Strategic Programme

Tree Health: The implications of tree diseases on the wider environment

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BioSS
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Science connecting land and people
Moredun Research Institute
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Approach

Identify the impact of a loss of X tree species on:

- Ecosystem function
- Species associated with X tree species
- Ground flora
- Impact on non-woodland trees - connectivity

Identify solutions:

- Suitability of alternative tree species

Collate data:

- Database

Policy/Practice:

- Tools for managers
- Advice/guidance

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Ecological implications of Ash dieback

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Quantifying the problem.

Species

955 species known to use ash

	Level of association with ash					
Group	Obligate	High	Partial	Cosmopolitan	Uses	Total
Bird			7	5		12
Bryophyte		6	30	10	12	58
Fungi	11	19	38			68
Invertebrate	30	24	37	19	131	241
Lichen	4	13	231	294	6	548
Mammal			1	2	25	28
Total	45	62	344	330	174	955






Ground flora

- Light demanding species increase due to increase light
- Similar to coppicing
- Long-term loss of species due to increased shade

Function

Compared to other UK deciduous tree species ash is at *one end of a spectrum*:

- Faster litter decomposition
- Greater nutrient concentrations in litter
- Lower C:N ratio in litter
- Higher top soil pH

Identifying solutions: the suitability of 48 alternative tree species

Alternative tree species*	Ecosystem function			No. of ash associated species supported
	Decom-position	Litter quality	Nutrient cycling	
Field Maple				
Sycamore				
Alder				
Birch				
Beech				
Walnut				
Aspen				
Wild Cherry				
Oak				
Rowen				
Lime				

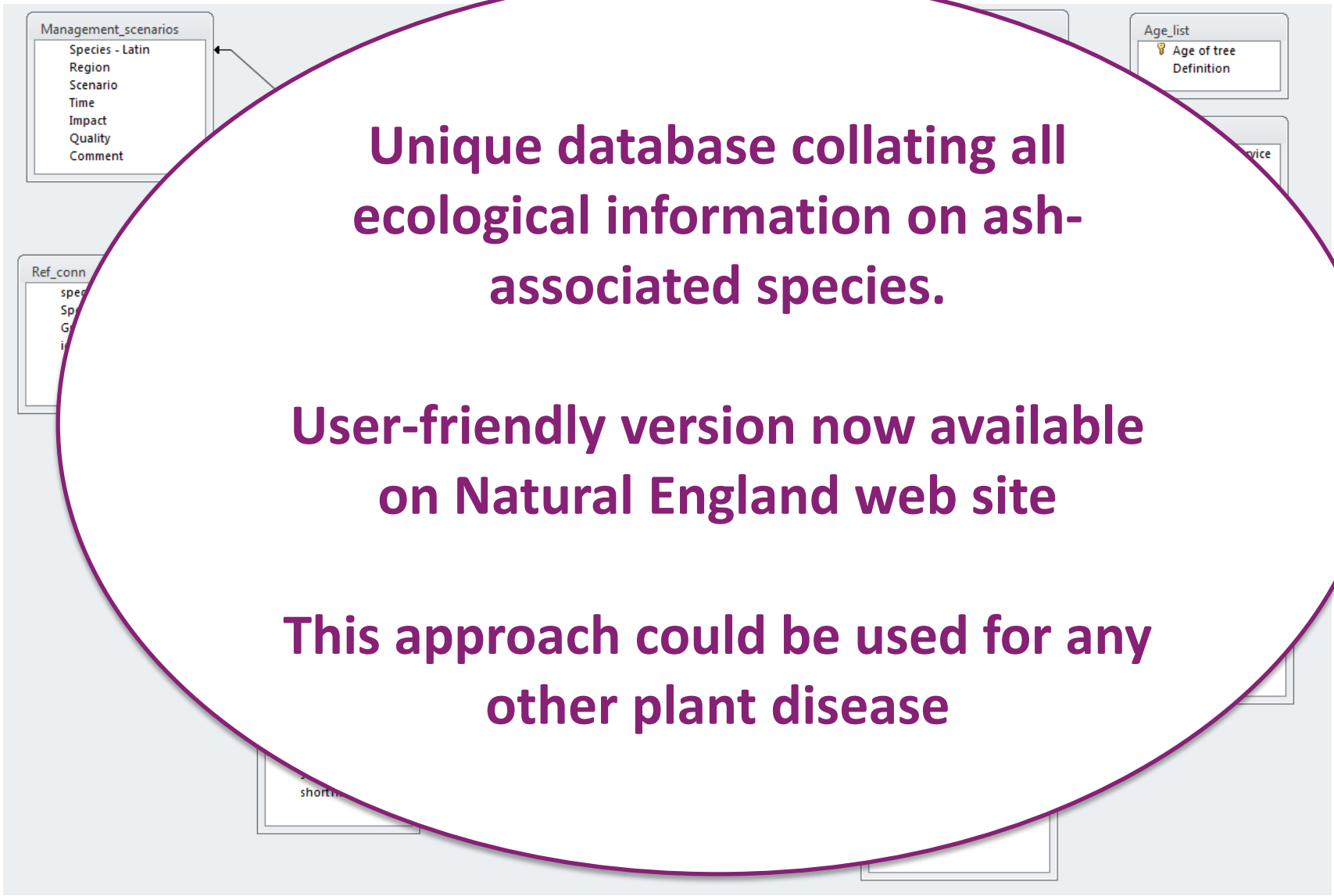
Most suitable alternative

Intermediate alternative

Least suitable alternative

*Assessments done for 48 tree species, only 11 shown

Collating data - AshEcol



Unique database collating all ecological information on ash-associated species.

User-friendly version now available on Natural England web site

This approach could be used for any other plant disease

Policy and Practise

Methodology to assess impacts:

1. Assess biodiversity potentially present
2. Short list ash-associated species for conservation – using **AshEcol** database
3. Identify alternative trees and shrub species are needed to maintain these – using **AshEcol** database
4. Assess site – which alternative trees are present?
5. Determine management

Practice

- Guidance on woodland management
- 15 Case studies across UK
- Workshop for woodland managers

Current RESAS work

Similar work to Ash on going for Oak (Joint RESAS and BBSRC THABI grant)

Current RESAS work

Assessment of different methods to assess the potential ecological impact of different tree diseases.

- Species databases
- Function databases
- Existing risk assessment methods
- The number of priority habitats that tree species/genera occurred in
- Area of priority habitat (ha)

Possible future work within CNP:

Implications of trees diseases on:

- Scots pine – associated species, habitats, ground flora
- Birch – associated species, habitats, ground flora

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