Tree species selection for sustainable and resilient agroforestry systems

Tom Staton[1], Laurence Smith[1], Kate Beauchamp[2], Alice Broome[2], Tom Breeze[1]

1. University of Reading

2. Forest Research

Farm Woodland Forum Annual Meeting
19 June 2024

Multifunctional farmland trees

- Which species should be planted in agroforestry?
- What are the ecosystem service benefits of different tree species?
- Are there any trade-offs between different ecosystem services, and with resilience?

Developing a tree species guide for agroforestry

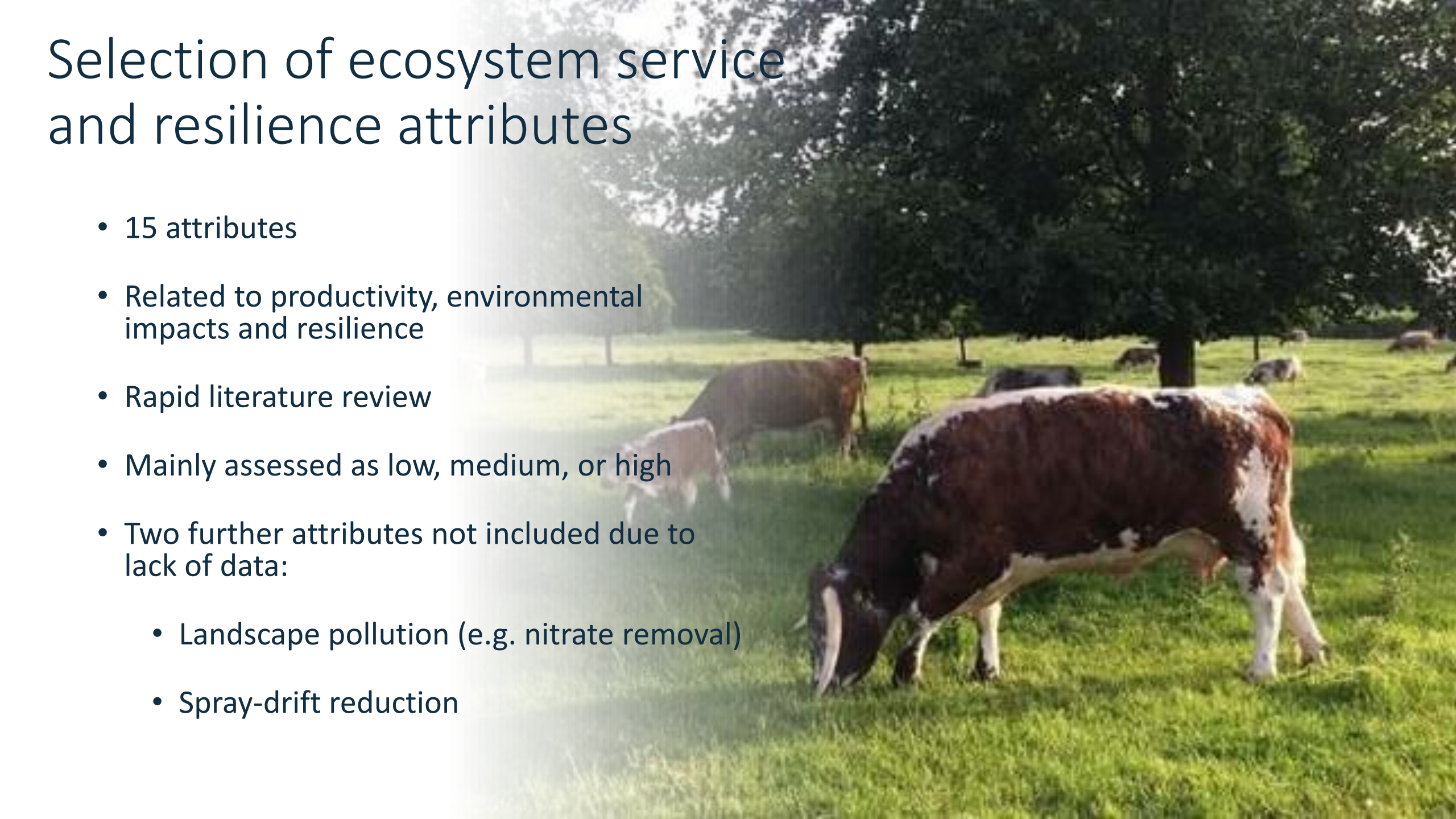
- Aim: farmer-friendly user guide for tree species selection
- UK focus
- Guide designed in collaboration with 28 stakeholders

Tree species selection

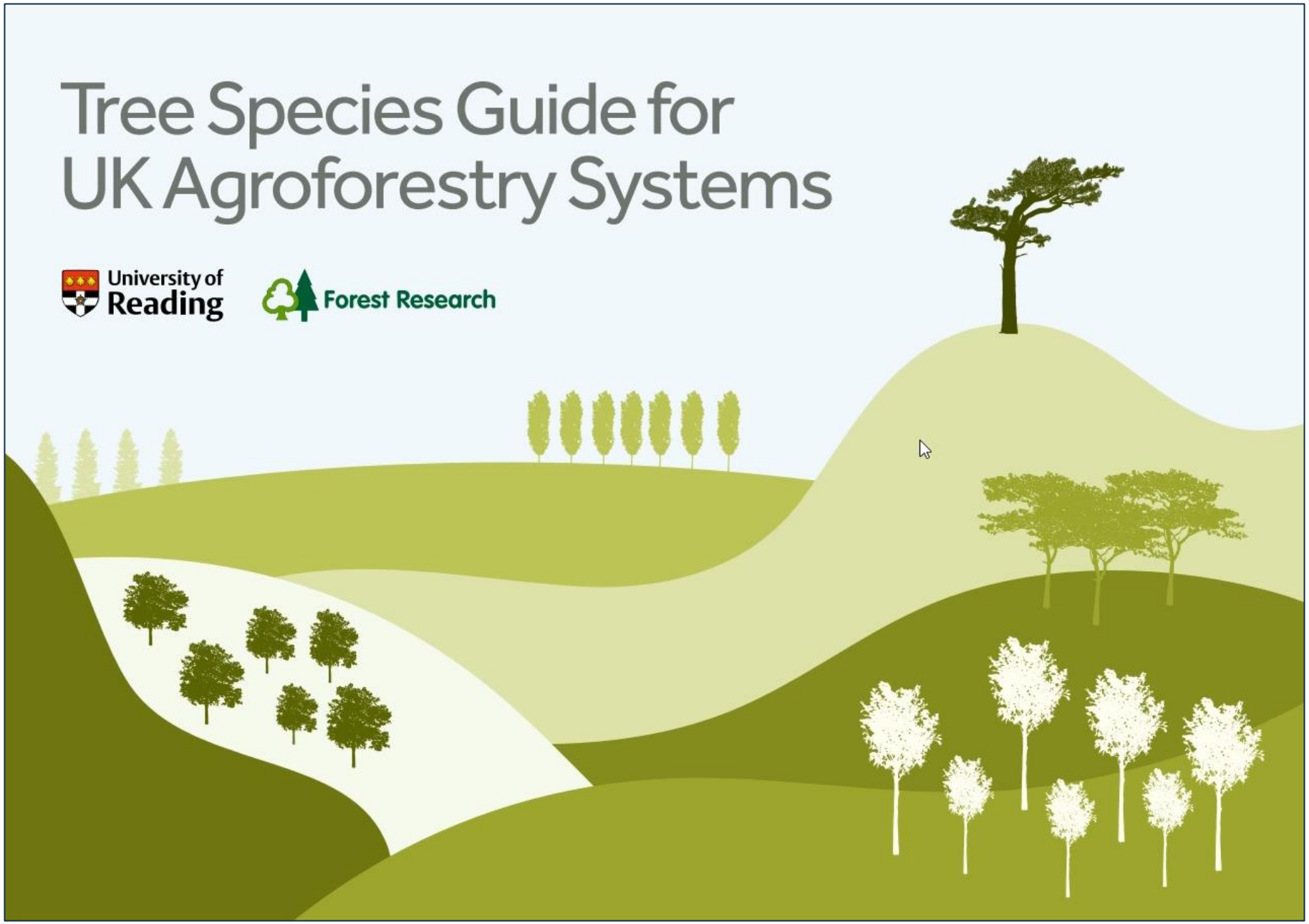
- 33 species selected
- Mostly commonly planted species, some more novel e.g. Red Alder, Red Oak, Paper-bark Birch
- 18 native vs 15 non-native
- 8 fruit/nut species

Selection of ecosystem service and resilience attributes

- 15 attributes
- Related to productivity, environmental impacts and resilience
- Rapid literature review
- Mainly assessed as low, medium, or high
- Two further attributes not included due to lack of data:
    - Landscape pollution (e.g. nitrate removal)
    - Spray-drift reduction

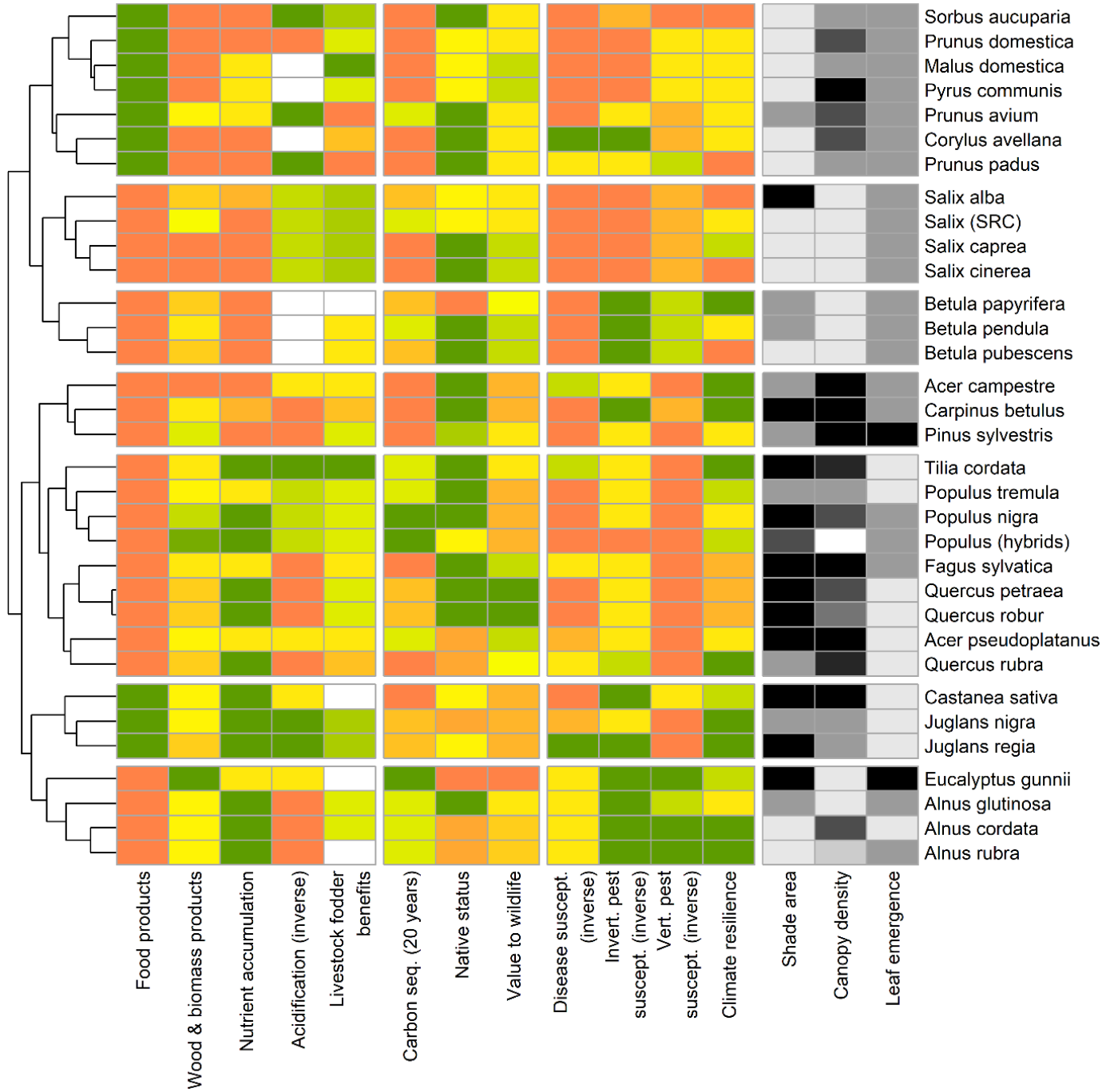


Preliminary species guide



Species clusters

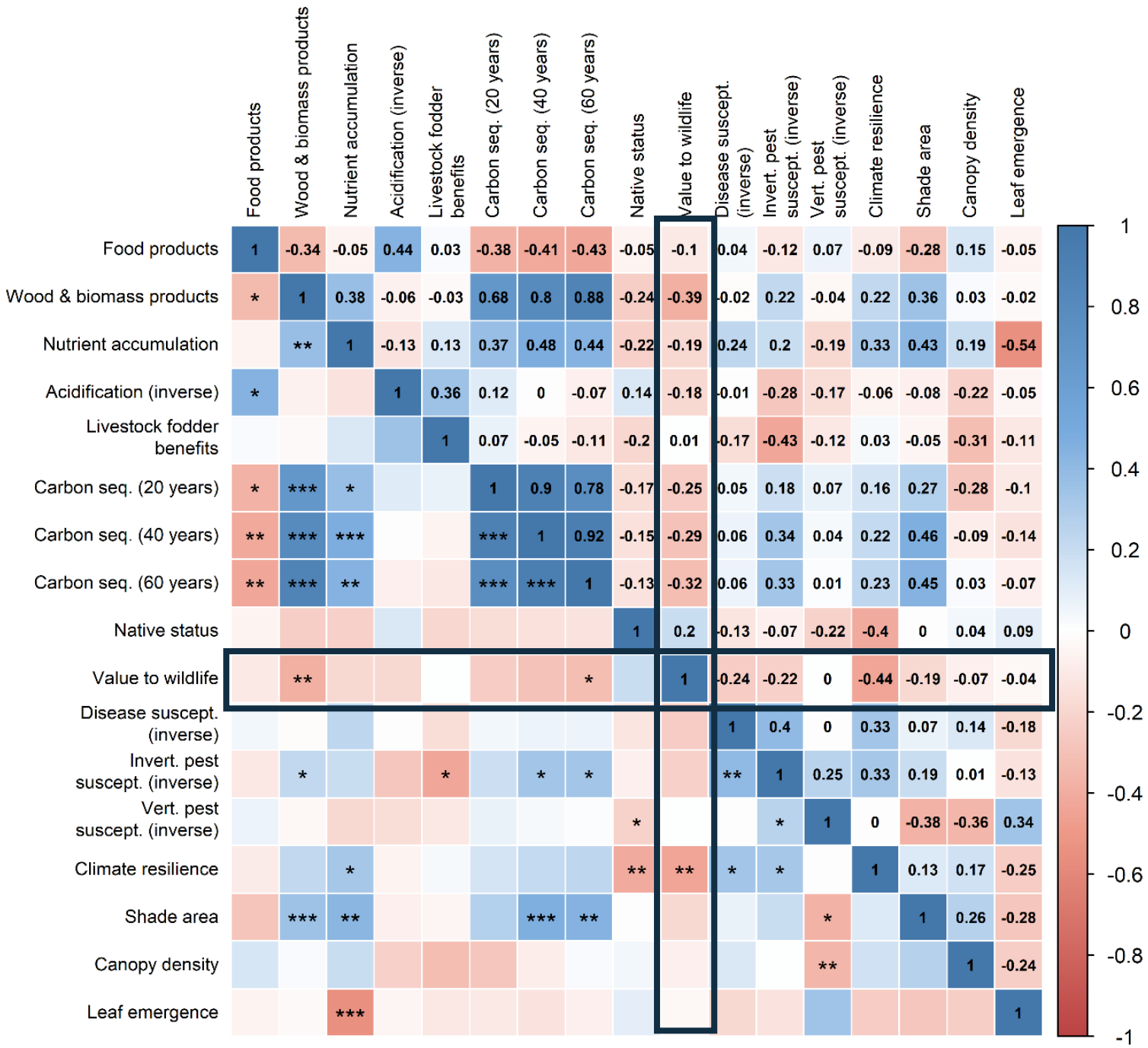
- All species have strengths and weaknesses
- Clustering aligns with taxonomy



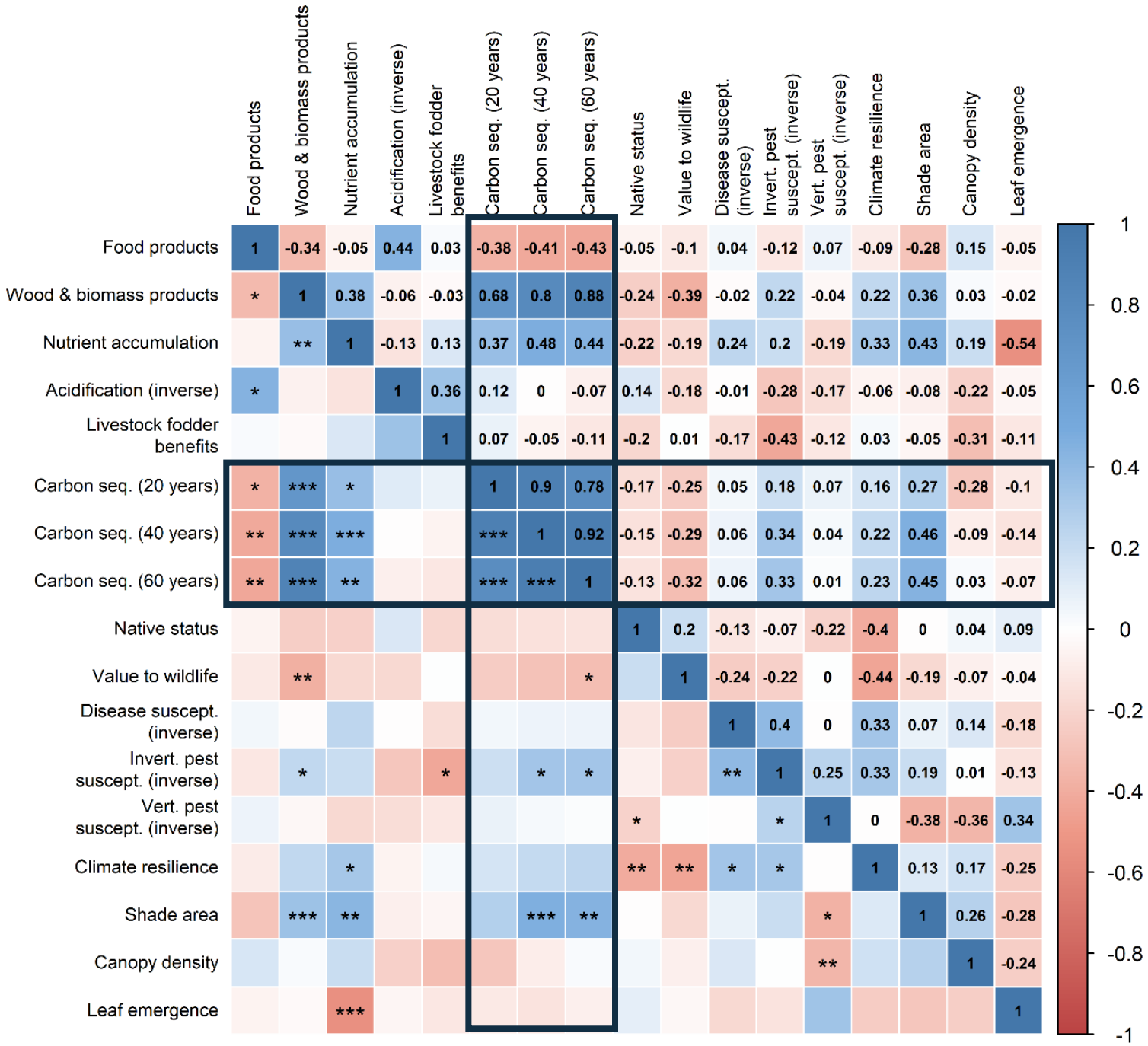
Low benefit / high disbenefit

High benefit / low disbenefit

Correlations
(Spearman's rank)



Correlations
(Spearman's rank)



Next steps

- Test the species guide on end users
- Convert into an online tool?
- Scientific publication

Thank you for listening

tom.staton@reading.ac.uk

Funded by Defra Nature for Climate Fund (NCF) England Tree Planting Programme (ETPP) Expanding Agroforestry project