

Right tree, right place: using botanical heat-maps to inform tree planting

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KEVIN WALKER, BECKY TRIPPIER & CLARE PINCHES

In 2021, the UK government published its ambitious plan to achieve 'Net Zero' decarbonisation by 2050 (UK Government, 2021a). In England, this includes planting around 30,000 hectares of trees every year (equivalent to around 74,000 football pitches) to sequester carbon and produce environmental benefits, such as nature recovery, flood alleviation and improvements to water and air quality (UK Government, 2021b). This is an unprecedented scale of tree planting and will largely be achieved by encouraging private and public landowners to plant trees on their land, often as part of government schemes, e.g. the Forestry Commission's new England Woodland Creation Offer (EWCO) or Community Forests that provide financial incentives.

Whilst tree planting will help to reduce our net carbon emissions, it could be disastrous for nature recovery ambitions if trees are planted on areas of

existing wildlife value. The starkest recent example of such inappropriate planting was the conversion of large parts of the Flow Country in Scotland to commercial forestry in the 1980s, which had far-reaching and long-lasting repercussions for both forestry and conservation (Warren, 2000). Since 2020, we have seen inappropriate planting of trees on several species rich grasslands and blanket bogs of high wildlife value in England (Figure 1). Frequently such areas have low agricultural value, so the income provided by trees, through comparatively generous incentive schemes and woodland carbon and timber incomes is attractive. For this reason, it is vital that those administering tree planting schemes are able to access high quality environmental information to help screen sites prior to planting. In response to this need, BSBI has been working with Natural England, Woodland Trust and Forestry Commission, to provide 'heat-maps' that help identify the most important areas for plants, so that trees are not established in the wrong place. In this note we describe the development and use of these heat-maps.

Development

Following some high-profile cases of inappropriate tree planting in Cumbria (Figure 1), it became obvious that BSBI data could have been used to screen woodland creation proposals, so ruling sites out for planting. To avoid further damage and losses BSBI, Woodland Trust, Forestry Commission and Natural England explored how these data could be used to screen planting proposals. Part of this 'brief' was that any resultant product would provide a remote and easily interpretable assessment of botanical interest that could be used by decision-makers to inform next steps (ideally on a geo-spatial web-based portal).



Figure 1. Example of inappropriate tree planting near to Greystoke, Cumbria, where planting was due to take place on deep peat supporting bog species such as Cranberry *Vaccinium oxycoccos*, sundews *Drosera* spp. and Creeping Forget-me-not *Myosotis stolonifera*. Keith Watson

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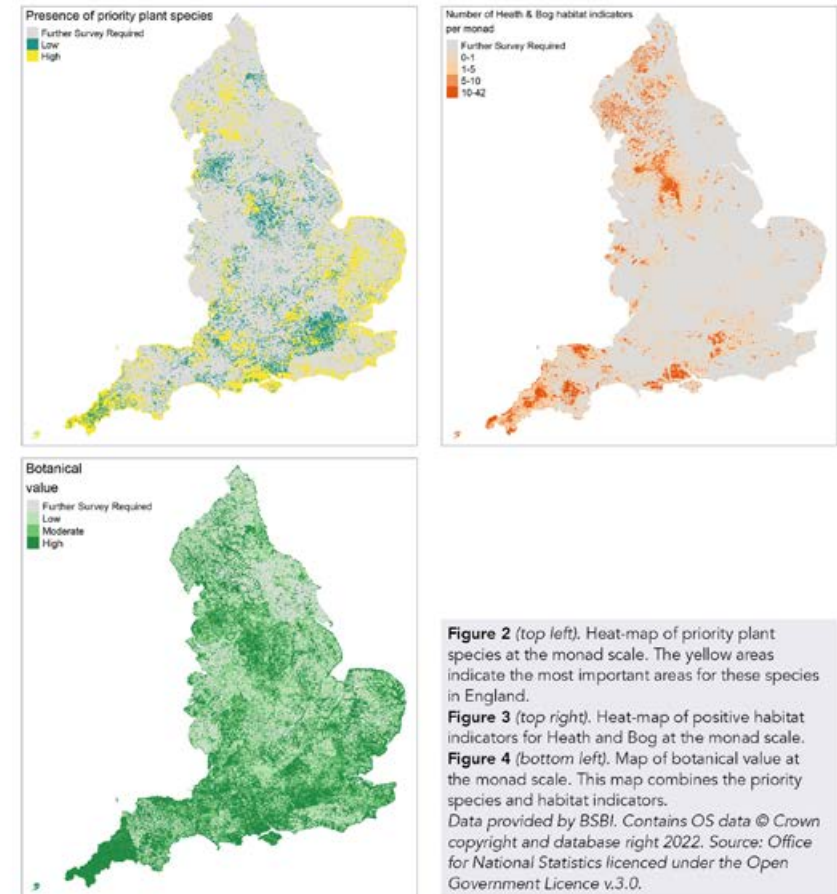


Figure 2 (top left). Heat-map of priority plant species at the monad scale. The yellow areas indicate the most important areas for these species in England.

Figure 3 (top right). Heat-map of positive habitat indicators for Heath and Bog at the monad scale.

Figure 4 (bottom left). Map of botanical value at the monad scale. This map combines the priority species and habitat indicators.

Data provided by BSBI. Contains OS data © Crown copyright and database right 2022. Source: Office for National Statistics licenced under the Open Government Licence v.3.0.

assessment was carried out of a range of thresholds to use for the boundaries between the categories.

Finally, an overall 'botanical value map' was produced to provide a high-level strategic overview that combines information in the priority species and habitat indicator maps described above (Figure 4). This took the highest broad habitat 'traffic light' value (low, medium, high) for each monad and the presence of priority species. If priority species were present then the monad is automatically flagged

as of high value. This approach ensures that the overall botanical interest at the monad scale is easily understood as well as highlighting the need to drill down into the more detailed heat-map spatial layers for high and medium value maps.

Survey coverage

The absence of records of priority species or habitat indicators for a given hectare or monad in the BSBI database is not conclusive proof of absence, as sites



How Irish place names can be used to locate rare species

MICHELINE SHEEHY SKEFFINGTON & NICK SCOTT

In carrying out field work for our recent paper examining the possible Bronze Age origins in Ireland of the Strawberry-tree, *Arbutus unedo* (Sheehy Skeffington & Scott, 2021), we were particularly interested in mapping the extent of *A. unedo* in its more remote areas, since such trees are unlikely to be recent introductions. In this, Irish place names proved helpful, not least as they can date back centuries. So we thought to share an example to illustrate this potential in searching for other rare or unusual plant species.

Checking the BSBI Distribution Database, we noted a few records at the eastern end of Lough Currane in the west of the Iveragh Peninsula in S. Kerry (v.c.H1). This is some 50km south-west of Lough Leane, Killarney (in v.c.H2), where the majority of *A. unedo* trees can be found today. Sporadic, mainly single trees were located by Scully (1916) on the shores of Lough Currane, most of which have since been found again (Garvey & Flynn, 1995), and one on the adjacent mountains, that has not so far been re-found.

Cliff line to east of stream with several *Arbutus unedo* trees (dark green) at Eisc na gCaithe, S. Kerry (v.c.H1), October 2021. M. Sheehy Skeffington

On the Ordnance Survey Discovery Series 1:50,000 map, we noted a smaller lake just to the east of Lough Currane named Isknagahiny Lake, and suspecting this name may have been derived from an Irish name referring to *caithe* (the Irish for *A. unedo*) we checked the government sponsored place name database (www.bogaimn.ie). This gave the original Irish name as *Eisc na gCaithe* and its interpretation as 'the fissure of the arbutuses', as well as its first occurrence in the 1735 Registry of Deeds. Notes on a scanned record card for this name also mentioned another place name for the same area, *Lag bán na gCaithe* recorded by a field worker in 1968, translated since as 'the white hollow of the arbutuses' or 'fallow land with arbutuses' (P. Ó Cearbhaill, pers. comm.). Another field note tantalisingly said 'it [the arbutus] is still growing there', but that was in 1968.



INTRODUCING MY VICE-COUNTY

Co. Fermanagh v.c. H33

ROBERT NORTHRIDGE (Recorders: Robert Northridge & Ralph Forbes)

Fermanagh is the most westerly county in Northern Ireland reaching to within three miles of the Atlantic Ocean. This proximity to the sea affects the climate which in turn affects the plants of the county. A man of Fermanagh is dominated

The Cliffs of Magho above Lower Lough Erne. Robert Thompson

by Lower Lough lough is the sea and the upper feature of the rises to 665 m the border with Ireland. M limestone upland bogs, upland wooded estates, on limestone of lakes: inter- and largish bo the county.

Upper and These two lake has numerous i

which enable a very rich and varied vegetation to flourish under water and to emerge in the shallow

Peatlands

Most of the raised bogs in Fermanagh have long since been lost to turf cutting, though there are still a couple in the south of the county with tiny patches of *Andromeda polifolia* (Bog-rosemary), occasional *Vaccinium oxycoccos* (Cranberry) and all three species of *Drosera* (sundews).

access to limestone is on the Marlbank Loop north of Culcagh.

On the damper limestone cliffs, especially if they are wooded, can be found *Papaver cambricum* (Welsh Poppy), while on more open ground can be found plentiful *Saxifrage hypnoides* (Mossy Saxifrage) and *Galium verum* (Lady's Bedstraw); other species that



Drosera anglica (Great Sundew) on a bog near Killadeas. Hannah Northridge



Pseudorchis albida (Small-white Orchid) on the limestone at Callow Hill. Hannah Northridge

The 'Adventives and Aliens' section features vice-county roundups of recent discoveries of escaped and naturalised plants, plus other articles on non-native species

ADVENTIVES AND ALIENS

Adventives and Aliens News 26

Compiled by Matthew Berry

ADVENTIVES AND ALIENS: Adventives & Aliens News 26

v.c.1 (1978), 5 (2012, 2021), 21 (2011), 33 (2019), 83 (2016, 2017 and 2019) and H6 (2006).

Agastache rugosa (Fischer & Meyer) Kuntze (Korean Mint), Sheringham (IG14694307), 12/10/2021, M. Lacey (comm. M. Lacey): one flowering and several non-flowering seedlings in gravel path bisecting allotments, with *Erigeron sumatrensis* (Guernsey Fleabane) and *E. floribundus* (Bilbao's Fleabane). It did not seem to be in cultivation anywhere nearby (Mick Lacey pers. comm.). See Adventives & Aliens News 3, v.c. H39 and v.c. 47 below.

V.c. 28 (W. Norfolk)

Erodium manescavii (Garden Stork's-bill), Swaffham (TF81970795), 16/10/2021, Norfolk Flora Group: a single plant on a mown suburban verge c. 2 m from garden boundary, growing with local *E. moschatum* (Musk Stork's-bill), a robust version of which it was seen to somewhat resemble. The first Norfolk record. A stemless, perennial garden plant (Geraniaceae) native to the Pyrenees with bracts fused in a cupule and glandless apical mericarp-pits. The magenta-purple flowers are c. 3 cm across. Stace (2019): 375.



Clerodendrum bungei Steud. (Glory Flower), Kenninghall (TM03498638), 9/10/2021, Norfolk Flora Group: a population spread over c.10 m of rural road verge outside a garden. The first Norfolk record. The status is somewhat uncertain and an initial deliberate introduction cannot be categorically excluded. See Adventives & Aliens News 18, v.c. 17 and Adventives & Aliens News 22, v.c. 9.



Clerodendrum bungei, Kenninghall, West Norfolk (v.c. 28). Jo Parmenter

V.c. 35 (Mons)

Laphangium latealbun (Jersey Cudweed), Garndiffaith (SO26600472), 8/8/2021, L. Gregory (comm. S. Tyler): growing in a plant pot with a large dying conifer at a school. The first v.c. record. It has also recently colonised pavements in Cardiff Bay in East Glamorgan.

V.c. 38 (Warks)

Marsilea hisuta R. Br. (Bristly Water-Clover), Baddesley Ensor (SP27299838), 29/10/2015, J. & M. Walton (conf. F. Ramsey & H. Schaefer, 11/10/2021): introduced in a newly dug wildlife pond on Baddesley Common. It was tentatively identified as *Marsilea linearis* (L.) Gleason by a native

ADVENTIVES AND ALIENS: *Sarracenia purpurea* in Scotland

populations in southern Britain and Ireland where conditions are slightly milder (representing what the climate in Rannoch may be like in years to come) and in these areas there are 'problem' populations where repeated attempts at eradication have been challenging and expensive.

Sarracenia purpurea has been shown to thrive at the expense of the associated bryophyte communities; it can compete for the mossy cushion niches favoured by native *Drosera* spp. (Sundews) as well as actually shade out the bryophytes it is growing around. This could change the surrounding habitat. Rannoch Moor is internationally important as one of the most extensive and undisturbed blanket bog and fen complexes in Britain and the only place where the Rannoch-rush (*Scheuchzeria palustris*) is found.

In light of all these considerations control was decided as the best course of action; to treat the populations with a herbicide that was safe to use in wetlands. With landowner support this was done in 2019 and checking the site in 2020 and 2021



Sarracenia purpurea (Pitcherplant), Lorne Gill

Reference

Walker, K.J. 2014. *Sarracenia purpurea* subsp. *purpurea* (Sarraceniaceae) naturalised in Britain and Ireland: *New Journal of Botany* 20423497

Centranthus ruber: Spread of a non-native in the British Isles, with a focus on v.c. 57 (Derbyshire)

DAVID P. BLOWERS

Centranthus ruber (Red Valerian) is a naturalised neophyte that has its origins in the Mediterranean region and, in the British Isles, is commonly found on walls, dry rocky, shingly or sandy places, cliffs and banks (Stace, 2019). Its red,

pink or white flowers add a touch of colour to many places from June to August (Rose & O'Reilly, 2006).

Casual observations in and around my 'home' hectad, SK08 within v.c.57 (Derbyshire), seemed to give the impression that *C. ruber* was increasing in abundance. Encouraged by the drive to explore the records within the BSBI Distribution Database (DDb) (Walker, 2021), an analysis of the distribution and temporal spread of *C. ruber* was undertaken. In addition, a more detailed analysis was performed for v.c. 57.

The DDb was interrogated for all records containing *C. ruber*. Those records with a year entry ('year from' field) were then divided by region. Table 1 shows the earliest such records for *C. ruber* in regions of the British Isles. The earliest such record is for v.c. 2 in 1758 (near Truro in Cornwall) where it was probably introduced as a garden ornamental.

The downloaded records reveal the increase in vice-counties (v.c.) containing *C. ruber*. Figure 1 summarises these data in terms of the number of v.c. (Figure 1a) and the percentage of v.c. within a region (Figure 1b). For England, Scotland & Wales the upward trend in records begins around the 1950s, followed by Northern Ireland and Eire in the early 1990s. Having just a single v.c., the Channel



Other regular sections include book reviews; news and announcements from BSBI; and a round-up of plant records from across England, Ireland, Scotland and Wales.

NOTICES

PAPERLESS MEMBERSHIP

Following feedback on ways BSBI could improve the environmental options available to our members, we are happy to announce that it is now possible to opt to receive all BSBI publications in digital format rather than by post. Members with an email address were contacted at the end of February to ask if they would like to take up this option. If any member would like to update their preferences, please email: membership@bsbi.org.

Sarah Woods
Fundraising Manager

THE BRITISH & IRISH BOTANICAL CONFERENCE

At the end of the 2021 Annual Exhibition Meeting, I announced a new name for this much-loved BSBI event, chosen following discussions by our Events & Communications Committee. In future the event will be called the British and Irish Botanical Conference, and the theme for 2022 will be 'A Festival of Plants'.

Our November meeting has long been a feature of our Society's calendar. The Botanical Exchange Club, the fore-runner of the BSBI, held annual meetings in the 19th century where members could

and Waterford are currently without a VCR in post. If you, or someone you know, is interested in taking up the role of VCR (or perhaps first trying it out as a trainee VCR), and would like to discuss what is involved, then please do get in touch with me, or the relevant Country Officer, using the contact details given on the inside front cover.

Pete Stroh

PANEL OF REFEREES AND SPECIALISTS: UPDATES AND AMENDMENTS

PANEL OF VCRS

Sylvia Reynolds has retired after nearly 40 years as VCR for Limerick (v.c. H8). Sylvia has been an active member of the BSBI since her appointment in 1983, served on the Committee for Ireland and on Council for many years, and during this time has made a huge contribution to botany in Ireland, and to a multitude of BSBI projects, including recent recording for the forthcoming atlas, covering not just Limerick but also Longford and Wicklow. Sylvia published two major works during her time as VCR – the *Catalogue of alien plants in Ireland* in 2002,

REVIEWS

Compiled by Clive Stace, Book Reviews Editor
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Nova Flora Neerlandica. Lycopodiopsida & Polypodiopsida
R. Haveman, R.H.M.J. Lemmens, E.L.A.N. Simons, I. de Ronde & J.H.J. Schaminée (eds)
KNNV Uitgeverij, Zeist, Netherlands, 2021; pp. 275, with many coloured illustrations; hbk £38.99. ISBN 9789050118026

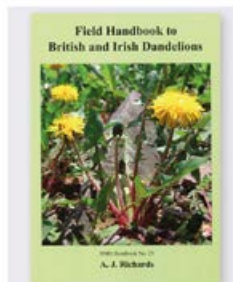
The current standard Flora of the Netherlands is the single-volume 24th edition of Heukels'

although the first to appear and at the obvious start of the systematic sequence, is not numbered.

The ferns and fern allies are here treated in the modern molecular-derived sequence, and each taxon (from family downwards) is given a fairly extensive introduction by the total of ten authors. There are keys to the families, genera, species and subspecies. A family key to ferns is not easily constructed and results in several families keying out in different places; I suggest that a single key to all the genera would have been a more user-friendly approach. The species descriptions are fairly detailed (similar in length to those in Sell & Murrell's *Flora*) and are followed by often lengthy texts under the headings habitat, distribution, biology, variation and miscellaneous other details. This format provides a very full account of the species in the Netherlands, except that biosystematic data (especially chromosome cytology), which are very extensive in the

volumes. Whether or not this is so, the present volume is one to be admired and enjoyed as well as providing an authoritative account of Dutch pteridophytes.

Clive Stace



Field Handbook to British and Irish Dandelions
A.J. Richards
Botanical Society of Britain and

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- Your password for the newly revamped members-only area of the BSBI website where you can access all the scientific papers published in *New Journal of Botany* 2011–2017, hear about discount offers on new botany books... and much, much more.



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