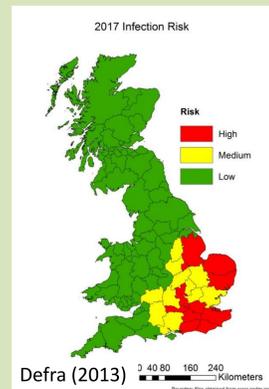




Monitoring the impacts of ash dieback on ash-associated epiphytic lichens

Ash dieback (*Hymenoscyphus pseudoalbidus*) in Europe

- Ash dieback has been spreading west across Europe since the mid-'90s
- Most ash trees (*F. excelsior*) infected where disease is well-established
- Mortality varies, but reports indicate between 30-70% of trees may die
- Latest information presented at EU 'FRAXBACK' Outreach meeting (29/11/2013): see <http://tinyurl.com/FRAXBACK> for presentation videos



Previous studies of lichen epiphytes of ash

- Jönsson & Thor (2012) inventoried 20 wooded habitats on Gotland, Sweden. Ash and oak (*Q. robur*) were the dominant hosts. The local extinction risks of the lichens recorded were estimated based on likely projections of ash mortality, lichen species population size and host-specificity (Table 1 and Fig. 1). Only 14 of the 174 recorded lichens in the Jönsson & Thor samples were completely ash-specific.
- British studies (Ellis et al. 2012, Edwards 2012) have so far focused on the analysis of existing records in the BLS database. There are 31k records of lichens and lichenicolous fungi on ash, for 536 lichen species (27.5% of the British lichen flora). Of these, 220 are nationally rare or scarce and 84 have a conservation status of near-threatened or above.

Table 1. The top twenty lichen species with the highest estimated local extinction probabilities from ash dieback in the habitat samples of Jönsson & Thor (2012).

Species	Prob. of loss	Species	Prob. of loss
<i>Opegrapha vermicellifera</i>	0.94	<i>Gyalecta flotowii</i>	0.64
<i>Leptogium intermedium</i>	0.92	<i>Sclerophora pallida</i>	0.60
<i>Rinodina polyspora</i>	0.90	<i>Rinodina sophodes</i>	0.59
<i>Peltigera praetextata</i>	0.86	<i>Lecania fuscella</i>	0.58
<i>Catinaria atropurpurea</i>	0.83	<i>Myxobilimbia sabuletorum</i>	0.57
<i>Megalania laureri</i>	0.76	<i>Leptogium lichenoides</i>	0.57
<i>Bacidia beckhausii</i>	0.76	<i>Parmelina tiliacea</i>	0.56
<i>Catillaria nigroclavata</i>	0.69	<i>Opegrapha ochrocheila</i>	0.56
<i>Pyrenula nitidella</i>	0.68	<i>Lecania naegelii</i>	0.55
<i>Leptogium teretiusculum</i>	0.68	<i>Naetrocymbe fraxini</i>	0.54

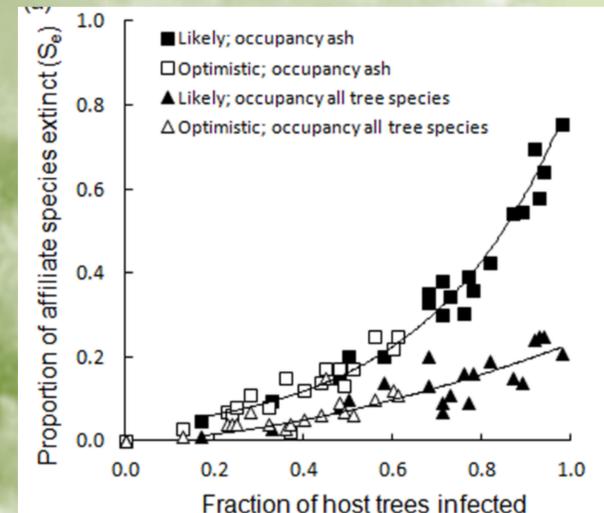


Figure 1. Average proportion of ash-associated lichen species projected to go extinct as a function of the fraction of host trees infected at each study site.

Ash Dieback Project aims

- To collect quantitative information on the patterns of ash-associated lichen, bryophyte and plant biodiversity in Britain, working with BLS, BBS and BSBI volunteers
- To obtain robust estimates of the host-specificity of epiphytic lichen species
- To use the above information in estimating the extinction risks to ash-associated lichens from ash dieback at different geographic scales

Sampling strategy

- 220 one x one km squares with ash selected using the National Forest Inventory
- Random samples avoid the recording bias in existing databases, enabling a statistical analysis of the risks to lichen epiphytes

Field methods

- Recorders asked to survey 5 ash trees and 5 other trees for lichens
- One survey in woodland and one in an open habitat in each square
- Online recording of results available

Recorders needed! Please email ash-survey@ceh.ac.uk to reserve squares.

Details of the squares and survey methods can be seen at <http://www.brc.ac.uk/splash/>

References

- Defra. 2013. *Chalara Management Plan March 2013*. <https://www.gov.uk/government/publications/chalara-management-plan>
- Edwards, B. 2012. *A preliminary assessment of the importance of ash trees for epiphytic lichens in the British Isles, Version 1.0*. British Lichen Society.
- Ellis, C. et al. 2012. Lichens under threat from ash dieback. *Nature*, **491**, 672.
- Jönsson, M.T. & Thor, G. 2012. Estimating coextinction risks from epidemic tree death: Affiliate lichen communities among diseased host tree populations of *Fraxinus excelsior*. *PLOS One*, **7**(9), e45701.