Utilizing tree species intraspecific diversity to adapt forests to climate change

Silvio Schueler, Austria

Climate crisis reached European forests!

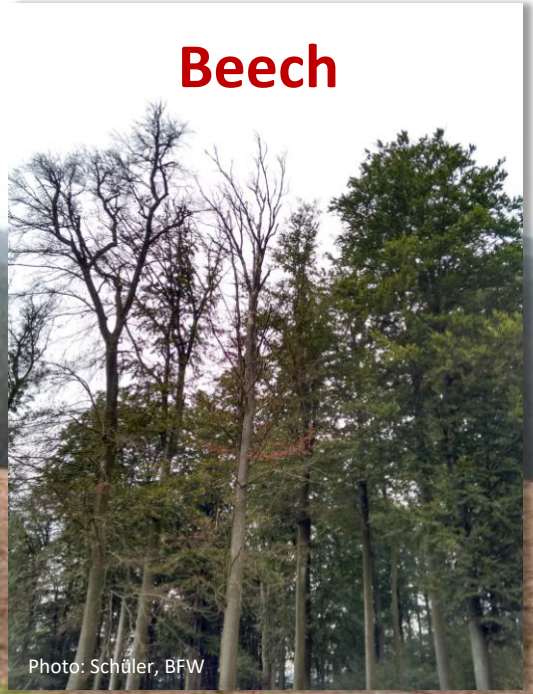


Photo: Hoch, BFW

Europe‘s heritage: tree diversity in northern hemisphere forests

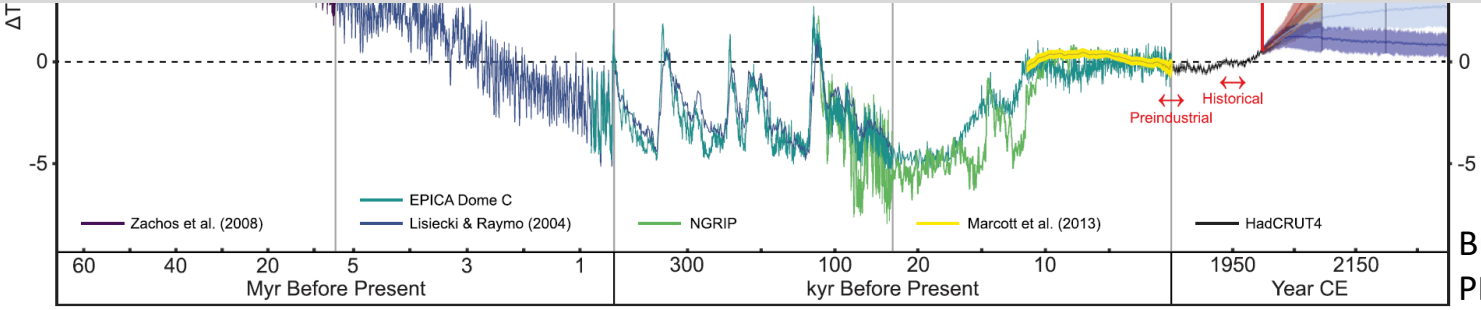
Fossil tree genera		Surviving until Holocen	
60	Eastern North America	49	(82%)
75	Western North America	35	(47%)
122	North/East Central Asia	117	(96%)

Latham & Ricklefts 1993

A drastic decline of tree diversity in prehuman times due to

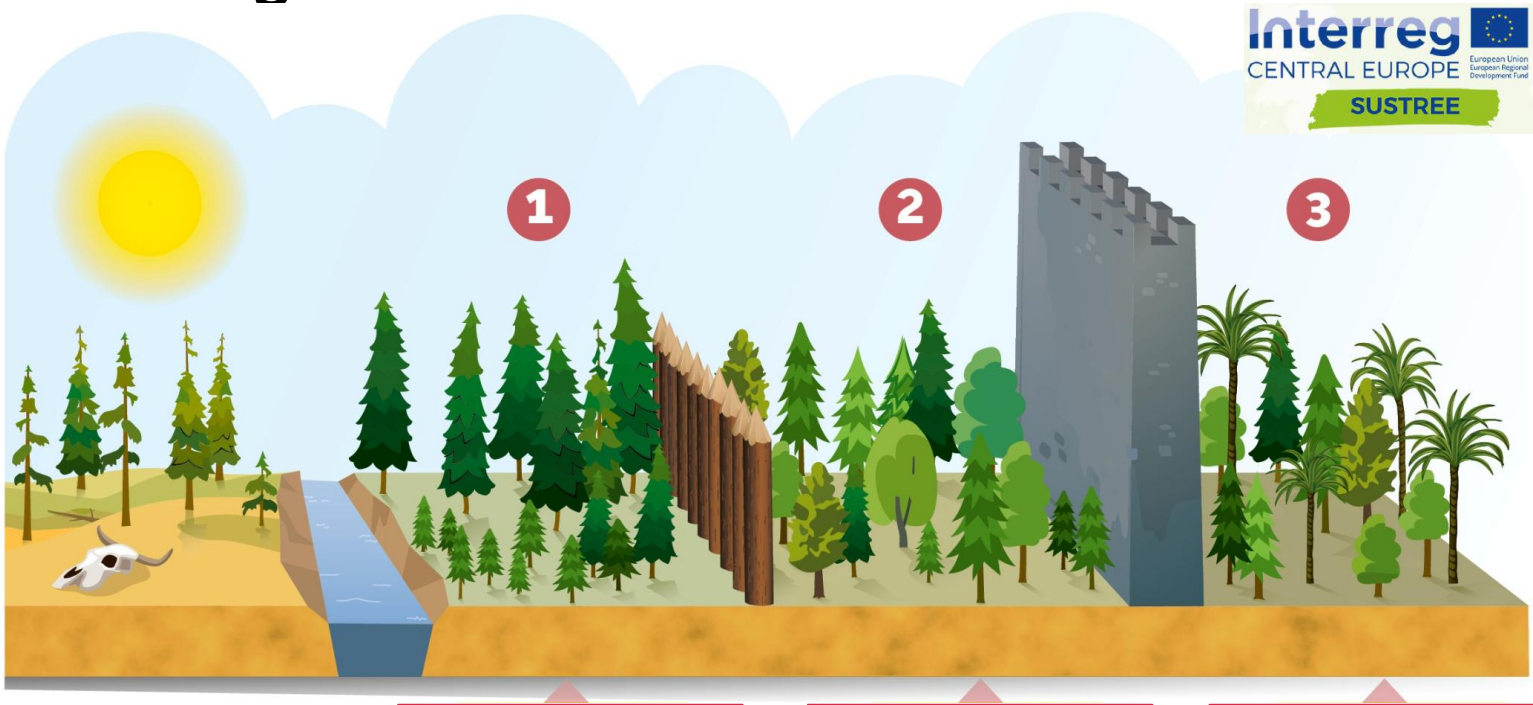
➔ mismatch of species niches and changing environments

➔ lags in adaptation and migration

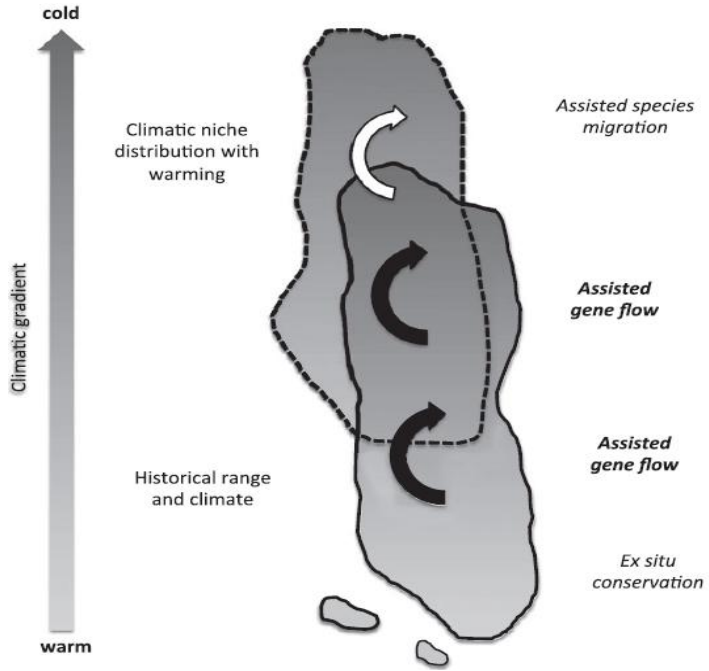


Burke et al. PNAS (2018)

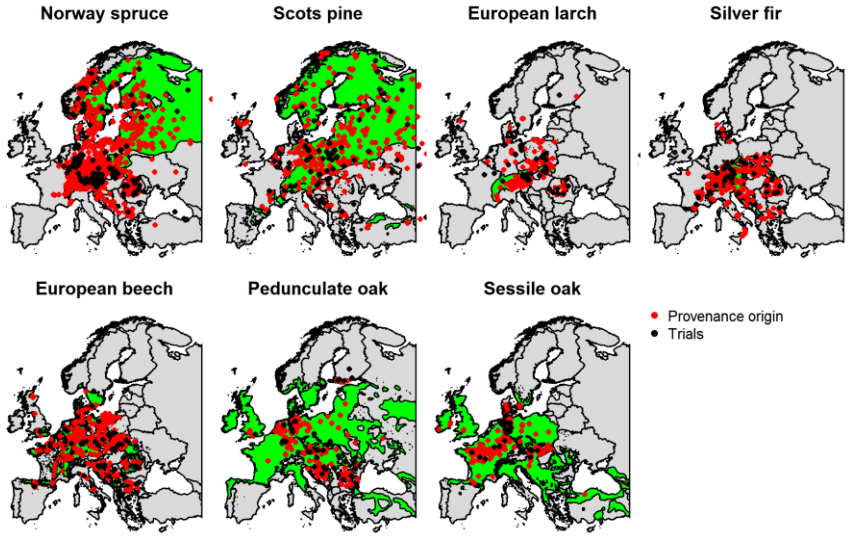
Three lines to defend forest ecosystem services in climate change



Assisted migration requires understanding local adaptation



Aitken & Bemmels (2016)



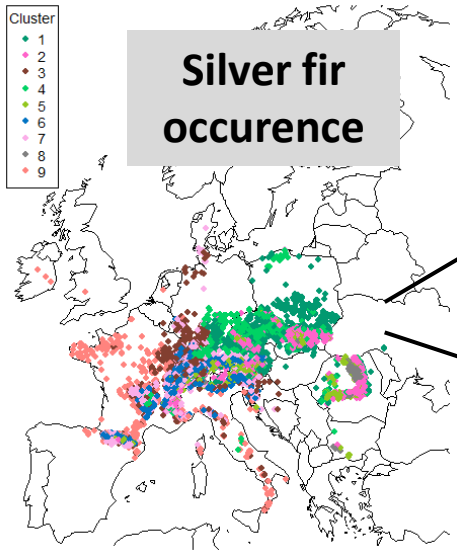
Interreg CENTRAL EUROPE
European Union European Regional Development Fund
SUSTREE

- **575 Trials**
- **10646 Provenances**

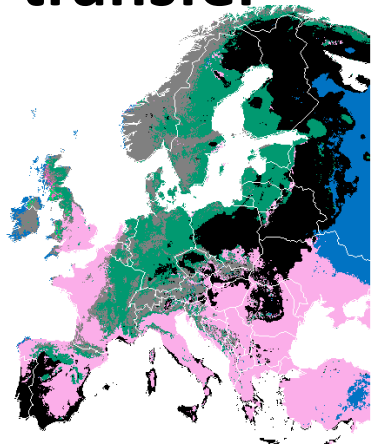
→ **Already in implementation in some countries „CA“, „US“ and mandatory installed within reforestation policies**

Using provenance trial data from across Europe to understand local adaptation and model seed transfer

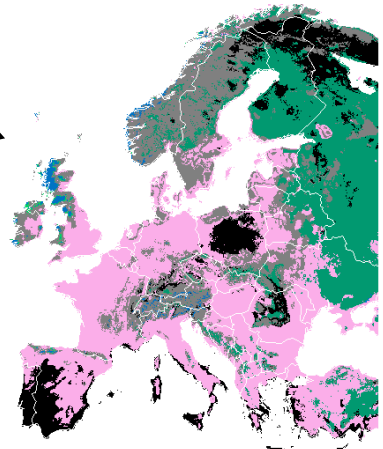
Assisted migration improves stability and forest resilience and reduces the vulnerability in climate change.



Silver fir occurence



Present climate



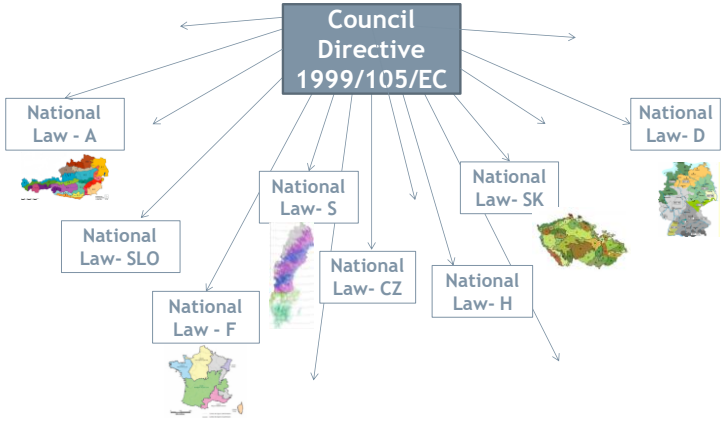
Future climate

Seed provenance transfer based on Europe-wide provenance trial data

Interreg CENTRAL EUROPE European Union European Regional Development Fund

SUSTREE

Ready for assisted migration?



1. More than 1 Billion forest trees are planted annually throughout Europe
2. Basic knowledge for AM in several species is already available
3. Climatic similarity is insufficient for AM
   ➔ knowledge of local adaptations is needed
4. Common national legislations (Regions of Provenance), seed information and certification schemes are missing
5. AM needs to be integrated into various silvicultural systems (e.g. via enrichment planting)
6. Requires strict forest nursery health guidelines

Picture | Filmstyle from „See Aural Woods" (Luma.Launisch & Takamovsky)

Thanks for your attention

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