Woodland Fungal Communities

***Amanita friabilis, Butryiboletus fuscopurpureus, Imperator rhodopurpureus, Imperator torosus, Cantharellus friesii, Cantharellus melanoxeros, Chlorencoelia versiformis, Chrysomyxa pirolata, Cotylidia pannosa, Hericium coralloides, Hericium erinaceus, Hydnellum concrescens, Hydnellum ferrugineum, Hydnellum spongiosipes, Hygrophorus pudorinus, Hypocreopsis lichenoides, Hypocreopsis rhododendri, Mycena renati, Phellodon confluens, Phellodon melaleucus, Phellodon niger, Phylloporus pelletieri, Piptoporus quercinus, Podoscypha multizonata, Puccinia physospermi, Puccinia thesii, Sarcodon squamosus, Sarcodontia crocea, Sarcosphaera coronaria, Stephanospora caroticola, Tremella moriformis, Tremellodendropsis tuberosa, Urocystis colchici*) Also covers a further 19 UK Red List Boletales, and over 100 provisional UK Red List woodland fungi.**

© Oak polypore, Mark Gurney

Areas and status: Rich fungal communities or individual rare species can potentially exist in any wooded habitat across the UK. As a generalisation, large contiguous blocks of semi-natural ancient woodland supporting diverse tree, shrub and herb cover offer the most opportunities, but plantations on ancient woodland sites, sweet chestnut coppice and other lesser priority habitats can also support important assemblages of fungi, including BAP species.

Woodland type: Upland Broadleaved Woodland, Lowland Broadleaved Woodland, Plantation Woodland, Wet Woodland, Wood Pasture.

Preferred habitat niches: Woodland fungi requirements do not always fit comfortably with either commercial forestry or conservation management practices. Fundamentally, the fungi need moist, undisturbed low light areas of woodland to thrive, so that any prescriptions for major ride, glade, coppicing, thinning/felling and PAWs restoration works can have at least a short-term detrimental effect on fruiting, and possibly cause long-term damage to underground mycelia through compaction and desiccation. Minimal managed semi-natural ancient woodland that supports mature and veteran trees will offer the best niche for mycorrhizal fungi and for saprotrophic litter and dead wood species. Softwood plantations will sometimes support diverse communities of fungi, with those mixed with broadleaves offering the best opportunities. In any woodland, regeneration of the native canopy trees and shrubs is vital. Many woodland fungi associate with a particular tree or shrub species, or form intimate links to various species of tree, creating a symbiotic relationship that is necessary for the continued health of both tree and associated fungi. The smaller fungi found on a host of vascular woodland plants should not be ignored.

Potential habitat management issues associated with decline:

- Lack of knowledge of presence and distribution of fungi
- Woodland loss and fragmentation
- Management promoting permanent open space and leading to extra light source to forest floor
- Deer presence
- Loss of standing and fallen dead wood
- Commercial picking

Potential habitat management solutions:	
Prescription	*Comment*
Organise mycological surveys	Perhaps the most important aspect of fungal conservation is the lack of knowledge surrounding presence and distribution of fungal species. The main issue is that the fungi exist unseen in the substrate most of the year, and then may only fruit fitfully in some years. However, it is important to undertake mycological surveys, especially if management is planned, as these will begin to identify suites of species present, and will also allow an assessment of the potential for the site to support significant fungal assemblages. Ideally, a survey over three seasons is recommended to allow for climatic variation. Long-term monitoring is particularly valuable. Many woodland owners now encourage annual surveys which start to build up a picture of the importance, or not, of a particular woodland for fungi.
Maintain woodland cover	Woodland fungi, with few exceptions, fruit poorly when exposed to high levels of light and warmth, such as follows coppicing or other woodland clearance. Edge effect of fragmented woodland blocks has the same detrimental impact. A regular traditional coppice cycle (hazel, sweet chestnut) is not considered permanently damaging, as re-growth is usually rapid over a short number of seasons and ground flora lacks the capacity to fully dominate. Derelict mixed coppice with standards is an

	important niche habitat for many mycorrhizal fungi and management should be approached with caution in these stands, leaving some compartments uncut for the long term. Ensure that the woodland is regenerating so that trees and shrubs are self-perpetuating. Restocking is a last resort. Management prescriptions allowing for long term open ground, such as wide rides and large glades will have a detrimental effect on most but not all woodland fungi present. There will be increased light alongside increased competition from vascular plants. Regular maintenance of the open areas usually requires some form of cutting or mowing which again may cause damage to fungi. Knowledge of the distribution of fungi before planning new rides and glades will limit the impact on mycologically valuable hotspots.
Protect important fungal assemblages during harvesting	All harvesting operations have the potential to permanently damage fungi. Heavy plant driven over the forest floor will cause compaction and deep rutting which can damage underground mycelia, possibly severing the link between tree and fungus. If the presence of important fungi is known then extraction routes should be planned to avoid them. During harvesting, ensure that selected mature trees are retained to grow on as veterans. These need to be healthy individuals with assured longevity to survive, rather than weak or damaged trees. Large brash fires in close proximity to each other should be avoided in areas known to support key fungi. Occasional fires on carefully chosen sites can add to fungal diversity as some species grow specifically on burned ground and charred wood. Large piles of unburnt brash do not offer significant habitat for fungi, and can restrict fruiting beneath the heaps. Where practical, brash is better left scattered on the woodland floor. A percentage of softwood species should be retained during PAWs restoration projects. Biomass harvesting is of particular concern as it has the potential to cause regular damage with heavy cutting and extraction machinery. The short cutting rotation typical of biomass operations prevents the formation of a closed canopy and thus creates exposed permanent open space dominated by vigorous vascular plants.
Control and monitor deer populations	Deer browsing potentially causes problems for fungi, depending on its severity. Heavy browsing of a particular shrub or plant will have a negative impact on any fungal species specifically dependant on the browsed plant, especially if the plant is ultimately unable to regenerate. Heavy browsing can lead to drying out of the forest floor by allowing higher light levels through the canopy, and ground compaction from concentrated browsing and resting areas.
Retain standing and fallen dead wood	Standing and fallen dead wood should be left in situ unless health & safety considerations dictate otherwise. If dead wood needs to be removed it should be carefully transferred wholesale to an area of forest in close proximity rather than cut up and removed off site. Wind-throw, tall snagged stumps, large trunks and whole fallen limbs provide superior fungal habitat compared to stacked log wood and brash piles. Tree surgery of damaged tree limbs should be avoided.
Commercial picking	Some forests are targeted by commercial pickers supplying the restaurant trade. The long-term effects of this practice on fungi are not known but this type of collection should be monitored and discouraged. There are issues around ground compaction in frequently visited areas. Commercial pickers will often collect indiscriminately, removing unidentified fungi from the wood where others will sift through for edible species, discarding the rest. This removes considerable fungal biomass from the woodland for little gain, whilst destroying a valuable food source and habitat for a host of woodland invertebrates.