

## Natural forest structure and dynamics in boreal forests – implications to continuous cover forestry

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## How nature does it?



Photo: Pasi Rautio, Luke

Forests regenerate  
usually after a forest  
fire or storm  
damage (opening  
new space for  
seedlings)



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## Natural development



Photo: Pasi Rautio, Luke

200 year old pine forest: regeneration mainly by spruce



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## Natural development



Photo: Pasi Rautio, Luke

In a closed spruce forest even spruce can't regenerate  
→ regeneration after forest fire or storm damage



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## How to imitate the nature: prescribed burning



Photo: Pasi Rautio, Luke

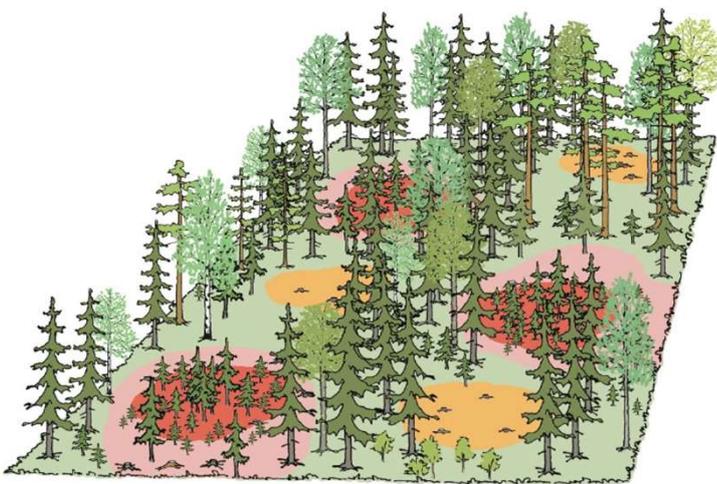
60 ha prescribed burning area in Northern Finland

- Difficult method
- Risks for forest fires



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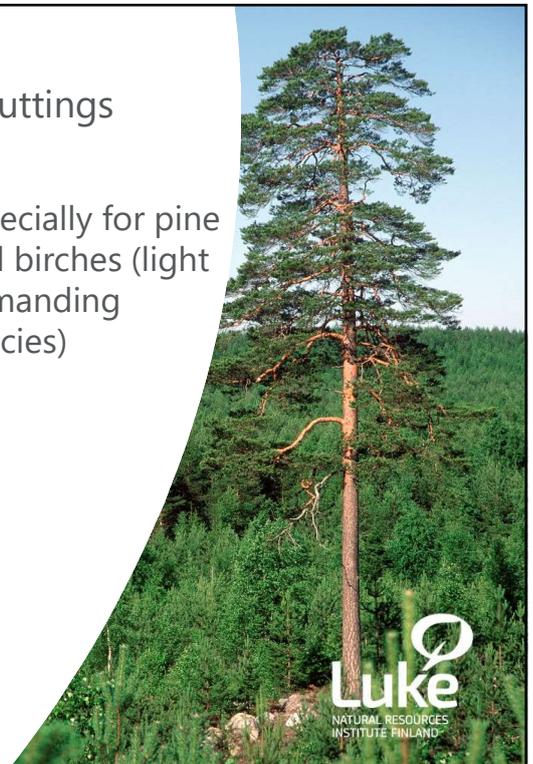
## How to imitate the nature: small gap cuttings



Especially for pine and birches (light demanding species)

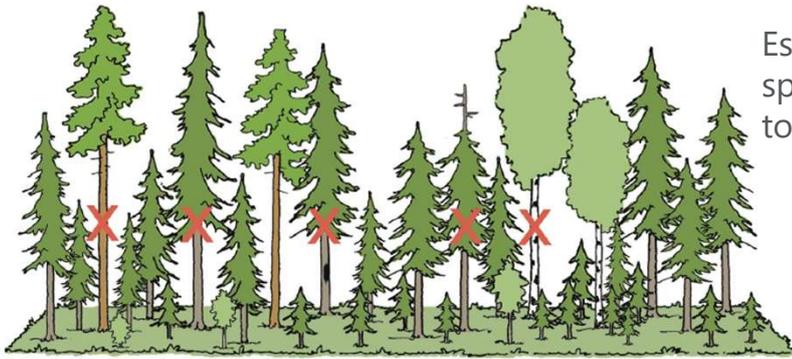
Example of small gap cutting. Gap openings in the first round (dark red) have been enlarged and also new gaps (pink and orange) have been made in the following rounds.

Valkonen 2022 in: Routa & Huuskonen (eds.). Jatkuvaiteinen metsänkasvatus



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## How to imitate the nature: selection cutting



Especially for spruce (shade tolerant species)

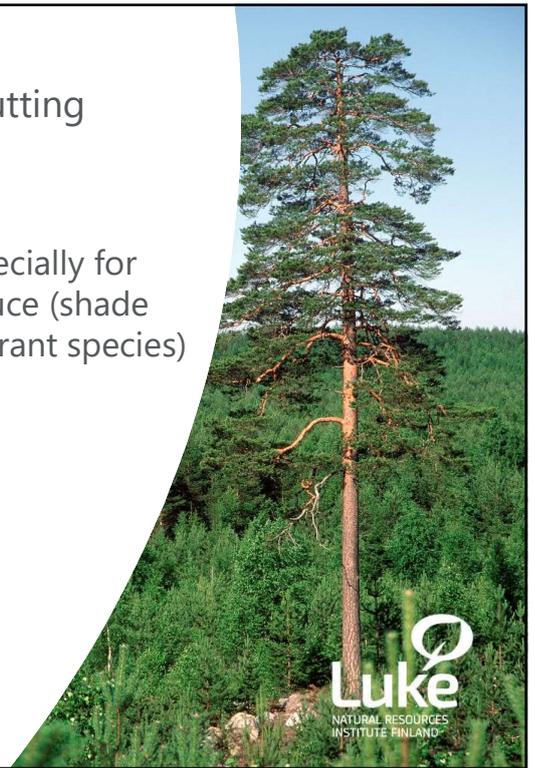
In selection cutting large trees as well as damaged and diseased trees are removed every 15-20-25 years.

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## How to imitate the nature: small gap cuttings



Gap cuttings in Lapland (20, 40 & 80m diameter gaps)  
→ what do we do in areas between gaps?

80m

20m

40m

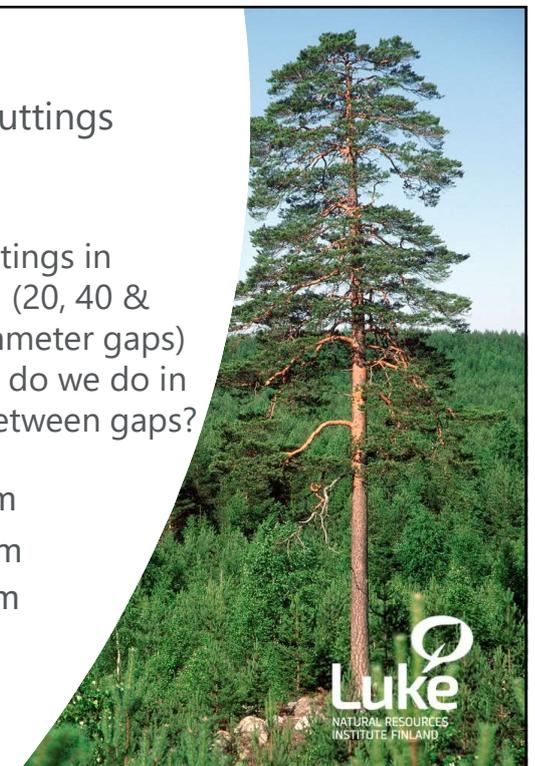


mapbox

Hallikainen et al. 2018. DOI: 10.1080/02827581.2018.1557248



200 m



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## How to imitate the nature: small gap cuttings & selection cuttings



Photos: Johan Svensson, SLU



Gap and selection cuttings in Northern Sweden



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## How to imitate the nature: avoid mistakes done with the CCF in the past

Forest assessment in 1890's in Lapland:

*"Mean age of forest is 250 years. Basically no regeneration can be seen. Only few saplings for reindeer to scrub their antlers."*

(Sandström et al. 2021; Savuinen savotta)

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## Continuous cover forestry

If done correctly:

- Selection cutting in spruce forest gives ~10-20-XX% less yield compared to even aged forestry\*
- Selection and gap cuttings in pine forests in Lapland give logs 30-35 years later compared to even aged forestry\*\*
- Value of other ecosystem services to compensate the loss in yield?

\* Lundqvist (2017: review article in Forest Ecology and Management)

\*\* manuscript in preparation