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Genetic effects of applying Continuous Cover Forestry in non-native conifer UK populations

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BACKGROUND
GENERAL AIMS OF RESEARCH
EXPERIMENTAL APPROACH
RESULTS



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BACKGROUND



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CHALLENGES IN THE 21st-CENTURY FOREST MANAGEMENT

Climate change

Higher temperatures

Species
switch

Pests &
diseases

Drought &
Fires



Multi-purpose forests

Timber production

Biodiversity

Landscape

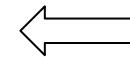
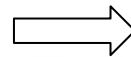
Public access, safety and recreation

Water quality and flooding risk

Carbon management – both in the soil and in standing timber

Cultural values – including archaeology, history and community interest

**Continuous Cover
Forestry approach**





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CONTINUOUS COVER FORESTRY APPROACH

Principles:

Ecosystem management

Natural regeneration and disturbances

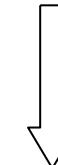
Work with site limitations

Irregular stand structure with a mixture of ages and species



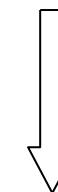
Development:

Even-aged plantations



Thinnings
...

First stages of irregular stands



Planting
Selection thinnings

Irregular, mixed stand



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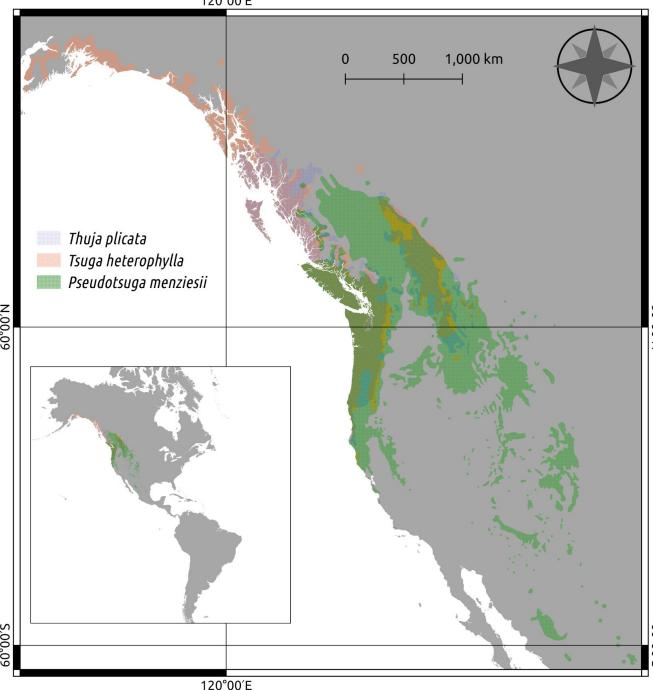


UK POPULATIONS





CIES

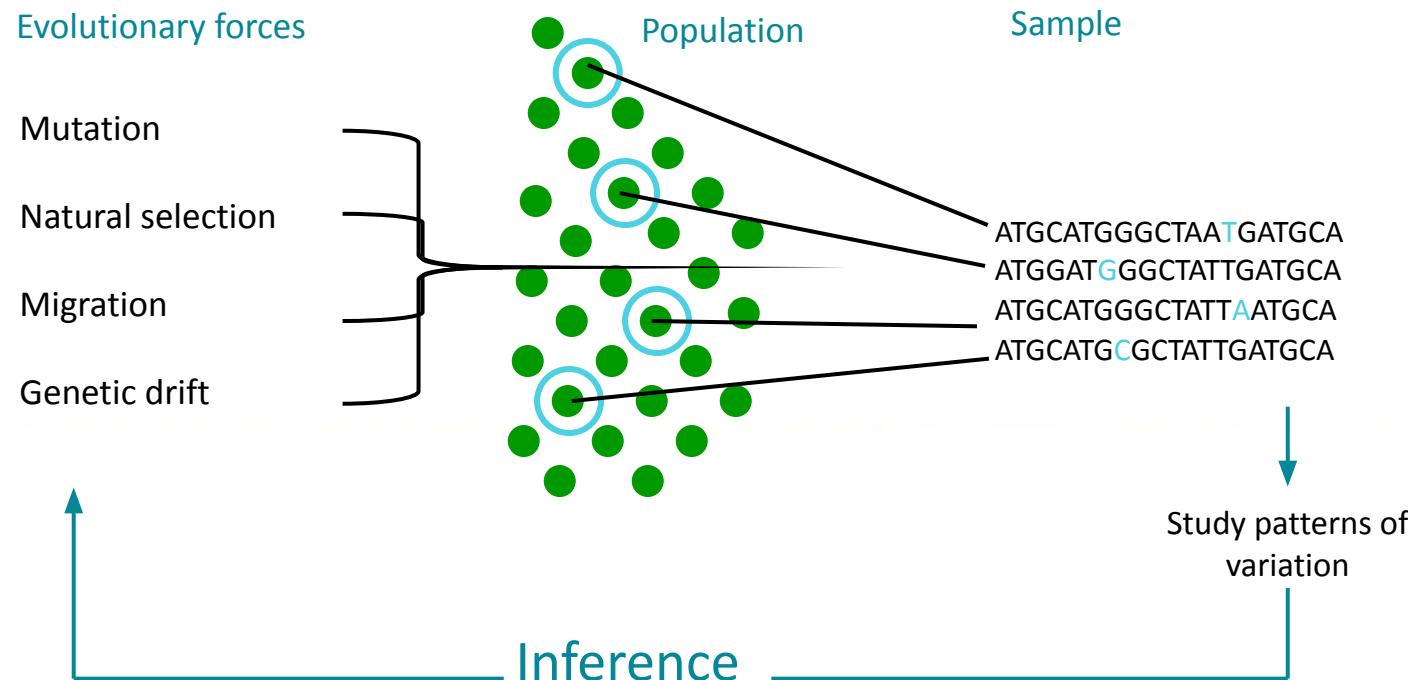


Seed sources used
in forest species
replacements in
Europe

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FACTORS INFLUENCING GENETIC DIVERSITY

How the evolutionary forces shape the patterns of genetic diversity observed?

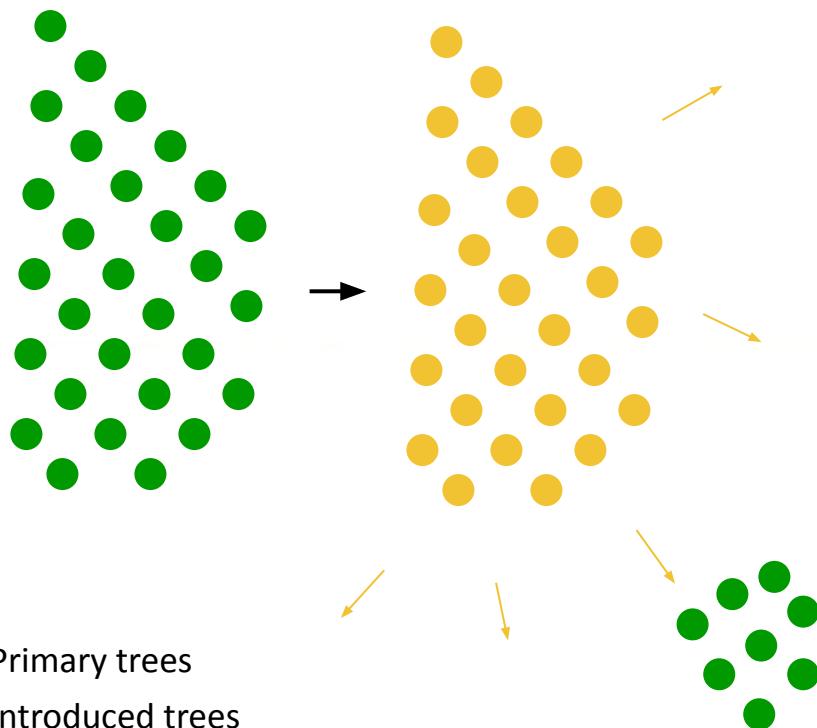


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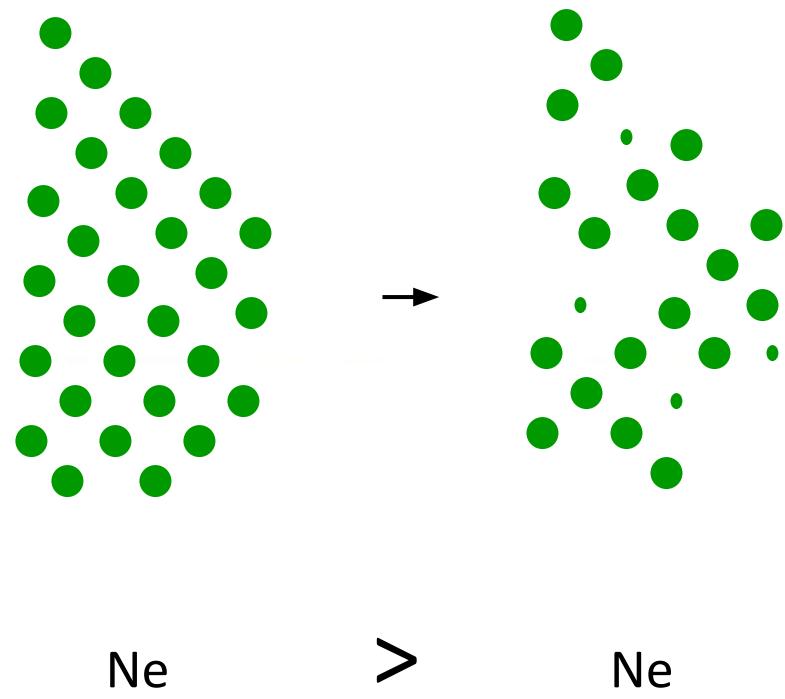
FACTORS INFLUENCING GENETIC DIVERSITY

Effects on genetic diversity by different forest management systems

Clear-cutting + artificial regeneration



Systems based on natural regeneration





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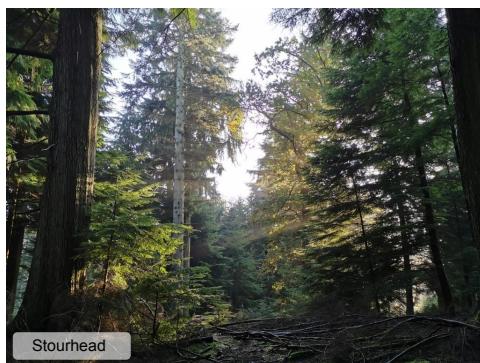
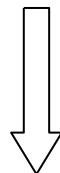
GENERAL AIMS OF RESEARCH



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Enough genetic diversity?
Gene pool transmission?



OBJECTIVES

Asses the genetic diversity in **canopy trees** and compare it with the genetic diversity that appears in **natural regeneration** seedling and saplings.

Assess the level of genetic variability **across the main species** in *Pseudotsuga menziesii*, *Thuja plicata* and *Tsuga heterophylla* by comparing them to native N. Am. forests.

Determine the **provenance** of non-native conifer **UK plantations** by comparing them to native N. Am. populations.

Evaluate differences in the genetic diversity at **different stages** of CCF plantations in both canopy trees and natural regeneration.



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EXPERIMENTAL APPROACH



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EXPERIMENTAL APPROACH - Sampling

N. Am.

UK

50 adults
150 nat. regen





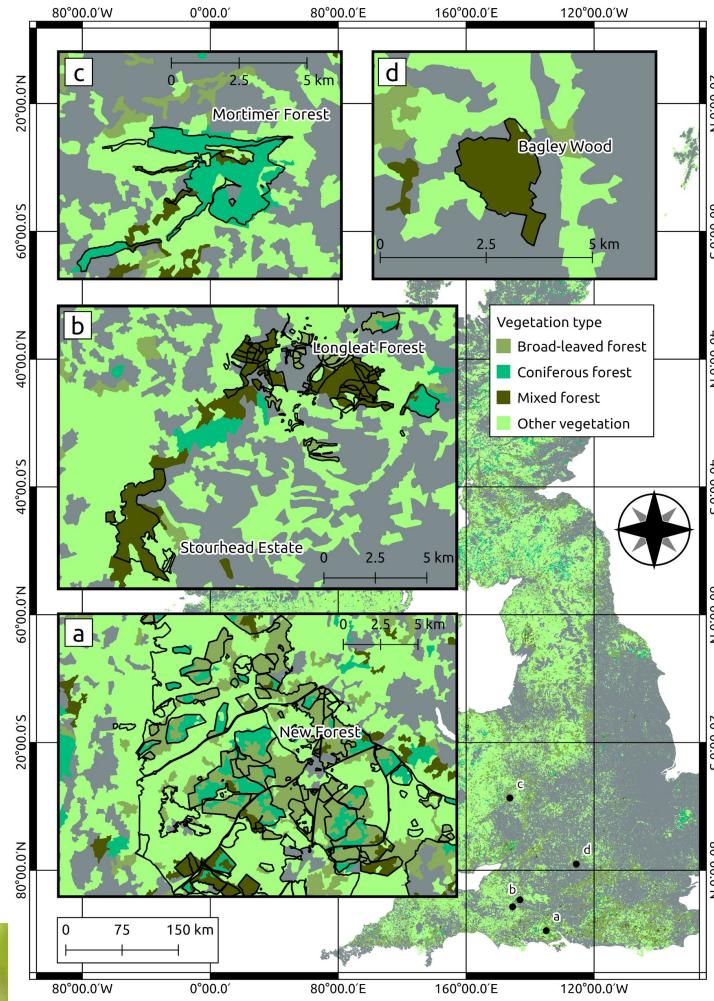
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EXPERIMENTAL APPROACH - Sampling

UK

50 adults
150 nat. regen

5 sites
12 stands





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EXPERIMENTAL APPROACH - Inventorying

2-3 random plots per stand

5 meters of diameter

Number and proportion of species

Size class

Regen proportion

Stand structure

EXPERIMENTAL APPROACH - Genotyping

T. plicata

P. menziesii

T. heterophylla

Gentotyping

SNPs resource screening

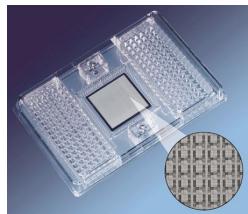
SNPs selection

candidate SNPs

SNPs discovery

Homologous sequences

GBS/RADseq





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RESULTS



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RESULTS

To be continue...



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ACKNOWLEDGMENTS

