

How Plantlife Scotland is giving Scottish bryophytes a boost

Training and support on the management and ecology of UKBAP species and their habitats

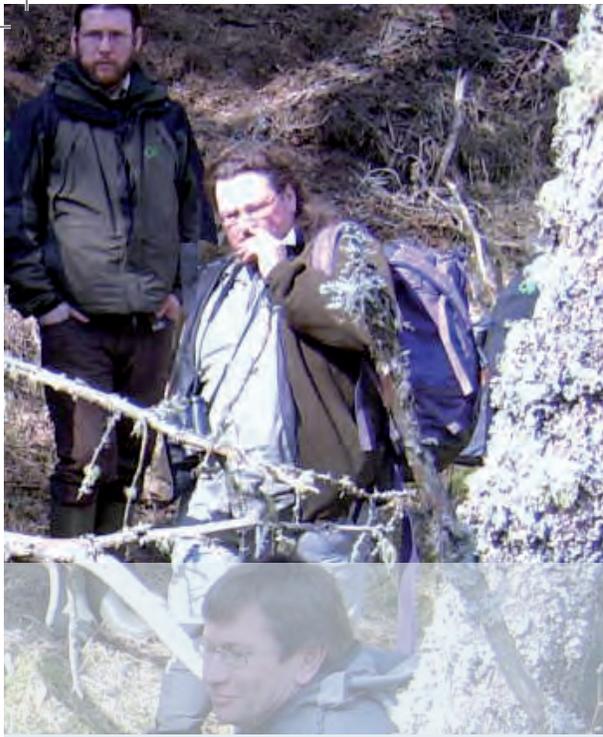
The Plantlife Scotland Lower Plants and Fungi Project ran three courses in its first year for agency staff on species identification, survey methodology, ecology and habitat management for UKBAP priority species and, for each, a suite of associated species found in the same habitats. Four more courses are planned for the current year.

These events are primarily for staff from the main environmental agencies, and provide skills and information to give people from a range of backgrounds the confidence to work pro-actively to conserve these species on sites they are involved with. As a simple example, land managers may suspect that they have a particular moss on a site, but do not know how to take samples or photos that are sufficient for identification. Are they legally allowed to take samples, how do they preserve samples, and who do they contact for help with identification? The events generate plenty of healthy discussion across the professions represented, particularly in terms of agreeing management prescriptions that are viable and commercially realistic.

Stipitate hydroid fungi (tooth fungi) of pine-woods, *Collema dichotomum* (river jelly lichen)

and other lichens of rivers, and *Buxbaumia viridis* (green shield-moss) and other bryophytes of deadwood were the chosen species and habitats in year 1. This year courses include bryophytes of springs and flushes, bryophytes and lichens of oceanic ravines and ancient Atlantic oakwoods, and bryophytes of loch and reservoir margins, with particular reference to *Weissia rostellata*. Agencies represented on the PLINKS Lower Plants and Fungi Steering Group, namely the Scottish Environmental Protection Agency (SEPA), Scottish Natural Heritage (SNH) and Forestry Commission Scotland (FCS) helped to select the species on the basis of their obligations under the UKBAP. The BBS and the British Lichen Society are also active members of the Steering Group and help to guide projects.

As mentioned above, one of the species covered in year 1 was *Buxbaumia viridis*, a stunning species of deadwood. Deadwood is an important habitat for a whole range of mosses and liverworts, and the course looked at this broad habitat, its ecology and effective forestry management for deadwood bryophytes. We do not know what precise conditions on a log give rise to the most diverse stands of this community, but it seems likely that the uneven texture of the log, its sponge-like capability of holding moisture and



The Plantlife Scotland Lower Plants and Fungi Project is now into its second of 3 years. The project officer **Matilda Scharsach** describes how this has raised the profile of Scottish bryophytes, as well as lichens and fungi.

- △ Delegates on the bryophytes of deadwood training event, led by Gordon Rothero. *Plantlife*
- ▷ A mature capsule of *Buxbaumia viridis* at Rothiemurchus. *Gordon Rothero*

possibly the nutrients released during decay are all important. Size does matter here as the larger logs offer not just the obvious greater surface area, but also better buffering against changes in humidity and greater longevity. Most *B. viridis* plants are associated with logs that have (or once had) a diameter of more than 20 cm. The loss of woodland cover over the centuries and, more recently, the intense management of woodland areas has led to a significant loss of habitat for these bryophyte species. The removal or ‘tidying up’ of fallen trees has been a particular problem, so that the volume of deadwood in even the least managed of our woodlands is far below that in natural woodland. Perhaps the best indicator species of the right kind of conditions for *B. viridis* are the two liverworts *Nowellia curvifolia* and *Riccardia palmata*. These two species are common on rotten logs in humid sites, *N. curvifolia* forming distinctive copper-coloured patches of thin stems and *R. palmata* forming dense green patches of flat fronds. Two nationally scarce species also occur on similar logs; *Anastrophyllum hellerianum* is a tiny liver-





◁ Rangers learning about how to enthuse the public about lichens. This year a similar event was run about bryophytes. Sara Millinger, Loch Lomond and the Trossachs National Park

wort with yellow stems tipped with dark red, and *Calyptogeia suecica* forms flat, whitish-green patches, but needs a microscope for confirmation.

Even the most simple management prescriptions to increase the volume of deadwood will be worthwhile to help *B. viridis*. For example:

- include deadwood policy in the site management plan;
- leave all fallen trees *in situ*;
- leave individual logs, not neatly stacked piles;
- actively manage/fell to create deadwood logs of at least 20 cm diameter during routine forestry operations;
- favour sites adjacent to watercourses or sheltered, humid areas for deadwood creation and retention;
- ensure a continuous supply of coarse woody debris;
- extend rotation of commercial compartments if possible, to increase the volume of coarse, woody debris;

- utilize broadleaf areas within commercial stands to create habitat;
- fell a few trees from commercial compartments into broadleaf areas;
- leave tangles of wind-throw to become a patch of deadwood within re-stock sites, allowing sufficient distance between the logs and new crops so that enough light can penetrate;
- where possible, move remaining logs in clear fell areas to more suitable sites.

The *B. viridis* course was led by Gordon Rothero, with an added bonus for delegates of an excellent presentation by the RSPB Abernethy hosts, who showed us examples on site of their various techniques for creation of standing and downed deadwood, such as winching down with a tractor, ring-barking or even the use of explosives! They are aiming at a target of 1 m³ of deadwood creation per hectare over a 5- to 10-year cycle. This is to attempt to create the continuous supply that is necessary for many species, includ-

ing *B. viridis*, and also to attempt to redress the balance between Abernethy and other UK forests, which have as little as 5–10% of the deadwood which is recorded in more natural boreal forests in Scandinavia and north-west Russia, the closest analogies to Abernethy in continental Europe.

Management leaflets

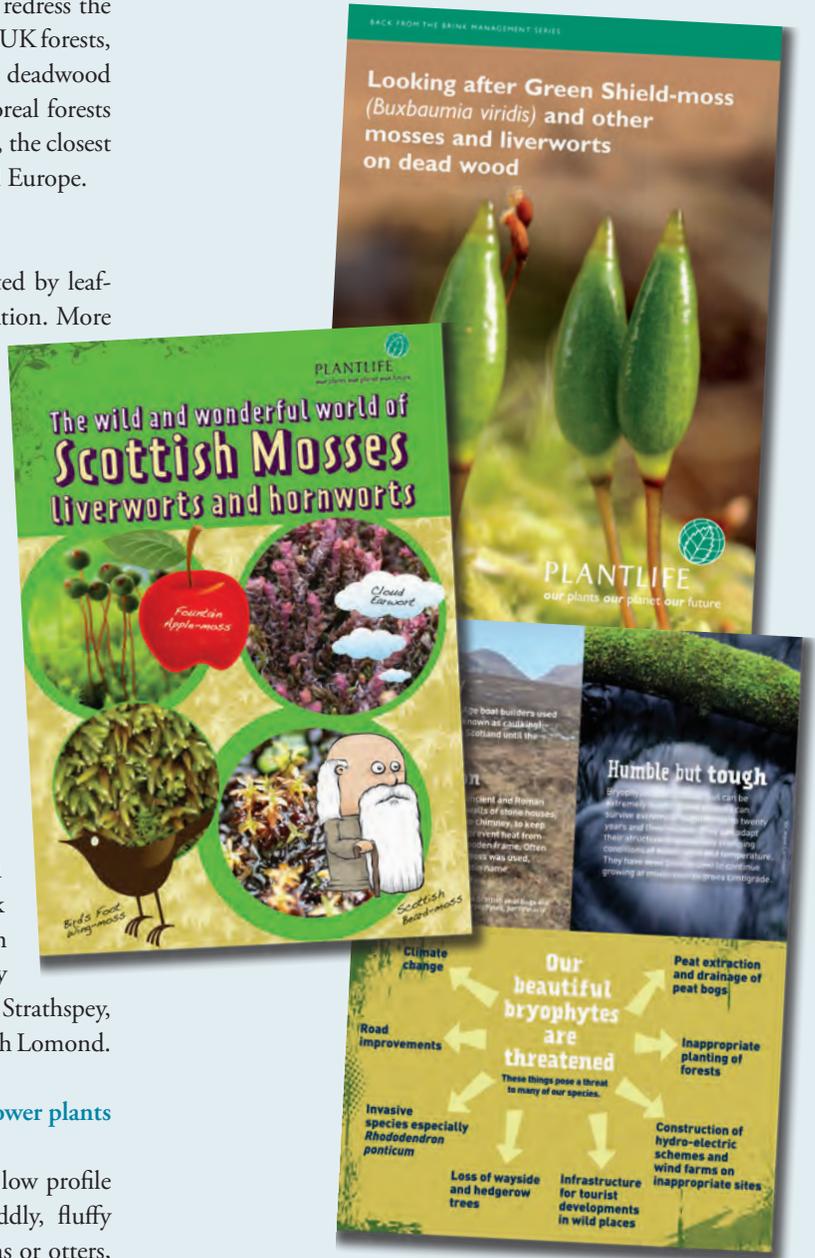
Most of the courses are complemented by leaflets, summarizing the course information. More detailed course notes are also available on the Plantlife website (www.plantlife.org.uk).

Training the trainer events for rangers

Fungal forays are fairly common, but lichen and bryophyte walks don't crop up very often, so the project runs workshops for rangers on how to run these for the public. In September 2008, 25 rangers attended Balmaha Visitor Centre at Loch Lomond for the first of these events. This was run by the Project in partnership with Loch Lomond and the Trossachs National Park Authority, and feedback has been really positive. 2009 saw two similarly successful events, one about lichens in Strathspey, and the other about bryophytes at Loch Lomond.

Bringing the bryophytes and other lower plants and fungi to life for the public.

Lower plants and fungi often have a low profile with the public. They lack the cuddly, fluffy factor needed to compete with puffins or otters, for example. However, lower plants and fungi are not only astoundingly beautiful, but come with a fascinating collection of facts and stories associated with use, folklore and longevity. The



△ Examples of two of the Plantlife bryophyte leaflets: *Buxbaumia viridis* (top) and *The Wild and Wonderful World of Scottish Mosses liverworts and hornworts* (middle and bottom). Plantlife

project is developing leaflets and posters to bring this information to the public, and thereby also delivering important messages about their conservation. The new *Wild and Wonderful Series* of leaflets are designed to enthuse and fascinate the reader, and therefore to counteract the fact that these groups are normally overlooked. Lichens and bryophytes were covered in year 1, and fungi and algae being covered in year 2. These bright and colourful leaflets are free of charge and will be available at outlets such as Forestry Commission or RSPB visitor centres.

Laminated ID guides

The project conducted a publications gap analysis to find out what is missing for lower plants and fungi, and the need for a set of guides to lower plants by habitat became very apparent. Two of these have now been produced, both for lichens of Atlantic woodlands. Guide 1 is *Lichens on ash, hazel, willow, rowan and old oak* (i.e. the Lobarion community), and Guide 2 is *Lichens on birch, alder and oak* (i.e. the Parmelion community). These guides are laminated and easy to use in the field, and would suit those who want help with basic species identification, ecology and management. These guides are available to buy at £3.50 each plus p&tp from Plantlife Scotland. The series is being expanded, with two guides to lichens of pinewoods being produced in year 2 of the project and several guides to bryophytes (as well as fungi) of a variety of habitats planned for year 3. These will hopefully include bryophytes of pinewoods, Atlantic heaths, Atlantic woodlands, and springs flushes and mires.

Information exchange

The project acts as a contact point for queries relating to lower plants and fungi, for example by providing links to experts regarding identifying difficult taxa, or from people looking to find out about events. A web page has been established

about the project and can be found on the Plantlife Website, Scotland pages, with links and information, recommended publications, lists of events and many more useful resources.

Sustainable use

There are currently few guidelines on collection of bryophytes, lichens or algae. The Lower Plants and Fungi Project and Reforesting Scotland's Sustainable Forest Harvest Project asked various species experts to draw up monitoring requirements to fit into collection licences issued by the Forestry Commission. These were included in a series of workshops with harvesters in autumn 2008. Plantlife Scotland is also working with Reforesting Scotland to update the Scottish Wild Mushroom code, and to develop new collection codes for *Lobaria pulmonaria* (tree lungwort) and *Sphagnum* mosses. The collection code for *Sphagnum* mosses will focus in particular on best practice for *Sphagnum* collection in forestry areas designated for clear fell.

To find out more about the Lower Plants and Fungi Project, contact the author.

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The Lower Plants and Fungi Project is supported by Plant Link Scotland, the forum for organizations working to conserve plants and fungi in Scotland and is funded by SNH, SEPA, the Forestry Commission, BBS and the British Lichen Society. Plantlife Scotland would like to take this opportunity to thank the BBS for its ongoing support.

All the publications mentioned in this article are available as paper copies from Plantlife Scotland, or can be downloaded from the Plantlife website (www.plantlife.org.uk). Most are free of charge, except for the laminated copies of the Atlantic lichen ID guides, which are available to buy at £3.50 each (plus p&tp).