

Experiences from Sweden – Closer-to-nature forest management

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Government Assignment on Continuous Cover Forestry & Closer-to- Nature forest management

Deadline 15 dec 2023

Closer-to-nature forest management

”SEPA and SFA should propose a definition of closer-to-nature forest management in a Swedish context”

- The equal goals of production and environment should be considered
- *The guidelines of the European commission should be considered*
- *The Ministry decides how the work with the definition should be continued*



Our starting points for the definition

- EU guidelines
 - The text for the boreal region is important
 - General principles
 - Toolbox
 - EFI-report on Closer-to-nature forestry
- It should be applicable both for private forest owners and large forest owners/forest companies
- The definition should aim to enable forest owners to fulfil the requirements of a future certification for closer-to-nature forest management (as proposed in the EU Forest Strategy).





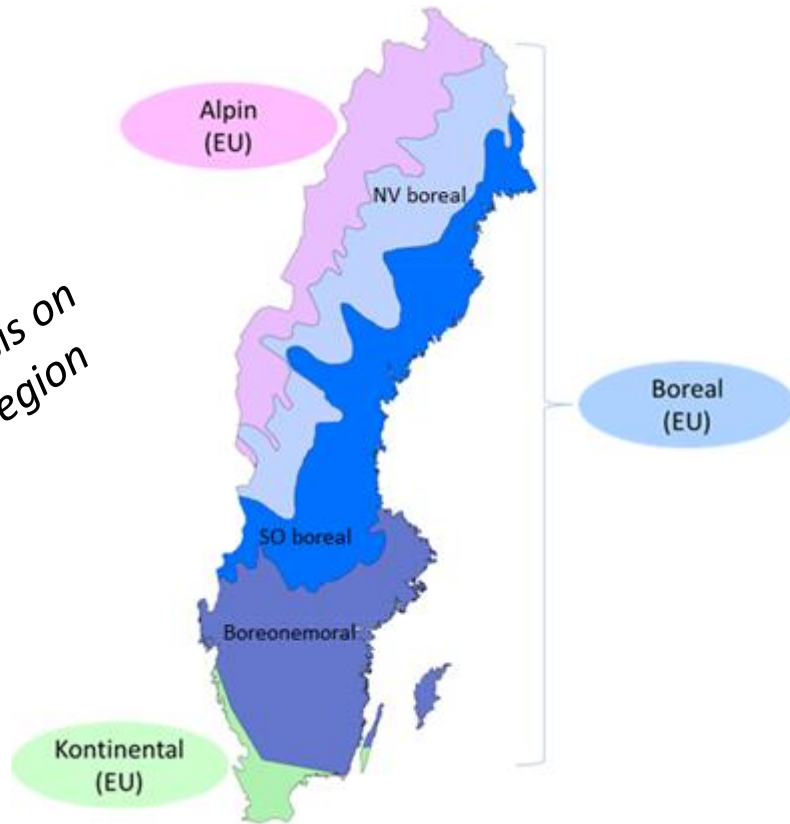
Process

- Broad dialogue with the forest sector
- Consultations with the Sami people
- Meetings & workshops with scientists, experts & practitioners
- Field visits to close-to-nature sites in Sweden, Germany & Slovenia
- Conference on closer-to-nature forest management in Slovenia
- Internal dialogue

Photo: Magnus Magnusson

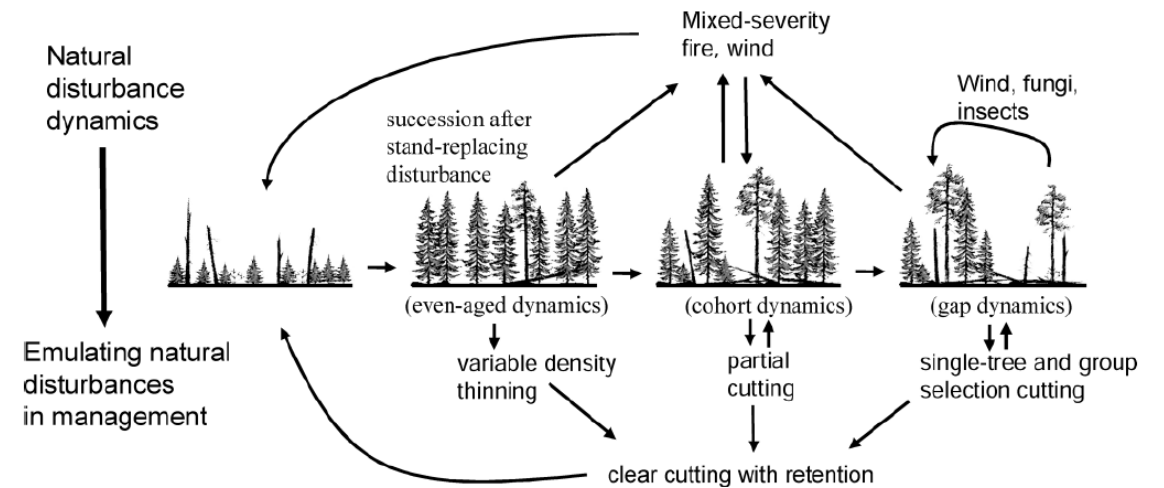
Biogeographic regions in Sweden

Strong emphasis on the boreal region



Berglund, H (2021)

Natural disturbance dynamics guide natural disturbance based management



Kuuluvainen, T (2009)

In what direction should we move?

- No loss of important habitat – high conservation areas including “continuity forests” (forests that has never been clear-cut).
- Less habitat fragmentation in the forest landscape
- A more varied forest – higher proportions of unevenaged forests, higher tree species diversity
- Lower-impact forestry (soil scarification, fertilizing, more retention etc)
- EU biodiversity target of 30 % protected forest area
- Nature conservation management in set asides – prescribed burning for fire dependent species

Adopting a landscape approach

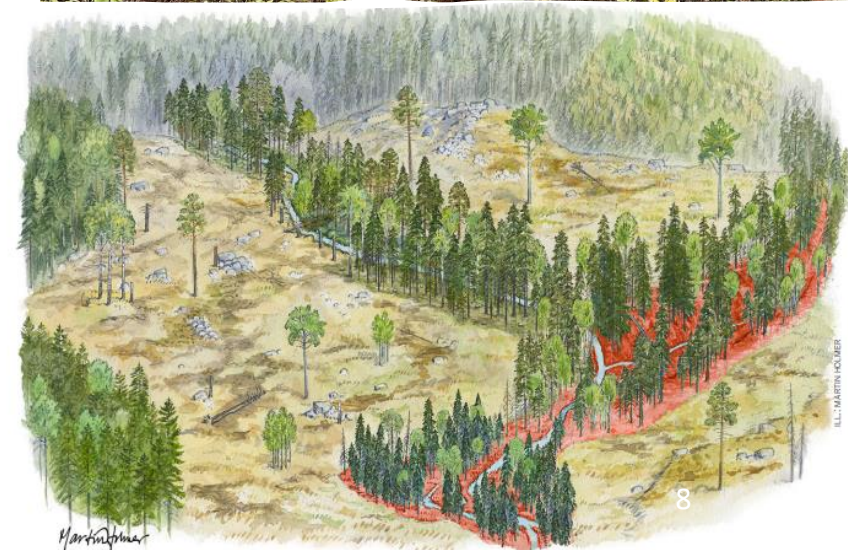
Management adaptations are made to mimic both natural disturbances and human traditional management that have shaped biodiversity on a landscape scale in the boreal, alpine and continental region of Sweden

The landscape perspective is critical and includes forest structure and substrates, important culture- and nature conservation areas, road infrastructure, distribution of management in time and space, potential for vulnerable species to utilize the landscape and connectivity of habitats



Retention forestry – key questions

- Today retention (miljöhänsyn) in Sweden is on average 10% of the cut area
 - Retention often varies between 2,5% and 70% depending on nature values on the site
 - Often small biotopes (e.g. wet or stony areas), habitat trees, dead wood
 - Streams: 1/3 lack buffers; ~4 m in Sweden & 15 m in Finland (Kuglerova et al. 2020)
- Retention forestry (föryngringsavverkning) constitutes about 97 % of the forest management (3 % CCF)
 - Clear cut size: ~3,6 ha
- Key questions/important to address:
 - Minimum retention levels
 - Improve quality of retention; more retention of trees, buffer zones to water
 - Avoidance of large continuous clear-cut areas/proportion of unevenaged forests in the landscape (compare with revised ASIO-model for boreal forest; Berglund & Kuuluvainen, 2021)
 - Maximum clear-cut sizes (EU:s guidelines proposes 0,2-0,5 ha)
 - Levels should be based on best current research/expertise
- Existing tools: ~50 “Goals for good nature consideration in forestry” (Målbilder för god miljöhänsyn) (www.skogsstyrelsen.se). Also included in FSC certification.



Sami people and reindeer herding

The forest landscape in northern Sweden is to a large extent feeding grounds for reindeers

The reindeer is a good indicator of forest green infrastructure

Lichen rich forests declined with ~70 % during the last 70 yrs after adoption of even-aged management systems (trakthyggesbruk) on a large scale (Sandström et al. 2016)

New research show in scenario analyses that adapted forest management can reverse the trend and increase lichen rich forests with 22% in 15 yrs (Eggers et al. 2023)

Closer-to-nature forest management in a Swedish context will be important for this purpose and the EU guidelines for the boreal region highlight this



Photo: "most photos"

Adaptations include: more gentle soil scarification than current practice, small scale thinning to increase sunlight, avoidance of thick, even-aged young forest stands, avoidance of forest stands with the exotic *Pinus contorta*, increased connectivity of uneven-aged forest habitats rich with pendulous- and ground lichens



Natural regeneration & soil scarification

- The conditions for natural generation differs greatly from those in southern Europe
 - More favorable in Southern Sweden (nemoral zone) than in Northern Sweden (boreal and alpine zone).
 - Climate, altitude and soil fertility limits the natural regeneration
 - Scarification is often needed for successful regeneration of conifers
 - Genetically improved plants increases the growth up to 25 %
- Today 8 % of the forest area is naturally regenerated, 87 % planted, and 3 % sown
- In artificially regenerated stands - there is a mix with naturally generated seedlings (26 % in northern Sweden and 41 % in Southern Sweden)
- Natural regeneration should be the first choice where conditions are favorable – and appropriate measures should be taken to achieve a successful natural regeneration (enough seed trees e.g.)
- When using artificial regeneration; always aim for a mix with naturally regenerated trees increase, and maintain the mix throughout regeneration
- Use a gentle scarification method when scarification is needed for successful regeneration, for preserving mycorrhizal fungi or reindeer lichen.
- Good examples of natural regeneration from:
 - Continuous cover forestry
 - Retention forestry with seed trees

Summary – Closer-to-nature

	Direction	Target	Threshold/ criteria	
Unevenaged forests	↑	X	X	Increase CCF , increase retention
Connectivity	↑			Decrease clear-cut size, quantity & quality of retention, landscape planning, transformation of evenaged forests
Climate adaptation	↑			Variation in tree species, stand structure
Retention	↑		x	Retention forestry (and CCF to some extent)
Tree species diversity	↑			Aim for mixed forests adapted to site conditions
Natural regeneration	↑			Artificial regeneration mixed with natural regeneration, natural regeneration on suitable sites
Fertilizing, ditching	↓	0		Not allowed
Ditch cleaning	→			To maintain productivity in forests
Exotic tree species (lodgepole pine/ <i>Pinus contorta</i>)	↓	0		Define what exotics that may be used considering biodiversity effects; exotics may be needed for ensuring tree biomass production in the future



Thankyou & good luck with your work!

- Can be good to know:

The translation of Closer-to-nature
to Swedish is tricky (Naturnära) –
same as Close-to-nature
(Naturnära)