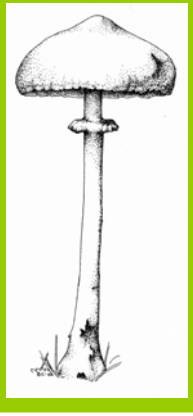
# Fungi Generic Action Plan

STATUS

***Fungi are protected by two items of legislation. Under The Theft Act 1968, it may be an offence to uproot and/or sell fungi without the landowner's permission. The Wildlife and Countryside Act 1981 (as amended), protects four species of fungi, none of which are found in the Durham area. Areas of land designated as Sites of Special Scientific Interest (SSSIs) or National Nature Reserves (NNRs) have special protection which may restrict the collection of fungi.***



## WHAT ARE FUNGI ?

Fungi are living organisms but technically they are classified as neither plants or animals, being placed in a separate kingdom - Fungi. In non-technical terms, they are often referred to, along with a number of other groups as 'non-flowering plants'.

The term fungi includes puffballs, cup fungi, moulds, mildews, rusts, smuts, toadstools and mushrooms. Unlike plants they do not produce food by using energy from sunlight but grow by absorbing food and water from their surroundings, mainly from dead animals, plants and their waste products (saprobes). A few fungi are parasitic and an important group form mutually beneficial mycorrhizal associations with the roots of trees and many other plants (e.g. orchids).

Most fungi are made up of minute tubes called hyphae. Individual hyphae are small, but they can form large interconnected masses called mycelia which grow on or in plant and animal material, or in the soil. When conditions are right, often in the autumn, the mycelium produces a spore-bearing growth known as the fruiting body. The fruiting bodies of fungi may be small and inconspicuous (microfungi) or much larger and appear as toadstools, brackets, puffballs or jelly fungi (i.e. macrofungi). The fruiting bodies bear spores which are dispersed through wind, rain or by contact with insects and animals. If they are deposited on a suitable substrate the spores germinate.

Their biochemical diversity means that fungi have great pharmacological potential and fungi are used in many fields of medicine. Fungi are also a source of food, flavouring and an ingredient in human food production e.g. bread, beer.

## WHERE ARE THEY FOUND IN THE UK?

Fungi are present everywhere - even on rocks and artificial materials. Approximately 13,000 described species are known to occur in Britain. Many others await discovery or formal description.

## WHY ARE FUNGI OF CONSERVATION IMPORTANCE?

Fungi play a vital role in maintaining the dynamic equilibrium of natural ecosystems and are important in the global carbon cycle; they are essential recyclers. In woodlands, fields and wetlands they assist in the processes of decomposition of dead plant and animal material as well as forming mycorrhizal associations with plant roots. These mycorrhiza assist in plant growth by making nutrients such as nitrogen and phosphorus available to the vascular plant whilst the fungus obtains sugars from the plant. Some fungi also form inseparable associations with algae to produce lichens.

Fungi are very sensitive to environmental pollution. They accumulate certain pollutants (e.g. heavy metals, radioactive elements) and are effective measures of the environmental health of their habitat. Some mycorrhizal fungi are sensitive to acid rain.

Some fungi appear to be indicators of ancient woodland. They are also used extensively by invertebrates as a food source, even species that are poisonous to humans. Mice and deer also use fungi as a food source. The process of the breakdown of wood provides a suitable habitat for a wide range of invertebrates. In the UK, over 1,000 species of invertebrates are dependent on fungi. Some of these species are threatened and legally protected.

Many drugs, currently in use are derived from fungi. Examples include antibiotics such as penicillin and cyclosporin as well as the migraine drug, ergotamine. Fungi are also used in genetic research.

Fungi also have considerable cultural value, having a strong mythology and folklore relating to their occurrence, growth and properties (some species of fungi are hallucinogenic). Mushrooms and toadstools visually enhance the habitats where they grow; people like to see them, collect them and take part in 'fungus forays'.

## FUNGI IN THE DURHAM AREA

### HOW HEALTHY ARE THE POPULATIONS OF FUNGI?

It is unlikely that any of the fungi listed in the national Short, Medium or Long lists are found today in County Durham. Two species from this list which were present in the Durham area - *Poronia puctata* and *Haploporus odorus* are thought to be extinct and other species on the national lists are unlikely to occur, because their habitats no longer exist in the area. An example is *Hygrocybe spadicea*, a wax cap, which may have occurred in the past along with many other wax cap species but whose habitat, unimproved sheep pasture, has now been lost.

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There is evidence, however, that some species with a more southerly provenance are moving into the area, possibly as a result of climate change. Indeed some of these may prove to be important monitors of such change. Moreover, a few new British records have been made in the Durham area. Some species with a northerly distribution are also moving into County Durham. This might be due to the planting of conifers on high ground which reduces the level of sheep grazing. This, in turn, allows a few broad-leaved trees and shrubs to become established, adding variety to the habitat, which encourages fungal diversity.

## HOW MUCH DO WE KNOW ABOUT FUNGI IN THE DURHAM AREA ?

In common with the rest of the world, comparatively little is known about fungi in County Durham, due to a shortage of mycologists and the inherent difficulties in finding fungi in perfect condition and identifying them. Before 1980, the total species count for the Durham area was 850. Many of these species had not been recorded for over 100 years. By mid-2001, the total had reached circa. 2,300. New records are routinely being made but it is only possible to estimate the number actually present. Over 1,100 species have been recorded in the highly artificial environment of Darlington West Cemetery.

## WHERE HAVE FUNGI BEEN FOUND IN THE DURHAM AREA ?

Fungi are found everywhere in the Durham area, although some habitats support larger and more varied populations of fungi. Woodlands, wooded valleys and unimproved grasslands all support large numbers of fungi.

Notable sites include: Chopwell Wood, Gibside, Derwent Reservoir (south-west shore woods), Derwent Gorge, Rainton Park and Moorhouse Woods, Kepier Wood, Elemore Wood, Tunstall Reservoir, Castle Eden Dene, Baal Hill Wood, Hamsterley Forest, Rosa Shafto, Low Barns (Witton-le-Wear), Bowlees area - Teesdale, Kings Walk - Middleton-in-Teesdale, Auckland Castle grounds, Hardwick Hall Country Park, Wynyard Park, Flatts Wood - Barnard Castle, Whorlton and Winston river bank woods, Darlington West Cemetery, Blackwell Carr, Darlington, Thornley Woods and Derwent Walk Country Park.

## FUNGI ARE AT RISK FROM:

Habitat loss and fragmentation - loss and disturbance of old woodland, heathland, unimproved grassland, wetlands as well as urban encroachment have all adversely affected fungi populations. Minor losses have occurred through road realignment, scrub encroachment on heath, infilling of old quarries, ploughing of old pastures, loss of boundary features and inappropriate tree surgery and felling.

Acid rain and air pollution - there is some evidence that fungi are susceptible to acid rain, particularly mycorrhizal species.

Pollution of land and water from agriculture - the widespread use of fungicides, herbicides and pesticides adversely affect populations of fungi.

The increased amount of recreational time now available to the public and the consideration given to the Health and Safety at Work Act. Many old trees are now being felled due to the perceived danger to the public from falling, dead wood and the increasing trend of claiming for compensation in such incidents.

Lack of baseline knowledge due to the fact that there are only a very small number of competent mycologists to collect and disseminate information regarding fungi in the Durham area.

Lack of general awareness about the ecological importance of fungi and the need to conserve them.

Vandalism - this is a more serious problem in and near urban areas. Many fruiting bodies, especially puffballs and toadstools, are destroyed.

## FUNGI BENEFIT FROM:

Habitat management and protection - this is a key factor in the conservation of fungi.

The recognition of dead wood as an important habitat and the necessity of its presence in woodlands as an integral part of the ecosystem.

The re-creation of semi-natural habitats such as unimproved meadows and pastures, woodlands, bogs and marshes.

The creation of wildlife corridors and conservation measures in the wider countryside.

Informing landowners of the presence of rare or uncommon fungi and offering conservation advice.

Reduction of the adverse effects of agriculture.

Ongoing surveying and monitoring of the range of fungi species present in the Durham area.

Further research and monitoring into the ecology and conservation requirements of local fungi.

Responsible collection and the implementation of the "Wild mushroom pickers code of conduct" (British Mycological Society *et al*, English Nature 1998) by collectors.

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## IMPORTANT HABITATS FOR FUNGI:

***Semi-natural ancient woodland***
***Broadleaved woodland***
***Coniferous woodland***
***Unimproved grassland***
***Heathland***
***Dead wood***
***Urban areas including parks and cemeteries.***
***Coastal sand dunes***
***Herbivore dung***
***Sites of recent fires***

## OTHER SPECIES AND HABITAT ACTION PLANS COVERING ISSUES RELEVANT TO FUNGI:

| | |
|---|---|
| ***Upland calcareous grassland*** | * |
| ***Upland and coastal dene ash woodland*** | ** |
| ***Upland oakwood*** | ** |
| ***Wet woodland*** | ** |
| ***Parks and amenity grasslands*** | * |
| ***Lowland pastures and meadows*** | ** |
| ***Lowland heathland*** | ** |
| ***Lichens*** | *** |
| ***Coastal lichens*** | *** |
| ***Coastal sand dunes*** | *** |

*N.B. ** indicates action plan produced in 1998.*
** indicates action plan produced in 2000.*
**** indicates action plan produced in 2001*

## FUNGI AND THE LAW

None of the species known to occur in the Durham plan area are specifically protected in law, though protection may be conferred on them at some sites due to site designation.

## TARGETS FOR THE CONSERVATION OF FUNGI IN THE DURHAM AREA:

| | | ***DATE*** |
|---|---|---|
| ***Target 1*** | ***Maintain current population and diversity of fungi species in the Durham area.*** | ***ONGOING*** |
| ***Target 2*** | ***Enhance the knowledge of the number and diversity of fungi found in the Durham area by increasing the number of records and recorders by 5% each year from 2002 to 2005.*** | ***2005*** |
| ***Target 3*** | ***Raise general awareness of fungi, their diversity and economic importance by supporting the organisation of 10 fungi-related events (media/ public) by 2005.*** | ***2005*** |
| ***Target 4*** | ***Support the setting up and maintenance of a database for local fungi records.*** | ***2005*** |
| ***Target 5*** | ***Provide guidance for 50 local landowners and managers regarding the conservation of fungi by 2003 and for 200, in total, by 2005.*** | ***2005*** |

# Fungi

| FUNGI ACTIONS | | | |
|---|---|---|---|
| ACTION | DATE | POSSIBLE PARTNERS | MEETS TARGET NO. |
| POLICY AND LEGISLATION | | | |
| 1. Consider the designation of protected areas for their fungal interest. | 2002 | EN, DWT, NEFSG, LAs | 1 |
| SPECIES MANAGEMENT AND PROTECTION | | | |
| 2. Identify habitats and areas of conservation importance in the Durham area. | 2002 | NEFSG, DWT, DBAP, EN, LAs, FC, NT | 1 |
| 3. Encourage site managers and land owners to survey and record fungi present on their land and to manage the land to encourage fungi. | 2002 ONWARDS | DWT, DBAP, EN, LAs, Land Owners | 1, 2 |
| 4. Encourage site managers and land owners to include contingencies for fungi in the production of management plans and practical site management | 2002 ONWARDS | DWT, LAs, EN, NT, NEFSG | 1, 2 |
| 5. Identify any species that are rare, scarce under threat or in decline. | ONGOING | NEFSG, Local Experts, DWT, DBAP, EN | 1, 2 |
| RESEARCH AND MONITORING | | | |
| 6. Provide support for the maintenance of a database of fungi records in the Durham area. | ONGOING | EN, DCC, EDC, DWT, DBAP, Universities | 4 |
| 7. Encourage the submission of all records to the Local Records Centre. | ONGOING | All Partners, Local Communities | 4 |
| 8. Investigate the ecology of fungi to gain insight into the management required to conserve them. | ONGOING | Universities, Local Experts | 1, 2 |
| 9. Provide support for the Fungi Group in the collection and collation of data. | ONGOING | DWT, DBAP, Local Experts, Universities | 1, 2, 4 |
| ADVISORY | | | |
| 10. Increase general awareness of fungi amongst landowners and managers. | ONGOING | LAs, EN, NEFSG, DBAP, DWT | 1, 2, 3, 5 |
| 11. Provide management guidance to relevant land owners and managers. | ONGOING | DWT, EN, NESFG, FWAG, DEFRA | 1, 2, 3, 5 |
| 12. Support the use of EN's fungi guidance document. Distribute to all major land owners in DBAP area. | 2003 | DBAP, EN | 1, 2, 4, 5 |
| COMMUNICATIONS AND PUBLICITY | | | |
| 13. Publicise the existence of the Fungus Group to a wide range of organisations and support events to encourage people to join NEFSG. | 2003 | NEFSG, DBAP | 1, 2, 5 |
| 14. Publish information to the public about fungi via a website. | 2003 | NEFSG | 1, 2, 5 |
| 15. Increase public awareness of the ecological importance of fungi and their conservation by means of events, provision of interpretation. | 2003 | CA, LAs, DBAP | 1, 2, 5 |