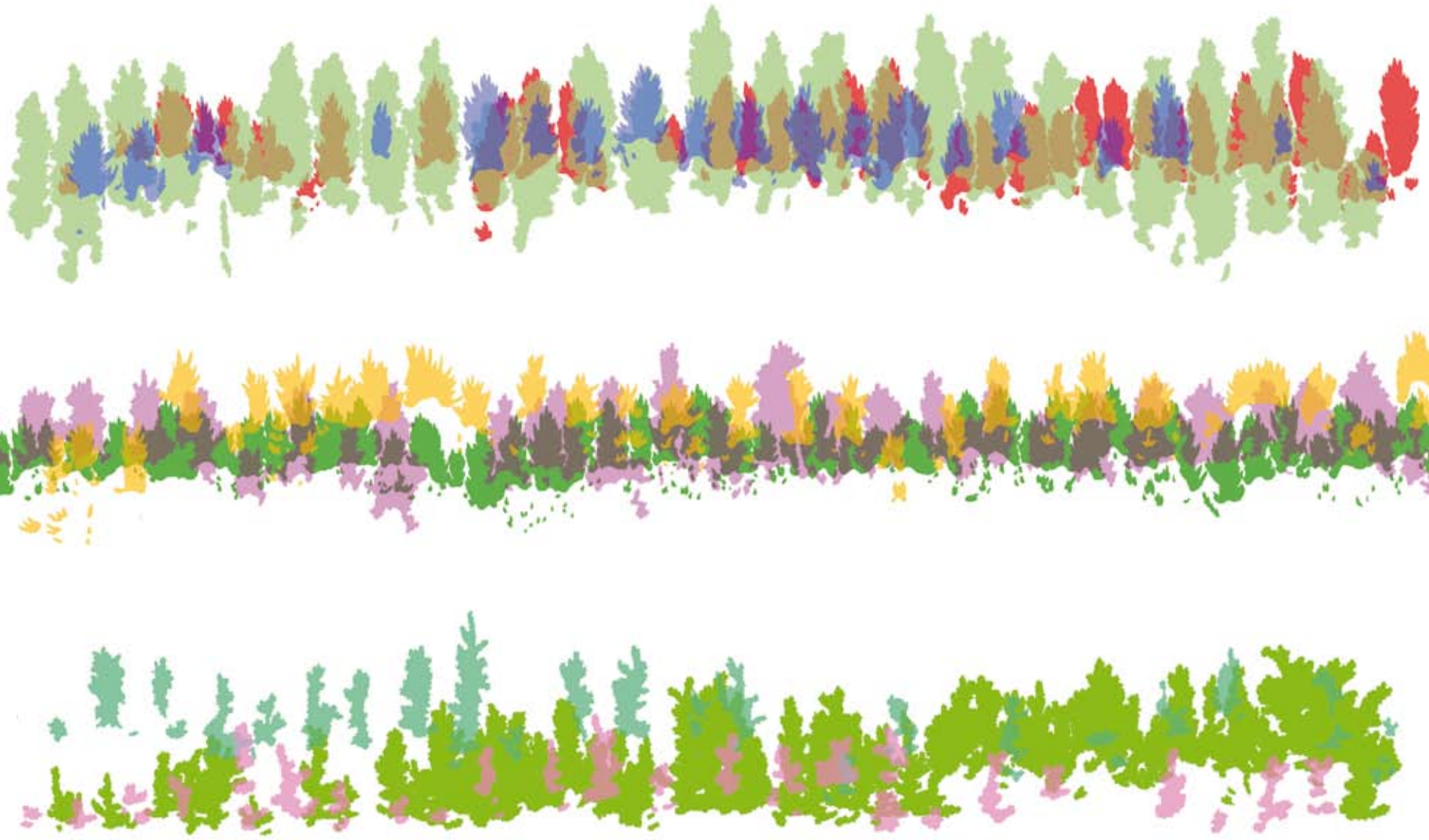
Structural development in young stands

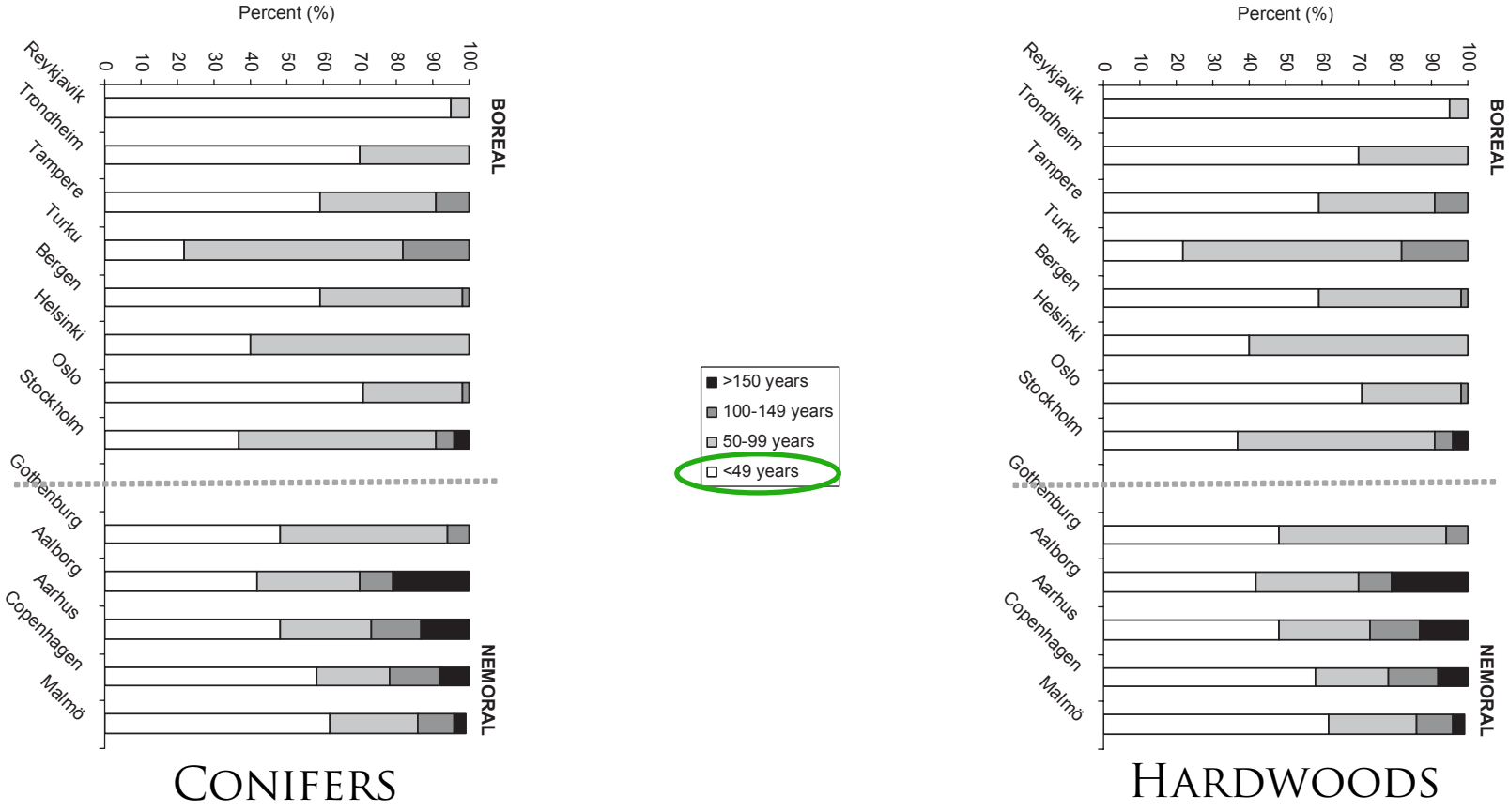
- a case-study focusing on three keyspecies



Björn Wiström & Dan Pålson - Department of Landscape Management, Design and Construction - Swedish University of Agricultural Sciences, SLU, Alnarp

Young forest stands make up a significant part of the urban forest in Europe...

Present age structure in urban woodlands according to: V. Gundersen et. al / Urban Forestry & Urban Greening 3 (2005) pp 195.



and this will also be the case in the future...

particularly in the NW European countries...

which have plans for massive afforestation!

Country	Forestcover in %	Goal	Planned afforestation
Ireland	9.6	17 % in 2030	700.000 ha
UnitedKingdom	11.6	Double the forest cover (~ 20 %)	2.000.000 ha
Denmark	14	Double the forest cover (~ 20 %)	400.000 ha
Southern Sweden	31	More urban forest around major cities	n.a.
Iceland	1	5 % at elevation < 400 m in 40 years	60.000 ha
Belgium	10.8	Positive strategies but no exact goal	13.665 ha
TheNetherlands	11	75.000 ha new forest starting 1992.	75.000 ha
North East France	8-10	The forest cover grows but no specific goal	n.a.
Total			**~ 3.500.000 ha**

Nielsen, A. B., Jensen, R. J., (2007): Some visual aspects of plating design and silviculture across contemporary forest management paradigms – Perspectives for urban afforestation. Urban Forestry & Urban Greening. Vol 6. 143-158.

But the youth phase is often forgotten and neglected. Should we just sit back and wait?

No! But knowledge is lacking. Regardless of scientific backgrounds the major knowledge bases are connected to more mature stages or the establishment phase.

Nature conservation

Forestry

Landscape architecture

Summing it up

The knowledge we have today is mostly connected to timber production in monocultures. (Kelty, 2006; Nielsen & Jensen, 2007)

Most afforestation project uses mixed hardwood planting designs but the practical experience of such planting are rather small. (Nielsen & Jensen, 2007)

The landscape laboratory concept is one way to gain and communicate knowledge in this field. (Gustavsson, 2002)

The knowledge that is fundamental for understanding the processes in mixed plantings are how individual species interact with each other. (Kelty, 2006)

To be able to do this a broad range of different studies and methods are needed.(Gustavsson, 2002; Kelty, 2006)

To better evaluate such experienced based functions as recreation, there is a need for more spatial approaches. (Gustavsson, 2004)

Gustavsson, R., (2002): Afforestation in and near urban areas. In Randrup, T. B., et.al (eds). Urban forest and tress; Proceedings No 1. Cost Action E12. Directorate-General for research, EUR 19861, Brussels, 286-314.

Gustavsson, R., (2004): Exploring woodland design: designing with complexity and dynamics - woodland types, their dynamic architecture and establishment. In Dunnett, H., Hitchmough, J., (eds). The dynamic landscape. Paperback edition. Taylor&Francis, London, 184-214.

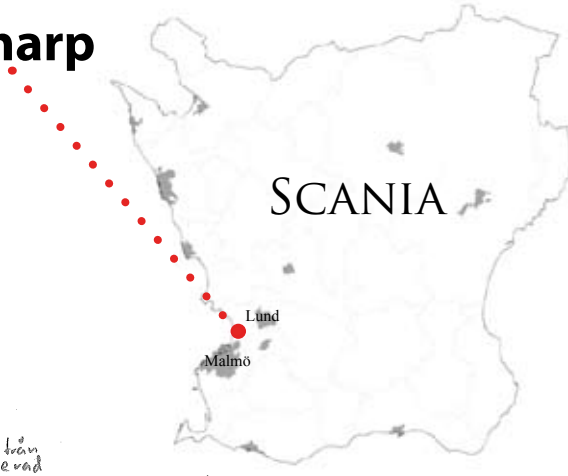
Kelty, M. J., (2006): The role of species mixtures in plantation forestry. Forest Ecology and Management. Vol 233. 195-204.

Nielsen, A. B., Jensen, R. J., (2007): Some visual aspects of plating design and silviculture across contemporary forest management paradigms – Perspectives for urban afforestation. Urban Forestry & Urban Greening. Vol 6. 143-158.

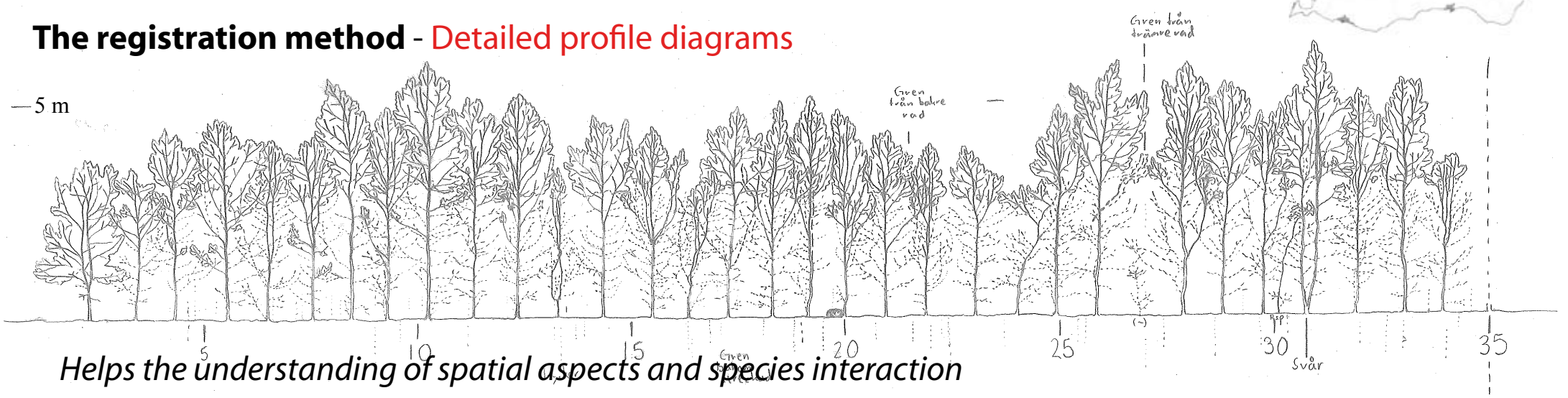
With this in mind a case-study was designed and implemented in Alnarp

The site - The landscape laboratory of Alnarp

Focus is on multifunctional aspects
Complexity ladders is used in the design
Contains many untraditional planting combinations



The registration method - Detailed profile diagrams



Helps the understanding of spatial aspects and species interaction

The species - Three key species

Silver birch - ***Betula pendula***

Common oak - ***Quercus robur***

Wild cherry - ***Prunus avium***

Timber production is possible
Different life ages/strategies
Different light requirements
Common and appreciated in an urban context
Are used as main trees in rich structured stands

The study site - Southwest Sweden - Scania - Alnarp

Registration was made 9 years after plantation

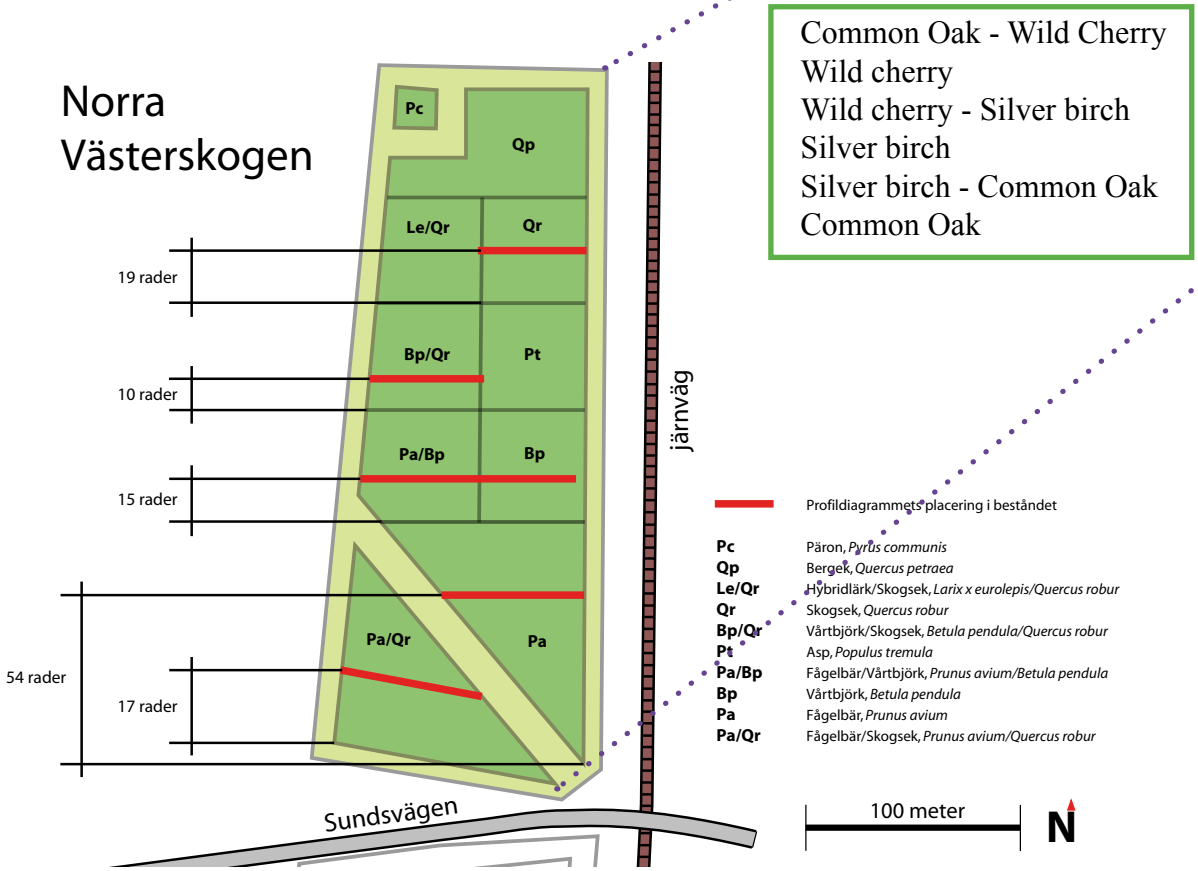
Planted at about 1 x 1,5 meter

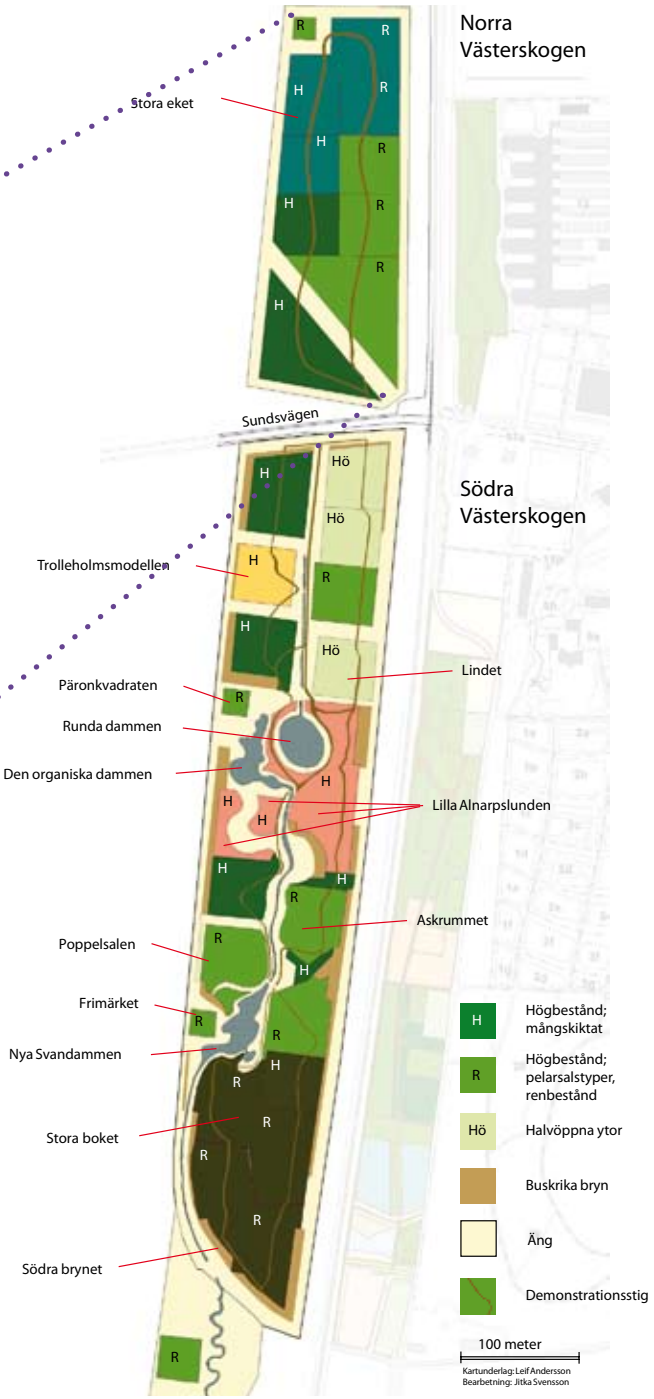
Mechanically weeded during the establishment phase

No thinning had taken place before the registration

Complemented with a field layer inventory

Six different parcels was included in the study






Prunus avium

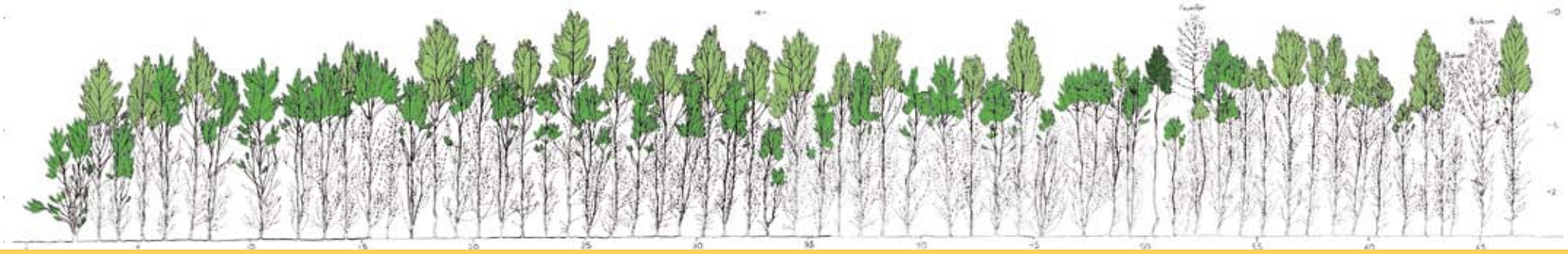

Quercus robur


Betula pendula

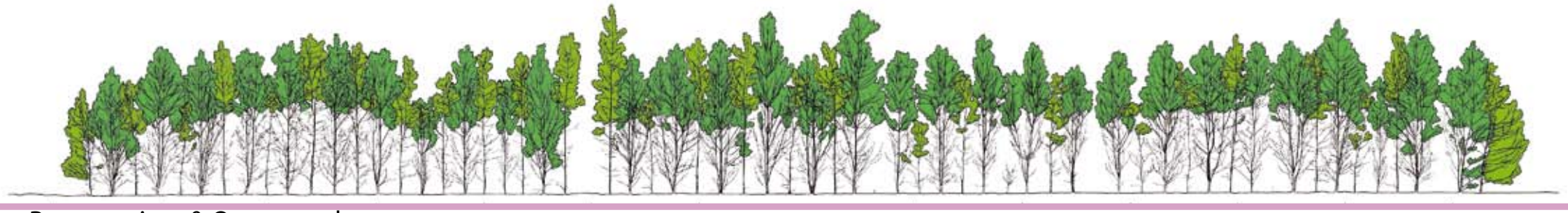

Prunus avium & Quercus robur


Quercus robur & Betula pendula

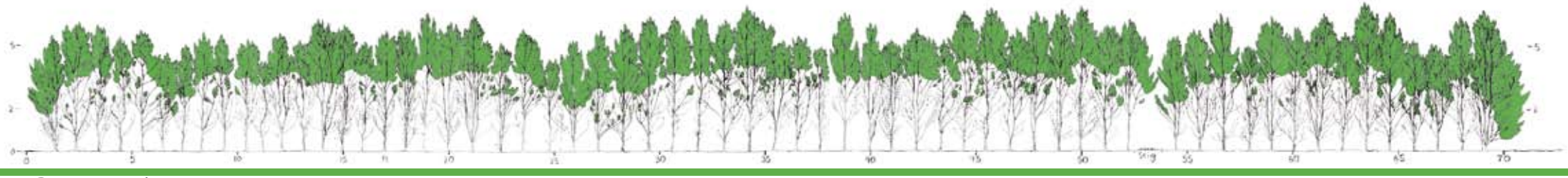

Betula pendula & Prunus avium



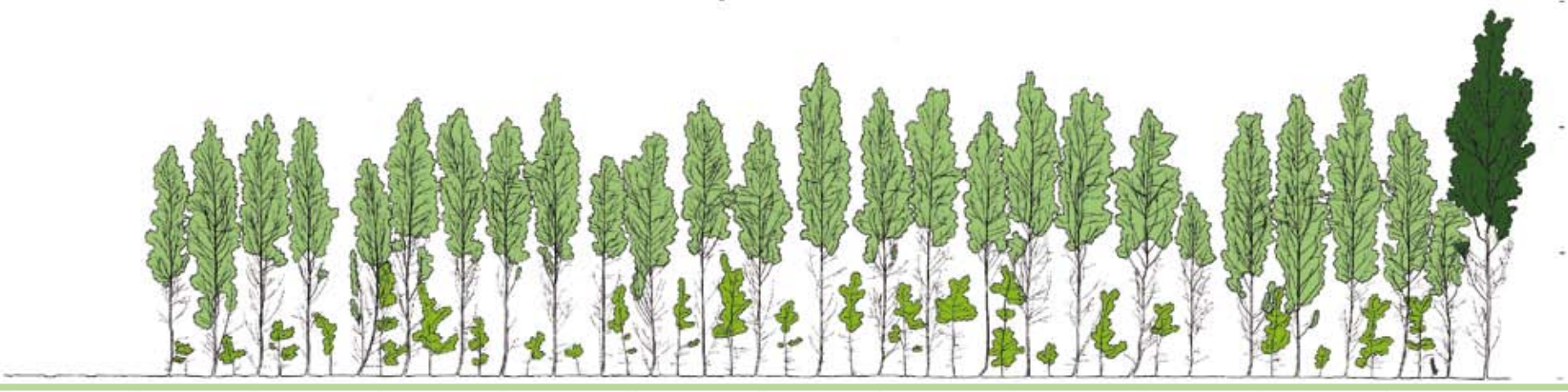
Prunus avium & Betula pendula



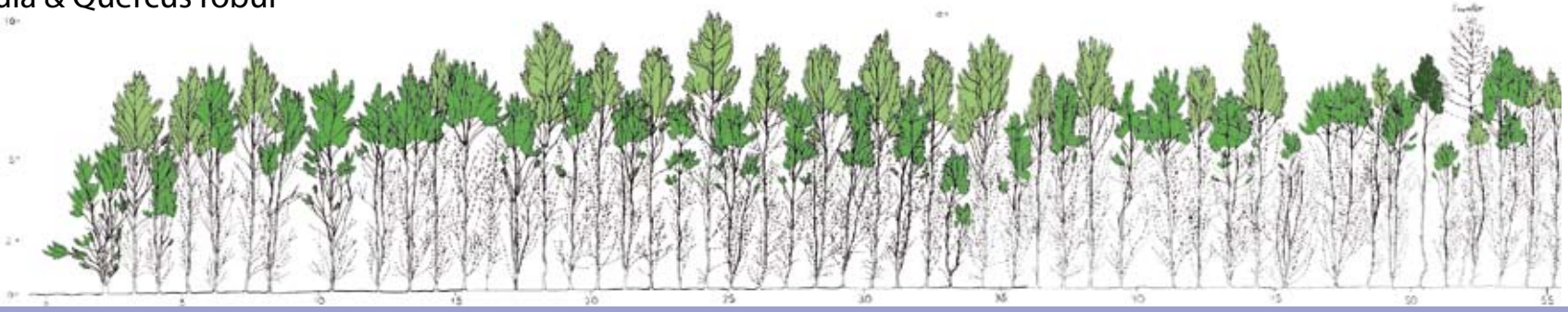
Prunus avium & Quercus robur



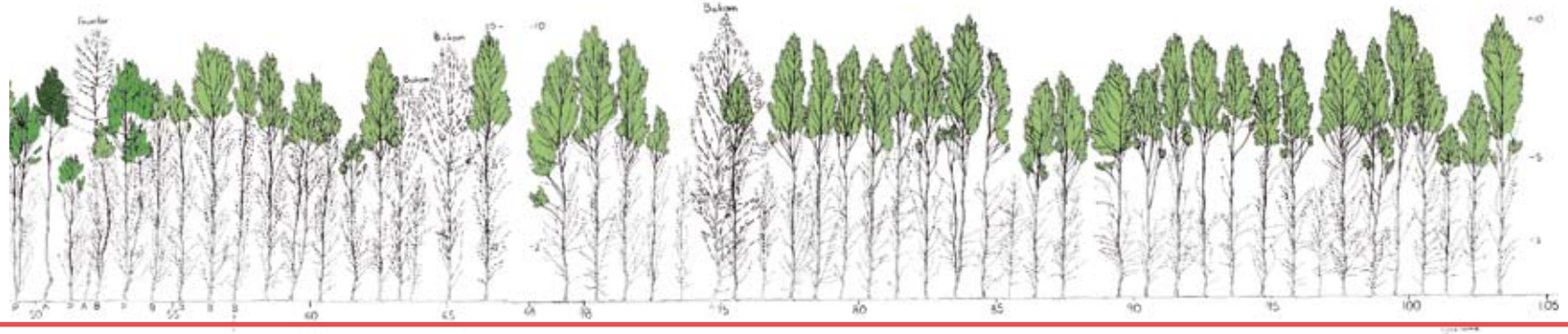
Prunus avium



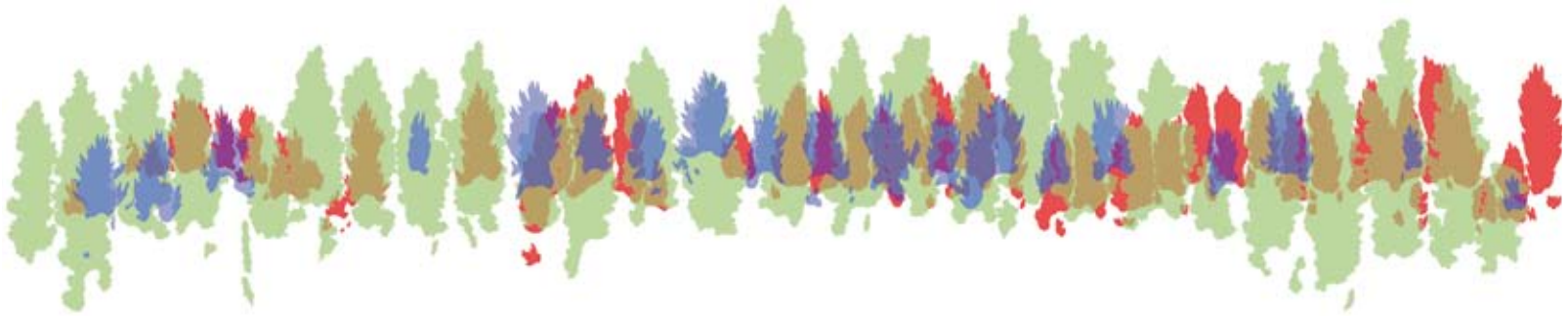
Betula pendula & Quercus robur



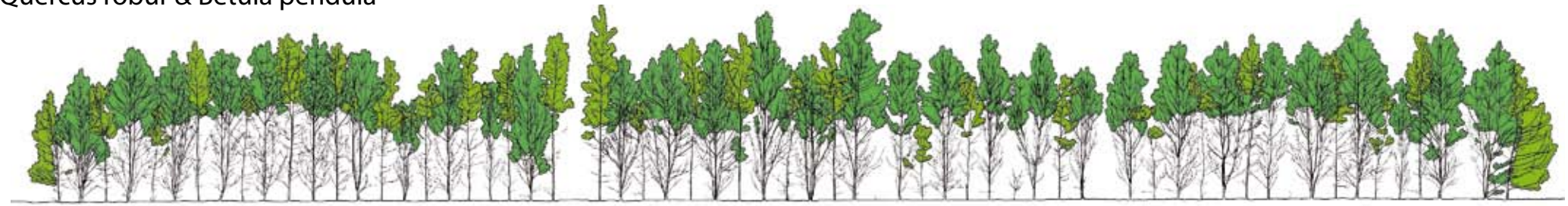
Betula pendula & Prunus avium



Betula pendula



Quercus robur & Betula pendula

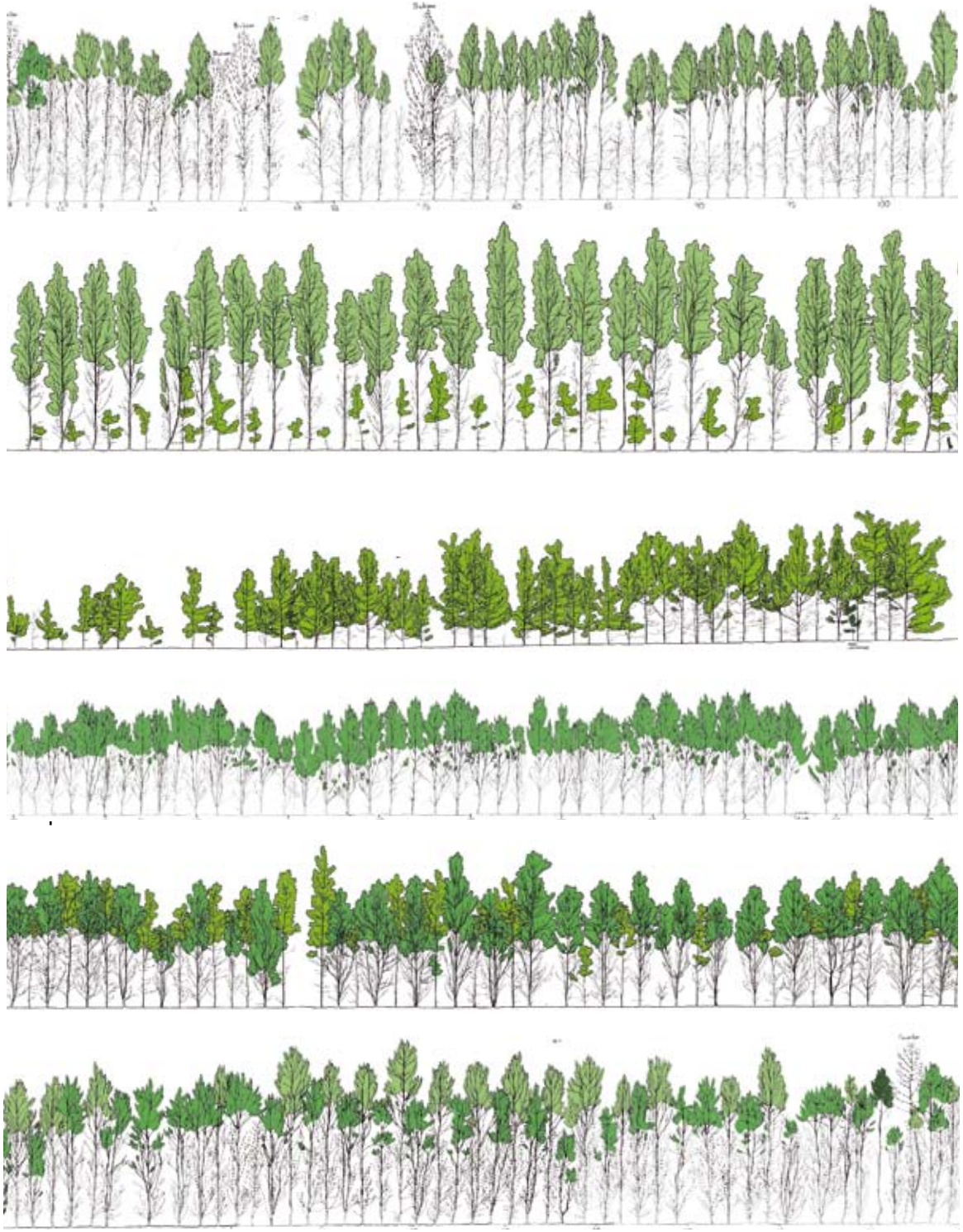


Quercus robur & Prunus avium

Quercus robur

Fieldlayer coverage

High coverage

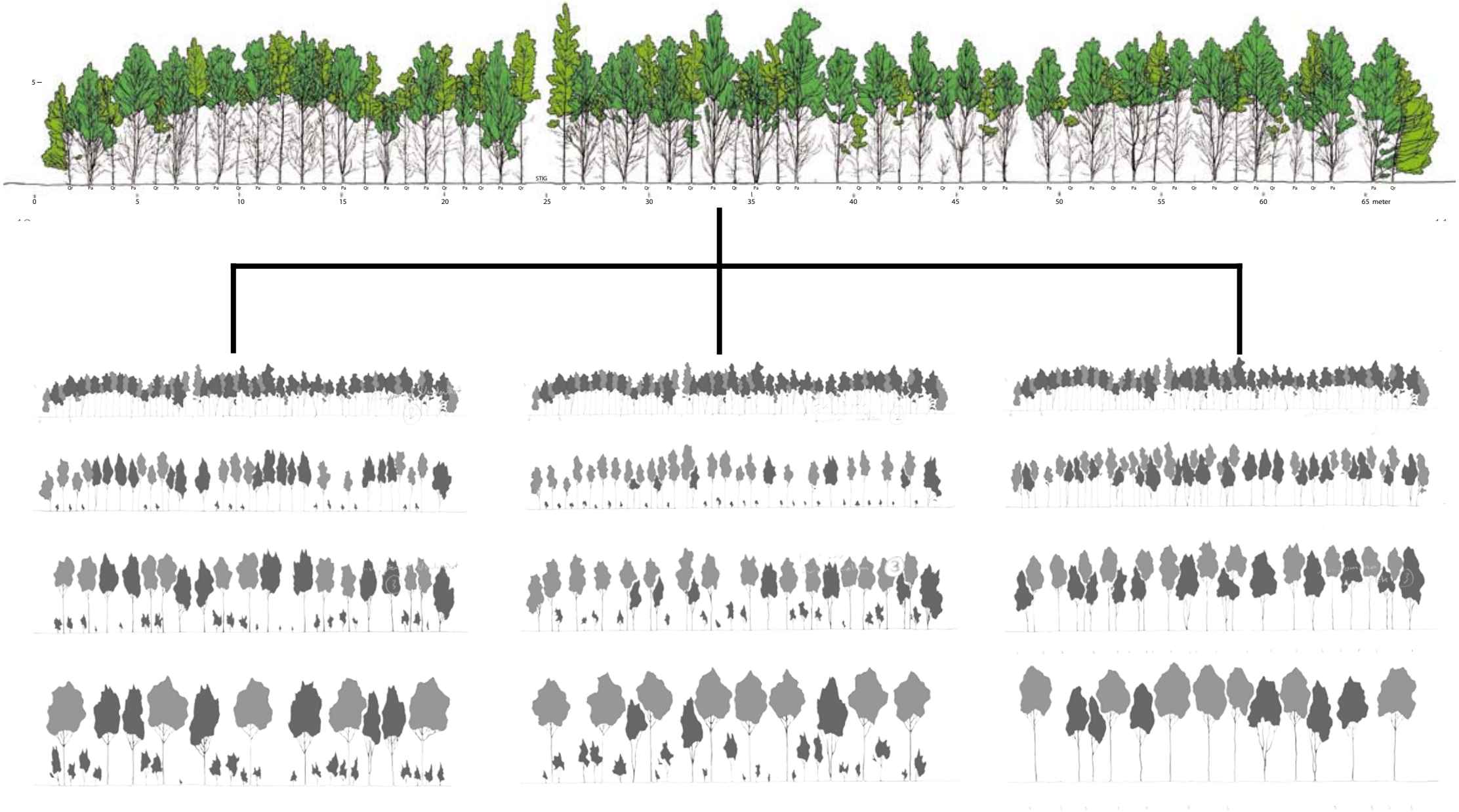


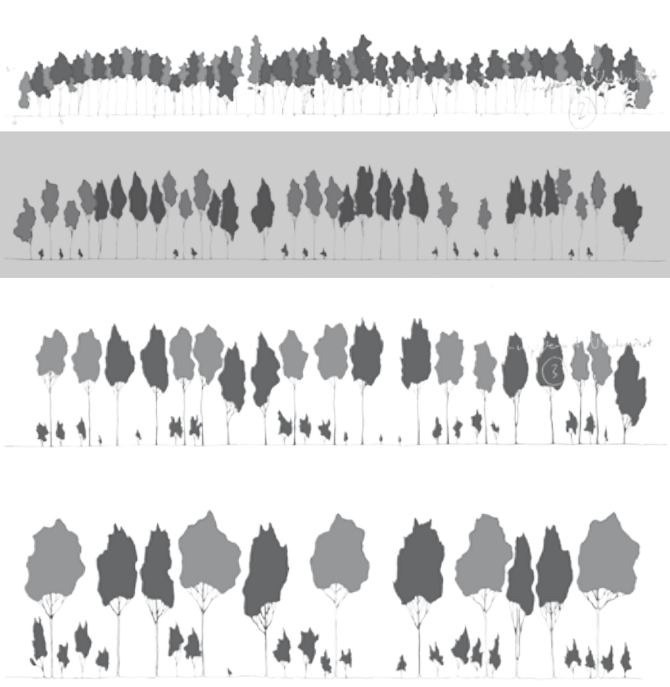
Bare soil

High coverage

Bare soil

Long term and short term strategies - developing different types through creative management





Observations and "findings"

All three species developed very differently depending on what kind of trees they where mixed with

Stratification of the canopy affects the fieldlayer and therefore also the visual experience

Mixed planting of oak and wild cheery can give better growth and timber qualities then monocultures

Interior qualities can sometimes develop faster in simple mixed plantings

Monoculture can have a stronger visual character then mixed plantings in the youth phase

Nursery species can be to fast and strong growing

Outlook

Formal design concepts could be used more in the youth phase

More concern should be given to what kind of character different species and stand provides during different life phases

The stand structure influences not only the spatial qualities but also the fieldlayer – how can this be incorporated in the design and management

The close interaction between different species are important for how they develop – what implications do this give to the use of group plantings versus fine grain mixtures.

The contrast between mixed planting and monocultures is an important design consideration

Mixed plantings offer more management options and considerations then monocultures

Other……..

Spurningar?

Takk fyrir athyglina!

Trjáplöntur sem eru gróðursettar ídag eru skógur morgundagsins.