Exploring oak woodland

Looking for regeneration

Prof. David Streeter:
One of the most evocative scenes of the English countryside, an oak wood in spring. Not only is it very attractive with all the bluebells in full flower, but it has a kind of primeval feel about it. But I wonder just how natural is it. One of the things that surprises me looking around is that all of the oaks appear to be of an age. I can't see any dead or decaying trees - there are no giants of the forest lying dead on the ground. Neither can I see any young trees or saplings come to that. And that I think is surprising because if the woodland is to be a self regenerating community I would expect to see the next generation coming up.

And indeed this lack of regeneration is one of the things which has been worrying foresters quite a bit recently and I think it would be useful to explore that a little bit further.

An absence of regeneration, a lack of young trees, suggests that something is going wrong with the life cycle of the oak itself and the first thing we want to find out is where that failure is happening. And the first stage in the life cycle is the flowering, so what I'm doing here is to see if I can find any oak flowers. Now what I've found first is the remains of this year's male flowers hanging in the catkins, so there's no absence of male flowers, there's this years dead catkins. So I need to find whether there are any female flowers for the pollen from the male catkins to fertilise. And for that I need to look at the tips of the shoots amongst the leaves and yes, lo and behold, there is a nice spike of oak female flowers which have been pollinated and already set to develop into acorns during the summer. So we've got flowers. Do we have any acorns? So the next stage is to look for acorns, and of course at this time of year, the third week in May, there are no young acorns, so I have to look for last autumn's acorns amongst the leaf litter.

Ah, here we are – there's some of last year's acorns, there's a cup, there's a cup with an acorn in it. And here's an acorn which won't have germinated, because it's been attacked by a fungus which has turned it into this hard, black mass. That's a fungus called Ciboria batschiana.

And of course many of the acorns will have been eaten by jays and also by squirrels and also off the tree whilst they're still green by wood pigeons. And I expect that small rodents will have accounted for quite a lot as well. On the other hand a good oak tree, a mature tree in a good year will produce anything up to ninety thousand acorns, so at least some of them should have survived in order to germinate and produce seedlings.

Well here's a nice little crop of this year's oak seedlings, and some of them here look. This one here has got at least 8 leaves on it already, extremely healthy, so there wouldn't appear to be anything the matter with the oak acorn germination. Here on the other hand is a seedling which looks much less healthy, in fact most of the leaves there have been chewed. So something's had a real go at those, and I think if we probably look a little bit further, yes here's one which no longer looks like an oak seedling at all. It's got no leaves left whatever, all the leaves have been eaten off, so that's clearly not going to survive.

So where have all these caterpillars come from which appear to be defoliating these young seedlings?

I think the answer lies above my head because if we look up we're right underneath the canopy of this big oak. The canopy of a tree is an extremely hazardous place for a young caterpillar - it can either get knocked off or blown off or washed off and I guess within a week's time it will be raining caterpillars down here, and they will have a go at all of these

seedlings and there'll be very few left within a very short time. And looking around I can't see any young trees or young saplings, so the answer to our problem seems to be here. The lack of regeneration in this wood is due to young caterpillars damaging the seedlings under the canopies of the trees.

So an oak seedling is unlikely to survive if it germinates under the shadow of its own parent. To have any chance of survival an acorn needs to germinate in a clearing and clearings are formed where an old tree falls, and if we look around the wood here what is missing as well as young trees are old trees. Most of the trees that we see are about a hundred and fifty years old probably re growth following felling at the beginning of the last century.

Why were they felled then? Well the most likely explanation is that the oaks were needed to build the ships that England needed in her fight against Napoleon. So Napoleon's attempts to conquer Europe at the beginning of the nineteenth century has had the effect of reducing the regeneration of this oak woodland in Sussex at the end of the twentieth century.