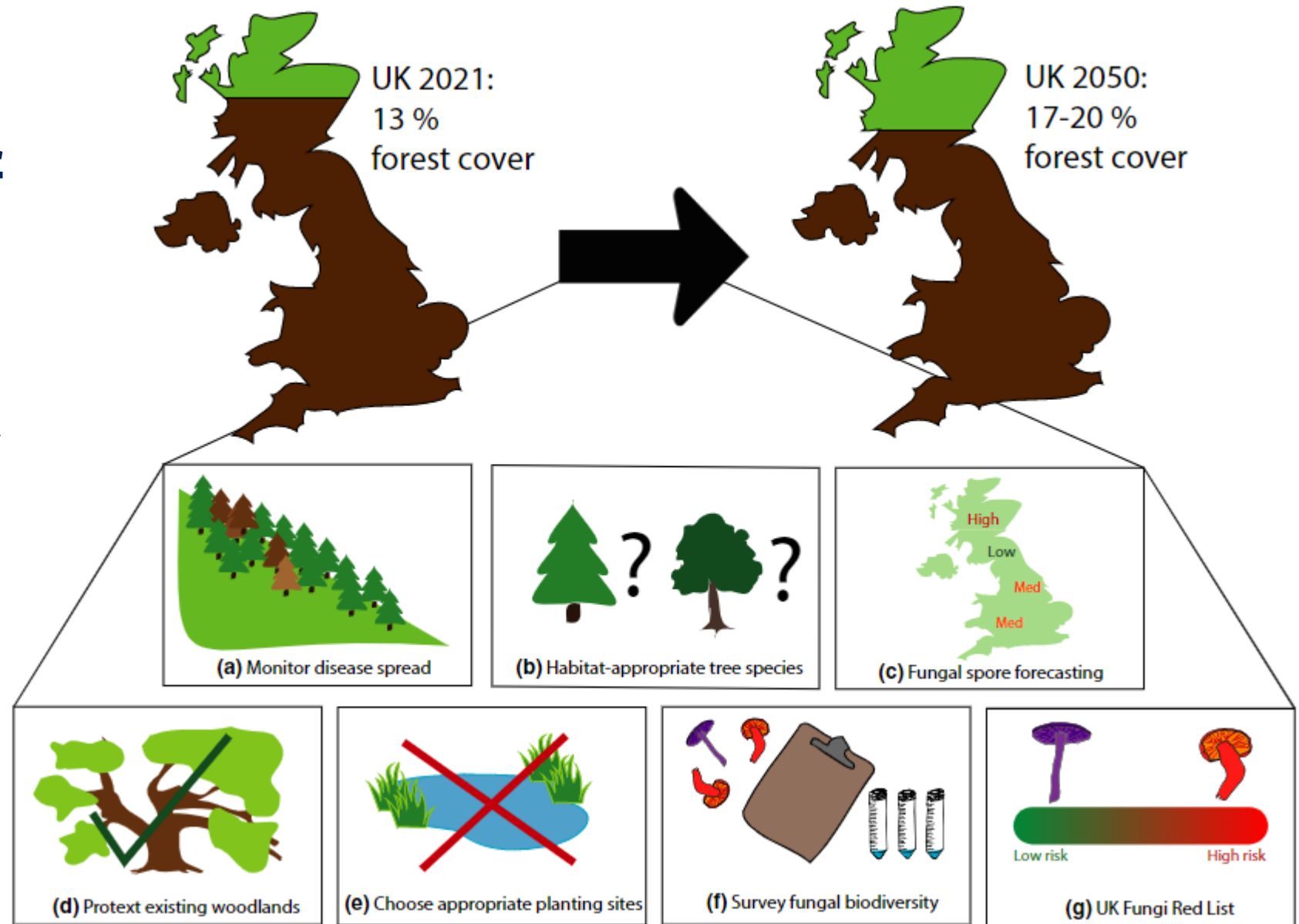


The importance of fungi in the context of UK tree planting

Aileen Baird



UK woodland creation targets

- Increase UK woodland cover from current ~ 13% to 17-20% by 2050
- England woodland cover from current ~10% to 12%.
- 30000 hectares woodland creation per year goal
- £500 million of Nature for Climate Funding to be spent on trees & woodlands



The England Trees Action Plan 2021-2024

May 2021



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The Tree Action Plan does not mention fungi



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Fungal tree diseases

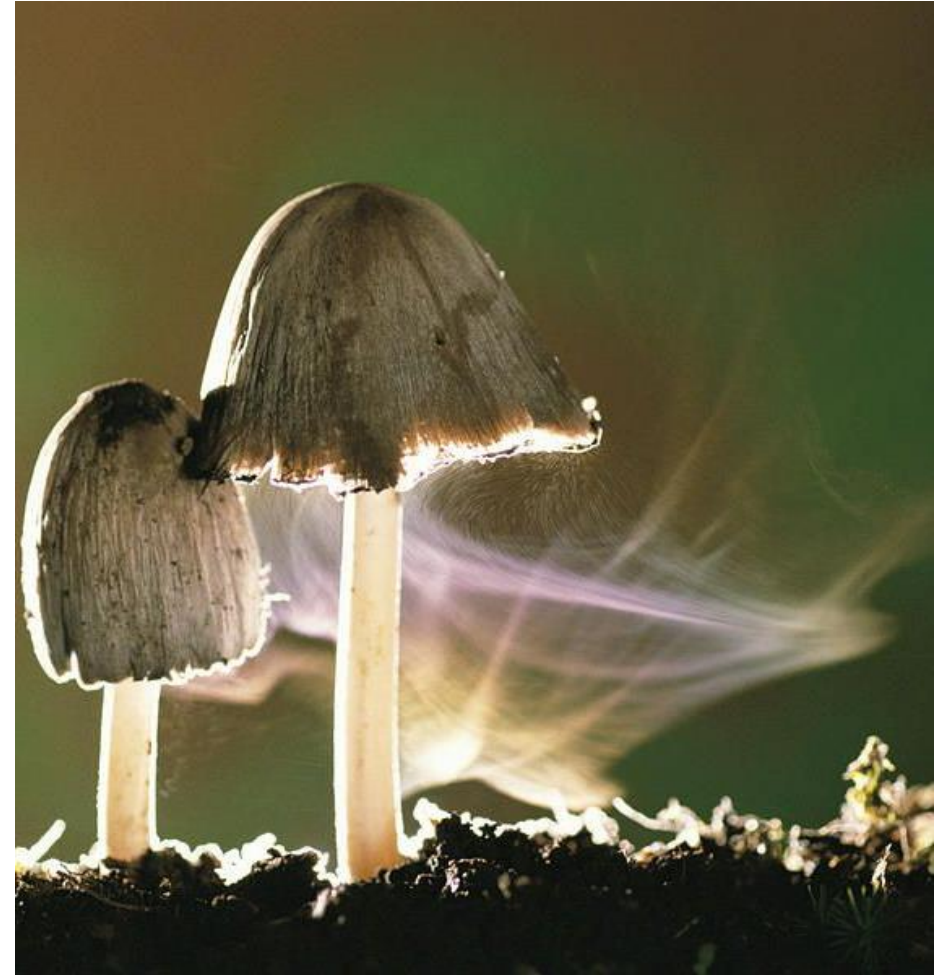
- Already have existing severe tree diseases
 - Ash dieback
 - Dutch elm disease
- Climate change is likely to alter the tree disease burden
 - Increased abiotic stresses
 - Temperature and moisture changes
 - Migration of pathogens to new areas
 - New threats appearing due to changes in common tree species



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Fungal effects on human health

- Fungi release millions of airborne spores
- Fungal spores cause similar effects to plant pollen:
 - “Hayfever” type symptoms
 - Asthma exacerbation
- Increased woodland cover could increase fungal spore numbers
- Climate change may also alter fungal sporulation



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Fungi control carbon and nutrient cycling

- Mycorrhizal fungi are symbiotic with trees
 - Receiving sugars (carbon) in exchange for nutrient delivery
 - Belowground fungal biomass stores carbon
- Saprotroph (decomposer) fungi break down dead plant materials, releasing carbon
- Different trees associate with different types of mycorrhizal fungi, and may result in different carbon storage



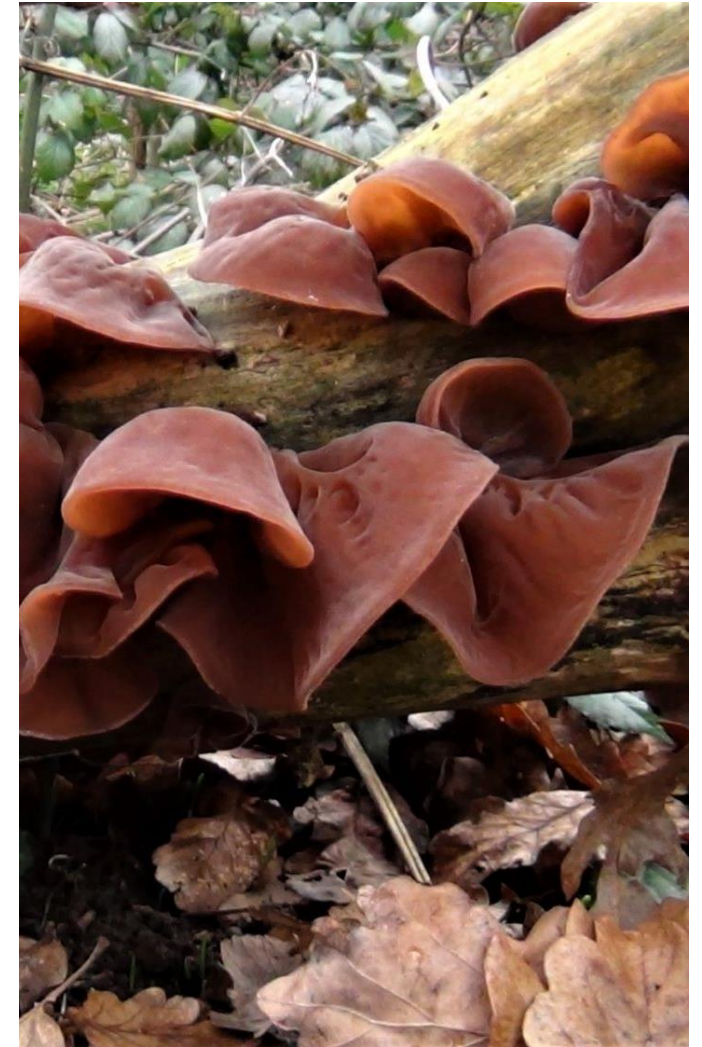
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Climate change is affecting fungi

- The autumn fungal fruiting season has extended, starting earlier and finishing later
- More fungi are having an additional fruiting season in the spring
- Host ranges of fungi are changing
 - E.g. Wood ear (*Auricularia auricula*)
- Some species are now able to grow in the UK, which previously couldn't
 - E.g. Périgord black truffle (*Tuber melanosporum*)



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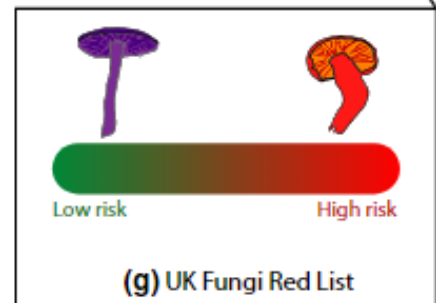
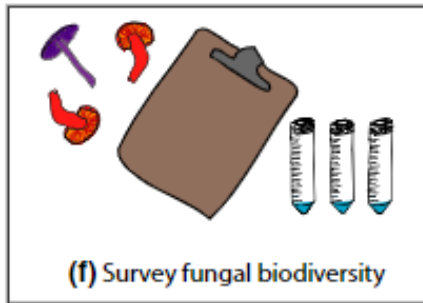
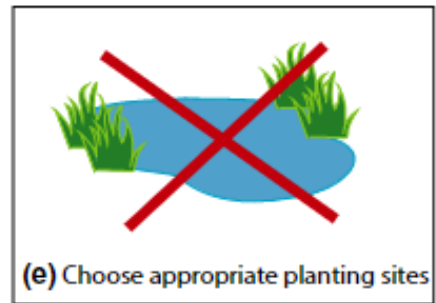
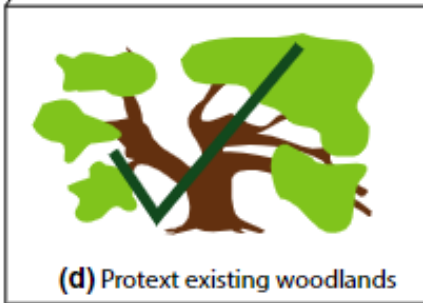
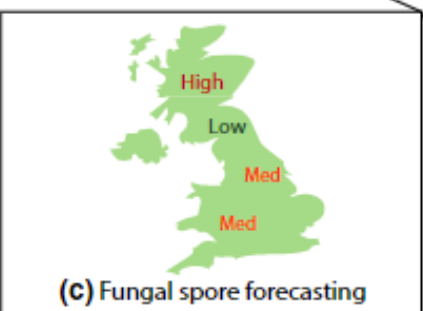
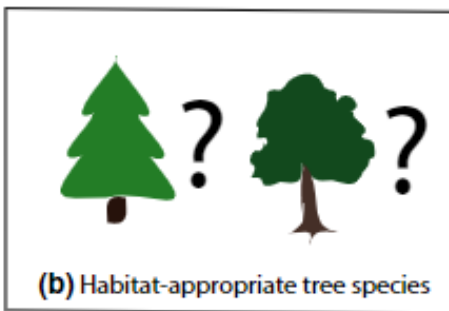
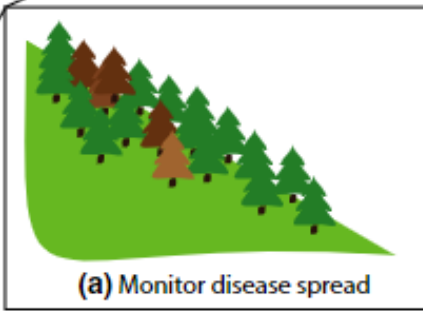
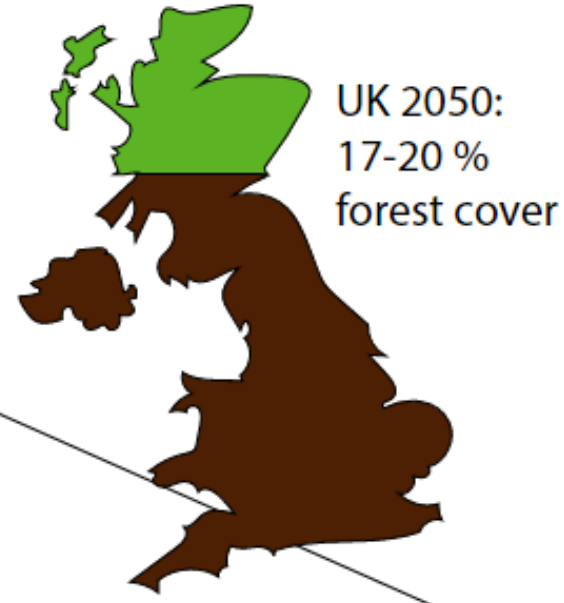
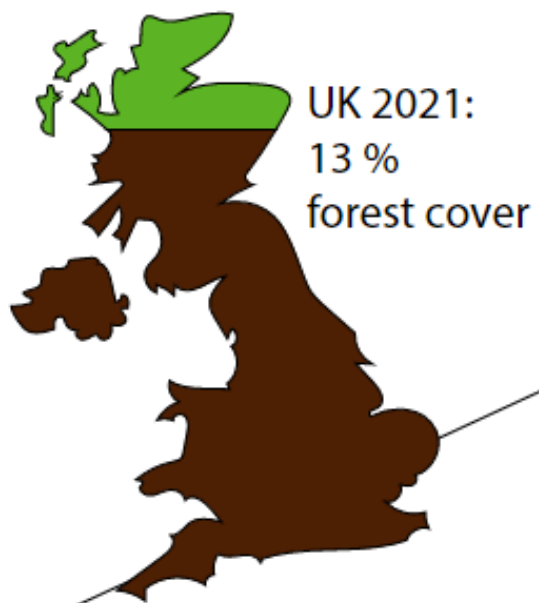
Some fungi are threatened by tree planting

- The UK is a stronghold for grassland fungi
 - Waxcaps
 - Club & coral fungi
 - Earthtongues
 - Pinkgills
- Internationally rare fungi & habitats
- Habitat is low-nutrient grasslands
- Threatened by tree planting




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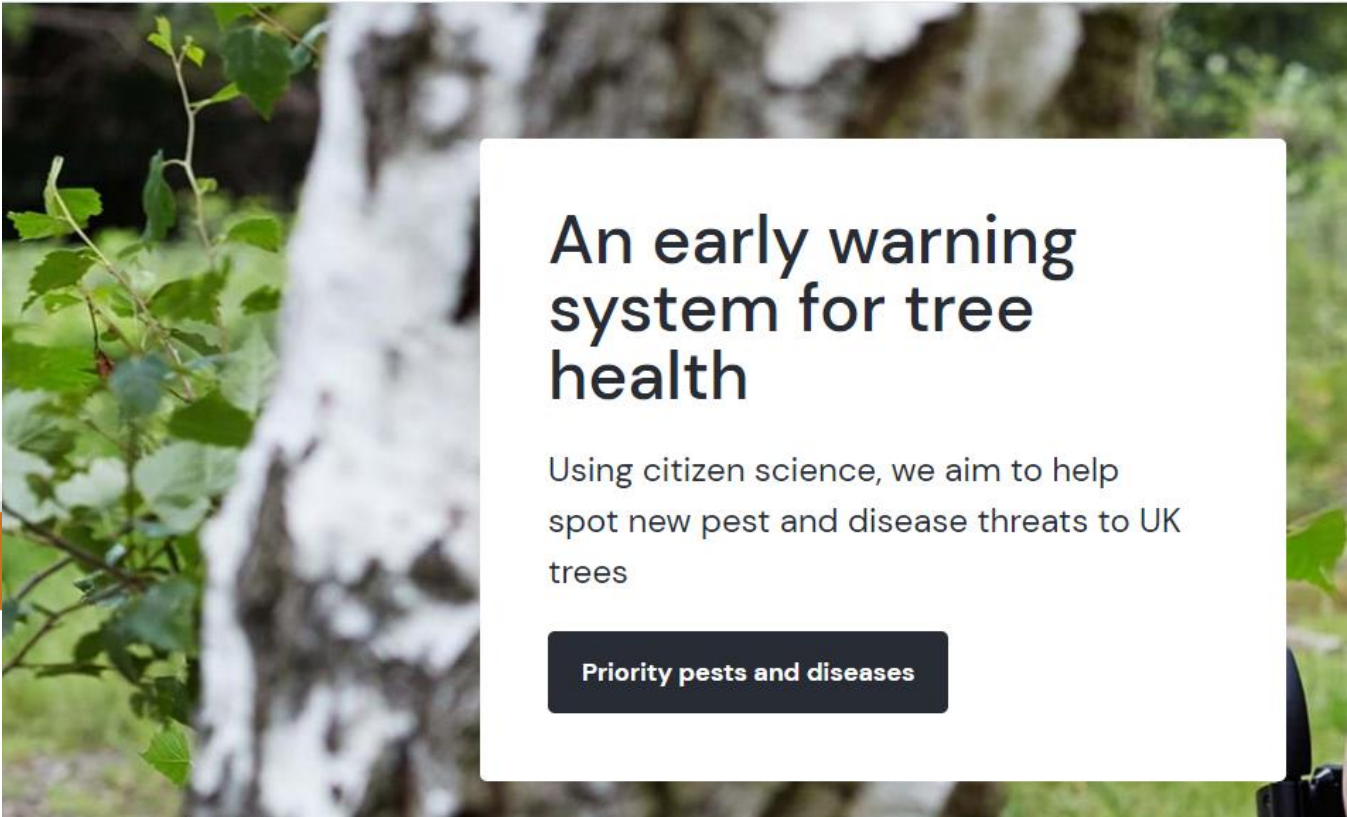
Monitoring fungal tree diseases

UK Plant Health Risk Register

 Department for Environment, Food & Rural Affairs

Search for a Pest or Organism

- Preferred Name
- Synonym
- Common Name
- Host 



An early warning system for tree health

Using citizen science, we aim to help spot new pest and disease threats to UK trees

Planting well-designed schemes

E.g.

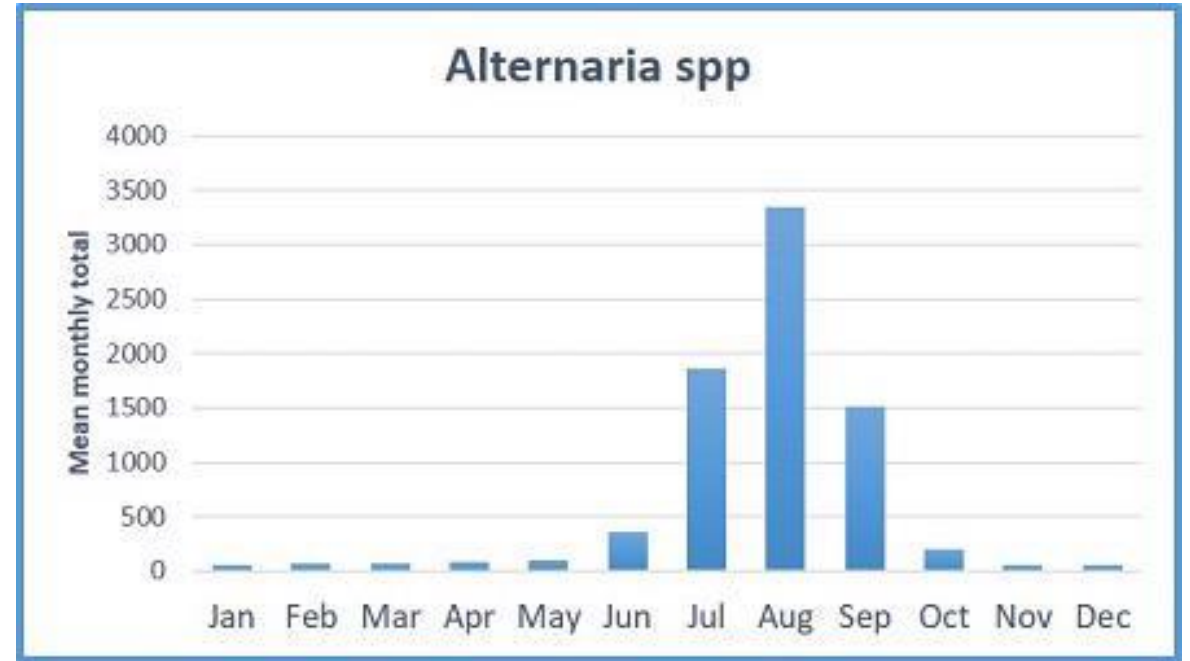
- Avoid planting on habitats which will cause more carbon release than storage
 - E.g. peat soils
- Choosing tree species suited to the habitat & climate
- Avoiding monocultures
- Protecting existing habitats of value
 - E.g. Waxcap grasslands



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Implement spore forecasting



Fungal Spore Levels - Moderate




Most spore types are low now but those people sensitive to spores released during/after rainfall, may still get some symptoms in association with rain, mist or high humidity.



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UK Red list for fungi

 THE IUCN RED LIST OF THREATENED SPECIES™

[About](#) [Assessment process](#) [Resources & Publications](#) [Support us](#)


Names - common, scientific, regions etc...

AMAZING SPECIES



PLANTAE - MAGNOLIOPSIDA GLOBAL

Holly
Ilex aquifolium

— Stable 



ANIMALIA - ACTINOPTERYGII GLOBAL


Nassau Grouper
Epinephelus striatus

↓ Decreasing 



ANIMALIA - BIVALVIA GLOBAL


Oyster Mussel
Epioblasma capsaeformis

↓ Decreasing 



ANIMALIA - INSECTA GLOBAL

Mamangava
Bombus bellicosus

Unknown 

feedback

[Amazing species](#)

Assessing sites for fungi



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Paper link (open access)

[:https://onlinelibrary.wiley.com/doi/epdf/10.1002/fes3.371](https://onlinelibrary.wiley.com/doi/epdf/10.1002/fes3.371)

Article in The Conversation:

<https://theconversation.com/fungi-in-the-missing-link-in-tree-planting-schemes-175008>

