

Scottish Botanists' Conference 2019 – Abstracts

Some Botanical Highlights from Dumfriesshire in 2019 (v.c.72)

Chris Miles

The Dumfries Botany Group continued with 10 meetings in the county in 2019 including a training day on identifying grasses and a joint meeting with the Botanical Society of Scotland (BSS) Urban team over 4 days. Accounts of all of these meetings can be seen on the blog <https://bsbi.org/dumfriesshire>

Botanical highlights from Dumfriesshire Group meetings included *Cicuta virosa* (Cowbane) and *Carex aquatilis* (Water Sedge) on the Dalswinton Estate; refinding *Botrychium lunaria* (Moonwort) at Wanlockhead; seeing the first *Glaucium flavum* (Yellow Horned-poppy) recorded for over a 100 years at Powfoot; the 11th site for *Apium inundatum* (Lesser Marshwort) at Drumlanrigg; *Scrophularia auriculata* (Water Figwort) at its 10th site near Loch Ettrick.

Highlights from the joint Urban weekend with BSS in Dumfries were *Lamium amplexicaule* (Henbit Dead-nettle) on the edge of the pavement, the first record in Dumfries for over 100 years. In Annan *Lamium confertum* (Northern Dead-nettle) had only 5 previous records in the County. The first record for *Valerianella locusta* (Common Cornsalad) was made for Upper Nithsdale.

The rest of the season has been focused on filling gaps for Atlas 2020. Some good finds include the refinding of *Blysmus compressus* (Flat-sedge) in a hectad after more than 100 years; the first refind of *Pseudorchis albida* (Small-white Orchid) since 1988; a new apparently natural site for *Potentilla argentea* (Hoary Cinquefoil).

Peeblesshire (v.c.78) plants 2019

Luke Gaskell

Juncus filiformis (Thread Rush) - One patch was found on peaty silt in the upper draw-down zone of Fruid reservoir, a typical habitat for this species. It is approximately 80km from the nearest populations in Cumbria and a similar distance from a 1980s record in Ayrshire so it fills a gap in the distribution. Presumably it is moved about by birds.

Fumaria densiflora (Dense-flowered Fumitory) - A declining arable weed with a distinctly eastern distribution in Scotland so this Peeblesshire record is a bit of an outlier. While most of the county is currently sown to grass some forage crops are still grown and the Fumitory was in a field split between fodder Beet and Turnips with a buffer of Barley around the edge. There were no weeds in the Barley.

Viola x scabra (*V. hirta x odorata*) - This hybrid seems to be relatively uncommon and there are no records in the current date class in Scotland though I expect that the population at Carham station in Roxburghshire is still extant. I have no idea as to why it appeared in Innerleithen, *Viola hirta* (Hairy Violet) has never been recorded in VC78 and *Viola odorata* (Sweet Violet) was last seen in 1969.

Symphotrichum novi-belgii, (Confused Michaelmas-daisy), *Symphotrichum x salignum* (Common Michaelmas-daisy) and *Symphotrichum x versicolor* (Late Michaelmas-daisy) are displayed. As the name implies now's the time to see Asters and I am showing plants that I have found in the Borders. All comments and alternative determinations welcome.

Vicia sepium (Bush Vetch) forming vegetative mats (v.c.80)

Michael Braithwaite

The small wildflower meadow at my house had been cropped for hay for 30 years, but had had no grazing or fertiliser application. This led to a dramatic loss of floral diversity. Large

swathes were reduced to a very species-poor sward co-dominated by *Anthoxanthum odoratum* (Sweet Vernal-grass) and the moss *Rhytidiadelphus squarrosus*. Following the application of a modest dressing of garden lime, *Vicia sepium* (Bush Vetch) has formed a remarkable patch 6m in diameter in the meadow, extending vegetatively from a patch 1m in diameter in a single season by taking advantage of the vegetation gaps only occupied by *Rhytidiadelphus squarrosus*. This phenomenon is discussed and illustrated.

Some finds, re-finds and losses in Midlothian (v.c.83)

Barbara Sumner

Finds illustrated include a first for Scotland, *Eryngium agavifolium* (Agave-leaved Sea-holly), discovered by David Merrick in an Edinburgh car park in 2009, reported in 2019. He also found a new Iris variety for Scotland, *Iris pseudacorus* var. *bastardii*, beside Harlaw Road, Balerno, in 2018, reported in 2019. *Trifolium incarnatum* subsp. *incarnatum* (Crimson Clover) was a new VC record in 2013, when found by Richard Milne at Inch Park, Edinburgh. In 2019 Sue Jury reported another Edinburgh site for the species, Fountainbridge. *Silene viscaria* (Sticky Catchfly), long-established on Arthur's Seat, was spotted by Stuart Maxwell at a new site in 2019, the edge of Monktonhall Bing, near Millerhill. *Viola cornuta* (Horned Pansy), recorded in 1963 and 1992 near the railway at Tynehead, was re-found there by the VC recorder in 2019, and a new site was spotted. *Ruscus hypoglossum* (Spineless Butcher's-broom), recorded in 1978 in a wooded quarry at Craigmillar Castle Park, was re-found there by Richard Milne in 2009, reported in 2019.

Losses concern plants and habitats. Commercial peat-cutting on Auchencorth Moss is in the area where *Drosera anglica* (Great Sundew) and *Andromeda polifolia* (Bog Rosemary) were previously recorded. *Anacamptis pyramidalis* (Pyramidal Orchid) was first recorded by Richard Milne in 2007, at the edge of Monktonhall Bing, but obliterated by railway construction works before 2014. Agricultural land is currently being lost to building developments.

Bits and Bobs from West Perthshire (v.c.87)

Liz Lavery & Jane Jones

PSNS (Perthshire Society of Natural Science) Botanical Section:

A poster describing the PSNS is displayed and programmes of Summer Excursions in 2019 and Winter Talks for 2019-20 <http://www.psns.org.uk>

Jane has prepared 3 displays: *Osmunda regalis* (Royal Fern) in Strathard, nr Aberfoyle; identifying a puzzling *Persicaria* species from an article in BSBI News; and finding *Hymenophyllum wilsonii* (Wilson's Filmy-fern) 10 years after Rhododendron clearance on Loch Ard.

Liz and Jane found a very unusual looking grass in Laihills Park, Dunblane which flummoxed several botanists. Liz sent it to Tom Cope at Kew, BSBI Poaceae referee. This is his surprising reply.

'Dear Liz, Thank you for your letter of 1 July. The specimen you enclosed was easy enough to identify, rather harder to account for. It was *Ventenata dubia* (North Africa grass or Wiregrass), a species known from Europe to Ukraine and Turkey but only rarely found as a casual in the UK. It belongs in tribe Aveneae and is very close to *Trisetum*. Its main distinguishing feature is the persistent lower floret, but it also has distinctively ribbed glumes and dimorphic florets not unlike those of *Arrhenatherum*. It is hard to explain its presence in Perthshire unless grasses have been sown there recently from imported stock. Best wishes, Tom.'

Neither *Persicaria runcinata* nor *Ventenata dubia* are in Stace 4. There are no records on the BSBI Ddb for North Africa-grass, is this a first?

How does *Pyrola media* (Intermediate Wintergreen) respond to muirburn, Angus (v.c.90)

Some observations

John Edgington

Pyrola media is a scarce and declining plant in Angus (v.c.90), as elsewhere. Recent records all come from an area of sub-montane *Calluna-vulgaris-Arctostaphylos uva-ursi* heath extending over about 1 km² in Glen Esk, which I have monitored for the last ten years. Part of the Invermark estate, this is intensively managed for grouse. Most of the hill has been burnt at least once during this time, but without obvious effect on the population of *P. media* whose numbers I estimate to remain in the hundreds, maybe thousands. This year, seasonal muirburn bordered a hill track which I regularly walk, and I noticed large numbers of fresh rosettes on newly-burnt ground, greatly exceeding numbers in adjacent unburnt parts. Ratcliffe, in *Scarce Plants in Britain* (1994) stated "it has evident powers of recovery after moorland fires". My observations, though *ad hoc* and only semi-quantitative, support Ratcliffe's comment. I suggest that its clonal nature and status as a partial saprophyte contribute to the plant's resilience.

Westernness (v.c.97) in 2019

Ian Strachan and Ian Bonner

Several notable finds were made in calcareous montane habitats. The Nationally Scarce *Phleum alpinum* (Alpine Cat's-tail) was refound on Geal Charn (Ardverikie) after 47 years. *Galium sternerii* (Limestone bedstraw), a very local plant of upland limestone grasslands with only one recent record in Westernness was refound in Coire an t-Seilich, Glen Roy, after 44 years. *Dryas octopetala* (Mountain Avens) and *Sibbaldia procumbens* (Sibbaldia) were also found on the nearby Beinn Laruinn, new to hectad NN28.

On the coast two new sites for *Atriplex praecox* (Early Orache) were recorded, by Liz MacDonald at Port Min (Ardnamurchan) and by IS near Arisaig. Material collected by Liz also included specimens determined by Ivor Rees to be probable hybrids with *A. glabriuscula* (Babington's Orache), our commonest species. Ivor's superb photos of bracteoles will be shown.

Najas flexilis (Slender Naiad) grows in Loch a' Bhada Dharaich, 2km east of Morar, where it was last recorded in 2001. This is the only mainland site north of the Great Glen for this internationally threatened species. In 2019 it was refound there, washed up, but also found for the first time in the adjacent water body, Lochan a' Mheadhoin.

VC100: Old and new finds in Bute (v.c.100)

Angus Hannah

1. Apple trees: Recently published research (Worrell, Ruhsam et al *Scottish Forestry* 2019) led me to reconsider some very old apple trees on Bute not noted by these authors. Photos are exhibited of two trees in a fragment of ancient woodland never enclosed from the surrounding marshy grazing and including very old oaks and alders (NS0863). The apples grow 150m apart on two olivine-dolerite dykes, close to the Highland Boundary Fault. They are about 12m tall, spread c.15m, with characteristic '2-storeyed' crowns, and bear abundant round yellow/green fruits up to 30-35mm diameter. The older-seeming tree has 12 living trunks arising from a stool extending 3m down a rocky slope. The other has recently lost a major trunk, but continues to prosper. Although not identical to each other, leaf morphology suggests both are close to *M. sylvestris* s.s.

2. Photos of a bramble new to Scotland: *Rubus echinatus* (conf. Rob Randall). Several bushes found growing in neglected ground along Argyle Terrace Rothesay (NS0865) in September 2019.

3. A specimen of *Elytrigia x drucei* (*E. repens* x *E. atherica*) from the Bute shore near Mountstuart (NS1160) determined by Mike Wilcox. Most northerly British record to date, and first in Clyde area since 1942 when found near Troon by R. Mackechnie.

4. A specimen of the grass *Echinichloa crus-galli* (Cockspur) new to the vc., from a vigorous patch growing near a continuously warm vent in Rothesay (NS0864), probably from birdseed.

Discovery of *Koenigia islandica* (Iceland-purslane) on Mull, 1956 (v.c.103)

R.W.M. Corner (v.c.79, 80)

The author made the second British record of this Circumpolar Arctic-montane annual during the Edinburgh University Biological Society visit to Mull in 1956 as a young first year medical student. It was not recognised at the time of collection but while looking through the Norwegian "Fjell-Flora" in a Bergen bookshop a few weeks later I recognised the little Mull plant as *Koenigia*. Plants were sent to the Royal Botanic Garden Edinburgh where Dr Harold Fletcher confirmed the identification and I received letters from Dr Max Walters from Cambridge and E.C. (Ted) Wallace congratulating me on its discovery. A short note was published in The Transactions of the Botanical Society of Edinburgh (1957 Vol 37) with the help of Dr Peter Green. The "Fjell-Flora" and copies of the letters and notes are exhibited together with the herbarium sheets of this first collection of *Koenigia islandica* from Mull. In addition, a sheet of a High Arctic population from North East Greenland with photographs is shown. Attempts to name these small Arctic plants as a separate species have not been substantiated. It has a bipolar distribution occurring in Tierra del Fuego at the southern tip of South America and its remarkable ability to thrive as an annual plant in hostile arctic-alpine environments is commented on. It is of note that the first British collection from The Storr in Skye made in 1934 lay in the herbarium at Kew for 15 years misidentified as *Lythrum portula* (Water Purslane) until Dr B.L. Burt correctly identified it in 1950. (Mountain Flowers by Raven and Walters, 1956).

The Spread of Aliens in Skye, Raasay and the Small Isles (v.c.104) Stephen Bungard

In order to assess the spread of alien plants, periodic distribution maps may not be sufficient. Changes in recorder, recording methodology and recording strategy need to be taken into account. Population sizes and, for perennials, population age distributions can be helpful.

VC 104 distribution data for *Epilobium brunnescens* (New Zealand Willowherb) are compared with those for the native *Succisa pratensis* (Devil's-bit Scabious) and recent increases in records for *Cortaderia richardii* (Early Pampas-grass) and *Crocsmia pottsii* (Pott's Montbretia) are explained.

February is the Cruellest Month – Monthly records from 4 sites (v.c.106)

Brian Ballinger

Four linear sites of approximately 100m in Easter Ross were visited monthly for 12 months by the same observer and all identifiable wild plants noted. Some identification was vegetative. Sites were walked once in each direction. The locations were woodland, parkland, coastal path and disused railway siding.

Of the 211 species recorded the maximum number was in July and the minimum in February. The monthly totals were: January 102, February 74, March 84, April 104, May 144, June 172, July 192, August 187, September 189, October 153, November 126 and December 96. 27 species were recorded every month and 38 only once. Some may have been overlooked or obscured by other vegetation. 22 taxa were only recorded in April - June, 45 only in July - September, 8 only in October - December and 1 only in January to February.

This was a limited study carried out by one observer and others may not produce the same findings. It is suggested that repeated visits to sites are worthwhile. Recording can take place all year round and the autumn is quite productive, but winter less so.

West Sutherland (v.c.108) in 2019

Ian Evans and Gwen Richards

Our final year's recording for Atlas 2020 was, again, focussed on eastern parts of the vice-county, from a self-catering cottage at Tongue. We are grateful to the Blodwen Lloyd Binns Bequest Fund (Glasgow NHS) and the Finnis Scott Foundation (BSBI) for substantial help towards expenses.

Three weeks' fieldwork generated some **3300 records from 30 monads**. Areas nearer home and contributions by visiting botanists added a **further 1700 records**.

Noteworthy records included:

Logfia minima (Small Cudweed), a NVCR: This annual species of thin soils had not previously been recorded from West Sutherland. On 16th June we found it in abundance on a track associated with the Strathy North Windfarm (NC8259) in the valley of the River Strathy. It later turned up on a track beside Loch Beag, Melvich (NC8863).

Eupatorium cannabinum (Hemp-agrimony) was rediscovered at the edge of a small area of woodland on the east bank of the River Naver, south of Bettyhill Pier (NC7061) on 19th July. The only previous record of this tall perennial in West Sutherland was made by H.C. Watson at Bettyhill in 1833.

The Inchnadamph 'Zoo': At some time in the mid-20th century, a variety of 'alien' species, mainly montane, were introduced by persons unknown to two remote limestone ridges east of Inchnadamph (NC2720). This assemblage was re-discovered by local botanists in the 1990s and last surveyed in 2008. On 7th July members of the Assynt and Lochbroom Field Clubs revisited the site and found the 'zoo' to be flourishing. 'Zoo' species include *Phyteuma scheuchzeri* (Oxford Rampion), *Silene alpestris* (Alpine Champion), *Campanula cochleariifolia* (Fairy's-thimble), *Erinus alpinus* (Fairy Foxglove) and *Gentiana verna* (Spring Gentian).

Also memorable were boat trips to Eilean nan Ron and Neave Island off Skerry (NC6465 and 6664) and a remote area south of Whiten Head (NC4865). Accounts of these will be published in *The Highland Naturalist*.

Thanks to Gordon Rothero and Ro Scott for help with fieldwork, to other BSBI members for their contributions, to Wildland Ltd. for transport to remote areas and to Avril Haines and Andy Amphlett for computerising the records.

Shelterbelt trials in the Outer Hebrides (v.c.110) after 50 years

Paul A. Smith

Shelterbelt trials were established in North Uist and Lewis in the Outer Hebrides in 1963 as part of a programme to evaluate the suitability of a wide range of species to grow in extremely exposed conditions. The sites were revisited during 2016-18 and the survival and condition of the species were evaluated. A surprising range of species survived (and some thrived) under the dense competition of the plots, and some further species had self-seeded in the sheltered conditions.

Precocious & Serotinous Taraxacology (Early & Late Flowering Dandelion Studies)

Les Tucker

Plant Crib advises: "only examine well-grown individuals just before and during early flowering ... 'summer' leaves are usually larger and not of typical shape". Correspondingly, BSBI DDb shows records predominantly mid-April - May. However, some species flower earlier and later,

importantly providing pollen for insects and nectar during 'hungry gaps'. Then, heterophylly (differing leaf shapes) within helically expanding rosettes requires diagnostic analysis.

Most *Ruderalia* (Weeds) section, disreputably, soon become overblown and indistinguishably leafy. However, Handbook diagnoses *Taraxacum ekmanii* (Ekman's Dandelion) by "later leaves gross, very variable, ..." [with] large terminal lobe"; extensive records supporting. Recently, characteristic flowers indicate younger, inner, leaves recapitulating 'juvenile', more-simplified, spatulate forms.

Contrastingly, though *Erythrosperma* (Red-seeded) section are typically lacinate, early *T. oxoniense* (Oxford D.) retain similarly spatulate 'juvenile' leaves; but by then displaced to older, outer, positions. Section *Hamata* (Hook-lobed) appear mostly homophyllous: *T. pseudohamatum* (False Hook-lobed D.), "earliest-flowering ... characteristic of roadsides", robustly so. Cautionarily, another such, phenotypically 'juvenile', was named *T. hibernicum* (Irish D.); but, subsequently revised as *T. marklundii* (Marklund's Hook-lobed D.), lectotypically more refined. Lately, after mowing ceased, local park colonies re-leaved and flowered identifiably.

Typically, late *T. duplidentifrons* (Double-toothed D.), "possibly our commonest ... north and west", like many section *Celtica* (sub-Atlantic) section, shows diagnostically different heterophylly: lobes lacinating and terminally contracting intrarosularly.

***Zizania latifolia* (Manchurian Wildrice) found near Hawick**

Douglas McKean

An inadequate vegetative specimen of this Asiatic grass from South Scotland was wrongly identified by me but is only found naturalised in SE England and Co. Wexford. A very recent visit to the Scottish site showed no evidence of this large broad-leaved grass. The nearest look-alike is *Spartanium erectum* (Branched Bur-reed).

Some Scottish Sedges

Fred Rumsey

Some Scottish Sedges seen while collecting for the Millennium Seed Bank are displayed. A sedge test: Can you guess which species is missing? Attendees are asked to name the species, say what links them and identify the missing one. The main prize for correct answers will be smug self-satisfaction but Sedge smartarse certificates may also be awarded on request.

A visual-flora of the British Isles

Lyn Jones

I will demonstrate an e-flora for identification of British plants that is suitable for use on smartphones, tablets or computers. It can be run off the web or downloaded to your tablet or smartphone. It enables one to identify plants using a largely image-based approach, either using flower or leaf characteristics. For further information see visual-flora.org.uk.

Identify Mountain Flowers

Alan Walker

Identify Mountain Flowers of Britain and Ireland by Alan R. Walker. This is a guide for people who explore the moors and mountains of this distinct botanical area: hill walkers, mountain instructors, naturalists, botanists and others. The design is for download as a 16Mb file in pdf format over the internet to save for field use on a smartphone or tablet, or on a home computer. The guide can also be printed as a ring-bound book for modest cost at a high-street laser-colour printer.

Population dynamics and life history of *Sagina nivalis* on Ben Lawers (v.c.88 NTS)

Sarah Watts, David Mardon and Dan Watson

Sagina nivalis (Snow Pearlwort) is one of Britain's rarest and least known arctic-alpine plants. It is a dwarf, tufted cushion-forming perennial which can only be found by careful observation. In Scotland it occurs at the extreme southern margin of its north European range. The vast majority of plants are located within the Ben Lawers NNR at altitudes between 915-1192m. Such rear edge populations deserve high priority for investigation in order to maintain biodiversity through anticipated global change. This poster presents the main findings from almost forty years of studying *Sagina nivalis* at Ben Lawers with permanent plots and long-term monitoring. It provides life history information on plant size, pollination, lifespan, survival and flowering rates. Overall numbers across the site have declined since the 1990s, and so threats to the conservation of the species in Britain are also identified. These include natural processes, sheep activity and climate change impacts.

Climate change impacts on Scottish alpine vegetation

Louise Ross (University of Aberdeen)

A 50-year resurvey shows that climate change poses a serious threat to the cold-adapted arctic-alpine species of Scottish alpine plant communities. Results showed a decline in species richness and diversity, characterised by a marked increase in graminoid cover accompanied by a decline in forbs and lichens, particularly those with an arctic-montane distribution. The "winning" species showed a marked preference for higher temperatures, higher moisture levels and more acidic conditions than the "losing" species, and the use of thermic indicator scores demonstrated the increased abundance of warm-adapted species. Many of the species that had increased significantly since the 1950s were generalist graminoids previously characteristic of lower altitudes, such as *Molinia caerulea* (Purple Moor-grass), *Nardus stricta* (Mat-grass), *Trichophorum germanicum* (Deergrass) and *Carex demissa* (Common Yellow-sedge). In contrast, species that had declined in abundance tended to be alpine specialists, such as *Carex saxatilis* (Russet Sedge), *Alchemilla alpina* (Alpine Lady's-mantle), *Arctostaphylos alpina* (Alpine Bearberry) and *Cherleria sedoides* (Cyphel). This replacement of cold-loving plants with warm-adapted species is a process known as thermophilisation, and indicates the considerable reduction in suitable climate space for Scotland's alpine plant species since the 1950s.

How common are Elders with green berries?

Ron Youngman

Who else has seen green-berried *Sambucus nigra* (Elder)? How common is it? I don't recall having ever seen this form before. Stace and others say the fruits are rarely red or greenish-white. A photograph taken in October 2019 near Dunkeld is exhibited. Not two metres away was a 'normal' Elder with black berries.

UK Pollinator Monitoring Scheme (UK PoMS)

Tereza Kocarkova

UK PoMS is a citizen science based project supported by various conservation, education and governmental organizations and coordinated by the Centre for Ecology and Hydrology (CEH). Its aim is to gather data on pollinator diversity and abundance across the entire country over an extended period of time. This is to see how pollinators are actually performing, to get a better idea about species distribution and most importantly to establish distribution trends over time. The data gathered will be analysed and the results used as a key stone for making informed decisions while establishing new pollinator conservation practices.

UK PoMS comes in two parts. One which anyone can do and another one which involves a bit more commitment. The first one is simple Flower-Insect-Timed count which takes about 15 minutes including the preparation. You can do it any time you feel like it for example in your back garden while you are enjoying a cup of tea. The second one is more complex. One gets allocated a randomly preselected 1km square to which than has to pay a monthly visit between May and August to collect pollinator samples and gather additional data. The samples collected are than sent to CEH labs to be identified by specialists. To learn more about the project please visit www.ceh.ac.uk/our-science/projects/pollinator-monitoring.

A poster is on display describing the UK Pollinator Monitoring Scheme (PoMS) project run by the Centre for Ecology and Hydrology.

BSBI Outreach 2019

Faith Anstey

Workshops held: In 2019 we held four beginners' workshops and one field meeting. Aileen Meek led the Plant Families workshop followed by a field meeting at Braemar. One workshop for Grasses was led by Faith at Stirling University and another by Chris Miles at Boreland, Dumfriesshire. The new Sedges & Rushes workshop was held at Mugdock Park and was a great success.

Who came? 81 people in total including more and more professionals – even on the Plant Families workshop. On the Sedges workshop, two-thirds were full-time ecologists. Participants came from far and wide, including England.

What did they think of it? The courses were enthusiastically appreciated. Whatever their level of experience (and it varied considerably), students always seem to find it 'pitched just right' – which is due to individual, expert and accessible attention from group tutors.

Next year: As yet we have no firm dates or venues. However, with the help of Recorders, we are hoping to run a Plant Families workshop in Edinburgh, Grasses workshops in Lanarkshire & Perthshire and Sedges workshops in Kinross and Dumfries. We are also planning several follow-up field meetings with perhaps one specialising in graminoids.

Plantlife – Cairngorms Wild Plants project

Alistair Whyte

Species such as twinflower *Linnaea borealis* (Twinflower) and *Moneses uniflora* (One-flowered Wintergreen) exist in small isolated populations, vulnerable to extinction, genetic isolation, disease and changing environmental conditions. The Cairngorms Wild Plants project, covering the Cairngorms Important Plant Area, trains volunteers, land managers, outdoor industry professionals and students to monitor populations of key species, provides bespoke land management advice, and assesses the feasibility of future translocations and other interventions. The project has engaged with over 700 individuals, as well as major private landowners, and demonstrates the positive ecological impact of working on a small range of priority target species within a defined geographical area.

Plantlife – Road verges

Alistair Whyte

Over 700 species of wildflower grow on the UK's road verges, and there is the potential for the road verge network to provide vital habitat and connectivity for pollinators as well as being refuges for threatened and scarce wild plants. This potential is often unrealised because of the mis-management of road verges. In September 2019 Plantlife released a new set of guidelines - "[Managing Grassland Road Verges - A Best Practice Guide](#)". This new publication has been endorsed by multiple highway agencies, industry and wildlife organisations,

including Transport Scotland and Scottish Natural Heritage. Two case studies are highlighted on the poster demonstrating the benefits of sensitive management.

Mapping Species Rich Grassland across Scotland

Apithanny Bourne, SNH (Scottish Natural Heritage)

Britain has lost 97% of its species rich grassland (SRG) in less than a century, according to UK charity Plantlife. Hundreds of plants, fungi and invertebrate species rely on these important habitats – which in turn support healthy populations of mammals and birds. Evaluating the best method to locate and map remaining fragments is therefore vital for its protection.

Only around half of Scotland has currently been mapped for SRG, so the initial phase of this project will involve a period of data collation. Local authorities, conservation NGOs and individuals will be encouraged to submit any grassland data they hold. The feasibility of using satellite technology to address non-surveyed areas will then be evaluated. In collaboration with the Cairngorm National Park, a pilot will be performed in Royal Deeside using satellite methods followed by ground truthing.

The British Pteridological Society for fern enthusiasts

Heather McHaffie

The British Pteridological Society (BPS) has a Scottish group that visits and monitors ferns in the wild and enjoys cultivating them in our gardens; everyone is welcome to join our excursions. We have leaflets offering suggestions for growing ferns and also an assortment of books about ferns and lycophytes (clubmosses and allies). Please talk with us for more information.

Conservation of *Woodsia ilvensis* (Oblong Woodsia)

Nadia Russell (RBGE)

Current conservation surrounding *Woodsia ilvensis* (Oblong Woodsia) is in the form of PhD research being carried out at RBGE by Nadia Russell. This research is investigating the reproductive biology and genetic diversity of this rare and endangered fern. Combinations of ecological, biological, and molecular processes are being used in an attempt to recognise the reasons why there is a recruitment issue with new plants at most sites in the wild in the UK. However, one population in the Lake District does appear to be regenerating somewhat, but it is unclear if the new plants are just spreading vegetatively and warrant further investigation? Initial results indicate *Woodsia ilvensis* populations in the UK have low genetic variation compared to populations in Norway and Canada where genetic variation is much greater. In an attempt to understand the reproductive biology of this fern a series of germination, fitness and crossing experiments are being carried out alongside plants being exposed to different environmental stresses. Research is ongoing.

Botanical Society of Scotland (BSS)

The BSS is Scotland's national botanical society and seeks to promote public interest in Scotland's plants and plant habitats and to advance the study, appreciation and conservation of all plants including cryptogams and fungi. Each year, we run series of lectures and field meetings, along with occasional training workshops on plant identification. We also award an annual student prize for the best final year dissertation and make grants for student field work and training. Our urban flora project, (see other posters) which investigates the flora of our towns and cities is in progress. This year, the dissertations submitted for our annual student prize were of exceptional quality and we awarded two first prizes. Their summaries will be on display.

BSS POSTER – Urban versus Rural Species Richness (and what lies behind it)

John Grace, Brian Ballinger, Roger West

We asked: Are towns and cities more species-rich than nearby rural areas? If so, why? We investigated urban *versus* rural species richness using two sampling methods:

1. Interrogation of the BSBI Distributional Database (monad and hectad) and
2. Forty-minutes of new sampling by an expert observer in the field.

We found: the evidence from the BSBI Database is that urban areas are indeed more species rich than rural areas. However, the 40-minute sampling in the field suggested that the difference is small and may not be significant. Both approaches have possible biases, and we are seeking ways to make a fair comparison.

BSS - TALK - Urban Flora of Scotland: notable finds 2015-2019

John Grace

I focus on a few cases where introduced species seem to be spreading rapidly. The first case is the grass *Polypogon viridis* (Water Bent) which we have found at several new Edinburgh sites, yet in Scotland as a whole it is very scarce. The second is the case of four species of *Conyza* (Fleabane), also spreading in Edinburgh (and we found new records in Ayr). The third is *Acaena novae-zelandiae* (Piri-piri burr) which is very common at a site in South Queensferry. Why might these taxa be increasing rapidly? Two hypotheses are discussed (i) we have had three successive warm summers (ii) many common species are showing glyphosate-resistance, and thus some habitats which are annually sprayed may now be open to certain species. Finally I present an intriguing case of 'mad clover disease' which we found whilst surveying the flora of the Edinburgh tramline, but which may be widespread.

This talk is accompanied by a poster, which will be displayed with other Urban Flora posters.

Unusual Phyllotaxy of *Acer platanoides* (Norway Maple)

Roger West (BSS)

A description, with photographs, of an *A. platanoides* sapling which grew from a tricotyledonous seedling and continues to have leaves in whorls of 3; and a shoot of *A. platanoides* which has leaves in an irregularly alternate phyllotaxy. The causes of these unusual phenomena are discussed.

Some Freshwater Algae from the Edinburgh Area

Derek Christie (BSS)

This PowerPoint presentation illustrates some of the freshwater algae to be found in freshwater ponds and lochs within Edinburgh. At the request of the Holyrood Park Ranger Service, I sampled the various water bodies within the park boundaries and presented my results as a short video and PowerPoint presentation. I also assisted in the identification of freshwater algae found during an investigation, led by Vladimir Krivtsov, into SUDs (Sustainable Urban Drainage) ponds within Edinburgh. The images are from these sources.

Is phenology keeping pace with rapid climate change in the arctic? Preliminary results

Maude Grenier (BSS)

Under climate change, phenology in many high latitude systems is advancing. Whilst the Arctic region has experienced warming twice the global average, few long-term phenological records for these regions exist. Field observation records and herbarium specimens can provide historical phenology records to estimate plant sensitivity to climate change. Where data collection has historically been spatially and temporally sparse, as in the Arctic, estimating plant response can be challenging. Botanical collection in South West Greenland

dates from the 18th century. However, many of the collected specimens are not digitised and therefore not available for analysis. In order to investigate plant response in SW Greenland, 3,581 herbarium specimens were digitised at the Royal Botanic Garden Edinburgh (RBGE) and 2,051 were imaged in the Natural History Museum of Denmark, Copenhagen (CPH). For SW Greenland specimens containing taxonomic information, date and location, phenology was scored using four categories from Yost *et al.* (2018). Analysis was conducted on the flowering mature phenological event in the most abundant 19 species in the dataset from 1871 to 1993. Each observation was matched with monthly mean temperature from the SW Greenland and a random slope model was used to estimate parameters. The preliminary model showed great variation between species, but not sites, and no overall advancing phenology trend over 122 years.

Coadaptation in the Caledonian pinewoods: are local mycorrhizal a better fit?

Jim Downie, University of Edinburgh

Mycorrhizal fungi play an important role in forests, aiding their host trees in accessing nutrients, water, and providing disease resistance in exchange for nutrients bound in the soil. Some fungal species provide more benefit to their hosts than others, and distributions of fungal species do not overlap. This leads to the question: have plants evolved to perform best with local mycorrhizal fungi? To test this, we set up an experiment with populations of *Pinus sylvestris* (Scots Pine) from the Caledonian pinewoods of Scotland paired with soil from each population. While we found no evidence of local adaptation to mycorrhizal fungi, we did find that different pine populations interacted differently with different groups of fungi, suggesting that other evolutionary factors may be driving interactions with symbiotic fungi.

Floristic DNA Barcoding reveals the landscape of hybridisation in the British Flora

Max Brown, University of Edinburgh

Natural hybridisation is widely recognised as an important ecological and evolutionary factor that may facilitate adaptation and promote species survival, generate novel variation, or cause extinction. We investigate hybridisation across an entire flora (1408 species) in a phylogenetic context by coupling ecological and genetic data. This is only possible as DNA data is now being generated rapidly and on large scales. We specifically look at how genus size, and a variety of genetic factors affect hybridisation after controlling for overlap in pairs of species distributions. Out of the 12,410 possible pairwise congeneric combinations of species in the British Flora only 9.1% produce hybrids. There is a significant but weak correlation between hybrid propensity, calculated as the number of hybrid combinations a species produces, and genus size. Phylogenetic mixed models show that hybrid formation has a clear phylogenetic signal, though with considerable variation not attributable to phylogeny. The effect of parental divergence on hybrid formation was also strongly significant and of large effect size. Lastly, parental species with differing ploidy levels are much less likely to lead to hybrid formation.

Botanical Society of Britain and Ireland (BSBI) is the leading organisation for amateur and professional botanists in Britain and Ireland. The following posters are displayed: -

BSBI: helping you as you learn more about wild plants **Jim McIntosh & Louise Marsh**

Find out how the Botanical Society of Britain & Ireland (BSBI) can support you, even if you are not a BSBI member: there are many useful ID resources free to download from our website, and there are some great plant-related activities to get involved with, such as field meetings and training workshops across Scotland, recording for Atlas 2020 or some midwinter plant-hunting with the New Year Plant Hunt. But there's even more on offer if you join BSBI! Our members have exclusive access to a network of 100+ expert plant referees to help with ID of tricky plants; they benefit from some great money-saving offers on botany books; our

membership newsletter *BSBI News* is popular with botanists at all skill levels; and there are many opportunities to develop or gain new skills, either for fun or to improve job prospects. Talk to Jim McIntosh, BSBI's Scotland Officer, to find out more or go to: www.bsbi.org/scotland

BSBI Atlas 2020

Kevin Walker

The main aim of this major project is to provide up to date distribution maps for all native and non-native vascular plants that occur in the wild in Britain and Ireland, so we can improve our understanding of how our flora has changed taking into account recording behaviour, human pressures and environmental drivers. Details of the survey methodology are given. Since the beginning of the survey in 2000, over 1,000 volunteers have collected an amazing 20 million records. This progress is charted and the geographical coverage is compared favourably with that for Atlas 2000 in a map of Great Britain & Ireland.

The outputs are outlined, including an updated and enhanced online atlas, summary reports for England, Scotland, Wales and Ireland, a fully verified dataset for use in research, conservation, policy-making and education and a popular book (Tbc) on the British and Irish flora based on the results of the survey.

BSBI Grants Programme 2020

Louise Marsh

BSBI offers a range of grants to help you learn more about wild plants. BSBI Training Grants are available to beginner and improver botanists looking to take a short plant ID course: www.bsbi.org/training-courses - note that in 2020 there is extra funding available, thanks to a generous donation from Inverness Botany Group, towards Training Grants for two applicants based in Scotland. BSBI Plant Study Grants support botany/ plant science students undertaking botanical projects, such as: <https://bsbipublicity.blogspot.com/2019/10/bsbi-plant-study-grant-funds-sedge.html> BSBI Science & Research Grants help fund research that advances our understanding of the British & Irish flora. Applications for all three grants open on 1st January each year and you will be able to download an application form here: www.bsbi.org/grants. You don't have to be a BSBI member to apply, but BSBI members are favoured if there is competition for grants.

BSBI New Year Plant Hunt: how many wild or naturalised species can you find in bloom in three hours over the New Year holiday?

Louise Marsh

BSBI's New Year Plant Hunt started in 2012 as a bit of midwinter fun but it has become an important citizen science project, helping us build up a clearer picture of how wild flowers across Britain and Ireland are responding to changes in autumn and winter weather patterns. Go out plant-hunting with friends, family, on your own or with fellow botanists, see what you can find in flower and then submit your records via our easy-to-use online form. Your finds will show up within seconds on our interactive map. Last year, Scottish plant hunters were out recording from Galloway to Orkney, from Galashiels to Arisaig. Join us in January and let's find out what's blooming across Scotland despite the weather! More info here: www.bsbi.org/new-year-plant-hunt

BSBI Committee for Scotland seeks a young volunteer**Lindsey Mackinlay**

The Committee for Scotland is keen to foster the next generation of botanists by promoting a passion for wild plants amongst younger people. So, we are looking for a young person to co-opt onto the committee to join in with our discussions and represent younger people on the committee and help promote the BSBI amongst young people in society. It will give you a fascinating insight into the study, understanding and conservation of wild plants, including the workings of BSBI (a charitable NGO) in Scotland and the many valuable botanical activities taking place across the country. The poster gives details of the voluntary position, and how to apply.

National Plant Monitoring Scheme**Kevin Walker**

This poster sets out the aims, method, results and outputs of the National Plant Monitoring Scheme, a collaboration project between the BSBI, CEH, JNCC & Plantlife. The increasing take-up of plots over the past 4 years is illustrated and the locations of plots from where data has been submitted mapped. One of the key outputs is an experimental statistic to provide trends in abundance for individual habitats and indicator species and graphs are presented to illustrate this for two such species.

Grassland Plants of the British and Irish Lowlands**Peter Stroh**

The composition of lowland grasslands in Britain and Ireland has changed radically in the last 80 years. Following a forward by George Peterken and an introduction describing the history and types of lowland grassland and the reasons for change, the main focus of this book concerns those plants currently considered to be of greatest conservation concern, assembling in one place everything you could ever need to know about over 100 of our most threatened species, from Orchids to Lady's-mantles, Maiden Pink to Meadow Thistle, Pasqueflower to Pennyroyal.

Each meticulously researched species account provides valuable information about identification, including similar-looking plants with which it may be confused, typical habitat, biogeography, a comprehensive ecology section, known and potential threats, and management requirements. Accounts are illustrated with a colour photo of the species, it's typical habitat, and an up-to-date distribution map.

The information contained in these accounts is essential reading for both amateur and professional ecologists alike, and will be especially useful to land managers and others who are responsible for the care and conservation of our wild flora.

BSBI Photographic Competition**Natalie Harmsworth**

A wonderful display of 80 photographs for this year's competition is on show. Vote for your favourite shot in each of the two categories: Native Plants and Alien Plants. The winners will be announced after the main talk and, if present, the photographers will be awarded their prizes. The winning photographs will be on display at the prize giving and will also appear in future BSBI publications.

BSBI Plant Identification Table**Douglas McKean**

A great opportunity to get expert help with identification with so many experts in the audience! Remember to bring your specimens and handlens!

RBGE Library & Archives**Lorna Mitchell, Head of Library Services, RBGE**

The Royal Botanic Garden Edinburgh Library, founded on the library of the Botanical Society of Edinburgh, is Scotland's national reference collection for specialist botanical and horticultural resources.

The Library is open for anyone to use on a reference-only basis from 10am to 4pm, Monday to Friday. Access to the Archives and Special Collections (Rare Books collection, Illustrations, Nursery Catalogues, etc) is by appointment. The Library catalogue is available to search at <https://rbge.koha-ptfs.co.uk/> and a collection-level listing of the Archives can be found at <http://atom.rbge.info/>.

RBGE Herbarium**Elsbeth Haston, Deputy Herbarium Curator**

The Herbarium of RBGE currently houses 3 million specimens, of which we estimate that over 500,000 were collected in Britain and Ireland. These specimens are an incredible resource for botanists for a wide range of scientific research and we have many researchers from UK and from around the world coming to work with the collections. They represent over 300 years of plant and fungal diversity, including many rare or extinct species. We welcome more Scottish botanists to use these collections and we are also working to make them more accessible through digitisation. There are now over 130,000 specimens catalogued from Britain and Ireland of which over 31,000 have been imaged. They are available on the Herbarium Catalogue at <http://data.rbge.org.uk/herb>. If you are interested in coming to use the collections please contact us at herbarium@rbge.org.uk.