



# Dead Wood Comes Alive

Research into cryptogamic diversity of beech forests across Europe led to a visit to Epping Forest for the authors **Erik Aude**, **Klaas van Dort**, **Rasmus Fuglsang Frederiksen** and **Sally Gadsdon**, who report on the groups findings.

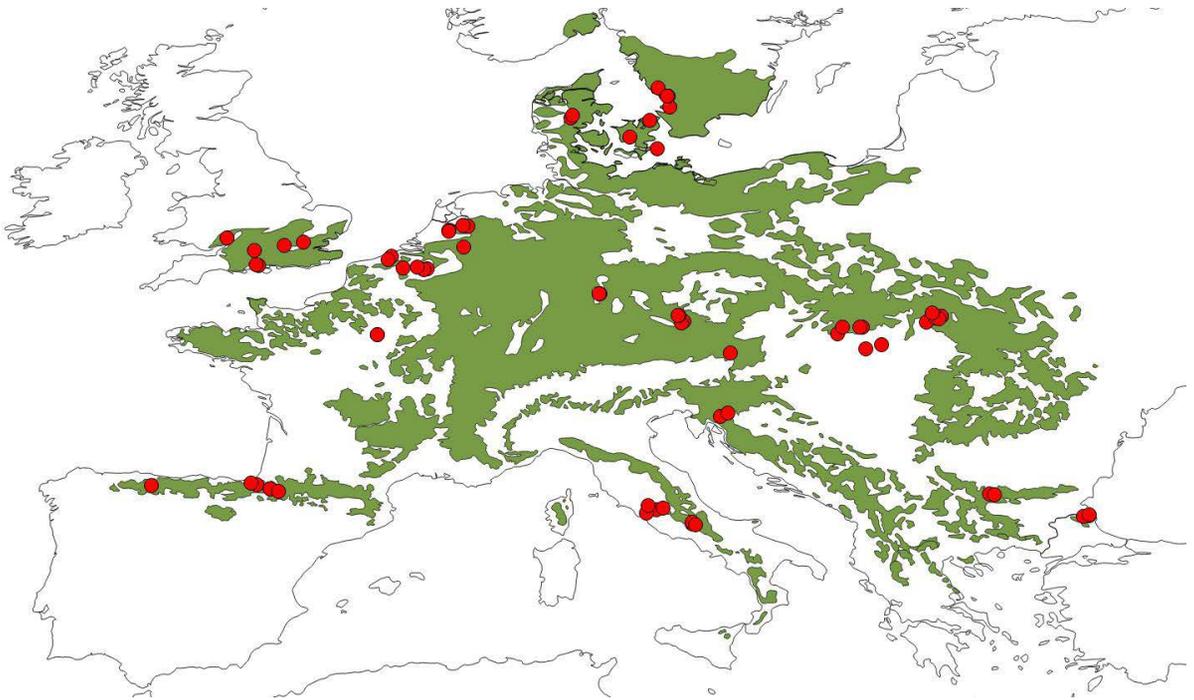
△Fig. 1 The Beech Boys (& girl!) at Burnham Beeches. *Sitting on beech log:* (left to right) Claus Baessler, Klaas van Dort, Erik Aude, Nerea Abrego Antia, Örjan Fritz. *In front of beech log:* (left to right) Morten Christensen, Martyn Ainsworth (guest Beech Boy), Rasmus Fuglsang Frederiksen. M. Christensen

Whilst many people dream of working in nature conservation, even those working at a European renowned site can forget just how a special place it is. In this case it is Epping Forest which lies across the boundary of Essex and Greater London. Being a well-known site, it often receives national and international visitors. In 2014 a group of European ecologists visited the site as part of a project studying the cryptogamic flora of dead beech wood. Other sites they included in their visit to Britain were the New Forest (Denny Wood and Wood Crates), Savernake (Wiltshire), Lady Park Wood (Gloucestershire/ Monmouthshire) and Burnham Beeches (Buckinghamshire).

## The project background

This visit was part of on-going research into beech woodlands. It started with research into

the diversity of dead wood inhabiting species in many of the best preserved beech forests in Belgium, Denmark, England, Hungary, Slovenia and The Netherlands. This was funded by the European Community as part of the Nat-Man project (Nature-based Management of beech in Europe) and it finished in 2005. From this some enthusiastic experts on cryptogams continued recording inventories in beech dominated ancient woodlands on a voluntary basis, under the name of “the Beech Boys” (beechboys.eu). Yes, pun intended. The original core of the Beech Boys survives and people join the group for one or several years, with new members welcome. Between 2005 and 2014 the Beech Boys have systematically collected data on species composition of epixylic communities in ancient woodland reserves in Austria, Bulgaria, Croatia, Czech Republic, Germany, Italy, Slovakia, Spain



△Map 1. European beech areas (in green, data EUFORGEN) and sites visited by Beech Boys (red dots). M. Christensen

and Sweden (see Map 1). In addition to dead wood communities, the epiphytic flora of the sites was studied.

The research is trying to disentangle biodiversity patterns with regards to bryophytes, fungi and lichens growing on dead wood and old trees on a European scale. More specifically, whether the influences of long term history, climate and human impact can be discerned on the biodiversity patterns of these taxa. Sites were selected across Europe to cover as wide a climatic gradient within the distribution of beech forests as possible. Over the last 10 years the Beech Boys have visited almost 100 forest reserves in Europe. Of the Beech Boys, Erik Aude, Klaas van Dort and Rasmus Fuglsang Frederiksen were responsible for recording bryophytes (and lichens!).

### The visit to Britain

The British sites were visited in late October 2014. Local managers and administrators warmly welcomed the group at the various sites. During the trip the Beech Boys were joined by Martyn Ainsworth, fungi expert from Kew

Gardens. In Wales George Peterken, the well-known conservationist of natural woodlands, showed them ‘his’ Lady Park Wood. The group enjoyed their short trip to England, not least as “the exploitation of local food and drinks made the trip very rewarding indeed”.

In general, dead wood specialists were very poorly represented at all sites. Most beech logs showed the effects of black rot fungi (*Eutypa spinosa*), which makes the wood hard and creates a very unfavourable substratum for epixylic bryophytes. As was to be expected the epiphytic lichen flora was very good in the New Forest, Wood Crates being among the “best” beech forests in Britain with many species of conservation concern, several figuring in Rose’s Revised Index of Ecological Continuity list (Coppins & Coppins, 2002). The remaining four sites were extremely poor. Beech stems in Burnham Beeches and Epping Forest were almost devoid of epiphytes, even nitrogen loving ones were scarce (but abundant on trees in gaps and along the forest edge). A preliminary list of the species found on beech logs and wind-thrown root-balls at Epping is given below (Table 1,

Table 1. Preliminary species list for species found on beech logs and wind-thrown root-balls at Epping Forest (some species still awaiting identification).

<i>Arthonia spadicea</i>	lichen	<i>Dicranum scoparium</i>	bryophyte	<i>Lophocolea heterophylla</i>	bryophyte
<i>Atrichum undulatum</i>	bryophyte	<i>Eurhynchium striatum</i>	bryophyte	<i>Metzgeria furcata</i>	bryophyte
<i>Brachythecium rutabulum</i>	bryophyte	<i>Fissidens bryoides</i>	bryophyte	<i>Mnium hornum</i>	bryophyte
<i>Brachythecium salebrosum</i>	bryophyte	<i>Fissidens taxifolius</i>	bryophyte	<i>Orthotrichum affine</i>	bryophyte
<i>Brachythecium velutinum</i>	bryophyte	<i>Frullania dilatata</i>	bryophyte	<i>Physcia tenella</i>	lichen
<i>Bryum flaccidum</i>	bryophyte	<i>Herzogiella seligeri</i>	bryophyte	<i>Polytrichum formosum</i>	bryophyte
<i>Calyptogeia arguta</i>	bryophyte	<i>Hypnum andoi</i>	bryophyte	<i>Porina aenea</i>	lichen
<i>Campylopus flexuosus</i>	bryophyte	<i>Hypnum cupressiforme</i>	bryophyte	<i>Rhizomnium punctatum</i>	bryophyte
<i>Campylopus introflexus</i>	bryophyte	<i>Isobrachium myosuroides</i>	bryophyte	<i>Thuidium tamariscinum</i>	bryophyte
<i>Candelaria concolor</i>	lichen	<i>Kindbergia psacalanga</i>	bryophyte	<i>Ulotia bruchii</i>	bryophyte
<i>Cephalozia bicuspidata</i>	bryophyte	<i>Leparia incana</i>	lichen	<i>Ulota crispata</i>	bryophyte
<i>Cladonia coniocraea</i>	lichen	<i>Leparia lobifcans</i>	lichen	<i>Zygodon conoides</i>	bryophyte
<i>Cladonia fimbriata</i>	lichen	<i>Leucobryum glaucum</i>	bryophyte	<i>Zygodon forsteri</i>	bryophyte
<i>Dicranoweisia cirrata</i>	bryophyte	<i>Lophocolea bidentata</i>	bryophyte	<i>Zygodon viridissimus</i>	bryophyte

some species still awaiting identification).

But the trip to Epping Forest was not without a highlight, Erik, Klaas and Rasmus were taken to a nearby patch of Forster’s Knothole Moss *Zygodon forsteri*, (Fig. 3). Epping Forest has the largest population of *Z. forsteri* in the UK with 158 known colonies on 77 trees (2008 survey,

Adams 2008). Burnham Beeches and the New Forest are the only other two UK sites where this beech specialist can be found. It has fairly specific habitat requirements, only being found on parts of the tree which are regularly wet or hold water such as root knotholes or stemflow routes. This was a new species for both Erik and Rasmus. Klaas said “according to literature *Zygodon forsteri* is widespread, but rare, in Europe, ranging from eastern Bulgaria to western Portugal and from southern Spain as far north as Denmark. Interesting is the shift in sporophytes throughout its range. *Fagus sylvatica* is by far the commonest host in the north, several species of *Quercus* are used in the southern part of its range, where beech reaches its southern limits. Before Sally Gadsdon showed it to us I had seen it only once, in Basaula, a small forest reserve occupying a sheltered canyon in the foothills of the Sierra de Urbasa (Navarra). It was abundantly fruiting and easily spotted on several stems of *Quercus faginea* and *Quercus ilex*. The wet rim of rot holes is the usual microhabitat to look for it. In Spain it grows well above the ground, e.g. where branches have broken off from the stem, quite unlike its usual habitat in England where root systems at ground level seem to be preferred. *Zygodon forsteri* is also known from Fontainebleau. Thanks to our field training in Epping we are quite confident to spot it there too!”

### What's the outcome?

One of the main aims is to produce illustrated manuals on cryptogamic indicator species dependent on dead beech wood. There will be three volumes, the first dealing with bryophytes, the second focusing on fungi, and the third will be on all epiphytes as ancient woodland indicators in (semi) natural European beech woodlands. These manuals are aimed at forest managers, staff at national parks and forest reserves, as well as people interested in cryptogams in general. Several scientific papers on the subject have already been published (see references) and there are more to follow (will be listed on [beechboys.eu](http://beechboys.eu)).

### The future

In 2015 the Beech Boys are preparing for a trip to Romania. In the future, a visit is planned to the important Ukrainian reserves, among which is the vast Uholka forest, the largest virgin beech forest in Europe and a UNESCO world heritage site. Also the best sites of Germany and France, including the famous La Tilleul reserve



△ Fig. 2. Klaas surveying beech dead wood in Epping Forest. S. Gadsdon

at Fontainebleau, await further investigation.

After this there will be more data analysis to complete, so the manuals are several years off publication. But for this one day, we knew that a little part of Epping Forest had had a thorough bryological going-over! And we remembered that Epping Forest is very special.

▽ Fig. 3. Erik, Klaas and Rasmus worshipping at the altar of *Zygodon forsteri*. S. Gadsdon

