BSS News

Botanical Society of Scotland

ISSUE NO. 125 | **SEPTEMBER 2025**

Scottish temperate rainforests

Rare bryophytes rescued

Book reviews

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Cover image: A detail from 'Oaks in Gleann Dubh, Morvern, Scotland (4)' by Ben Averis © 2017

Editorial

Jonathan Silvertown & Chris Jeffree

There is lots to share with you, our members, in this third, full-colour issue of *BSS News*.

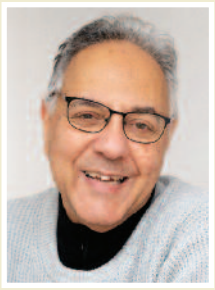
The cover image is by ecologist, artist and poet Ben Averis who has generously allowed us to use his colour pencil drawing of the Black Glen, Morvern. There was a capacity crowd at Ben's lecture on Scottish Rainforests earlier in the year and we are delighted to have an article by him that nicely captures the unique charm of that event. If you missed it or want to enjoy the lecture again, you will find it on our YouTube channel. Do look up Ben's artwork at his website **www.benaverisart.co.uk**. Also in this issue, we have another fascinating piece by Peggy Walters on plants in the poetry of Robert Burns, with elms now her focus. In other articles, Rachel Thomas tells us about the botanical gardens of northern Italy, some of which inspired the foundation of the Edinburgh Botanics and Rich Wilson has more advice on plant photography. Book Reviews are back, with three interesting titles discussed.

As usual, in Society News, you can read about the student projects that the Society has supported and some of the field meetings that have been held. The back cover is your at-a-glance guide to the Society's events programme for the coming six months and more. Once again, our Meetings Secretary Maria Chamberlain has put together a stellar list of speakers, none of whom you will want to miss.

We thank all the contributors to this issue of BSS News. It is written largely by and entirely for members, so why not contribute yourself?

If you would like to write or submit photographs for *BSS News*, please drop us a line at **BSS-contact@botsoc.scot** Anything of botanical interest will be considered. The deadline for copy for the March 2026 issue is January 15th, but you needn't leave it till then to write.

Society News



Jonathan Silvertown

From the President's podium

Here I am again, still President after re-election by Council in a closely-fought battle with myself.

In the last two years the society has brought all the systems behind the scenes, or rather behind the web interface of the Society, up-to-date. I am amazed at how many apps are needed to run the society efficiently. The most recent innovation has been the adoption of a new membership platform called MyClubHouse that enables us to do lots of things better. Rich Wilson tells you more, below.

The BSS is run entirely by voluntary effort, which is part of the fun of being a member because, after all, "Society" implies that we are sociable, as indeed we are. There are many ways that you can join in and help. Come to lectures and field meetings of course but also encourage your friends to join the society. It has to be the best value you can get for £25 a year (£5 for students). Do come and say hello at lectures and the Plant Pub, or drop me a line at **bss-contact@botsoc.scot**

From Rich Wilson's Publicity Desk...

We have successfully moved to a new member management and accounting system – **MyClubHouse (MCH)**. Members now have a new view of their membership details. If you haven't logged in from the BSS website, please do, as you need to reset your password for the new system. You can update any personal information, such as changes to email or home address. The move gives the Society a more flexible management system and an important new feature – **The Calendar**! The new Calendar feature allows for sign-up to special events and field meetings is very helpful in managing attendance and preparing for events. For those who also subscribe to the *BSS Journal*, Plant Ecology & Diversity, we have now completed the conversion to an electronic format and is available via the Member's Area on the BSS Website.

Also, a reminder that our Website and Social Media instances provide updates to events and links to lecture videos. Of course, you don't have to subscribe to all of them. Select your favourite(s) and stay informed.

Wild*ID* Urban flowers of Scotland and northern England

We are pleased to announce the publication of this fold-out ID guide by the Field Studies Council, based on the research of the BSS Urban Flora of Scotland Project. The Guide features 45 of the most common urban herbaceous species recorded by the project, illustrated by wonderful paintings by Lizzie Harper. John Grace has written a short piece about the botany and ecology of each species. Look for the guide in any book shops and visitor centres you may visit, and if they don't have our guide, ask them to stock it please. BSS itself will not be selling the guide, but you can buy a copy at a 20% discount now being offered to BSS members by the FSC.

Special offer for BSS Members

20% off all Field Studies Council Publications (excluding Sale items), for online orders placed up to Sunday 16 November 2025.

Use the discount code **BSS20** at the checkout

www.field-studies-council.org/shop/

Botanical Society for Students

***Toby Cullen**, newly elected student rep on BSS Council says hello*

Hi everyone! I'm Toby and I'm the new Student Rep for the coming year. The BSS has a strong community of botanically-minded students from all around Scotland, and my goal is to make it even stronger. Over the next year, we can host events that range from a field trip into the Pentlands looking at bryophytes to a career advice session and help with grant applications. I want to develop existing connections to cities and Universities outside of Edinburgh and make our Society more cosmopolitan, as well as keeping up the growth of new student members we have seen recently. If you would like to get involved in helping organise and build our botanical bunch, don't hesitate to reach out!

Toby Cullen
BSS Council Member

How to get in touch

Learn more about the student group at **https://botsoc.scot/students/**

Our Instagram page is at **https://www.instagram.com/botsocscot/**

Find us at **https://botsoc.scot/about/contact-us/**

Field Excursion Reports

Addiewell Bing: Joint with Edinburgh and Lothians Fungal Enthusiasts (ELFE)

1st June 2025 | Led by Cameron Diekonigin and Richard Milne

Lunch break at Addiewell Bing

The West Lothian Bings, the spoil heaps left by shale oil mining, have now become iconic relics of Scotland's industrial past. Once barren sterile substrate wastelands, they have since colonised to become biodiversity hotspots, showcasing primary succession, and providing a haven for flora, fauna and fungi.

We thought that a bing excursion would be popular item on our field programme but were unsure as to which bing to choose. Addiewell seemed to fit the bill as it provided a variety of habitats, accessible terrain, while its Nature Reserve status promised a rich vascular plant, moss and fungal flora. The Scottish Wildlife Trust (SWT), who administer it, were very welcoming – in return for a species list of course. We did several recces, mainly to check out the parking, terrain and health and safety concerns.

On the day of the outing, the weather was brisk, but the sun did peek out from time to time. A good turnout of about 25 participants assembled at West Calder railway station as instructed to be ferried to the site by willing drivers.

The path from the entrance led to a colourful flower-rich grassland, with masses of ox-eye daisy (*Leucanthmum vulgare*), pignut (*Conopodium majus*), tufted vetch (*Vicia cracca*), yellow rattle (*Rhinanthus minor*), *Holcus mollis* and *H. lanatus*, and nestling in between them a couple of lovely twayblades (*Neottia ovata*).

The fungus *Dacrymyces minor.* Photo by Carolyn Hargest.

Moving East, the path led through species rich woodland and scrub, dotted with a few stunning specimens of *Viburnum opulus* in full flower. I think it was there that one of the ELFEs found a perfect eyelash fungus (*Scutullaria scutellata*).

At the Eastern perimeter fence the ground fell less steeply downwards towards Breich Water, to reveal a rich riparian habitat with yellow flags (*Iris pseudacorus*), brooklime (*Veronica beccabunga*), marsh hawk's beard (*Crepis paludosa*).

While on my recce, I feared that the trip would not yield anything of much interest to the ELFEs, but I was wrong. It is often assumed that Autumn is the best time of year for fungi and that the rest of the year is a bit sparse mycologically; this is not true, and it all depends on what you are looking for.

Late spring, early summer is the time when the parasitic fungi of plants can be at their best, taking full advantage of the fresh green plant growth. These parasitic fungi do not represent a specific taxonomic group, instead they come from various different phyla.

A slime mould *Lycogala epidendrum*, commonly called "wolf's milk".

"Who would have thought that within 60 years a sterile spoil heap would become a beautiful botanical oasis."

Some of the notable finds were:

- *Puccinia punctiformis* (creeping thistle rust), which gives it host's leaves a wonderful, very noticeable honey-like scent, which can be detected even before the infected plant is found
- *Gymnosporagnium clavariiforme* (crown rust) which forms small but spectacular growths in the leaves of hawthorn
- *Triphragmium ulmariae* (potentilla rust) produces an intense orange rust on the underside of the leaves, the colour of which always elicits comments from observers.
- *Taphridium umbelliferarum* which creates a wonderful patterned effect on the upper surface of the leaves of hogweed
- *Taphrina betulina*, that distorts the leaves and stems of silver birch and is often responsible for creating the 'witches brooms' on the birch branches
- *Monilinia johnsonii* (Hawthorn Leaf Blight) which produces a silvery growth on hawthorn leaves and emitting a scent very much like hawthorn flowers, to attract pollinating insects to unwittingly pick up spores, which they then invariably transport to hawthorn flowers.

Altogether we listed 118 vascular plant species, 50 bryophyte species and 52 fungi. (The lists were duly delivered to the SWT). Although we did not find any particular rarities, the views of the Five Sisters were stunning, and the environment was magical. Who would have thought that within 60 years a sterile spoil heap would become a beautiful botanical oasis.

The BSS and ELFE members mingled, met new people and learned from each other. With the five sisters just a short walk away, there were several chats about another joint venture there, maybe next year.

Maria Chamberlain and Cameron Diekonigin

Full species list at www.tinyurl.com/SppLists

Celebrating 900 plants in Holyrood Park

22 June 2025 | Led by John Grace and Sue Jury

In the year 1124 King David I, established the town of Edinburgh as one of Scotland's earliest Royal burghs, protected by his royal fortress, on the slope below the castle rock. Edinburgh selected 2024 to mark the start of the 900th anniversary of our city, with a programme of events for 2024–25. We decided to mark the event by trying to find 900 plant species in Edinburgh. We were surprised to see by early 2025 that we already had 1,027 species (291 bryophytes, 780 vascular plants). So, we decided to celebrate with a field meeting at one of the most species-rich areas in Edinburgh, Holyrood Park. Despite the surpassed target, 900 species for 900 years, the meeting seemed like a good idea that might attract new members.

And we did have a good number of bookings, but on the day the heavens opened just as we were setting out, so just 10 hardy souls assembled in the Holyrood Park Education Centre. Thank you to the Rangers, for agreeing to host us, for providing a drying room for our wet clothes and facilities for the much-needed teas and coffees.

John started the day by introducing us to the geology and varied ecology of this very special urban park. Arthur's Seat is of course an extinct volcano which erupted about 342 million years ago. The black basalt full of bubbles, which feels warm to the touch, is what remains of the lava from that dramatic eruption. Later tectonic movements caused further uplift and folding. The last 300 million years saw slower change, with slow erosion which stripped away hundreds of metres of overlying rock. In the last two million years, ice shaped the landscape, exposing today's crags and cliffs and leaving behind the varied topography of volcanic hills and flat, swampy lowlands.

Field Excursion Reports

In the morning the party split into two, one party led by John Grace, headed South to take in the rocks above Queen's Drive and Samson's Ribs, while the other led by Sue Jury, set off towards St Margaret's Loch and Haggis Knowe. In the afternoon we joined forces to go to Hunter's Bog.

Altogether we saw 158 of the 180 species of vascular plants which we had previously listed (excursions of the BSS in 2023 and 2015), including the usual local rarities such as *Asplenium septentrionale*, *Silene viscaria*, *Ballota nigra*, *Dianthus deltoides*, *Ranunculus sceleratus* and Ophioglossum vulgatum.

Although the plant lists remained much the same, we did notice a significant change in the balance of the dominant species present. The most notable change was a marked increase in abundance of the tall fescue, previously called *Festuca arundinacea*, then *Schenodonorus arundinaceus* and very recently changed again to *Lolium arundinaceum*. In Hunter's bog (previous page, foreground) it appeared to be swamping the few extant plants of adder's tongue, *Ophioglossum vulgatum*, the only site in Midlothian for this fern. In fact, the grass appeared to be rampant, almost thuggish, all over the park. The taxonomy of the grass has been the subject of much research. *Lolium perenne* and tall fescue look so very different, yet they hybridise readily, and their DNA confirms their close relationship.

Given the fact that many hybrids exist, each with varying representations of the parental genomes, Sue Jury rightly felt that confirmation was needed. (She has since had its ID confirmed by Michael Wilcox, the BSBI grass expert). Tall fescue produces copious seeds, deep root systems and short rhizomes, though a new generation of turf grass, the rhizomatous tall fescue (RTF) has been bred to produce more extensive rhizome systems. RTF sends its roots much deeper into the soil. can withstand water logging and drought, filling in bare spots, leaving no room for weeds. Maybe that is the variety that is now colonising Holyrood Park. Clearly more research into the exact cultivar or ecotype of tall fescue that is rapidly spreading at Holyrood Park is urgently needed.

Maria Chamberlain and John Grace

Full species list at www.tinyurl.com/SppLists

Hamshya Rajkumar reports on a lichen field training course at Bennachie

This course led by Petra Vergunst at Bennachie was a foundational step in developing my understanding of lichen ecology and identification – especially as I find myself increasingly fascinated by post-industrial landscapes and the *Cladonia* species (commonly known as "cup lichen") that inhabit the ground and bases of silver birch trees.

The course was structured over two days, combining both classroom-based learning and practical fieldwork. Mornings were spent indoors, where we were introduced to the biology, ecology, and diversity of lichens. In the afternoons, we ventured into the pine and birch woodlands of Bennachie to apply our knowledge directly in the field.

Bennachie proved to be an ideal setting for beginner lichenologists. The acidic and nutrient-poor bark of pine and birch trees supports a limited but distinctive range of lichen species. Their flaky bark surfaces made it easier to focus on identifying key features without being overwhelmed by species richness. Petra encouraged us to "take a lens of lichen" – both metaphorically and literally – inviting us to engage more deeply with the landscape.

I was particularly intrigued by Petra's description of lichens as "the fifth strategy of fungi", emphasising lichenisation as a form of symbiosis often disregarded by mycologists.

Lichen growth is not linear but instead responds dynamically to environmental conditions. For instance, lichens only photosynthesise during brief periods of hydration and can remain dormant for extended times. This resilience allows them to thrive in some of the harshest environments on Earth.

We also explored how lichens can serve as indicators of environmental change and human impact. Petra explained how historical human activities – such as quarrying – have exposed large areas of stone that now provide habitat for a wide range of lichen species. This includes stone circles, boulders, and stone dyke walls – forms of land disturbance I had previously overlooked.

By the end of the weekend, we were introduced to resources and keying techniques to support continued lichen identification. The course has given me both the confidence and curiosity to begin identifying the lichens I encounter – particularly in the post-industrial sites that interest me. I now see these places not merely as remnants of human activity, but as habitats for resilient and often overlooked organisms.

Taking this course has opened a new layer of ecological awareness for me, revealing a complexity in the landscape that might otherwise go unnoticed. I look forward to continuing this journey, viewing the environments around me – especially those shaped by industry – through the enriching and revealing lens of lichen.

Dmytro Dorofeiev surveyed plants at Langlands Moss in South Lanarkshire

The aim of the project was to assess the health of the Langlands Moss ecosystem by examining the density of its cross-leaved heath and common bog cotton populations that are important to bogland vitality. The Langlands Moss Local Nature Reserve is a 20-ha lowland raised peat bog located two miles east of East Kilbride's town centre in South Lanarkshire that holds the status of a Local Nature Reserve (LNS) since March 1996.

Over the 10-day duration of the field project, the density of Cross-leaved heath (*Erica tetralix*) and Common bog cotton (*Eriophorum angustifolium*) was measured by the quadrat method. *E. tetralix* is critical for maintaining an area's soil acidity, which creates a unique ecosystem for other acidophilic species. Additionally, the plant's nectar is the primary food source for adult large heath butterfly (*Coenonympha tullia*), a declining species in the UK, that in turn, is responsible for pollinating the heather family and other plant species native to the peatlands and boglands of Scotland. Bog cotton plays an important role as a carbon sink. Also, the species is a common food source for caterpillars of the large heath butterfly.

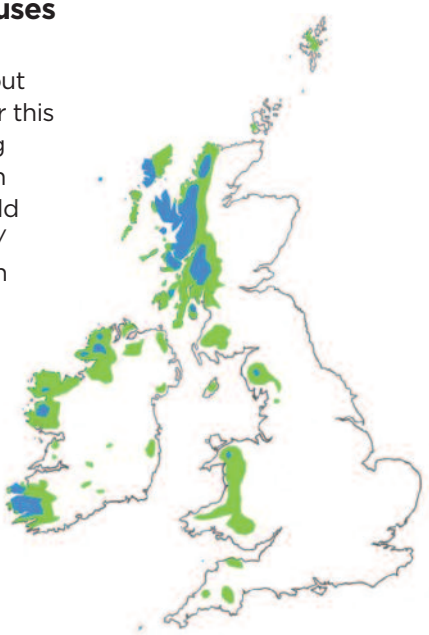
Both species were found to be abundant, indicating that this diverse environment is currently in good health. As apparently no previous statistical data on the healthy densities of cross-leaved heath and common bog cotton in the peatland/bogland ecosystems were available, the data gathered will hopefully serve as a useful reference point for any future assessments of the Langland Moss. This could be especially timely considering South Lanarkshire's plans to expand the reserve from its current 20 to 47 ha.

This report has been abbreviated by the editor.

Check out **botsoc.scot/students/awards-for-students/** to find out how to apply for a BSS grant if you are a student.

Scottish temperate rainforests

Ben Averis, botanist, poet and artist muses

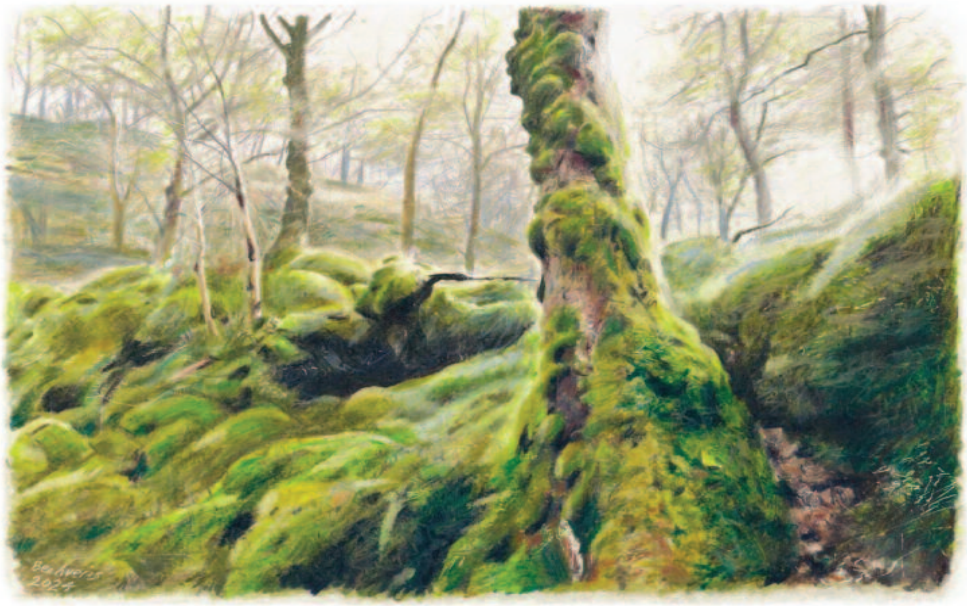


It was an honour to be invited to give a talk about Scottish temperate rainforests to the BSS earlier this year, after which I was asked to write something about this subject for *BSS News*. I've been given free rein regarding approach and style: "...it could be art-led, or a mixture of conservation/botany/science/art/poetry..." Great! But which approach should I take?

I could begin with climate, which is so fundamental to this habitat. For example, I could say that our rainforest is in western areas whose wet and equable climate can be mapped in various ways including indices of climatic temperate rainforest-ness. Here is a map of one such index: mean annual precipitation (cm) divided by maximum deviation (ºC) of monthly mean temperatures from 9ºC. Temperate rainforest occurs mainly in areas of higher index value: green (25–49) and blue (>40, these having most of the floristically richest rainforest).

Perhaps it would be better to start by describing rainforest vegetation, with an accompanying coloured pencil drawing of golden rainforest mossiness?

If I mention mossiness I should clarify that most mosses (and liverworts) in these woods are widespread species, and that rainforest indicators grow mostly on rocks and trees. This would lead on to saying that some rainforest specialists are tiny, despite the general luxuriance of bryophytes... and, of course, that there are many rainforest lichens and some rainforest vascular plants such as filmy ferns. Mention should also be made that some rainforest 'indicators' such as the lichen *Lobaria pulmonaria* previously grew further east when the air was cleaner there, so they don't actually need a rainforest climate.



When mentioning that many species show a genuine need for a rainforest climate it might be best not to list names: such an interjection as "...the mosses *Hageniella micans* and *Dicranodontium subporodictyon*, the liverworts *Acrobolbus wilsonii*, *Leptoscyphus cuneifolius*, *Plagiochila heterophylla*, *Pseudomarsupidium decipiens*, *Radula aquilegia*, *R. carringtonii*, *R. holtii* and *R. voluta*, and the lichens *Fissurina alboscripta*, *Leptogidium dendriscum*, *Pseudocyphellaria norvegica* and *Pyrenula hibernica*" could disrupt the flow of things!

Likewise, it might be too much to cram something in about ancient woodland and the fact that some rainforest species such as *H. micans*, *P. heterophylla*, *P. decipiens* and many lichens grow mainly in woods with a long-recorded historical continuity of tree cover. (Such species are commonly referred to as "ancient woodland indicators" by botanists, but lichenologists often say "old forest species" instead. Why this difference?)

One thing I really should say is that this is a rare and beautiful habitat for which Scotland is perhaps the best part of Europe. "Beautiful" may suggest happy smiles of appreciation, but – even better – there is a great variety of contrasting moods that these places offer. For example:

Skies are grey; a rainy day
Through steamed-up specs a misted scene
We do our best to trudge away
on slippy slope by spating stream
Deary me – we can't expect
much comfort or relief in sight,
unless, perhaps in retrospect,
things may, in some way, be all right

The liverwort *Plagiochila heterophylla* in woodland near Loch Moidart; a temperate rainforest species that is strongly associated with ancient woodland.

Talking of downsides, I would add that many rainforest sites suffer from invasive rhododendron whose overshading and toxic leaf litter depletes the native flora, and excessive numbers of deer whose overgrazing prevents tree regeneration. However, work is being done to remove rhododendron and reduce grazing in many places.

Another positive: some special western moss, liverwort and lichen species are spreading east now that sulphur dioxide pollution is a small fraction of what it used to be. A wetter and milder climate probably helps with their eastward expansions too, but I suspect reduced SO_2 is a particularly significant factor. Some are even turning up in the Glasgow-Edinburgh central belt. For example, I found *Frullania teneriffae* – a liverwort of western native woods and rocky habitats – on a sycamore (yes, a sycamore!) by a path through an urban fringe plantation where someone walking by gave absolutely no response to my friendly *"Hello"*. Huh! But, staying positive, this really shows how far *F. teneriffae* has come!

Hats off to that liverwort! And to all those working on rainforest conservation. And to BSS for inviting me to write something about this habitat, and to you for taking the trouble to read through my thoughts on how to write it!

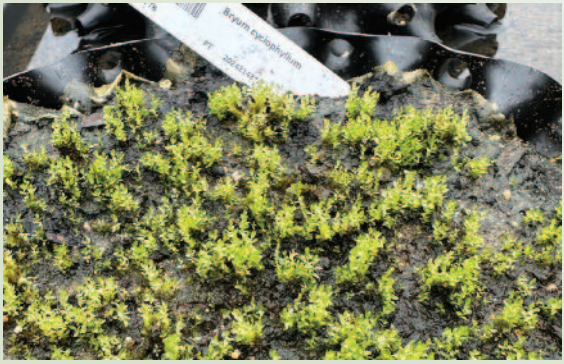
The liverwort *Frullania teneriffae* on a tree in West Lothian.

The future of rare bryophytes is secured at Bavelaw Reservoir in Midlothian

Octogenarian mudlark David Chamberlain comes to the rescue

Bavelaw is one of a cascade of nineteenth century compensation reservoirs in the Pentlands, west of Edinburgh, built to regulate the water flow for a string of water mills along the Water of Leith.

Towards the end of a drought period in the Autumn of 2003, Gordon Rothero and I visited the reservoir to check on the status of known rare bryophytes, *Riccia canaliculata* and *Physcomitrium sphaericum*. Both depend on sites that remain flooded for several years but can occasionally dry out, exposing areas of mud. Their spores germinate, leading to a rapid life cycle, and a new supply of spores that can again survive several years of continuous emersion.



Top photo shows *Bryum cyclophyllum* and bottom, in culture

Gordon spotted the light salmon coloured, concave leaves of *Bryum cyclophyllum*, a species requiring a similar regime of inundation and occasional exposure. This was the only recent British record for a rapidly declining species.

In 2010, a flood prevention scheme for the Water of Leith, threatened to maintain a constant water level in the reservoir, and a consequent loss of habitat for my precious bryophytes.

So, I proposed the water level be dropped for two or three months every 7–10 years to allow the bryophytes to replenish the propagule burden in the mud.

“As a BSS member for 59 years, I value the enduring support of the society; long may it prosper.”

David Chamberlain

Kat O’Brien (NatureScot) and Neil Bell (RBGE) establish a trial translocation of *Bryum cyclophyllum*. © Rebecca Drew

By 2020, and fearing the worst, I approached Richard Kehoe, representing NatureScot, who established that Bavelaw’s designation as a Site of Special Scientific Interest should extend Statutory Protection to the bryophytes there.

The Botanics (RBGE), under the watchful eye of Rebecca Drew, offered to bulk up live material of the *Riccia* and the *Bryum* as part of a Conservation by Translocation Project, managed by Kat O’Brien on behalf of NatureScot. In the light of a formal complaint to the Scottish Parliament over the lowering of the water level in the reservoir, the interested parties gathered at Bavelaw in September 2023.

A full and frank discussion ensued against the stark backdrop of hectares of bare mud. I then located suitable material for propagation, realising that the saying ‘a stick in the mud’ quite literally applied to me; I had to be pulled out. July 17th, 2025, saw the first collaborative translocation onto two compensation reservoirs in Central Scotland, involving: Scottish Water, NatureScot, the RBGE and the British Bryological Society, whose participation I gratefully acknowledge. As a BSS member for 59 years, I value the enduring support of the society; long may it prosper.

Transplanted *Bryum cyclophyllum*

Botanical gardens in northern Italy

Our roving reporter (and Hon Sec) Rachel Thomas visits the gardens that inspired the foundation of our own Botanics

My interest in the botanical gardens of northern Italy was sparked during our introductory lectures training as a Garden Guide for Royal Botanic Gardens, Edinburgh. Mention of Pisa (1543), Florence (1545) and Padua (1545) – the oldest botanical gardens – was romantic and exciting. In addition, there was a tradition of Scots visiting Italy to study medicine, botany and the fine arts including Sir Andrew Balfour (1630–1694) who with Sir Robert Sibbald (1641–1722) established RBGE.

In spring 2025, I enjoyed an extended tour through parts of southeast France and northern Italy visiting many of the historic cities. Although not a botanical or horticultural tour per se, I couldn't visit these wonderful places without also visiting their botanical gardens or *giardino dei semplici*, reflecting their medicinal origins.

Padua Botanic Garden, founded 1545, a UNESCO World Heritage Site. One of the oldest botanical gardens in the world. Retains its original layout (although with newer additions) and purpose. Meticulously maintained. A glorious and fascinating place to visit.

Planting beds in systematic order, Padua Botanic Garden.

In total we visited eight botanical gardens, encountered an unexpected Simples garden associated with a large private palace and enjoyed a miscellaneous collection of private gardens and other botanical observations which stimulated our thinking about plants and place. The following comments reflect a few of our personal observations, rather than a detailed study of the gardens.

Although the botanical gardens (Bologna, Florence, Lucca, Milan, Padua, Pisa, Ravenna, Siena) were all different, most were and still are associated with each city's university, and the focus was on botanical interpretation with plants arranged in systematic order or grouped according to medicinal or other uses (e.g. dyeing, poisons), reflecting their origin as teaching aids for medical students.

Some had museums with both modern and historic explanations and teaching aids. The attention to horticultural detail varied. Padua (with UNESCO World Heritage status) and Pisa stood out for the quality of maintenance combined with a wonderful new museum and glass houses at Padua stressing their history and modern scientific role in plant conservation. Padua's UNESCO listing cites the garden's preservation of its historical layout and that it still serves its original purpose Padua was so fascinating and such a beautiful space to enjoy that we spent nearly an entire day exploring different aspects of the garden, popping out for sustenance and returning more than once.

The garden in Pisa is near the 'leaning tower' and other historic sites but is thankfully so much quieter and less visited. Milan now has three different botanical gardens. Two in the city – the historic Brera Botanical Garden near the Pinacoteca di Brera where the interpretation includes an exploration of the relationship between plants depicted in the paintings and the real thing growing in the garden, as well as a bed replicating one of Mendel's pea experiments – and a newer garden in the science quarter of the city with an interesting display on forensic botany. The third garden, which we didn't manage to visit, is near Lake Garda when the focus is on current scientific study.

Pisa Botanic Garden, founded in 1543, was moved to its current site in 1591. Freshwater plants are grown in systematic beds.

On a steep broadly south facing slope, Siena Botanic Garden has good views out of the city to agricultural landscape beyond and brings the natural environment into the city.

Simples Garden, Ducal Palace, Mantua

Palazzo Pfanner, Lucca, is a Baroque garden associated with the Palazzo, recently reopened following restoration. This garden was included on the RBGE Patrons tour, 2025.

Botanical gardens in northern Italy

Living bridge, Aix-en-Provence

Biodiversity and conservation were elements in each garden, sometimes through written reference to the garden or university research work, and sometimes through comments on habitat management in the garden, as at Bologna where 'no mow May' was an active theme. All the gardens recognised their value for tourism (most charging a modest entry fee), but also as a cool, calm place of tranquillity away from hot, busy, city centres (a service appreciated by both locals and tourists). That value was most apparent in Ravenna, where the botanical garden which has a history as a private garden rather than a university one, is now a delightful place to sit with a coffee or something stronger and minimal botanical explanation. On the day of our visit, it was the setting for a family christening or naming ceremony. Siena, something of a challenge to find and access through the University Zoology Department, is on the edge of the old city and was the only garden planted on a steep hillside (the others are all level) but does act as a habitat corridor bringing a green connection deep into the city. Although not a botanical garden, we also came upon the Simples Garden associated with the Ducal Palace, Mantua where the formal box hedging divides the garden into four flowerbeds where medicinal plants were grown. This would have merited a longer stay and exploration but as can happen in Edinburgh, the heavens opened and we were ushered out and back into the Palace at speed.

Verona does not have a formal botanical garden, but it wasn't without its botanical treats: the 16th century Giardino Giusti; the calcareous grassland in the Parco delle Mura between the defensive walls of Castel San Felice at the top of the funicular railway and an unexpected, international exhibition of quilting which included a lovely piece featuring Charles Rennie MacKintosh-inspired roses submitted by Jayn Roush Mayton. Travelling to and from Edinburgh to Italy by car took us through Arles (France) where we noticed a plaque on a house wall commemorating Louis Jacquemin, Botanist and Archaeologist 1797–1868 – his herbarium specimens are now kept at a local medical research facility; the magnificent green wall of a pedestrian/multipurpose bridge in Aix-en-Provence (France); and green roofs and solar panels in Marchirolo (Nr Varese, Italy) and Vaduz (Liechtenstein). Prompted by Brian Ballinger's article on the Flora of Bus Stops (*BSS News* #124 pp28–29) I was particularly gladdened to see the grassland management round the bus stops and either side of the bus route from Vaduz to Malbun (Liechtenstein).

The Dubious Elm of Robert Burns

Peggy Edwards finds elms celebrated in the poetry of Burns

"There was a time, it's nae langsyne,
Ye might hae seen me in my pride,
When a'my banks sae bravely saw
Their woody pictures in my tide;
When hanging beech and spreading elm
Shaded my stream sae clear and cool:
And stately oaks their twisted arms
Threw broad and dark across the pool;

In his outrage the poet ends the poem with:

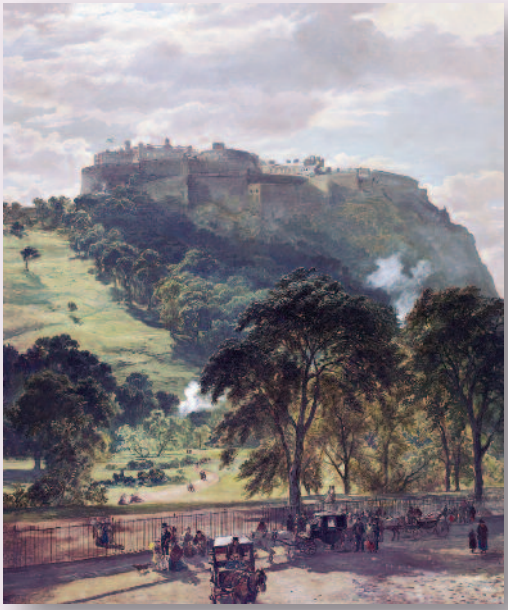
"Man! cruel man!" the genius sighed –
As through the cliffs he sank him down –
"The worm that gnaw'd my bonie trees,
That reptile wears a ducal crown."[1]

Ulmus campestris (AKA *Ulmus glabra*) Plate 0242, Flora Batava, Wikimedia Commons

In the 1791 poem "Verses On The Destruction Of The Woods Near Drumlanrig"[1] the poet mentions an elm which was most likely the native wych, Scots or Scotch elm, *Ulmus glabra*, with its deciduous, serrated leaves, winged seeds, and stunning autumn colours. The poem focuses on the felling of the woods by William Douglas, 4th Duke of Queensberry along the banks of the River Nith near Ellisland. As in Robert Burns' poem "The Humble Petition of Bruar Water" the poet uses as a vehicle to promote positive environmental change.

Over the years the identity of "the poet" who wrote the poem has been debated. Was the poet Robert Burns or was he Henry Mackenzie? Should the poem be included with Burns' work or attributed to Mackenzie, a Scottish lawyer, novelist, and writer?

In 1890 William Scott Douglas wrote that before the "Verses On The Destruction Of The Woods Near Drumlanrig" "were *first collected* in Hogg & Motherwell's edition, they appeared in a newspaper... introduced by a note that maintained that "They were found written on the window-shutter of a small inn on the Banks of the Nith" soon after the trees mentioned in the poem were "sacrificed to *sordid avarice*."[2]



Edinburgh Castle from Princes Street (with wych elms) by Samuel Bough who was admired by Robert Louis Stevenson. Painted c.1878 and now in the National Galleries Scotland.

The poem was initially attributed to Burns, however in 1853 in the preface to his book, *The Complete Works of Robert Burns: Containing His Poems, Songs, and Correspondence*, Allan Cunningham wrote, "I have deliberately omitted several pieces of verse ascribed to Burns by other editors, who too hastily, and I think on insufficient testimony, admitted them among his works." The poems omitted included "Verses on the Destruction of the "Woods of Drumlanrig". Cunningham wrote that the verses "were never seen by any one even in the handwriting of Burns, and are one and all wanting in that original vigour of language and manliness of sentiment which distinguish his poetry."[3]

According to G. Ross Roy, "Another well-known author whose work was credited to Burns was Henry Mackenzie, who sent "On the Destruction of Drumlanrig Woods" to the *Scots* Magazine, where it appeared in 1803 with the note that it was "supposed to have been written by Burns." Burns was said to have carved the poem into a windowpane of a small country inn on the Banks of the Nith. According to Mackay, Mackenzie told James Currie, editor of the first collected works of Burns in 1800, that the poem was his, "which I passed as written by Burns in a fit of indignation at the wood on the river Nith being cut down by the Duke of Queensberry." (It was Mackenzie who coined the epithet of Burns as a "heaven-taught ploughman.").
In 1897 T.F. Henderson included the poem in *The Poetry of Robert Burns vol III* although according to Roy, "he acknowledged reservations, saying "one could credit Mackenzie with them far more easily than one could credit Burns. (Henley & Henderson, IV, 106)"[4]

In 2023 in co-editing the letters of James Currie (1756–1805), Gerard Caruthers wrote of Mackenzie, "What we have here, in fact, is Burns impersonation by Henry Mackenzie (1745–1831)" who "hijacked... the powerful anti-aristocratical vein in Burns."

The Waterloo Elm. Pencil and scraper, by Anna Children 1818. The tree had marked Wellington's headquarters at Waterloo and had been stripped for souvenirs. It was cut down not long after this drawing was made.

The Dubious Elm of Robert Burns

Mackenzie wrote to Currie that he had written "little Poem in question, & read it next day at a Gentleman's House where we visited, from the pencilled Copy in my Note-Book, which I pretended to have taken from the Window-Shutter of a little Inn, whence I had actually copied some other Lines of Burns' in praise of a Young Lady. (Carruthers & Simpson, Citation 2011)"[3]

Burns Country's online biography of Henry Mackenzie states that some of the lines were written by Mackenzie saying, "Mackenzie is the author of some lines, *Verses on the Destruction of the Woods near Drumlanrig* once credited to Burns." Indeed, the first two lines of the poem, "As on the banks o' wandering Nith, Ae smiling simmer morn I stray'd," reflect Burns' opening line of "Address to Edinburgh," that opens with, "As on the banks of Ayr I stray'd".[6]

John Young in his book *Robert Burns, A Man for All Seasons*, in writing about the wych elm, appears to believe that the poem was penned by Burns, "Considering the value placed on the tree at that time, it is surprising that Burns only mentioned it once, when he penned his "Verses" on the destruction of the woods near Drumlanrig, Dumfriesshire."[7]

Today, although Mackenzie may indeed be the author of choice, the poem's authorship remains open to debate. Unfortunately, by the time Mackenzie admitted that he wrote the poem, Burns was long gone and so could not admit to having written the poem nor deny it. To this date no manuscript version by Burns has been found.

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I would like to thank David Sibbald, President of the Stirling Burns Club, for his input regarding the poem "Verses On The Destruction Of The Woods Near Drumlanrig"; and John Lamont for his photos of the wych elms of Edinburgh and details from his Edinburgh Elm Project in which he is striving to preserve rare elm hybrids and cultivars.

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Fern spore banks

Adrian Dyer asks "Is there a bank near you?"

Yes there is! Your money might be miles away but you are within a few yards of a fern spore bank. The existence of Angiosperm seed banks is well known but until comparatively recently it was thought unlikely that ferns would form a Soil Spore Bank (SSB), a reservoir of live but dormant spores buried in the soil. Even though a fern spore is a single, seemingly vulnerable, cell (**Fig. 1**), it is now known that many ferns form soil spore banks and spores of some species can remain viable in the soil for more than a year, possibly for many years, forming a Persistent Soil Spore Bank (PSSB). Of the British native species for which information is available, 28 species from 14 genera form PSSBs. Interestingly, the list includes *Osmunda regalis*, which has green spores reputed to be short lived. The only British species known to possess a Transient Soil Spore Bank (TSSB, which survives for less than a year) is bracken, *Pteridium aquilinum.*

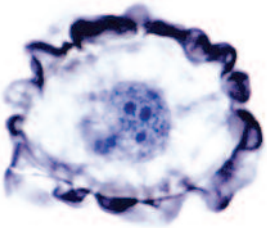


Fig. 1. Stained section through a spore of Scaly Male Fern, *Dryopteris affinis agg.* showing the central nucleus, cell wall and protective outer perispore. Because, in this species, sporophytes develop directly from the gametophytes without fertilisation (apogamy), all the genetic information needed to produce both generations is contained within this small (about 50µm) spore, mostly in the nucleus.

To detect an SSB, horizontal soil cores were made with a steel cylinder at measured depths of 0cm, 5cm, 10cm 20cm and 30cm down a soil profile, but less in shallow soils. The samples was then protected from aerial contamination. Back in the lab a layer of sterile sand is placed in a 5cm ($20cm^2$) Petri dish to act as a water reservoir. The soil sample is then placed on the sand and sterile water added before the dish is sealed. Spore banks have been revealed at 130cm. If taken just before the sporing season, the sample will reveal whether it is a PSSB. Soil samples were then cultured in optimum growth conditions in a sealed Petri dish as shown in **Figs. 2 and 3**.

Fig. 2 (left) Gametophytes developing on soil sampled within a stand of bracken, Pentland Hills, Midlothian.

Fig. 3 (right) Sporelings developing on a soil sample. Other species may be present as live spores that do not develop in the conditions of culture.

Spores will only germinate in the light at the soil surface, so the number of gametophytes is only a relative measure of the size of the spore bank. Gametophyte densities of up to 17 per cm^2 (c.350 per Petri dish) have been recorded. When sporelings appear, it is possible to identify at least some of the species present (**Fig. 3**).

Using this method in Scotland and North Carolina I have observed PSSBs in a wide variety of habitats, including woods and meadows, sea cliffs and heather moorland, urban parks, wasteland and road verges. In almost every case, and even among *Asplenium marinum* plants on an exposed sea cliff on the Isle of Iona, at least two species were present (**Fig. 4**).

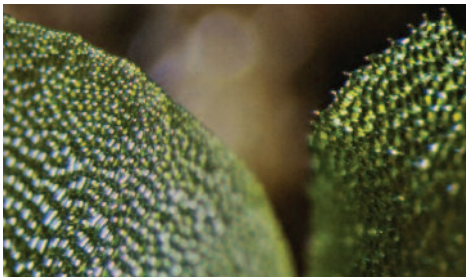


Fig. 4. Gametophytes, (probably *Polystichum acrostichoides*) with trichomes (hair-like cells, often glandular), left without (probably *Athyrium asplenioides*), on a soil sample from 100 year-old deciduous woodland in Duke Forest, North Carolina. Trichomes are a consistent character of the prothalli of many fern species, and the presence of gametophytes with and without trichomes in a soil sample indicates that at least two species are present.

The composition of the PSSB is only dominated by the nearest fertile fern within about 5m (more than 2m, less than 10m); beyond that other widely dispersed spores are more abundant. For example, a sample taken within a population of *Woodsia alpina* at Ben Lawers yielded 8 species, including Woodsia and, surprisingly, *Dryopteris aemula* (**Figs 5 & 6**).

Fig. 5. Dr. Stuart Lindsay sampling (with the necessary permissions) soil at a *Woodsia alpina* population at Ben Lawers.

Fig. 6. Examples of ferns raised from the Ben Lawers soil samples: *Cystopteris fragilis, Dryopteris aemula, D.affinis agg., Gymnocarpium robertianum, Oreopteris limbosperma, Phegopteris connectilis,* and *Woodsia alpina*. Also recovered but not in the photograph was *Athyrium filix-femina*. Growing near the sample site in addition to *Woodsia* and *Oreopteris* were several species not identified in the soil samples: *Asplenium trichomanes, A. viride, Cryptogramma crispa, Cystopteris fragilis*, and *Struthiopteris spicant.*

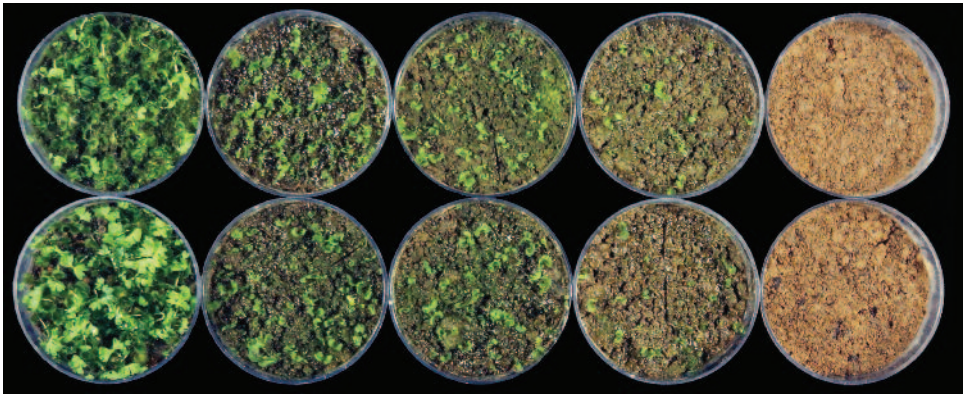


Fig. 7 The spore bank reduces with depth (left to right). The soil was sampled in ancient semi-natural oak/birch woodland beside the River North Esk within Roslin Glen Country Park near Edinburgh. Duplicate cultures of samples taken (top to bottom) at 0cm, 5cm, 10cm, 20cm and 30cm depth show that with increasing depth: a) the soil changes from humus-rich surface soil to mineral sub-soil; b) the numbers of gametophytes decline; and c) the development of gametophytes is slower.

At most sites with sufficient soil depth, the size of the spore bank, i.e. the number of live spores, reduces with depth (**Fig. 7**). This is also true of the total number of spores, dead and alive, as determined by standard palynological methods. At another Roslin Glen site, total spore densities of 155,000 per cm^3 were recorded in surface samples, reducing to about 2,000 per cm^3 at 50cm depth. These values corresponded to gametophyte densities in the same samples when cultured of about $15cm^2$ and $1cm^2$ respectively. These reductions with depth were interpreted to be the result of most spores binding to soil particles near the surface, while a minority were, within their life span, washed down by rainwater to greater depth through channels made by invertebrates and decayed roots. Palynological techniques allow for species identification of the spores, and differences in the species representation between the PSSB and the, probably much older, dead spores, might reflect long-term changes in the surface flora. Also declining with depth was the rate of gametophyte development, probably due to the reduction in nutrient availability in the deeper soils (**Fig. 7**). The distribution of seeds and moss propagules down the soil profile frequently differed from that of fern spores.

PSSBs mean that live spores are present throughout the year, which has obvious implications for fern reproductive biology. Previously buried spores exposed to light after soil disturbance, such as wind-throw of trees, soil erosion or animal activity (**Fig. 8**), could result in recruitment whenever surface conditions are suitable and perhaps restore lost genotypes or even lost populations, as for example after clear felling.

There are implications too for accidental importation; I have retrieved 6 fern species from Atlantic islands, Brazil and the USA by culturing soil cleaned from my boots (**Fig. 8**).

There are also implications for conservation. During two externally funded research projects based at RBGE and the University of Edinburgh Botany Department, Stuart Lindsay and I used soil samples, taken outwith the sporing season and without disturbing the protected plants, to establish *ex situ* collections of 8 species rare in Britain, together with *Woodsia ilvensis* from Norway and two globally endangered species, *Adiantum reniforme var reniforme* and *Asplenium hemionitis*, from Tenerife.

Fig. 8. A plant of *Dryopteris intermedia* growing in my garden after being raised in a Petri dish on soil scraped from my boots after a visit to Michigan, USA.

PSSBs might also enable in situ conservation if soil disturbance beside an endangered population resulted in the establishment of new individuals from the spore bank, and perhaps the retrieval of lost genotypes or even lost populations, but this has not yet been attempted.

A more detailed account of fern spore banks is available in Pteridologist 8 (1) 2025, pages 44–48 and 62–71.

Storytelling in the Cammo

Autumn Thomas connects with an arts company

In May I helped connect the BSS' Richard Milne and David Chamberlain with the experimental arts company* ghostbag*. They wanted to know about the ecology of a particular Cammo meadow for a project in the 2025 Hidden Door Festival. I helped set up an informal survey with the BSS' Richard Milne and David Chamberlain.

PLACE: **A field on the edge of the Cammo estate.**

TIME: **A day that can only be described as balmy.**

EQUIPMENT: **Hand lens; plant ID book; several flasks of tea and coffee; fresh gingerbread.**

SCHEDULE: **An informal field survey; lunch underneath the Cammo Tower; a gentle walk in the woods.**

Cammo is a confluence of land use. Spanking new suburban homes lie across the road from our field, which folds into the Cammo estate park and adjoining areas of wasteground and agriculture. Cammo Tower, the only surviving building from the old Cammo estate, is a striking centrepiece to the landscape.

The trip got me thinking about the way we use the city and its land. To many, our field would just be another empty space on the outskirts of Edinburgh. Some would see it as useful real estate, more land to be paved over and built upon, suburbs in the making. To the friendly locals we met when walking, it's essential urban green space. But to botanists, even the most innocuous of meadows is a wonderland.

Stories were the theme of the day. Stories about the greater plantain (more effective than dock leaves on nettle stings); stories about Socrates and his death by hemlock (*I shall go away when I am dead, and not remain with you…*); stories of beech galls, oak galls, insects and inks; stories of historical nomenclature and medicinal myths.

“Green spaces on the outskirts of cities – these fringe habitats – are places of great biodiversity. They are also rich in stories.”

Richard talked about the doctrine of signatures: the old belief that plants that resemble a particular body part can treat illness in that body part. Liverworts treat liver, lungworts treat lungs etc. Humorous, but it reveals an old truth about humans: we have always told stories, and we have always told stories about plants.

We found over 70 species in a few relaxed hours, from some of my favourite plants (lady’s mantle) to a few of my least favourites (Himalayan balsam). What surprised me was how new it all was. A quick look on Google Earth revealed our field was cropland as recently as 2018. All these plants were the result of six short years of growth.

Botanists know the value of grasslands and meadows. So do the locals who use the field. But not everybody does. The spectre of the nearby housing development loomed over us as we returned to our car. Those same housing developers (BDW) are also the owners of our field. The manually planted English oak saplings – new, green and hopeful – that scatter the field suggest the developers might be intending to foster it as a green space. Newly flattened and excavated ground on the edge of the field suggests: maybe not.

Green spaces on the outskirts of cities – these fringe habitats – are places of great biodiversity. They are also rich in stories. Trawling old walking websites in preparation for this article, I found comments from Edinburgh residents who explored the area as children. “My friends and I kept horses in the water tower field back in the 70s,” writes Yvonne on lothianlife.co.uk. According to her, the lady of Cammo House was buried in the grounds, and her ghost still haunts the estate. “There was certainly an eerie atmosphere but it was also so beautiful and peaceful then, with hardly a soul around. Expect it’s all changed now though.”

Not quite, Yvonne. The atmosphere of peace and tranquillity on the edge of a bustling city remains intact, even with the new builds so close. But for how long? I hope our field remains green well into the future. If it, and places like it, are lost and built over, not only do the plants go, the stories go too.

More information about Hidden Door can be found at **hiddendoorarts.org**.
More information about Ghostbag can be found at **ghostbag.co.uk**.
Many thanks to Richard Milne and David Chamberlain.

Book Reviews

Fen, Bog & Swamp by Annie Proux

4th Estate, London, 2022

Maria Chamberlain

Annie Proux is a novelist, famed for her Pulitzer Prize winning novel, *The Shipping News* and many short stories including *Brokeback Mountain.* But *Fen, Bog & Swamp* is not fiction: it is a short history of wetlands their destruction and its role in the climate crisis. It tells how throughout our time on Earth, we Homo sapiens, the wise guys, have drained, cut and logged these mulchy, squelchy, desolate places, and then in the name of progress, tilled, reforested and farmed them, blissfully unaware that each hectare thus 'improved', gasses out 2.1 tons of carbon, unaware that it even matters. It sounds like fact upon sorry fact, but Proux writes with a light touch in wonderful, sometimes lyrical prose, with frequent references to works of classical literature (some of which I have read). This makes the book readable, even enjoyable, as well as giving me a ready wish list of all the interesting books she mentions which I have not read.

Proux was brought up in the 1930s and 40s in Connecticut by amateur naturalist parents who knew the names of the local plants and animals and revered the intricate complexities of the natural world. She grew up knowing the joy of recognising a plant by its distinctive characteristics, like 'finding a friend in the woodland fringe'. Many of us in the BSS can relate to that.

The book is divided into four sections: an introduction of 'discursive thoughts on wetlands', followed by individual chapters on fens, bogs and swamps. It is useful to define them so simply because there are many ways to categorise wetlands and ecologists, geographers and hydrologists don't always agree. What they do agree on, however, is that with 35% lost globally since 1970, wetlands are disappearing three times faster than forests.

Restoration is difficult, but possible, as has been shown at Wicken Fen and in the Flow Country. In the USA, where 5% of the land mass is classified as wetlands, restoration efforts may be seriously threatened. Trump, who is essentially a climate-change denier, has already proposed to cut the Environmental Protection Agency budget by 31% and signed an executive order to withdraw the United States from the Paris Accord for a second time.

Although I found the book worthwhile, even admirable, I do have a couple of niggles. In all four chapters on fens, bogs and swamps, Proux talks indiscriminately of reeds. Does she mean Phragmites? But reed is a generic term which includes Carex and Juncus species. In the 'Bog' chapter she indiscriminately lists some Sphagnum species, but she does not tell that each can act as an indicator of nutrient status and hydrology, allowing the discerning bryologist to read the landscape.

However, if one wanted to pursue the topic more academically, these is an extensive set of notes for each chapter. Referencing them throughout might have been useful for me but would probably have probably complicated the message, which stands loud and clear: even the most apparently lowly habitats should be fully appreciated and not exploited.

Landscape Change in the Scottish Highlands. Imagination and reality by James Fenton

Whittles publishing, Dunbeath

Brian Ballinger

James Fenton, a retired professional ecologist, has become well known in conservation circles because of his challenges to some current views. In this well illustrated book, he looks at the history of the Highland landscape and the changes that have occurred. He questions certain ideas, including the concept of the former Great Wood of Caledon, degraded by human activity.

The author emphasises the importance of moorland in Scotland and the contribution it makes to landscape and wildlife. It may be in danger of fragmentation and loss. James Fenton is concerned by some of the widespread planting of native tree species, sometimes in inappropriate places, where they may not flourish and can damage the ancient soil. He describes the impact of commercial forestry, hydro-electric, ski centre and other developments. Some alien species are causing problems and he singles out the major forestry species of Sitka spruce, which tends to invade moorland. Elsewhere Rhododendron can spread readily. The management of these and other species can be problematic.

This is a very readable book, which provides an interesting alternative vision of the Highland Scottish landscape.

Islands of abandonment: Life in the post-human landscape by Cal Flyn

William Collins, London

John Grace

Our first BSS lecture of the 2024/5 season (in late September) was by Cal Flyn, an award-winning writer from the Highlands. Many of us who attended were so engaged with her subject that we bought her book. In Islands of Abandonment she reports on her many travels to sites of devastation and dereliction – places where humans can no longer live. Usually, she finds that plants and animals have colonised the void, reminding us of Aristotle's aphorism: nature abhors a vacuum.

Such places exist as exclusion zones for various reasons: in the aftermath of battle (Zone Rouge at Verdun, France), nuclear explosions (Chernobyl, in Ukraine), volcanic eruptions (Montserrat), industrial pollution (many cases). The author writes not just about the species that have found a home amongst the rubble but also her own reactions and reflections, expressing feelings of fear and trepidation but sometimes hope as well. She cites Anaïs Nin who wrote 'in chaos there is fertility'.

Other places she visits are less dramatic but just as poignant: an abandoned church in Detroit, an abandoned cottage on the Isle of Swona, and the old fields in Estonia which were abandoned after the collapse of the Soviet Union. She also considers urban decline alongside abandonment.

Members of the Botanical Society of Scotland will enjoy her accurate resumé of the botanical recording by Barbra Harvie, who served as the BSS Secretary some years ago. Barbra surveyed local 'islands of abandonment' – the shale bings of West Lothian – and found 350 plant species in what most people consider to be a dead and desolate site.

Cal Flyn shows a firm grasp of scientific ideas whether she is writing about the carbon cycle, plant succession or the 'unnatural selection' whereby fish living in polluted waters on the East coast of USA have become 8,000 times more resistant to industrial pollution (she cites a 2016 paper in *Science*).

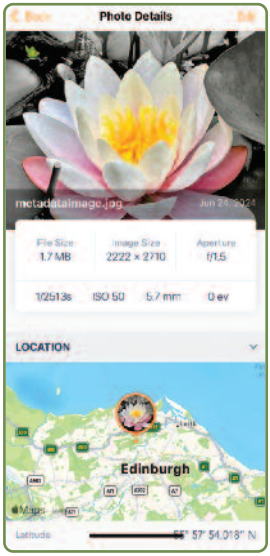
Her early career as a newspaper reporter really shows. She is never boring, switching from one visit to another before the reader tires; and her text dazzles. I liked the description of 'buxom puffins' on Inchkeith Island and the West Lothian bings: 'a knuckled red fist rises from a soft green landscape'.

This book deserves to be read by a wide audience. It informs, educates and entertains. It is highly original, often surprising and deeply thought-provoking.

Secondary successional woodland on a coal-waste spoil heap. Photo J. Muscott

More tips for your smartphone or digital camera

Shhh! Secrets Inside... **Rich Wilson** reveals what's hidden in your image files



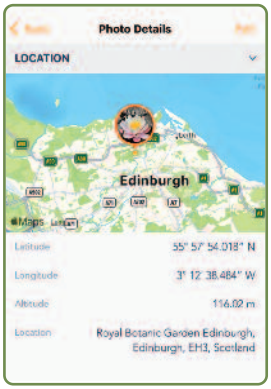
We all take photographs with our smartphones and digital cameras, but there is more to a digital image than you might think. This article will give you a glimpse of what information is within that beautiful blooming flower image. When you take a photo with your smartphone or digital camera, a wide array of information is captured and stored within that image file. You have noticed that the date, time are recorded, but manufacturers use a standard to fill data fields within each photo with things like location (e.g. GPS info), camera settings, lens used, resolution, the photographer, copyright, and many, many more. Some manufacturers add additional proprietary fields specific to their equipment.

Profile Name	Display P3
Resolution	6 MegaPixels
Saturation	-
Scene Capture Type	Standard
Scene Type	Directly photographed
Sensing Method	One-chip color area
Sharpness	-
Shutter Speed Value	1/2512s
Software	17.5.1
Subject Area	1180, 1580, 745, 745
Subject Distance Range	-
White Balance	Auto
Author	Richard Wilson
Title	Hyacinth
Description	-
Comment	-
Keywords	-
Copyright	© Richard Wilson 2025

While not all the fields are populated with data, they are available to be filled in with data at a later time. Various applications are available to view the photo data, others allow you to update the file data, while some allow bulk updating of many files at once. This image data is generally referred to as photo metadata (data about photo data). The most common standard for recording this information is EXIF, Exchangeable Image File Format. There are standards other than EXIF that provide other fields to store different information. These standards are IPTC and XMP. In case you are wondering if these other standards are they complement each other and don't overlap data.

IPTC (International Press Telecommunications Council) standard is another standard used to enhance the photo metadata using fields to provide more detail such as keywords, captions, title, author specifics, ID of people in the image, licensing, and much more. It also has a standardised vocabulary to help identify categories of images.

XMP, Extensible Metadata Platform, originally developed by Adobe, is now an ISO standard (ISO 16684-1:2019) that enables metadata to be stored in an XML format (Web format). This format is used for websites to allow sharing of photo metadata on websites and on different platforms.



So, how can this metadata help you? It can be used to organise your photo collections. Several photo management applications use metadata to help you organise your photos. Include your copyright information on those precious photos. You can also find out where and when a photo was taken (not just copied to your phone or computer). That is of importance to those of your that post photos on social media. Your location or location of the photo can reveal where you are/were. If that is helpful – great! If your location is not to be disclosed, you may want to edit the metadata and remove that information. For example, WhatsApp removes location data from images posted to preserve privacy.

Hopefully, this overview of photo metadata gives you a better understanding of what goes into those beautiful images you take and how you can control the data within.

Links of Interest:

EXIF: https://www.iso.org/standard/75163.html

IPTC: https://www.iptc.org/std/photometadata/documentation/userguide/

XMP: https://www.iso.org/standard/75163.html

Mobile Application examples:

- Exif Metadata Editor & IPTC. Photo & Video.
- EXIF Viewer LITE/Pro, EXIF Metadata
- Metapho
- The Photo Investigator. Photo & Video.

Computer Application examples:

- Lightroom, Photoshop, Affinity Photo, et al.
- Most camera manufacturer software (e.g. Canon, Fuji, Hasselblad, Nikon, Olympus, etc.)
- ExifTool, Exif Pilot, AnyEXIF, EXIF Studio (Mac only) – there are many

BSS News is published by the Botanical Society of Scotland in March and September each year and is available exclusively to members.

The society welcomes all enthusiasts of plants and fungi.

- Join us at the society's website **www.botsoc.scot**
- Attend our free monthly lectures, held September – May – details overleaf and on our website
- Come along to field meetings, held June – September. see details on our website
- Enjoy an evening with fellow botanists and plant scientists at the Plant Pub. See Events overleaf for dates and venue.
- Volunteer to help us run the society via **BSS-Contact@botsoc.scot**
- View videos of past lectures on our YouTube channel (Search Botanical Society of Scotland)
- Connect with us on our socials. We are on Facebook, LinkedIn, X and Instagram.
- Participate in student events – see **@botsocscot** on Instagram for the latest
- Contribute to BSS News – deadlines for copy are 15th January and 15th July.
- Contact us at **BSS-Contact@botsoc.scot**

Published by the Botanical Society of Scotland,
c/o Royal Botanic Garden Edinburgh,
20A Inverleith Row, Edinburgh EH3 5LR

Design: **emmaquinn.co.uk**

Image opposite: **A hazel wood on the island of Seil, just off the Argyll coast. The orange patches are a rare fungus called hazel gloves, *Hypocreopsis rhododendri*. © Ben Averis**

Botanical Society Of Scotland
Lecture & Events Programme 2025/2026

Last-minute changes sometimes occur for reasons beyond our control, so always check with our website before attending. Members receive updates via email with more details about each event. Please update your email if it changes by logging-in to the members area at **www.botsoc.scot**

Lectures are held jointly with the Royal Botanic Garden, Edinburgh. **They take place in the Lecture Theatre at 20A Inverleith Row, Edinburgh EH3 5LR at 6pm**. Tea is available from 5.30pm. We endeavour to record the lectures and make them available on our YouTube channel soon after the live event.

Plant Pub is a free social event to which all botanists and plant scientists are invited. It is organised jointly with the Institute of Molecular Plant Sciences at University of Edinburgh, on the second Thursday of the month, except December and August, at the Wash Bar, The Mound, Edinburgh, EH1 2LP

Field Meetings: All are welcome. It is essential you check the details at **https://botsoc.scot/events-2/field-meetings/** Joining instructions will be issued from there.

THURS 11th SEPTEMBER 2025, 6.30pm
Plant Pub. Wash Bar, The Mound, Edinburgh EH1 2LP

THURSDAY 18th SEPTEMBER 2025, 6.30pm
(the later time is to allow students to return from a field excursion)
Lecture. Prof David Wilkinson, University of Lincoln
Wood-wide web: popular culture meets complex science

SATURDAY, 20th SEPTEMBER, 11am
Field Meeting. Fungus foray. Joint with ELFE. Selm Muir Wood, West Lothian.
Check **BotSoc.Scot** for details & to register

SUNDAY, 29th SEPTEMBER, all day
Field Meeting. Fossil Hunt at West Wemyss for carboniferous plant fossils.
Check **BotSoc.Scot** for details & to register.

THURSDAY, 9th OCTOBER 2025, 6.30pm
Plant Pub. Wash Bar, The Mound, Edinburgh EH1 2LP

THURSDAY, 16th OCTOBER 2025, 6pm
Lecture. Prof Spencer Barrett, University of Toronto
The Cape Floristic Kingdom: flower sex hotspot and horticultural motherlode

SATURDAY, 1st NOVEMBER 2024 – all day
Scottish Botanists' Conference, Joint with BSBI
Lecture Theatre, Royal Botanic Garden, Edinburgh
All participants must register on the BSBI website.

THURS 13th NOVEMBER 2025, 6:30pm
Plant Pub. Wash Bar, The Mound, Edinburgh EH1 2LP

THURSDAY 27th NOVEMBER 2025, 6pm
Lecture. Dr Andrea Harper, University of York
Rising from the ashes: why do some trees survive ash dieback disease?

THURSDAY, 18th DECEMBER 2025, 6pm
Lecture. Dr Axel Poulsen, Royal Botanic Garden, Edinburgh
Spicing up Christmas: the story of gingers

THURSDAY 15th JANUARY 2026, 6pm
Lecture. Dr Helen Kopnina, Northumbria University
Requiem for the weeds

THURSDAY 26th FEBRUARY 2026, 6pm
Lecture. Dr Olwen Grace, Royal Botanic Garden, Edinburgh
Curating herbarium collections in a time of biodiversity crisis

THURSDAY 19th MARCH 2026, 6pm
Lecture. Prof. Simon Hiscock, Oxford Botanic Garden
The Oxford Ragwort and the Bristol Whitebeam: tales of hybrid speciation

THURSDAY 16th APRIL 2026, 6pm
Lecture. Prof Laura Carder, University of Leeds
Plants on prescription

THURSDAY 21st MAY 2026, 6pm
Lecture. Prof Enrico Coen, John Innes Institute
From genes to types: how species part and meet
The lecture will be followed by the AGM

DUNDEE LECTURES 2025/2026
TUESDAY, 28th October 2025, 7pm
The Science Centre, 14 Greenmarket, Dundee DD1 4QB
Joint with Dundee Naturalists
Martin Robinson, the BSBI recorder for East Perth
Perthshire Plants

TUESDAY, 24th February 2026, 7pm
Venue to be confirmed
Joint with Dundee Naturalists
Dr Richard Milne, University of Edinburgh
Photographing all the plant species in Britain

INVERNESS LECTURE 2026
TUESDAY 10th March, 7.30pm
Smithton Free Church, 1 Murray Rd, Smithton, Inverness IV2 7YU
The lecture is joint with Inverness Botany Group.
Ben Averis, Botanical Consultant
Scotland's western rainforests and increasing hints of it further east