Tomentypnum nitens (Woolly Feather-moss) rediscovered in Norfolk

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recount this chance discovery and discuss the importance of 'monitoring' for the protection of this and other vulnerable taxa

Tomentypnum nitens (Hedw.) Loeske is a moss of considerable interest because of its distribution and history. It is a common circumpolar species in Arctic and subarctic areas, where it grows in both wet and dry habitats such as *Dryas* heath; further south it is mainly a montane species.

In the UK it is restricted to base-rich springs and flushes in the uplands and oligotrophic, base-rich fens in East Anglia. It occurs frequently in late Pleistocene sub-fossil deposits (Dickson, 1973), often accompanied by the species *Helodium blandowii* and *Paludella squarrosa,* both now extinct in Britain. The sub-fossil records indicate it retreated steadily northwards and eastwards during late Pleistocene times. It is, therefore, regarded as a glacial relict. Porley (2013) provides a more detailed account of the species. Until relatively recently, in geological years, this species was found across more of lowland England than today e.g. Wynbunbury Moss, Cheshire. Now it is restricted to base-rich springs, such as on Anglesey and the Lleyn Peninsular, and on the Selkirk basin mires, where carpets of *T. nitens* occur in the transition between the mixed acid and base-rich mire.

A quick glance at the distribution maps in the *Field Guide* (Atherton, Bosanquet & Lawley, 2010) or the *Atlas of the Bryophytes of Britain and Ireland* (Hill, Preston & Smith, 1994) would lead the unsuspecting to imagine that East Anglia was replete with sites where *Tomentypnum nitens* might be found. Alas, this was not the case.

Burrell (in Nicholson, 1914) recorded it (as *Camptothecium nitens*) as 'Very rare', citing Acle and Smallburgh as sites. Petch & Swann (1968) noted that it had become extinct in many counties but persisted in Norfolk where, as at Smallburgh Fen it was 'locally abundant'. They listed two locations in west Norfolk: Roydon Common and Swangey Fen, and four in east Norfolk: Holt

◁Left: *Tomentypnum nitens*. R Stevenson

▷Right: Habitat of *Tomentypnum nitens* at Roydon Common. R Stevenson

Lowes, Buxton Heath, Smallburgh and Acle Carr. At Roydon Common, where it was found by Francis Rose, it was 'rare' in 1956, but was noted as having 'increased since' then (Petch & Swann, 1968).

This information is repeated verbatim in Swann (1982) but in a survey of Swangey Fen in 1981, Wheeler, Dalglish & Morris (1982) failed to find *Camptothecium nitens*, along with other former rarities such as *Cinclidium stygium*, *Leiocolea rutheana*, and *Hamatocaulis vernicosus*.

Seventeen years later Beckett, Bull & Stevenson (1999) reported: 'No recent records. This is a species which appears to have become extinct in the county. All recent searches at its former known localities have been without success'.

And that had remained the position until March of 2013, when a group of Natural England and Norfolk Wildlife Trust staff visited NWT Roydon Common NNR to discuss the current condition of the site in the light of threats posed by various proposed developments. They were accompanied by Julia Masson, a freelance ecologist. The visit took two of the group, Julia Masson and Iain Diack, via an area close to recovering M13 vegetation, where they chanced upon a colony of *Tomentypnum nitens.*

The colony found is small, covering only a few decimetres at the base of *Molinia caerulea* tussocks, where it is accompanied by *Calliergonella cuspidata* and *Aulacomnium palustre*. It lies close to an area of recovering fen vegetation that is probably closest to black bog-rush - blunt-flowered rush *Schoenus nigricans - Juncus subnodulosus* mire (M13) in NVC terminology (Rodwell, 1991) which, until relatively recently, was heavily shaded and overgrown by willow scrub. This was extensively cleared during 1992-97 and is now being grazed by Dartmoor ponies which continue to open up the vegetation.

Lockhart, Hodgetts & Holyoak (2012) provide a useful summary of the plant's ecology and biology, citing calcareous flushes of differing sizes as a major habitat in Ireland. Sites with fairly constant water levels are also required, whilst pH values of between 5.7 and 8.0 (from Scandinavia) are quoted; values of around pH 7 have been obtained from the water near the newly discovered colony on Roydon.

Porley & Hodgetts (2005) claim that *T. nitens* managed to survive in some of its Broadland sites into the 1980s, noting in passing that it appears to be very sensitive to enrichment by nitrogen and phosphorus - a character it apparently shares with sixteen other species which have either disappeared from, or become very rare on, Roydon Common and all of which have low Ellenberg values for N[1] (Table 1).

As is often the case, the actual stages of the decline of these species have gone unrecorded, leaving the causes to be guessed at, although habitat loss and degradation as well as climate

[1]N: Nitrogen. An estimate of the relative tolerance of species to the presence of the major fertiliser, Nitrogen.

Species	Ellenberg 'N' Value	Status
Campylopus brevipilus	1	Ex
Cladopodiella francisci	2	NSR
Dicranum spurium	2	Ex
Diplophyllum albicans	1	VR
Pseudocalliergon lycopodioides	2	Ex
Lophozia incisa	1	Ex
Lophozia ventricosa	2	NSR
Philonotis calcarea	2	Ex
Polytrichum strictum	1	VR
Ptilidium ciliare	2	NSR
Racomitrium canescens	2	Ex
Riccardia latifrons	1	NSR
Scorpidium scorpioides	2	VR
Sphagnum contortum	2	VR
Sphagnum subsecundum	2	NSR
Straminergon stramineum	2	NSR

◁Table 1: Species which have become extinct on Roydon Common, have not been seen recently or which occur at very low frequencies. Ex = extinct?; NSR = not seen recently; VR = very rare. (Bryophyte nomenclature follows Hill *et al.*, 2008)

related factors - leading to serial changes in vegetation - are almost certainly implicated.

Although the advent of hand-held GPS devices has improved accuracy of recording localities quite considerably, the legacy of past records is woefully inadequate for ensuring the protection of vulnerable taxa such as bryophytes. All too often, as has been the case here, the precise location and size of key species populations has not been recorded, and on sites as large as Roydon Common refinding them is as much a matter of luck, combined with field skills in recognising the likely environmental conditions, as of persistence in searching. This may prove to be also true for some of the species in Table 1.

Porley (2013) discusses the problems associated with bryophyte conservation in some detail, and briefly mentions the Common Standards Monitoring (CSM) criteria[2], before going on to urge 'competent bryologists' to get involved in the monitoring of rare species. However, there is, as he acknowledges, a shortage of suitably experienced bryologists.

Moreover, the CSM criteria related to specific habitats e.g. Heathland (Anon, 2004a) and Wetland (Anon, 2004b), which were set out nearly ten years ago, are too broad-brush to deal with the detail required for monitoring bryophytes, particularly as the surveys are conducted over too short a time period to enable populations such as the present discovery to be monitored effectively. The CSM standards for bryophytes and lichens (Anon, 2005) also suffer from the long time-intervals specified between surveys. It is, perhaps, a good time to revisit and refine the CSM protocols, particularly for bryophytes and lichens, including consultation with those who have had experience of using them. In particular, if it proves impossible to get repeat surveys undertaken by the same person, then it is imperative that a new surveyor is provided with copies of all previous documentation. These documents should also be lodged with the appropriate vice-county recorder. Work has commenced on developing enhanced methods for bryophyte monitoring through CSM e.g. Callaghan (2013), which could start to address some of these issues.

[2]Common Standards Monitoring: a set of recording criteria which try to ensure common standards are adhered to.

▷Right: Small colony of *Tomentypnum nitens* at the base of *Molinia caerulea* tussocks, Roydon Common. R Stevenson

Rediscovered species such as *Tomentypnum nitens*, or species judged to be 'on the brink' may need to be monitored more frequently in the short term, until their populations have stabilised. Much more attention needs to be devoted to suitable environmental monitoring so that we can build up a more accurate picture of their actual requirements. Only monitoring the population size and location is of little use unless we can actually ensure that environmental conditions are sufficiently improved to enable maintenance of populations in the first instance, followed by population expansion. As a way forward, Natural England and other bodies such as the Wildlife Trusts could engage much more actively with universities in encouraging and funding research into the ecology of rare bryophytes.

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References

Anon. (2004a) *Common Standards Monitoring Guidance for Lowland Heathland.* Peterborough: JNCC.

Anon. (2004b) *Common Standards Monitoring Guidance for Lowland Wetland.* Peterborough: JNCC.

Anon. (2005) *Common Standards Monitoring Guidance for Bryophytes and Lichens.* Peterborough: JNCC.

Atherton, I., Bosanquet, S. & Lawley, M. (2010) *Mosses and liverworts of Britain and Ireland - a field guide*. Plymouth: British Bryological Society.

Beckett, G., Bull, A. & Stevenson, R. (1999) *A Flora of Norfolk.* Thetford: Privately printed.

Burrell, W.H. (1914) *Mosses and Liverworts, in* Nicholson, W.A., *Flora of Norfolk*. London: West, Newman & Co.

Callaghan, D. (2013) The grid-mapping of species at sites. *British Wildlife* **24** (5).

Dickson, J.H. (1973) *Bryophytes of the Pleistocene - the British record and its chorological and ecological implications.* Cambridge: Cambridge University Press.

Hill, M.O., Blackstock, T.H., Long, D.G. & Rothero, G.P. (2008) *A Checklist and census catalogue of British and Irish bryophytes.* Middlewich: British Bryological Society.

Hill, M.O., Preston, C.D. & Smith, A.J.E. (1994) *Atlas of the bryophytes of Britain and Ireland. Volume 3: Mosses (Diplolepideae)*. Colchester: Harley Books.

Lockhart, N., Hodgetts, N. & Holyoak, D. (2012) *Rare and threatened bryophytes of Ireland.* Holywood: National Museums Northern Ireland.

Nicholson, W.A. (1914) *Flora of Norfolk*. London: West, Newman & Co.

Petch, C.P. & Swann, E.L. (1968) *Flora of Norfolk*. Norwich: Jarrold & Sons Ltd.

Porley, R. & Hodgetts, N. (2005) *Mosses and liverworts.* London: Collins.

Porley, R. (2013) *England's rare mosses and liverworts: Their history, ecology and conservation.* Woodstock: Princetown University Press.

Rodwell, J.S. (ed). (1991) *British plant communities Volume 2 Mires and heaths.* Cambridge: Cambridge University Press.

Swann, E.L. (1982) Norfolk bryophytes today. *Journal of Bryology* **12**: 77-112.

Wheeler, B. D., Dalglish, G.J. & Morris, J.F. (1982) Vegetation survey of Swangey Fen (Attleborough Poors' Fen), Norfolk. *Bulletin British Ecological Society* **13**: 69-70.

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