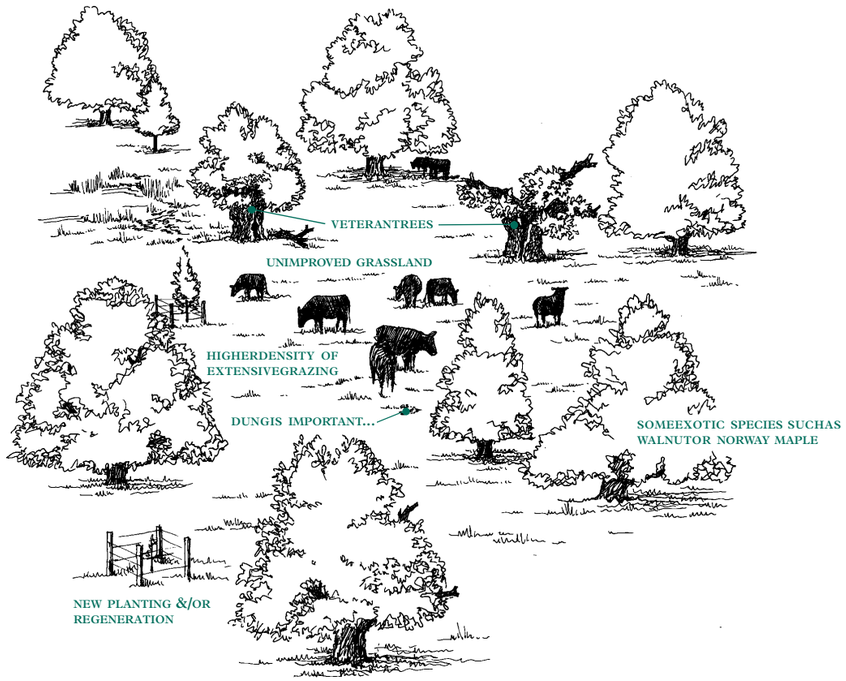
**Figure 40.** *Site characteristics and management for parkland lichens.*




*Translocations should be seen as a last resort where lichen trees have to be removed or are threatened. It can also be considered for boosting relict populations in damaged sites. Translocation has a low success rate and does not work for crust forming species. Try to find a tree as similar as possible to the host tree and use isopon glass fibre resin as glue ('bostic', 'evostick' and 'araldite' all might work but have been shown to induce some necrosis on the lichen). Try to take a part of the bark with the lichen and apply the glue to the bark. Recent experiments with lichen thallus lobes or small thallus fragments fastened to a new tree by nylon mesh staple to the bark have proved more promising than older techniques.*

**Further reading:** Adams (1996), Gilbert (1984, 1991), Harding and Rose (1986), Hodgetts (1989), Reed (1996), Rose (1976, 1991, 1993), Sanderson (1996b), Scheidegger *et al*. (1995).

## 7.4 Ground flora

While the main conservation value of sites with old trees is usually the trees themselves and the organisms living on them, the ground flora between the trees can be of interest in its own right. This aspect is also covered in chapter 5.

Examples of vegetation types include:

- Woodland - where the canopy of ancient trees (and associated younger trees) is dense enough that the ground flora is of a woodland type.
- Grassland - where the trees are spaced widely enough and the land is grazed so that pasture results.
- Heathland - as above but on heathy sites where heather dominated communities arise.
- Hedgerows - where ancient trees occur as part of ancient hedges.

On some sites with veteran trees a decline in grazing has caused a change in the ground flora and one option for future management is to reinstate the grazing. The merits of opening up woodland to recreate former wood-pasture must be carefully considered. Ideal management of the trees should take first priority, then the ground flora. Is the woodland flora of higher value than the pasture/heathland that will result? A specific rare or unusual species of plant that is not associated with the veteran trees can usually be protected/managed for without compromising the trees themselves.

Veteran trees in hedges are particularly vulnerable to damage by hedge trimmers, and flails. It is also necessary to ensure that some young trees are left in hedges to grow on and become ancient hedgerow trees of the future. Those at field corners often have a better chance of survival than those along the length of hedges.

**Further reading:** Harding & Rose (1986), Sanderson (1996a), Sanderson (in prep.)

## 7.5 Fung i

### 7.5.1 Fungi and veteran trees

Our understanding of the role of fungi in woodlands and especially woodlands of veteran trees has changed completely in recent years. Even as recently as the 1970s some people considered that the fungi rotting and hollowing out a veteran tree were detrimental to it and that fungal fruiting bodies on a trunk meant that the tree was soon to die. Fungi are fundamental to the growth of the tree and fulfil an important role at all stages in its life (Figure 41) see section 3.5 for more information about the role of fungi in the decay process. Remember that the fruiting body is just a tiny part of the organism; the rest, the mycelium, is very extensive but less often seen.

**Fungi are beneficial to veteran trees and the organisms associated with them in the following w ays:**

- **As mycorrhizal species. There are two different types**
  - Ectomycorrhizae where the fungus sheaths the roots of the tree, eg fly agaric, boletes and amethyst deceiver.
  - Endomycorrhizae or vesicular arbuscular (VA) where the fungus penetrates the cells of the roots. These are much smaller fungi and less easy to see.

  **Mycorrhizae enhance the ability of the tree to take up phosphorus and nitrogen and in return the fungi gain carbohydrates. The fungi probably also help the tree withstand drought, pollutants and pathogens. It has been shown that trees grown without their mycorrhizae are very poor specimens. Most plants have mycorrhizal fungi associated with them, not just trees.**
- **As nutrient cyclers. Fungi are one of the main agents of decomposition for both leaves and woody material on the woodland floor and inside the tree. They recycle nutrients from the dead plant material and make them available again. The products of the fungal decomposition are taken up by invertebrates, plants, and even the trees themselves when aerial roots from the tree grow into the rotting trunk.**
- **As a consequence of the decay inside the tree,especially in veterans,the conditions are created for a range of animals and plants including saproxylic invertebrates, birds and bats.**
- **Through an interaction between the fungi and the trees, zones of decay within living trees become 'compartmentalised'. This creates a range of different microhabitats within a single tree. The presence of one species of fungus may inhibit the growth of others and may confer protection from more aggressive species.**
- **The fruiting bodies of the fungi provide a food resource for invertebrates and mammals.**

Not all fungi are beneficial to trees. Some are pathogenic and can kill trees, but they are in the minority. Pathogenic fungi tend to be far less common in natural woodlands than in plantations and isolated trees in ornamental situations. There are a few important points to be remembered when a pathogenic species is suspected:

- **Many pathogens take hold when the tree is already stressed for some reason, eg by drought or shading.**
- **Some pathogenic species are in fact species groups in which individual species vary considerably in their behaviour, eg of the honey fungi, *Armillaria mellea* can be pathogenic but *Armillaria gallica*, which looks almost identical, is more frequently found in woodland situations and is only weakly pathogenic.**
- **Some species produce copious fruiting bodies on freshly dead wood but are not responsible for the death of the tree, eg oyster fungus.**
- **Heart rotters are not usually pathogens;they are just causing the decay of the dead wood in the centre of the tree, eg *Laetiporus*.**
- **Pathogenic species are more likely to be a problem when trees are in monospecific stands or more or less isolated within agricultural land or gardens, rather than in natural woodland situations.**

However, there are some situations when fungi can at least contribute to the decline of veteran trees. An important example is the growth of *Bjerkandera adusta* (a sap wood colonising species) on pollarded hornbeam in Essex. This highlights the need to carry out work on a few trees at a time and alter the programme in the light of experience. *Bjerkandera* seems to be encouraged by the drying out of exposed wood following complete crown removal.

Like other organisms some fungal species are rare and threatened. Many of those found hollowing out old trees have restricted distributions as do some of those found on undisturbed grassland areas surrounding old trees. Of the 447 macrofungi on the British Red Data Book list all but 50 are from ancient woodland and lowland wood pasture. Most of them are wood decomposing or mycorrhizal.

In view of their importance, and in some instances conservation status, measures to conserve fungi should be considered.

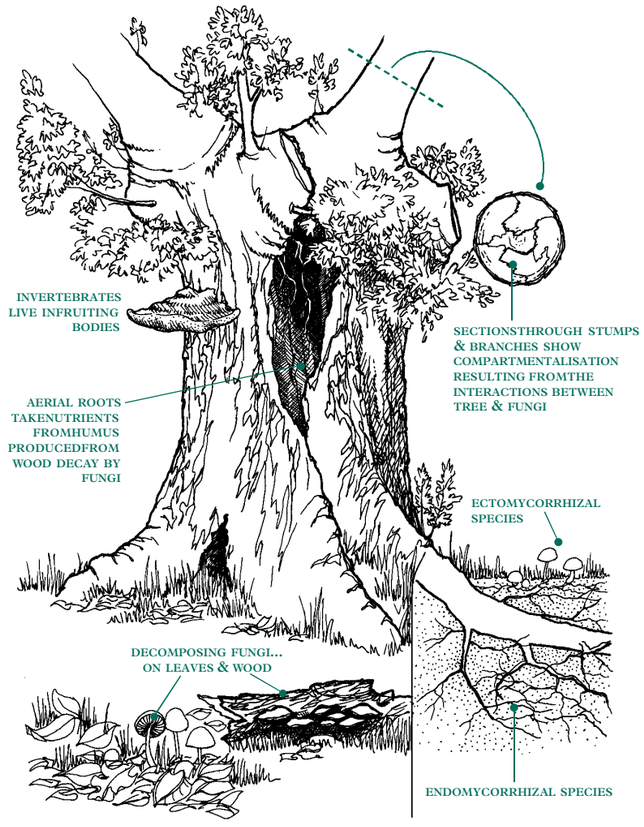



**Figure 41.** *The importance of fungi for veteran trees.*

**Figure 1.** *A veteran oak tree in Lincolnshire.*

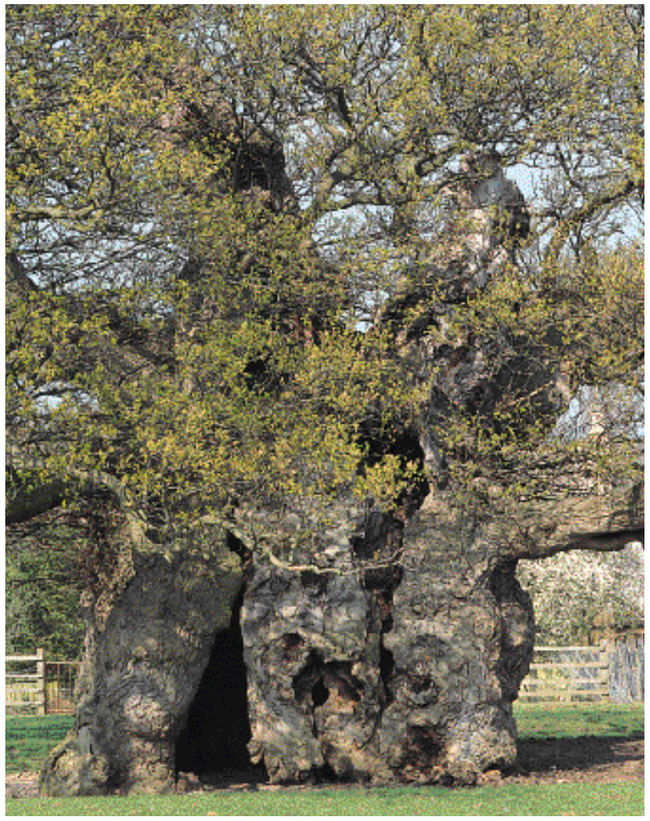


**Figure 2 .** *Veteran hawthorn pollards at Croft Castle (Hereford).*