is particularly helpful in guiding the reader towards sensible choices of content (where many novices come unstuck). The book concludes with useful advice for the artist wishing to sell their work effectively. 192 pp., well illustrated, many of the plates being full colour and full page.

*PARSLOW, ROSEMARY. *Plants and ferns in the Isles of Scilly*. Isles of Scilly Museum, St. Mary's. 2009. £5. p/b. This checklist was sent for review to the late Mike Walpole, a noted Cassiteridophile (= 'lover of the Isles of Scilly', known to the Phoenicians as the Tin Islands) who sadly was unable to complete it. This replaces the 1983 checklist and contains brief descriptions of the status and distribution of phanerogams, both native and introduced. It contains 48 colour photographs.

RAY, JOHN (translated and edited by Philip Oswald and Chris Preston). *Catalogue of*

Cambridge plants 1660 [Flora Cantabrigiensis]. The Ray Society, London. 2011.

RICH, T., HOUSTON, L., ROBERTSON, A. & PROCTOR, M. *Whitebeams, rowans and service trees of Britain and Ireland*. (BSBI Handbook no. 14). BSBI, in association with National Museum Wales. 2010. £30. ISBN 978 0 001158 43 7. h/b.

STEVENS, D.P. ET AL. *Grasslands of Wales: a survey of lowland species-rich grasslands, 1987-2004*. University of Wales Press, Cardiff. 2010. £70. ISBN 978 0 7083 2255 0. h/b.

A new panel of book reviewers for *New Journal of Botany*

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

For many years *Watsonia* relied on a single book reviews editor to receive copies of books for review. This sometimes involves a considerable effort chasing up publishers. It is invariably the books of greatest interest to our readers that are the most difficult to source. Information on newly published books comes from a variety of sources, including the publishers themselves (when they have a properly organised marketing department), specialist booksellers such as Summerfield Books, and reviews appearing in other publications, especially those with a more frequent publication schedule than ours.

To increase the number of people involved in selecting and reviewing books for the *New Journal of Botany*, I have proposed to the Publications Committee that we establish a panel of reviewers who will co-operate in targeting books for review and in selecting suitable specialist reviewers. They would also be responsible for writing a small number of

reviews, but it is not envisaged that the members of the panel would write the majority of reviews themselves.

My aim would be to have a group of five or six people representing different areas within the scope of the *New Journal*, so as to make the book reviews section reflect the coverage of the journal as a whole. This includes a greater emphasis on the flora of north-western Europe. The coverage of *Watsonia* was largely confined to the British Isles, whereas the aim of the new journal is to embrace a wider geographical area.

We have, of course, regular reviewers who may wish to join the panel (and need little persuasion to do so) but I would also like to extend an invitation to other members who wish to add some new enthusiasm to the mix. Offers would be welcomed. Please send me an email with a brief précis of your areas of interest.

Mike Walpole's library sale: some personal impressions

JOHN EDMONDSON, 243 Pensby Road, Heswall, Wirral, CH61 5UA; (a.books@mac.com)

One of the most complete collections of British and Irish floristic literature to exist outside the libraries of the major institutions, Mike Walpole's botanical library, was recently sold at auction. It took two whole

days, the first being devoted mainly to continental literature and the second to more local material. The sales realised more than £1m.

The catalogues of the auction revealed a great deal about Mike's collecting efforts, and

the second also contained the obituary originally published in *Watsonia*. Because provenance is important to collectors of rare books, the auction catalogue frequently mentioned the source of the book and indeed its documentation – Mike kept many of the old catalogues and invoices recording where they had originally been purchased. He also typically made a discreet inscription “MW” in pencil on the rear pastedown. This should ensure that books thereby proven to have come from his library will be cherished all the more by their new owners.

I attended the second auction, and was struck by the high prices achieved. The estimates had been pitched temptingly low. Only a few of the more expensive items failed to exceed their estimates, notably the painting said to be of John Gerard (1545-1612) about which there is some doubt as to whether he was indeed the sitter: see Charles Nelson’s recent note in the *Newsletter* of the Society for the History of Natural History.

One of the criticisms I heard about the second sale was that multiple copies of rare works were sold in a single lot, making it difficult for a prospective purchaser wishing to acquire only one copy. This was explicable from the auctioneer’s point of view: despite this aggregation, the sale went on well into the evening, and to have broken the lots down any further would have made the number too large for a single day’s session. Despite this, the lunch break was curtailed to 15 minutes as the morning session over-ran. Such comments are not new. The artist Georg D. Ehret, writing in a memoir published posthumously in vol. 7 of the *Proceedings of the Linnean Society of London*, noted somewhat grumpily that some

of his paintings originally commissioned by Dr Richard Mead had been sold as a set of two volumes for a mere £36 (in around 1755) for “if they had been divided up in the auction, they would have brought in twice as much money, for they were too many for a single lot”. This problem arose partly because Mike was rarely satisfied with a single copy of a title. He often had two, three or four copies even of the rarest examples; indeed in one instance there were twelve copies (of the second edition of Linton’s *The ferns of the English Lake Country*, published in 1878). Like all keen collectors he wished to own every known variant. I well remember an incident during the BSBI conference on local floras held in Liverpool’s newly opened Maritime Museum. A book fair had been arranged to run alongside the conference programme, and in one of the breaks Mike was chatting with some of us about Wheldon & Wilson’s *Flora of west Lancashire: that portion of Lancashire north of the river Ribble and south of Morecambe bay*. Mike was perhaps unaware that this existed in two states, one published by Henry Young & Sons in Liverpool, the other privately printed by V.T. Sumfield of Eastbourne. When I mentioned that I had seen a copy of the latter version on one of the bookseller’s shelves, Mike shot off like a misdirected rocket on Guy Fawkes’ Night.

It will no doubt take some time for the book dealers who bought many of Mike’s books to complete the cataloguing process before advertising their acquisitions for sale; but thanks to Mike’s decades-long pursuit of bibliographic rarities, the coming year promises to be an *annus mirabilis* for those seeking floras and botanical ephemera that are “seldom seen in trade”.

Watsonia* is dead – long live the *New Journal of Botany!

MARTIN SANFORD, 78 Murray Road, Ipswich, Suffolk, IP3 9AQ

As retiring Receiving Editor for *Watsonia*, I would like to take this opportunity to thank the many people who have given freely of their knowledge and time in helping with the production of the journal. Authors, artists, editors and referees have combined with typesetters and printers to provide an attractive and efficient

means of communication for British botanists. In the eleven years that I have been Receiving Editor I have had tremendous support from members of the editorial panel: Michael Foley, Daniel Kelly, Douglas McKean and David Simpson. They have dealt with several hundred papers and notes between them, not only

tactfully steering authors through the editorial process, but also spending many hours proof reading and checking material before publication. They have all handled the work with good humour, coping with short deadlines and ‘difficult’ authors efficiently and all have added greatly to the quality of the journal. Many anonymous referees have put time and effort into reading and checking papers. Peer-review is a largely thankless, but essential, part of the process, ensuring we maintain scientific rigour.

Mary Briggs has been a stalwart supplier of obituaries. John Edmondson, Chris Preston and David Pearman have managed the endless stream of book reviews. Mike Porter, Gwynn Ellis and Chris Preston have ensured that accurate and up-to-date ‘Plant Records’ are regularly supplied. Chris Boon has done a tremendous job providing indices for each volume and compiled the valuable cumulative index to Vols. 1–20. Philip Oswald has ably dealt with most of the Latin translations and Rosemary Wise has provided the attractive drawings that have graced the cover for the last decade or so. My wife, Katherine, has been responsible for typesetting since 1999, capably turning a mass of paper and variety of electronic copy into elegantly formatted text and illustrations, and correcting many minor inconsistencies I had overlooked. I would also like to extend special thanks to Tim Rich for being the most reliable (and productive) author the journal has ever had. Without his contributions *Watsonia* would have been much thinner in recent years.

The journal has been produced by the Society since 1949 and has featured contributions from most (if not all) of the major figures in British botany. In the early days, E.F. Warburg (1949–1960) and M.C.F. Proctor (1961–1971) handled the journal virtually single-handedly until C.D.K. Cook (1968) and N.K.B. Robson (1968–1988) joined Proctor in 1968. After the merger with *Proceedings* in 1970, the editorial team was further expanded to include G. Halliday (1970–1979) and E.F. Greenwood (1970–1975). Since then, the journal has continued to be managed by a

small team, including C.A. Stace (1972–1983), S.M. Coles (1978–1979), D.L. Wigston (1978–1983), S.M. Eden (1980–1985), J.R. Akeroyd (1983–1996), R.J. Gornall (1982–1991), C.D. Preston (1985–1999 & 2003–2007), J.R. Edmondson (1989–1999 & 2008–2010), B.S. Rushton (1986–1999), R.R. Mill (1992–1997), E.C. Nelson (1992–1997), M.N. Sanford (1997–2010), D.L. Kelly (1997–2009), M. Briggs (1997–2010), D.A. Simpson (1999–2005), D.A. Pearman (1999–2003), D.R. McKean (2000–2008), R.G. Ellis (2002–2004), M.S. Porter (2004–2010) and M.J.Y. Foley (2005–2010).

Over some 60 years, the journal has been very successful in providing members with up-to-date information on a wide range of topics with material representing the interests of both amateur and professional botanists. As Ted Warburg wrote in the Editorial of the first volume:

“There is at present no periodical devoted primarily to those aspects of British botany in which our Society is interested, notably the taxonomy and distribution of the higher plants, and we hope that *Watsonia* will supply this need. It is intended that the scope shall be wide. Papers will be published not only on systematic botany and distribution in the narrow sense, but also on any aspect of botany which adds to our knowledge of British plants considered as living organisms in the field ... It is hoped to publish in each number something that will interest every member, whether a beginner or a more advanced student of the subject. The title of the journal has been chosen with two points in mind, firstly to suggest its scope and secondly for ease in citation and the avoidance of confusion with other publications.”

The latter point is certainly true, but few readers today appreciate the significance of H.C. Watson’s studies in plant distribution or even realise who the title commemorates.

To all those who have contributed to *Watsonia* over the years I say: ‘thank you’.

OBITUARY NOTES

MARY BRIGGS, *9 Arun Prospect, Pulborough, West Sussex, RH20 1AL*

As announced in *BSBI News* **115** (on the back cover) *Watsonia* has been discontinued, and Council has decided that longer Obituaries will in future be published annually in the *BSBI Yearbook*. Look in *Yearbook 2011* for obituaries of: Dr Barbara Ballinger, Ann Conolly, Peter Fry, Dr Alan Knapp and Charles Sinker.

Obituary notes will continue to be published more frequently in *BSBI News* and all obituaries published in *BSBI Yearbook* will also appear on the *BSBI website*, sometimes in an extended version.

As I write these notes I am sorry to hear that Ron Payne has died peacefully in his sleep after a short illness. Ron joined BSBI in 1947 so had given his support for 63 years. He specialised in Grasses, both in the British Isles

and worldwide. On a botanical holiday in Western Australia we were able to find the *Spinifex* species which filled a long felt want and a cartoon of him on this trip appeared in *BSBI News* **56**: 19.

In retirement Ron and Sheila moved from Bristol to East Anglia near Kings Lynn, and Ron wrote a series of detailed small Floras of precise habitats which will be known to many members. One of these – *The Flora of Walls in West Norfolk* appeared in *BSBI News* **78**: 72.

Since *BSBI News* **115** we regret to report that the following members have died:

Mrs V.B. Hyde of Kendal (2003), Mr B Nicholson of Norwich (1999), and Dr Eric Chicken of Driffield East Yorks (1962).

We send regrets and sympathies to all the families.

RECORDERS AND RECORDING

Panel of Referees and Specialists

MARY CLARE SHEAHAN, *61 Westmoreland Road, Barnes, London SW13 9RZ*;
(mc_sheahan@kew.org)

There are some changes to the referees list: Paul Green has offered to provide identifications for garden shrubs, and Fred Rumsey has taken over *Dryopteris*.

Rose Murphy is joining Dr Daker as referee for *Fumaria*, and Jeremy Roberts is joining

Michael Braithwaite as referee for *Trichophorum*.

There are also several changes to names and addresses, so please check in *BSBI Yearbook 2011* before sending specimens.

Panel of Vice-county Recorders

DAVID PEARMAN, *Algiers, Feock, Truro, Cornwall, TR3 6RA*; 01872 863388

New Recorders

All these appointments are reflected in the 2011 Yearbook, but are reproduced here for convenience. Please refer to the Year Book for addresses and emails (where applicable)

V.c.15 E. Kent: Mrs Sue Buckingham (joint). Correspondence to Mr G.D. Kitchen.

V.c.28 W. Norfolk: Dr Richard Carter (correspondent) & Ms Sarah Harmer.

V.c.38 Warks: Mr John & Mrs Monika Walton

V.c.41 W. Glamorgan: Mr Barry Stewart. Dr Q.O.N. Kay, recorder since 1983, resigns.

V.c.48 Merioneth: Dr. Rod Gritten. Mr P. Benoit recorder since 1954, resigns.

V.c.64 Mid-W Yorks: Mr D Broughton.

V.c.83 Midlothian: Dr Barbara Sumner. Dr D.R. McKean, recorder since 1980, resigns.

V.c.85 Fife: Mr. Sandy Edwards (joint).
Correspondence to Mr. G.H. Ballantyne.
V.c.107 E. Sutherland: Prof. M.J. Crawley.
Mrs M.E. Murray, recorder since 1996,
resigns.
V.c.113 Jersey: Mrs M.L. Long to be sole
recorder. Mrs J. Banks, joint recorder since
1996, resigns
V.c.H1 S. Kerry: Mr R.L. Hodd (joint).
Correspondence to Dr E.C. Mhic Daeid.
V.c.H13 Carlow: Dr Mark McCorry & Dr
Fiona McGowan. Miss B. Hickey, recorder
since 2003, resigns.

As ever, I would like to thank those retiring for
their sterling efforts over so many years – this
simple thanks seems so inadequate after often

30 or more years of help, and we could not do
what we do without that entirely voluntary
help.

Changes of Address

V.c.74 Wigtowns: Dr A.J. Silverside, School
of Science, University of the West of
Scotland, Paisley, Renfrewshire, PA1 2BE

V.c.75 Ayr.: Mr D.A. Lang, Flat 2/1, 27
Skirving Street, Shawlands, Glasgow, G41
3AB

V.c.110 Outer Hebrides: Dr R.J. Pankhurst,
7 Eildon Street, Edinburgh, EH3 5JU

Change of Email

V.c.101 Kintyre: Mr B.D. Batty -
dragonfly.batty@gmail.com

NOTES FROM THE OFFICERS

From the Hon General Secretary – *LYNNE FARRELL*

41 High Street, Hemingford Grey, Cambs., PE28 9BJ
(01480 462728; farrell104@btinternet.com)

Members of long-standing

We would like to offer our congratulations to
10 people who have now been members for 60
years: Dr. D.L. Broomfield, Dr. M.E.
Bradshaw, Dr. D.H. Dalby, Mrs. S. Gilmour,
Mr. K. Goodway, Miss R.J. Murphy, Dr
N.K.B. Robson, Dr C.M. Roden, Dr J.P.
Savidge, Mr. P.L. Ward. We hope that they
continue to enjoy attending meetings, contrib-
uting to the Society and reading *News*.

Autumn meetings

The 2 meetings held at the Birmingham and
Midland Institute on 26/27th November,
'Botanical hotspots in Britain and Ireland:
who revealed them and why?' convened by

David Allen, followed by the Annual Exhibi-
tion meeting, were well-attended, very
informative and enjoyable. May be this
format, with a one-day conference adjoining
the Annual Exhibition, is one which we can
follow in the future?

The only drawback was the weather (over
which we have no control). I only hope that
everyone will have safely arrived home by the
time they read this! It took me 7 hours, with
buses replacing trains, then trains conking out
and having to be shunted all the way from
Stamford to Peterborough!

From the Head of Research and Development – *KEVIN WALKER*

97 Dragon Parade, Harrogate, North Yorkshire HG1 5DG; (kevinwalker@bsbi.org.uk)

2011 was a busy year for the Plant Unit with four notable publications that were either wholly or partly based on BSBI work: the first was the BSBI's recording strategy, *Recording the British and Irish Flora, 2010-2020*, produced in April, which set-out our recording plans for the next decade.¹ Shortly after Natural England published their 'Lost Life' report which chronicled the loss of species in Britain over the last century.² The BSBI contributed the majority of the higher plant information which was widely reported in the press. During the summer Plant Unit staff also completed a report on the design of a new national plant surveillance scheme in collaboration with Plantlife, BTO and CEH. This attempted to draw up plans for a new scheme that would be available to all botanists, regardless of affiliation and expertise.³ The publication of *Making Space for Nature* in September was the result of a 12 month government review of England's wildlife sites, chaired by Professor John Lawton.⁴ At its heart was an assessment, based on BSBI data, of how dependent our threatened plants are on nature reserves. The results provide a fascinating insight into how effective our ecological networks are, or are likely to be in the future, in the face of major environmental challenges such as climate change.

There were lots of other exciting developments in 2011 and so here's a summary of the main projects that are still in progress or planned for coming year.

Recording guidelines

Following on from the publication of the Society's recording strategy we intend to produce a series of 'guidelines' covering aspects of recording over the coming year. Once completed these will be sent to vice-county recorders but all other members should be able to access them on the website.

Welsh Officer

At the time of writing funding has been secured to recruit at least a part-time BSBI

Welsh Officer in the New Year. This may be extended to a full time post if an application for funding to the Countryside Council for Wales is successful. Either way we intend to advertise the post in the spring and appoint the Welsh Officer in time for the 2011 field season.

Threatened Plants Project (TPP)

We are now in the third year of this project having covered 30 species since 2008. An update on the project was sent out to vice-county recorders in early December⁵ and so I'll just pick out the salient highlights for recorders here. The results for this year's (2010) species continue to trickle in and early indications are that around 700 populations have been surveyed which compares well with previous years totals of 833 in 2008 and 706 in 2009. All these data have entered into an Access database and analyses of the 2008 species is currently underway. We plan to cover another 20 species in 2011 and 2012 taking the total to 50 species. These are listed on the next page.

We hope you find these an interesting group of species to record. Hopefully there should be at least one species to record in your vice-county each year. If not then why not spend the a few days visiting sites for species covered in earlier years that you never got around to doing in 2009 or 2010? Species for which we'd really like some more surveys completed for are *Fallopia dumetorum*, *Herminium monorchis*, *Hordeum marinum*, *Melampyrum cristatum* and *Sibbaldia procumbens*. If you are unsure whether sites you know for these species have already been surveyed, or were included in the sample we asked VCRs, please don't hesitate to get in touch. We plan to send VCRs the lists of sites to survey for 2011 species in late January or early February. As in previous years this information will also be available to download from the TPP webpage along with recording guidelines and forms.

2011	2012
<i>Baldellia ranunculoides</i>	<i>Aceras anthropophorum</i>
<i>Cicendia filiformis</i>	<i>Alchemilla wichurae</i>
<i>Cuscuta epithymum</i>	<i>Anacamptis (Orchis) morio</i>
<i>Galium pumilum</i>	<i>Bupleurum tenuissimum</i>
<i>Juncus compressus</i>	<i>Fumaria parviflora</i>
<i>Neotinea (Orchis) ustulata</i>	<i>Hypochaeris glabra</i>
<i>Pseudorchis albida</i>	<i>Persicaria minor</i>
<i>Sedum villosum</i>	<i>Ranunculus arvensis</i>
<i>Silene conica</i>	<i>Tephrosia integrifolia*</i>
<i>Torilis arvensis</i>	<i>Vicia parviflora</i>
	*Subsp. <i>integrifolia</i> only

We hope you find this an interesting group of species to record. Hopefully there should be at least one species to record in your vice-county each year. If not then why not spend the a few days visiting sites for species covered in earlier years that you never got around to doing in 2009 or 2010? Species for which we'd really like some more surveys completed for are *Fallopia dumetorum*, *Herminium monorchis*, *Hordeum marinum*, *Melampyrum cristatum* and *Sibbaldia procumbens*. If you are unsure whether sites you know for these species have already been surveyed, or were included in the sample we asked VCRs, please don't hesitate to get in touch. We plan to send VCRs the lists of sites to survey for 2011 species in late January or early February. As in previous years this information will also be available to download from the TPP webpage along with recording guidelines and forms.

Invasive aliens

BSBI is currently working on a major new database of alien plant traits and producing species accounts for 80 of our most 'invasive' alien species. The work, which is being funded by Defra, will eventually be available via the Non-native Species Information Portal⁶ and is due to be completed in June 2011. As a spin-off we also plan to produce an 'Alien Plantatt' in the same format as the Plantatt for native taxa already published by Centre for Ecology and Hydrology (CEH).

Red List

The BSBI is now heavily involved in producing the new Red List for British plants which has provisionally been scheduled for around 2017. This will be an update of the 'threat' assessment that was carried out in 2003/04 which resulted in the publication of *The Vascular Plant Red List for Great Britain* by Chris Cheffings and Lynne Farrell in 2005. Over the last few months we have been updating and amending the 'old' list in light of recent taxonomic changes and advances in our knowledge of the status of many taxa (see Year 3, 4 and 5 amendments article on pages 51-56 of this issue) and in 2011 we hope to produce 'species dossiers' for all currently 'threatened taxa'.

The BSBI's Distribution Database (DDB)

Over the last 10 months Tom Humphries has been developing a database capable of holding all the Society's distribution records; an online prototype of this Distribution database (DDB) is now available for vice-county recorders and currently contains all the records held in the Vascular Plants Database managed by CEH and the MapMate Hub. This is very much a 'work in progress' as much of the content and structure remains unchecked but over the next 12 months we plan to run tests on the system and improve its functionality in relation to displaying maps and allowing online inputting and editing. Although the system has been designed specifically for vice-county record-

ers and their co-workers to better manage their own data, we hope to make it publicly available (with access restrictions on the resolution of records it contains) sometime in 2012.

Online Atlas of the British and Irish flora

Another website that you might find useful is being developed by the BSBI in collaboration with CEH. The 'Online Atlas of the British and Irish flora' provides an online archive for published information including the *New Atlas* captions, distribution maps, published accounts, digital images, and plant traits.⁷ At present we have two volunteers working on the site. Alla Mashanova is collating digital photographs for all taxa included on the

webpage so if you think you might images of suitable quality then please contact Alla (A.Mashanova@rhul.ac.uk). Thanks to all of you who have already responded to my earlier request for images – hopefully you'll start to see your images appearing on the site over the next few months. Our other volunteer, John Patmore is rapidly loading-up the species accounts from the Red Data and Scarce Plants books. This will be a great asset to the site as both books are currently out of print and difficult and expensive to get hold of second hand. The site is still under construction but should be launched fully in January or February of next year.

¹ <http://www.bsbi.org.uk/RecordingStrategy.pdf>

² <http://naturalengland.etraderstores.com/NaturalEnglandShop/NE233>

³ <http://www.jncc.gov.uk/page-5528>

⁴ <http://www.defra.gov.uk/environment/biodiversity/documents/201009space-for-nature.pdf>

⁵ <http://www.bsbi.org.uk/TPPDecember2010update.pdf>

⁶ <https://secure.fera.defra.gov.uk/nonnativespecies/factsheet/index.cfm>

⁷ <http://192.171.199.230/plantatlas/>

From the Scottish Officer – JIM MCINTOSH

Royal Botanic Garden, 20A Inverleith Row, Edinburgh, EH3 5LR; Tel: 0131 2482894; (j.mcintosh@rbge.ac.uk)

Scottish Officer

The Scottish Officer project is funded by the BSBI and Scottish Natural Heritage (SNH), while the Royal Botanic Garden Edinburgh (RBGE) provides an in-kind contribution of office facilities. The current funding arrangements are, however, due to expire at the end of October 2011. The funders were therefore approached and a grant application was made to SNH last November for a further three year period, the outcome of which is awaited with some trepidation. Even if approved, SNH have said that they can only guarantee funding for one year at a time.

Recording the British and Irish flora 2010-20

The work will continue to support and build the BSBI voluntary network in Scotland so it can help fulfil the BSBI's aims. These aims are now clearly set out in our recently published recording plan – *Recording the British and Irish flora 2010-2020* (see BSBI

website). However, they are ambitious – in fact very ambitious – especially in Scotland, with its extensive and difficult terrain and general lack of botanists. They include a comprehensive update of hectad recording, using a sampling approach at tetrad resolution or better and working towards a new atlas in around 2024; and every vice-county to have at least a draft Rare Plant Register by 2019. Recorders will need all the help they can get from the BSBI Scottish Officer, the BSBI generally and you!

Computerisation Project

The computerisation project is on the final straight. All contracts must be completed and paid for by the end of the financial year in April. Currently there are ten contractors working in parallel with ten vice-county recorders. They have about 100,000 records to complete. This will bring the total up to not far short of a million records. However, there

is much work still to do to ensure all data is fully checked, handed back to the recorders and uploaded to the NBN Gateway. The first tranches of data are already available there for all researchers, conservationists and botanists - including you! (See: <http://data.nbn.org.uk/>).

MapMate support

With the end of the Computerisation Project now in sight, we have begun to think about how we can continue to help vice-county recorders (VCRs) after it finishes. The Computerisation Project is, for example, funding home support visits for VCRs by the leading *MapMate* trainer in Britain, Martin Harvey. He has made twenty visits to date and further visits are planned to remaining VCRs. It is hoped that this will improve proficiency with *MapMate* and will lead to more records being more easily digitised and ultimately made available on the NBN Gateway.

Maps for Scottish BSBI Vice-county Recorders

I am really interested in electronic mapping. It is a powerful tool for recorders, and its ability to print off and view superimposed data particularly useful. Gazetteers included in these electronic maps allow a search for any OS place name – which is also very handy. I have Memory Map and use it to print off a 1:25,000 map with the precise route or GPS track taken whilst out recording and attach it to the recording card as a permanent record,

for example. So we have made this technology available to fellow Scottish VCRs - 26 of whom took up the offer of digital maps of their vice-counties and 13 took delivery of leads to connect GPSs to PCs. More recently we distributed v.c. boundary overlays and our mapping volunteer is currently preparing SSSI boundary overlays.

Field meetings

We had one of the fullest field meeting programs ever in Scotland in 2010: 12 in total, of which six were educational. 2011 looks no less exciting, with three meetings for beginners and members who have never been on a BSBI field meeting before. We are also planning an arable weed training day near Melrose and an *Alchemilla* workshop at Ullapool. These are in addition to the normal varied exciting programme of meetings organised by the Scottish Committee. See the accompanying Yearbook or see www.bsbiScotland.org for full details and book your place now!

Further information

The website also has further information about the activity of the Scottish Officer project, including my 2009/10 Annual Report, available to download as a pdf. Thanks are due to the funders: SNH, BSBI and RBGE; and all those who have contributed to the work of the BSBI in Scotland over the past year.

From the Hon. Field Meetings Secretary – JILL SUTCLIFFE

Ingrams Farm, Fittleworth Road, Wisborough Green, Nr Billingshurst, West Sussex, RH14 0JA;
(JillSutcliffe1@gmail.com; Tel. (landline): 01403 700395; (mobile): 07747 022 727)

The vacancy for the Hon. Field Meetings Secretary has been filled – by me. I am a great enthusiast for our flora, was one of the team members who undertook the first botanical survey of Cornwall in 1980-81 and, more recently, led the botanical and fungal work for the statutory organisation English Nature now Natural England. During the coming year 2011-12, expect to be contacted and asked by me if you can lead a meeting for the BSBI, so be prepared!

Following in the shoes of Jane Croft presents quite a challenge so I would be very grateful for offers which can assist in a pain-free handover.

Jane has done a terrific job and I have already been very glad for her sage advice as to what needs doing when and am looking forward to it.

BSBI Publicity Officer vacancy

JIM MCINTOSH, BSBI Scottish Officer, *Royal Botanic Garden, 20A Inverleith Row, Edinburgh, EH3 5LR*; (Tel: 0131 2482894; j.mcintosh@rbge.ac.uk)

The BSBI are looking for a volunteer publicity officer to develop and implement a simple publicity plan for the BSBI in Scotland. The plan will include publicising the benefit of BSBI membership to expand the Scottish active membership. This is crucial to the success of the BSBI in Scotland, particularly with the ambitious aims set out in the BSBI recording plan. It will also publicise the BSBI's activities, such as project fieldwork, field and indoor meetings with a view to engaging more people.

We are looking for a good communicator for this important role, who is proficient with technology and preferably has publicity and

marketing experience. The post holder will report to the BSBI Scottish Officer who is based at Royal Botanic Garden Edinburgh and where a desk will be available. However the job will largely involve home working.

Generally the time commitment will be modest and flexible. However the officer should mount membership displays at the BSBI Scottish Annual Meeting and at other events where botanists gather and this will entail working the very occasional evening or weekend day.

If you are interested in this vacancy, please contact me.

Scottish vice-county joint recorder vacancies

JIM MCINTOSH, BSBI Scottish Officer, *Royal Botanic Garden, 20A Inverleith Row, Edinburgh, EH3 5LR*; (Tel: 0131 2482894; j.mcintosh@rbge.ac.uk)

We are looking for three keen, fit and reasonably proficient botanists to work as Vice-county Recorders in Scotland. One for Peebles (v.c.78) to replace David McCosh, who has indicated that he would like to retire. Two to work jointly with the Vice-county Recorders in Stirling (v.c.86) and West Sutherland (v.c.108). The recorders in these counties, Edna Stewart and Pat Evans respectively have both requested help.

Good Recorders are critical to the BSBI's success. The focus for all Recorders will be helping to fulfil the ambitious aims set out in the BSBI's *Recording the British and Irish flora 2010-2020* (See BSBI website).

The principal roles of a Recorder are the collection, validation and maintenance of vascular plant records. It would be a great opportunity to improve plant identification skills whilst making a valuable contribution to the work of the BSBI locally. The joint positions are opportunities to serve an apprenticeship with experienced and time-served Recorders.

Being a reasonable competent botanist is important, but knowing one's limits is even more important. No one can be an expert in all aspects of a county's flora – especially when starting out. The senior recorder will be happy to help with identifications and confirmations and our referees are always happy to help. Competency with computers, particularly e-mail, the internet and MapMate, would be highly desirable although training and support will be provided.

Living in or near the vice-county is obviously an advantage, but is not essential - some VCRs live remotely and operate very successfully. But you would have to be able to spend a reasonable time in the Vice-county during each field season.

If you are interested in these vacancies, please contact me, Jim McIntosh, by e-mail to j.mcintosh@rbge.ac.uk or by post to BSBI Scottish Officer, RBGE, 20A Inverleith Row, Edinburgh EH3 5LR. Please indicate which Vice-county you are interested in.

STOP PRESS

Francis Rose and the Flora of Kent

DAVID PEARMAN, *Algiers, Feock, Truro, Cornwall, TR3 6RA*; (Dpearman4@aol.com)

The welcome arrival of Eric Philp's second *Atlas of the Kent Flora* reminded me again of the rumours regarding Francis's magnum opus for the county. For years I had heard, and indeed he had told me at least half-a dozen times, that he had a draft, and his next project was to finish it. He once sent me a handwritten manuscript page. Others echo this – I was talking to Eric Clement the other day, and he confirmed he had heard similar stories. Tim Rich, perhaps best placed to comment, reports that "although the National Museum Wales hold Francis's herbarium, notebooks and archive, there is no manuscript for a Kent flora amongst the papers" (pers. comm., 2010). He added that when they collected all of his archive Francis passed over all the other folders of County records but not those for Kent, implying that he was working on the 'Flora' still.

His notebooks were made accessible through a project by Sussex Record Centre,

funded by local authorities, Wildlife Trusts in South East England, English Nature, the BSBI, British Lichen Society and the British Mycological Society, and computerised copies of the data are now available to all County Recorders through the NBN Gateway, but no trace has been found of this draft 'Flora'. It was rumoured that a copy had been lodged in Maidstone Museum, but Eric cannot trace anything there.

After his death I wrote to his widow, and had several letters from his daughter, but all of these efforts failed to find anything at all. The family said that they certainly had thrown away nothing like that. I have also asked the local NE team, as well as other active members in Kent, including Joyce Pitt and Judith Church. We wonder if he lent the manuscript to anyone, and I would be very grateful if any member who can shed light on this would contact me.

**CONTRIBUTIONS INTENDED FOR
BSBI NEWS 117 should reach the Receiving Editor before
 March 1st**

The General Editor Gwynn Ellis can be contacted by answerphone or fax on 02920 496042
 email: rgellis@ntlworld.com

The Receiving Editor Trevor James can be contacted by phone on 01462 742684 or
 email trevorjames@btinternet.com

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 Enquiries concerning the Society's activities and membership should be addressed to: The Hon. General Secretary, c/o Dept. of Botany, The Natural History Museum, Cromwell Road, London SW7 5BD Tel: 0207 942 5002.

Camera ready copy produced by Gwynn Ellis and printed by J. & P. Davison, 3 James Place, Treforest, Pontypridd, Mid Glamorgan CF37 1SQ (Tel. 01443-400585;
 email: davison.litho@talktalkbusiness.net)

ADMINISTRATION and IMPORTANT ADDRESSES

PRESIDENT

Mr Michael Braithwaite
Clarilaw Farmhouse, Clarilaw, Hawick, Roxburghshire, TD9 8PT
Tel. 01450 372129

PRESIDENT ELECT

Mr I R Bonner
Cae Trefor, Tyn y Gongl, Anglesey, LL74 8SD
Tel.: 01248 852651; BSBI@caetrefor.co.uk

HON. GENERAL SECRETARY (General Enquiries)

Miss Lynne Farrell
41 High St, Hemingford Grey, Cambs, PE28 9BJ
Tel.: 01480 462728; farrell1104@btinternet.com

HON. TREASURER (All financial matters except Membership)

Mr Terry Swainbank
c/o Synergis Technologies Ltd, 7th Floor, 23 Buckingham Gate, London, SW1E 6LB
Tel.: 07710 491589; terry.swainbank@btinternet.com

MEMBERSHIP SECRETARY (Payment of Subs and changes of address)

Mr Gwynn Ellis
41 Marlborough Road, Roath, Cardiff, CF23 5BU

(Please quote membership number on all correspondence; see address label on post,
or Members List in *Year Book 2009* or 2010)

Answerphone: 02920 496042; rgellis@ntlworld.com

HON. FIELD SECRETARY (Including enquiries about Field Meetings)

Dr Jill Sutcliffe
Ingrams Farm, Fittleworth Road, Wisborough Green, Nr Billingshurst, West Sussex RH14 0JA
Tel.: 01403 700395; Jillsutcliffe1@gmail.com

HON. ASSISTANT SECRETARY (General enquiries)

c/o Roy Vickery
c/o Dept. of Botany, The Natural History Museum, Cromwell Road, London, SW7 5BD
Answerphone only: 0207 942 5002

**BSBI PROJECT MANAGER &
VICE-COUNTY RECORDERS**

(Comments and/or changes of address)

Mr David Pearman
Algiers, Feock, Truro, Cornwall, TR3 6RA
Tel.: 01872 863388; DPearman4@aol.com

PANEL OF REFEREES & SPECIALISTS

(Comments and/or changes of address)

Dr Mary Clare Sheahan
61 Westmoreland Road, Barnes, London, SW13 9RZ
Tel.: 020 8748 4365; m.sheahan@kew.org

NEW JOURNAL OF BOTANY RECEIVING EDITOR

Dr Richard Gornall
Botany Dept., University of Leicester, Leicester, LE1 7RH
Tel. 0116-252-3394; rjg@leicester.ac.uk

BOOK REVIEWS EDITOR

Dr John Edmondson
243 Pensby Road, Heswall, Wirral, CH61 5UA
Tel: 0151 342 8287; a.books@mac.com

BSBI NEWS RECEIVING EDITOR

Mr Trevor J James
56 Back Street, Ashwell, Baldock, Herts., SG7 5PE
Tel.: 01462 742684; trevorjames@btinternet.com

BSBI NEWS GENERAL EDITOR

Mr Gwynn Ellis
41 Marlborough Road, Roath, Cardiff, CF23 5BU
Tel. 02920 496042; rgellis@ntlworld.com

BSBI HEAD OF RESEARCH & DEVELOPMENT

Dr Kevin J Walker
97 Dragon Parade, Harrogate, North Yorkshire, HG1 5DG
Tel 01423 544902; kevinwalker@bsbi.org.uk

BSBI COORDINATOR

Mr Alex Lockton
66 North Street, Shrewsbury, Shropshire, SY1 2JL
Tel. & Fax: 01743 343789; coordinator@bsbi.org.uk

BSBI VOLUNTEERS OFFICER

Mr Bob Ellis
11 Havelock Road, Norwich, NR2 3HQ
Tel.: 01603 662260; bob@elymus.demon.co.uk

BSBI SCOTTISH OFFICER

Mr Jim McIntosh
c/o Royal Botanic Garden, Inverleith Row, Edinburgh, EH3 5LR
Tel. 0131 248 2894 (w); 0791 7152580 (mob); j.mcintosh@rbge.ac.uk

RESEARCH FUND APPLICATIONS

Mr Alex Lockton
66 North Street, Shrewsbury, Shropshire, SY1 2JL
Tel. & Fax: 01743 343789; coordinator@bsbi.org.uk

BSBI PUBLICATIONS

Mr Paul O'Hara
Summerfield Books 2007 Ltd, 3 Phoenix Park, Skelton, Penrith, Cumbria, CA11 9SD
Tel.: 01768 484910; Fax: 01768 484909; info@summerfieldbooks.com

BSBI WEB SITE ADDRESS

www.bsbi.org.uk

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Sedum kamtschaticum habitat at Johnston (v.c.45) with close-up of plant inset.
Photos D.S. Bosanquet © 2006 (see p. 69)



Alopecurus aequalis habitat with close-up of plant showing bright orange anthers inset.
Both photos taken at Great Fen (v.c.31) by P. Stroh © 2010 (see p. 5)



Ophrys apifera var *atrofusca* at Weymouth
(v.c.9). Photo N. Bailey © 2009 (see p. 35)



Taraxacum limbatum herbarium specimen



Taraxacum limbatum, whole plant with capitulum inset on Isle of Tiree (v.c.103)
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