

Changing Ecology – what might our woods be like in future?

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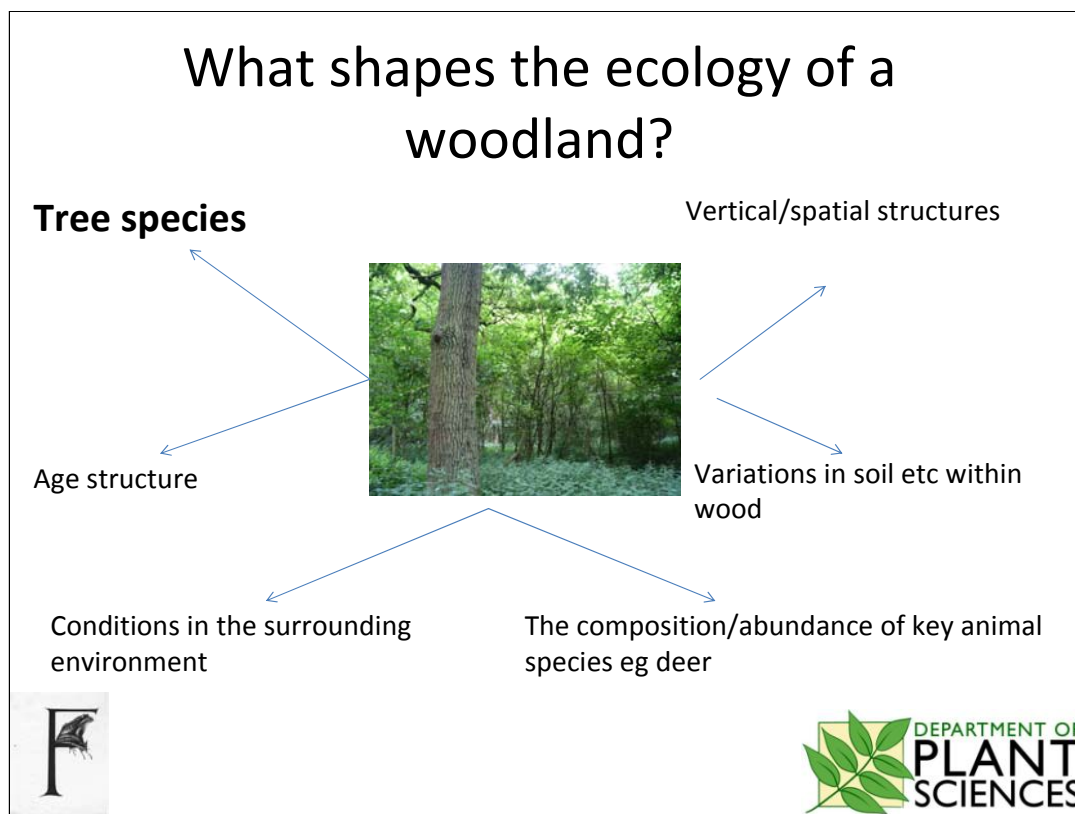
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We live in a cultural landscape. The soils and climate set the framework for what trees and shrubs can grow in an area but history and management have also had a major impact on the composition and structure of our woods. Therefore it is to some extent up to us to decide what elements of the past we value and wish to conserve, albeit perhaps in a modified form; what changes we want to make as part of our contribution to the future landscape. Change should however be approached in a spirit of humility – on the whole it is much easier to make changes that will be seen as wrong in future than to make bold positive moves. The history of our towns is clear evidence of that.

So I have been asked to suggest how we might approach the question essentially of what combinations of trees we might use that will help maintain much of the wildlife that we have inherited and allow the development of rich plant and animal communities in the new conditions of climate, pests and diseases that await us and our successors. In other words what do we do with our semi-natural woods?

I should stress much of what I will say is informed speculation. We do not know exactly what the climate of England, let alone this region is actually going to be like; our ability to predict the composition and function of woodland under the current climate is very limited, so we cannot say what will happen in an uncertain future except in a fairly crude way. Similarly with the new pests and diseases: so far I have found very little information on what has *actually* happened, for example, in continental woods hit by Chalara as far as other plants and animals are concerned.



This is one framework, expanded from work done in 1989 by Peter Mitchell in the Forestry Department which illustrates some of the factors that influence how woods change. I am only going to be talking about tree species changes but these obviously interact with the other factors, some of which have already been discussed.

Background

So woods might change because of changes in tree species – at the time the concern was the effect of coniferisation of ancient woods but now it might be what happens if ash dieback or some other disease takes leads to a change of canopy dominant. But change also happens if you keep the species the same but change the age structure of the stand; or how different layers are distributed vertically or horizontally across the wood.

While not as extreme as in farmland we do also change the soil conditions within sites, by drainage, by the effects of atmospheric deposition – increasing acidity in the 1980s, and continuing to increase Nitrogen levels.

Something we did not think so much about in the 1980s was impact of changes in the surrounding environment on woods, both the sort of long-distance pollution already mentioned but the effects of habitat fragmentation, loss of wider countryside stepping stones such as hedges.

We have also come to realise the profound effects that large herbivores can have on woodland systems.

How does tree species affect ecology?



- Associated species
- Shade
- Litter
- Dead wood
- Bark
- Gregarious

Changes to tree species must lead to other changes in the system.



The tree species affect the rest of the system through:
its shade, affecting understory composition and abundance (both shrub and ground layers)

Litter abundance, composition, degradation

Nature of the bark for epiphytes etc

Gregariousness

Nature of deadwood

There is no escaping the fact that if we change species there will be changes to the rest of the system which we will have to live with.

Different landscapes, different options

- The Chilterns and south
- The Clay Vales and north
- (Urban)



In one sense every wood is unique, but we have to try and suggest some general approaches. So I am going to split things down into three broad situations for the time I have available.

The Chilterns and south; range of soil conditions including free-draining acid ones in places such as Burnham Beeches, but tending to be more base-rich and mesotrophic, particularly in the Chilterns itself. Beech is major component of many woods; ash and oak locally abundant particularly after disturbance.

The Clay Vales to the north. Tend to be heavier soils, often poorly drained. Oak and oak-ash woods tend to dominate, beech is much rarer.

And if there is time I will touch very briefly on urban trees, though this is not my forte.

Chilterns and south

- Beech-oak-(ash) woodland; understorey holly, yew, hawthorn, rowan, (hazel, whitebeam, field maple)
- Species that might fit in?
 - Birch, sweet chestnut, small-leaved lime, hornbeam, pine on sandy soils
 - Sycamore, elm, yew (if disease resistant form), cherry
- Longer shots?
 - Other oaks, ashes, beeches if shown to be disease-resistant & future climate-proof
 - Walnut, hickories, maples (model on N.American forests)
 - Firs, larch in moderation (model on European mountain forests)



On the more acid soils at present the semi-natural mixture tends towards beech and oak at present, but with understoreys of holly, some hazel, hawthorn, occasional rowan. The understorey is currently relatively free of disease, indeed on many sites holly may be getting too vigorous.

On the richer sites there is a wider range of understorey species that could be favoured where production is not an issue including whitebeam, hazel, field maple as well as those mentioned above.

Possible other species which might fit in with a continuing element of oak, beech and ash, to give similar types of shade, litter and dead wood conditions could be birch that comes up in regeneration, sweet chestnut as a possible substitute for oak, small-leaved lime and on appropriate sites pine as part of mixtures. On the richer soils sycamore has a place, as might elm if a disease resistant form is found.

Where more radical change might be acceptable then we could look perhaps to other types of model for our forests: are there other oaks, beeches or ash that are disease and future-climate proof?

Could we look to North American temperate woods which have many similar types of community to ours, but with a much wider range of trees and shrubs in both the canopy and understorey?

Or to the mountain forests of southern Europe and include elements of fir and larch?

Clay Vales and north

- Oak-ash woods; understories of hazel, hawthorn, maple more significant
- Species that might fit in:
 - Birch, sweet chestnut, small-leaved lime, hornbeam, pine on sandy soils
 - Sycamore, elm (if disease resistant form), cherry, alder (?disease), poplar, willows
- Less role for other conifers



Obviously to some extent it is a similar range of species, except that often the soils are more poorly drained and beech is much less a component of the semi-natural woods until you get to the Cotswolds. I think we could see more of a role for species such as alder (subject to the disease question), poplars and willows. I see less of a natural role for conifers in this area; there seems to be less of a natural analogue and past experience has generally not been good on these types of soils and locations. The understorey shrubs tend to be a more significant part of ecology and conservation interest of these woods, so the dense shade casting species such as chestnut, lime or hornbeam need to be used with caution.

Urban

- What will grow in an artificial environment!
- A mixture – but blocks by street?
- Rich in flowers and fruits
- Low maintenance, now and in future
- Past nativeness less of an issue



This is not an area I have done much work, so these are very much top of head stuff. I think there can be a much wider choice of species in urban areas – it is an almost entirely artificial habitat and increasingly an artificial environment (heat island effects, changed nutrient and drainage regimes). We should avoid too much reliance on one species although the scale at which we mix things needs careful consideration – street scale. We want species rich in flowers and fruits to support a wide range of other species.

Not large-scale rapid change!

- Leave some woods alone
- Experiment first with least valuable sites
- Change at a small-scale first
- What we have is diverse, distinctive, valued
- What we hand on must be equally good



I believe even our semi-natural woods are going to need to change and we will need to help manage that change. But this is not an endorsement of going in and making large-scale rapid changes in the next ten years. In some sites it may be forced on us, but for the most part we should be talking 'evolution, not revolution'. We should be trying the changes on the least valuable sites (ecologically) first - so in recent woods, or perhaps on those plantations on ancient woodland sites where some planting is unavoidable anyway to replace past conifer crops. Again, where we can change should be on a small scale first, only gearing up when we are sure that we are satisfied with the outcome. And we should be leaving some woods alone as far as possible to see what the outcome is if we do not intervene.

We know what we have is diverse, distinctive, valued in wildlife terms. We must make sure we hand on something equally good, if different. I stress the cautious approach because remember all those town centres demolished in the sixties and seventies to be replaced by identikit office blocks and shopping centres. That is what we risk happening to our woods.

Thank you

