Forest management and use of forest genetic resources in a changing climate

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European Forest Week Side Event

A brief history of UK forestry

- Imperial period: timber imported from the Empire, forestry neglected at home
- The shock of the wars: extensive felling and creaming off of the best stands results in the creation of the Forestry Commission
- 1960s - economic forestry
- 1980s - rise of native woodlands
- 1990s - increasing concern over imported planting stock
- 2000s - a strong “local is best” philosophy

History and Policy

- Policy reflects history and recent politics
- Policy is based on precedent
  - Rio Convention
  - Helsinki Declaration
  - Forest Certification
- Therefore changing policy to reflect an uncertain future is difficult

Predicted changes in our climate

Now 2050 Hi 2080 Hi

Local is sometimes the best
Sometimes local is not best

What determines genetic variation at a site?

Neutral variation: cpDNA variation in European oak

Neutral markers in ash show very little population differentiation across GB - indicating effective gene flow

Adaptive variation can be seen in ash: natural selection

Grimsthorpe, Lincs. (52.48N) Newton, Morayshire (57.44N)

What is local?
What is “best”?

- Natural selection can only operate on the material present at a site, therefore,
- the best genotypes on a site are only better than the other local possibilities
- there may be better genotypes on other sites

Romanian (approx. 45N) Brockhampton, Worcs (52.11N)

Long distance transfers do show local advantage

Reciprocal transplant expts. are not showing a local advantage for ash

Romanian

Brockhampton, Worcs (52.11N)

Options for Managers

- Maintain genetic variation and promote natural regeneration
- Adopt a portfolio approach and plant a mix of provenances alongside the current population
- Use assisted migration by planting a different provenance or species

"The Knowns"
- Our tree species have the ability to migrate
- Our climate is changing
- Uncertainty, and therefore risk, is increasing

"The Known Unknowns"
- Do our native provenances have within them the genetic capacity to respond?
- Will the rate of climate change be too fast for them to respond?
Strategy 1: Use natural regeneration

Strategy 2: Increase genetic diversity

Strategy 3: Use a different provenance or species

Mixed broadleaf with walnut planting at Jaguar Lount wood, National Forest.

Information Notes are available from the FC website
www.forestry.gov.uk
(Library; publications)

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