MASTER LANDSCAPE ARCHITECTURE

Out of the *Blue*
A nature-based armature for urban development

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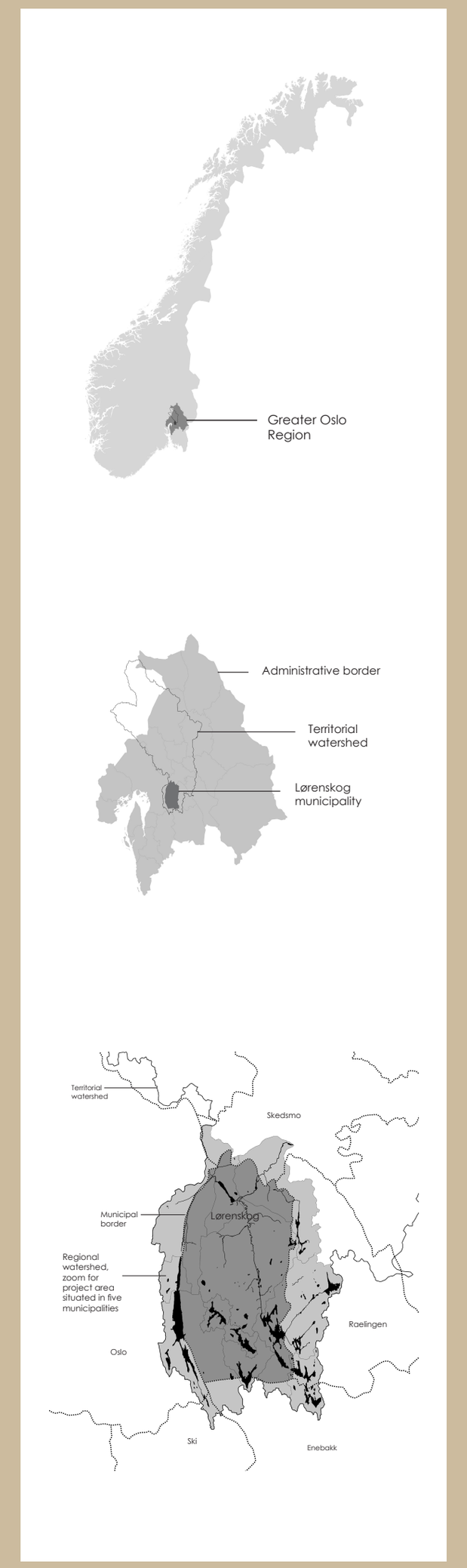
The project proposes a nature-based design strategy that addresses the urban challenges of flood, fragmentation and underused spaces to provide social connectivity in the Municipality of Lørenskog.

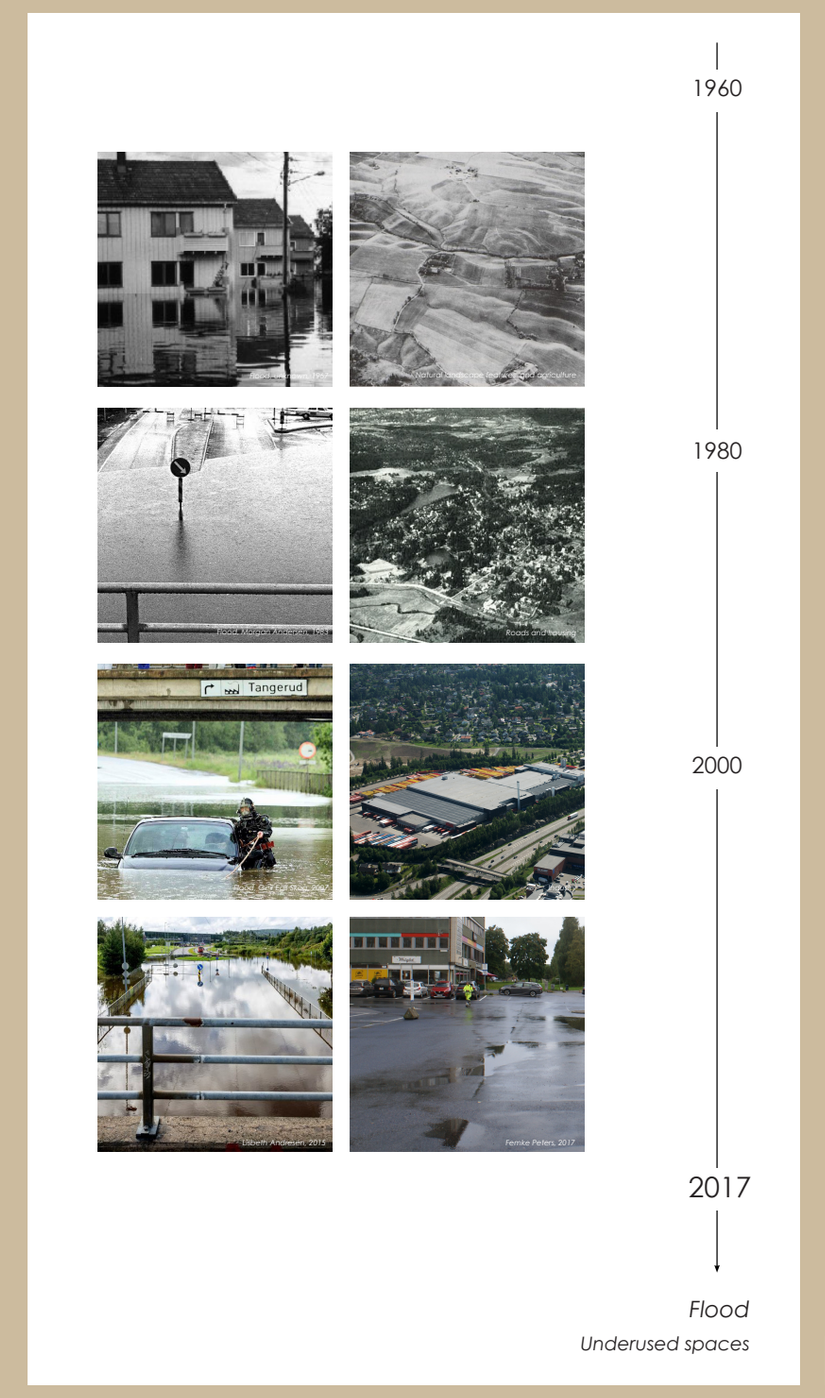
A changing climate and a rapid growing city, has become highly problematic: Recently occurring heavy rains, causing flooding of the urban fabric. By taking the watershed with its flows and cycles as base for intervention, the project opens up a new approach towards the existing logics of urban expansion, exploring ecological infrastructure as place-maker within the wider territory.

The city's trouble is prototypical for the Eastern suburban area of Oslo and will serve as a spatial spine and conceptual entry point for future urban development.

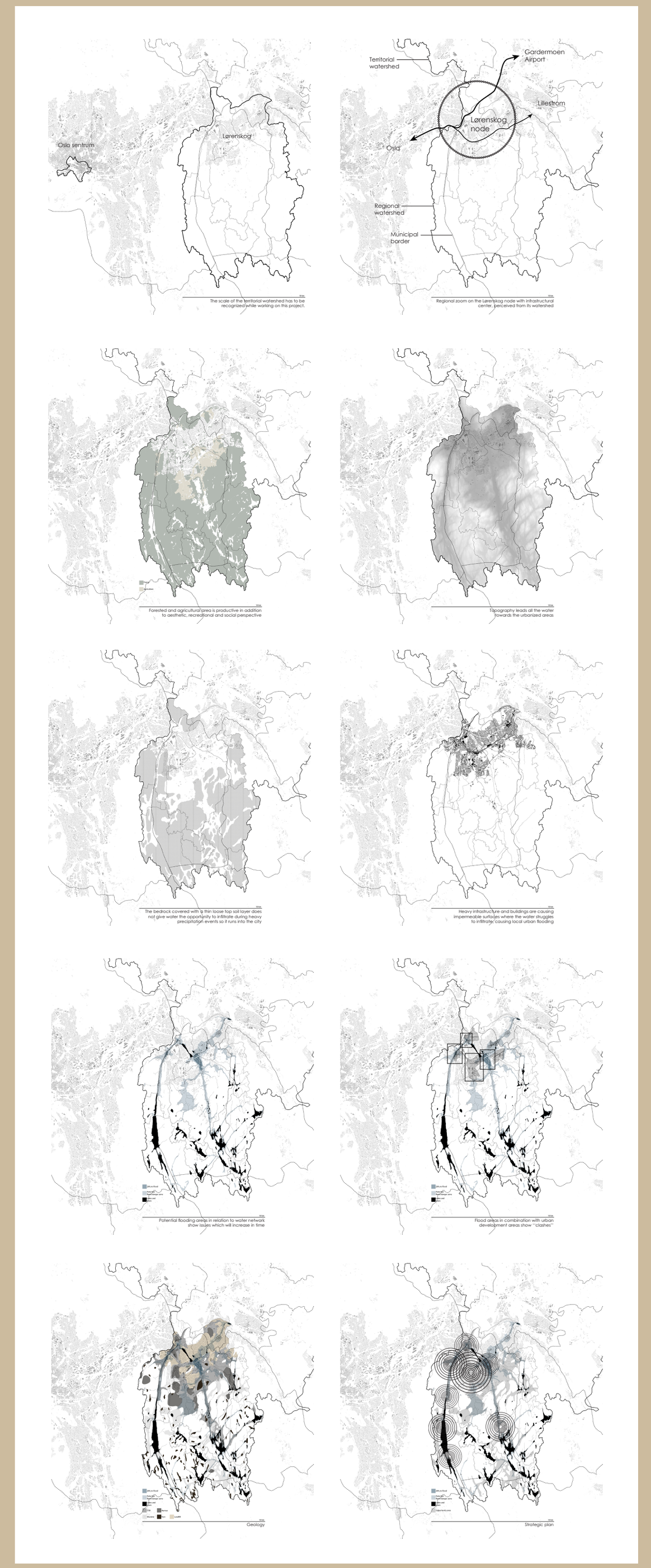
AHO WORKS DIPLOMA AUTUMN 2017


Greater Oslo Region
Administrative border
Territorial watershed
Lørenskog municipality
Territorial watershed
Skedsmo
Municipal border
Lørenskog
Regional watershed, zoom for project area situated in five municipalities
Rælingen
Oslo
Ski
Enebakk

Location project area


1960
1980
2000
2017
Lisbeth Andresen, 2015
Femke Peters, 2017
Flood
Underused spaces

Challenge climate change vs rapid urban growth


Oslo sentrum
Lørenskog
Territorial watershed
Gardermoen Airport
Lillestrøm
Lørenskog node
Oslo
Regional watershed
Municipal border

The scale of the territorial watershed has to be recognized while working on this project.

Regional zoom on the Lørenskog node with infrastructural center, perceived from its watershed

Forested and agricultural area is productive in addition to aesthetic, recreational and social perspective

Topography leads all the water towards the urbanized areas

The bedrock covered with a thin loose top soil layer does not give water the opportunity to infiltrate during heavy precipitation events so it runs into the city

Heavy infrastructure and buildings are causing impermeable surfaces where the water struggles to infiltrate, causing local urban flooding

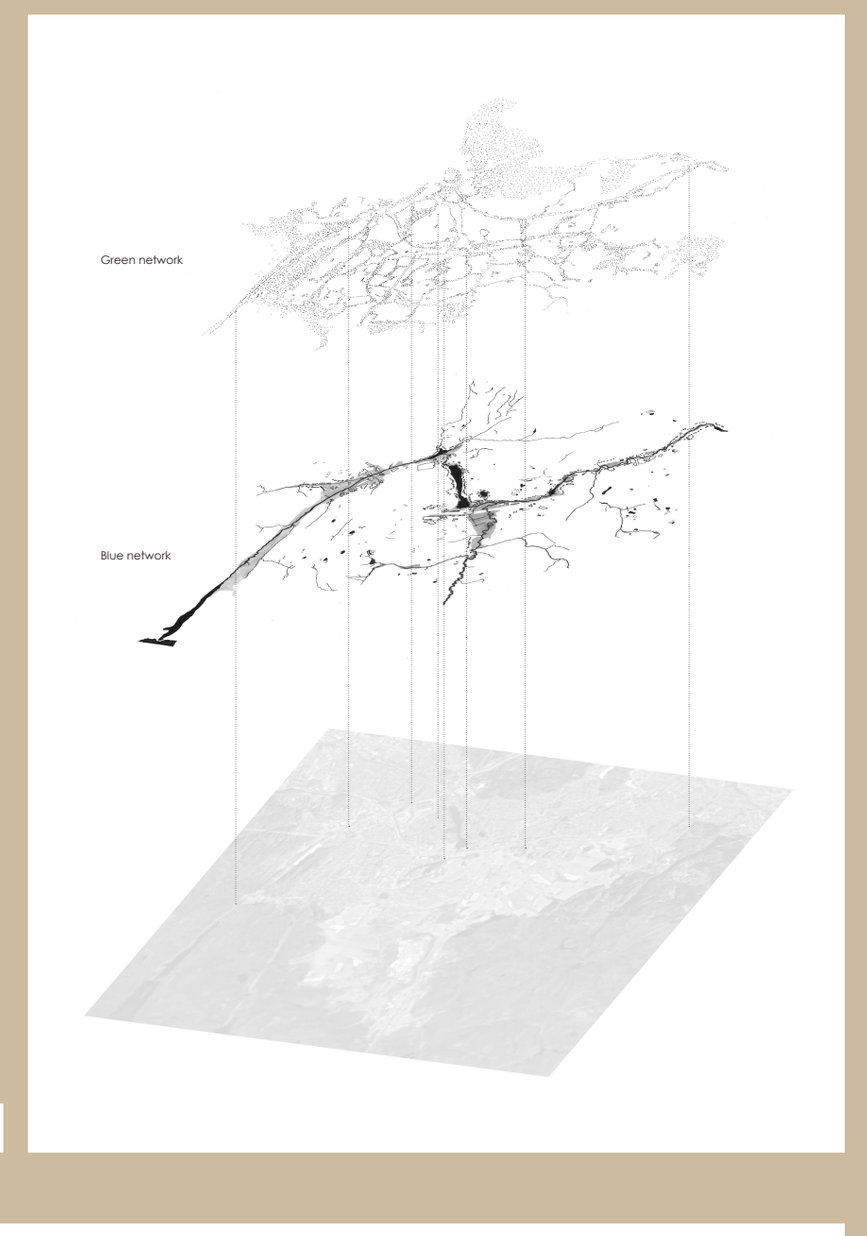
Potential flooding areas in relation to water network show issues which will increase in time

Flood areas in combination with urban development areas show "clashes"

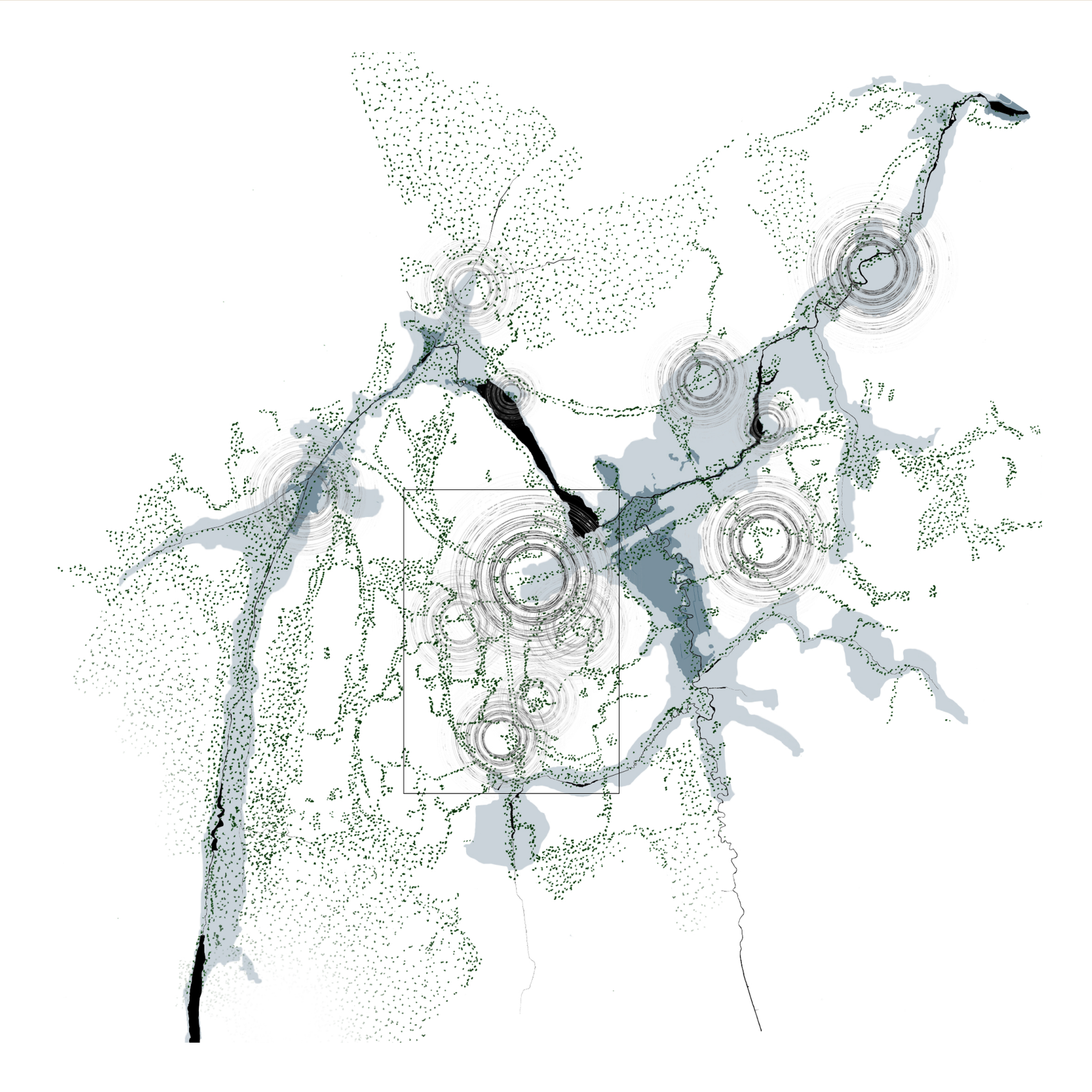
Geology

Strategic plan

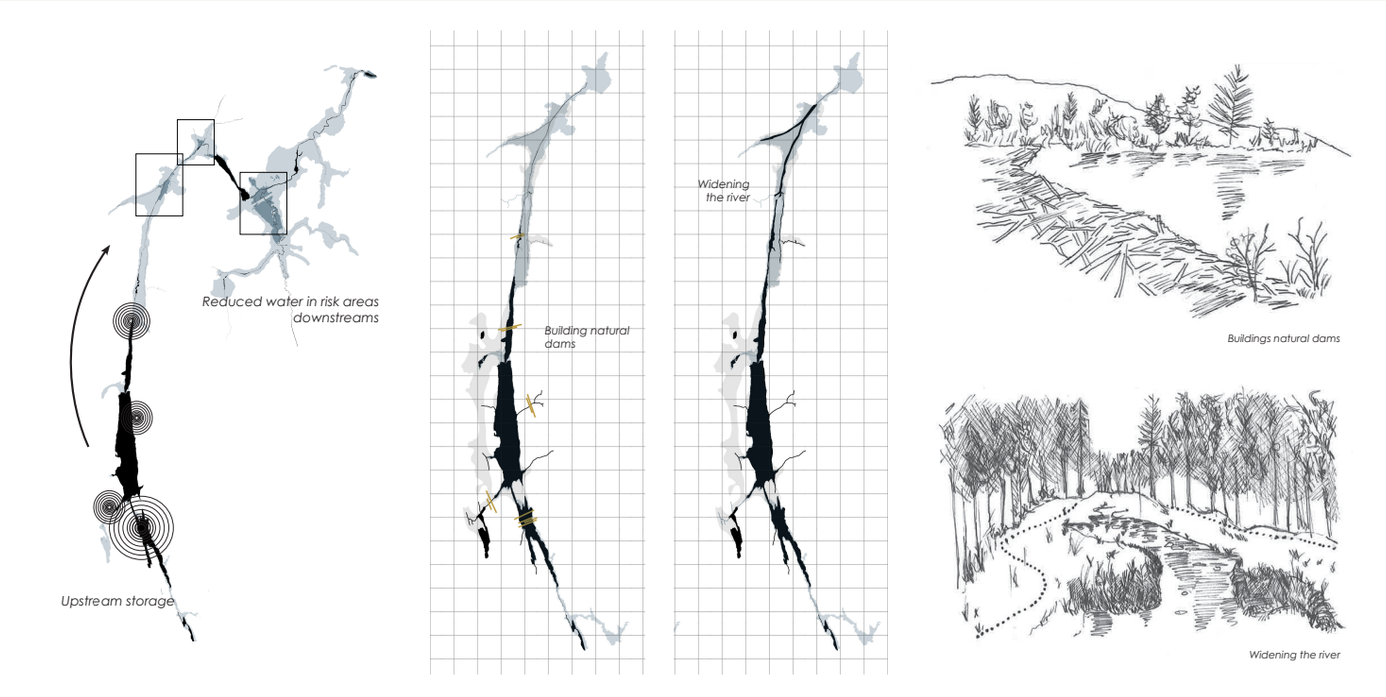
Projective cartography watershed


Green network
Blue network

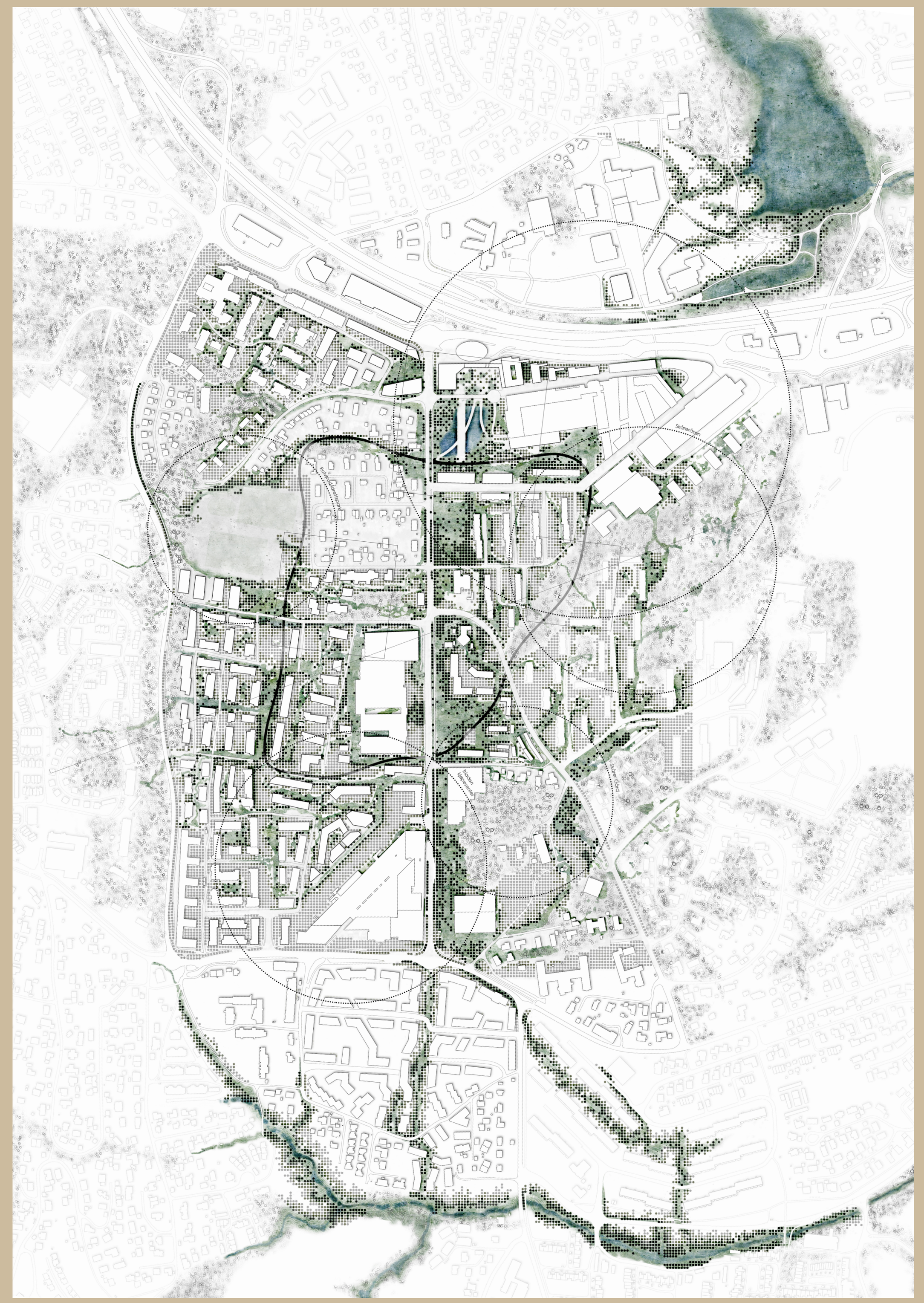
Blue and green network strategy

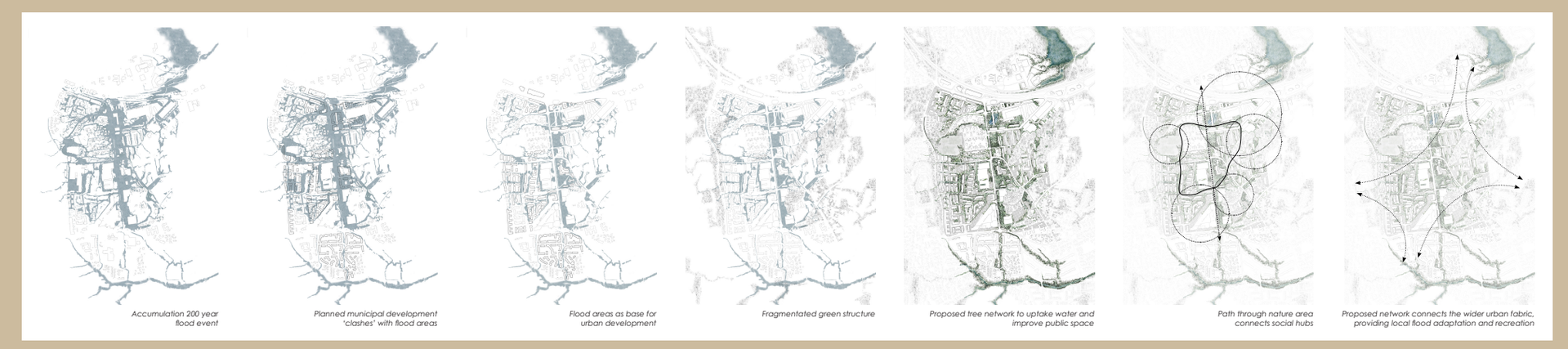


Downstream strategy


Reduced water in risk areas downstreams
Upstream storage
Building natural dams
Widening the river
Buildings natural dams
Widening the river

Upstream strategy





Accumulation 200 year flood event

Planned municipal development "clashes" with flood areas

Flood areas as base for urban development

Fragmentated green structure

Proposed tree network to uptake water and improve public space

Path through nature area connects social hubs

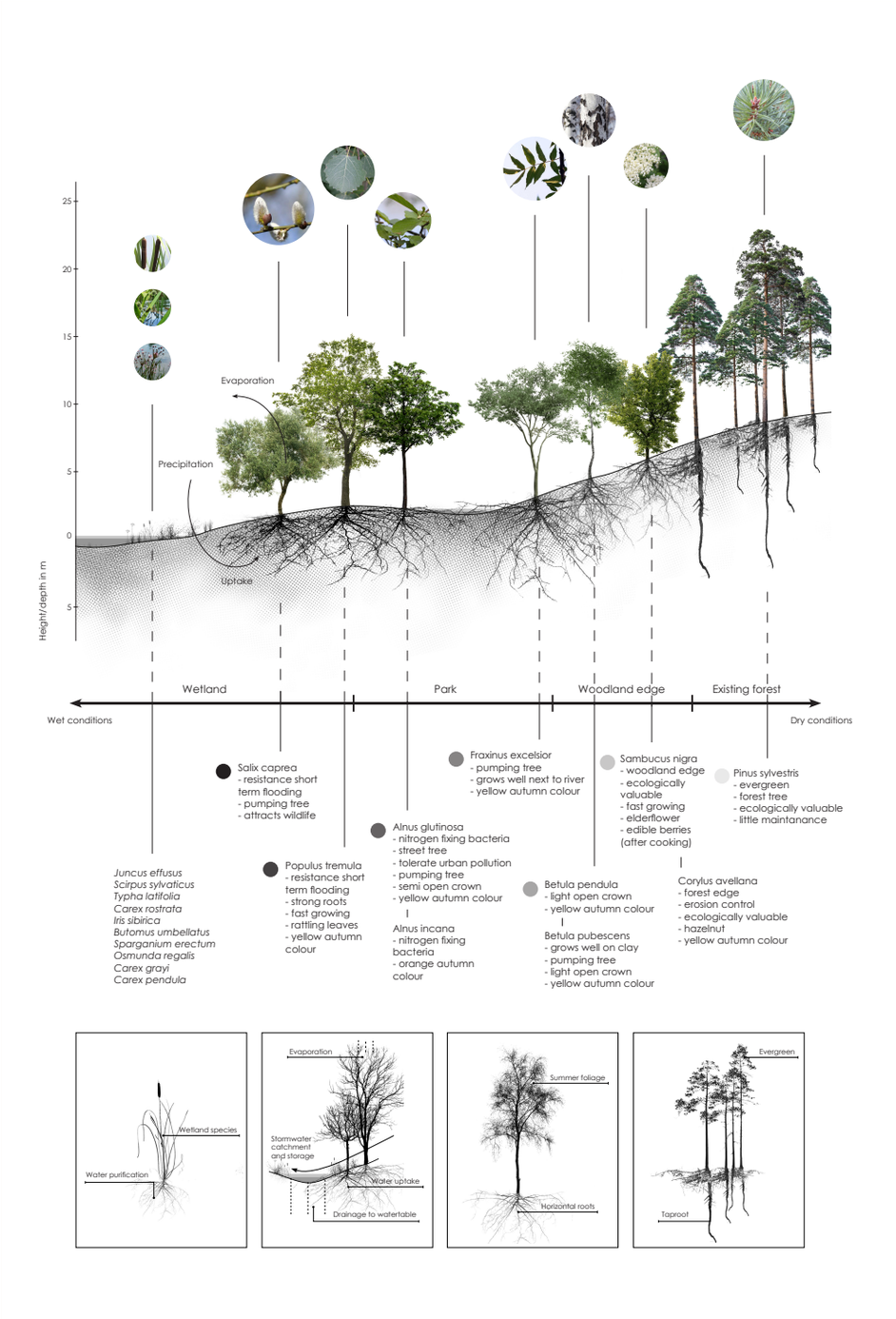
Proposed network connects the wider urban fabric, providing local flood adaptation and recreation

Legend masterplan 1:2000 N

- Existing forest
- ● Tree species dry conditions
- ● Tree species average conditions
- ● Tree species moist conditions

Diagrams design proces N

Sectional model topography 1:2000


Height/depth in m
25
20
15
10
5
0
5
Evaporation
Precipitation
Uptake
Wetland
Park
Woodland edge
Existing forest
Wet conditions
Dry conditions
Water purification
Wetland species
Evaporation
Stormwater catchment and storage
Water uptake
Drainage to watertable
Summer foliage
Horizontal roots
Evergreen
Taproot

Juncus effusus
Scirpus sylvaticus
Typha latifolia
Carex rostrata
Iris sibirica
Butomus umbellatus
Sparganium erectum
Osmunda regalis
Carex grayi
Carex pendula

Salix caprea
- resistance short term flooding
- pumping tree
- attracts wildlife

Populus tremula
- resistance short term flooding
- strong roots
- fast growing
- rattling leaves
- yellow autumn colour

Alnus glutinosa
- nitrogen fixing bacteria
- street tree
- tolerate urban pollution
- pumping tree
- semi open crown
- yellow autumn colour

Alnus incana
- nitrogen fixing bacteria
- orange autumn colour

Fraxinus excelsior
- pumping tree
- grows well next to river
- yellow autumn colour

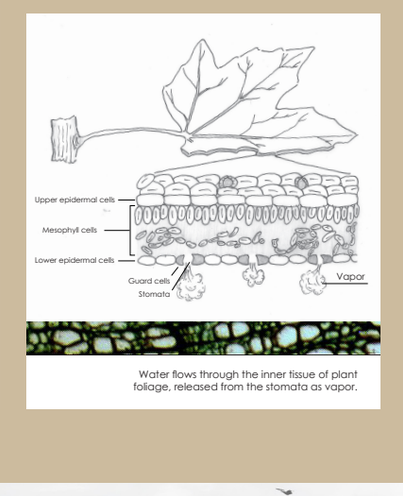
Betula pendula
- light open crown
- yellow autumn colour

Betula pubescens
- grows well on clay
- pumping tree
- light open crown
- yellow autumn colour

Sambucus nigra
- woodland edge
- ecologically valuable
- fast growing
- elderflower
- edible berries (after cooking)

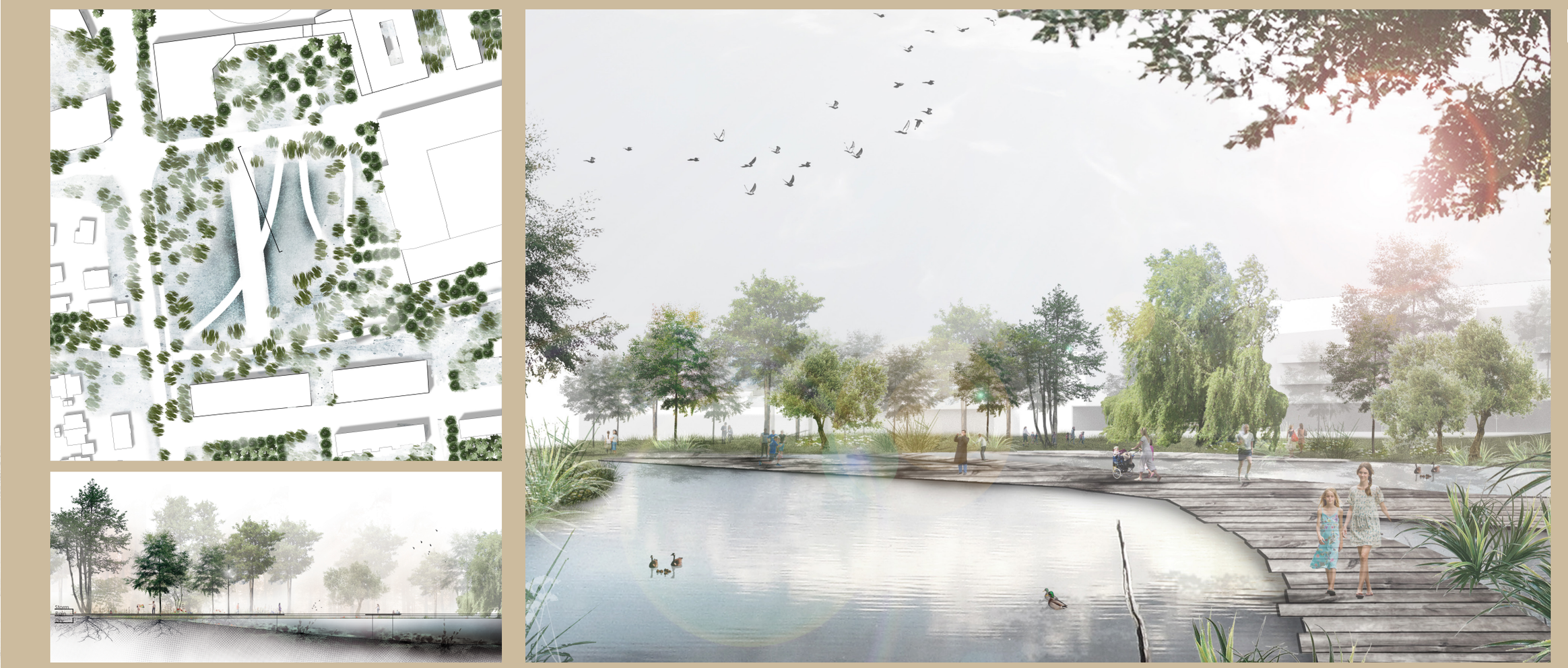
Corylus avellana
- forest edge
- erosion control
- ecologically valuable
- hazelnut
- yellow autumn colour

Pinus sylvestris
- evergreen
- forest tree
- ecologically valuable
- little maintanance

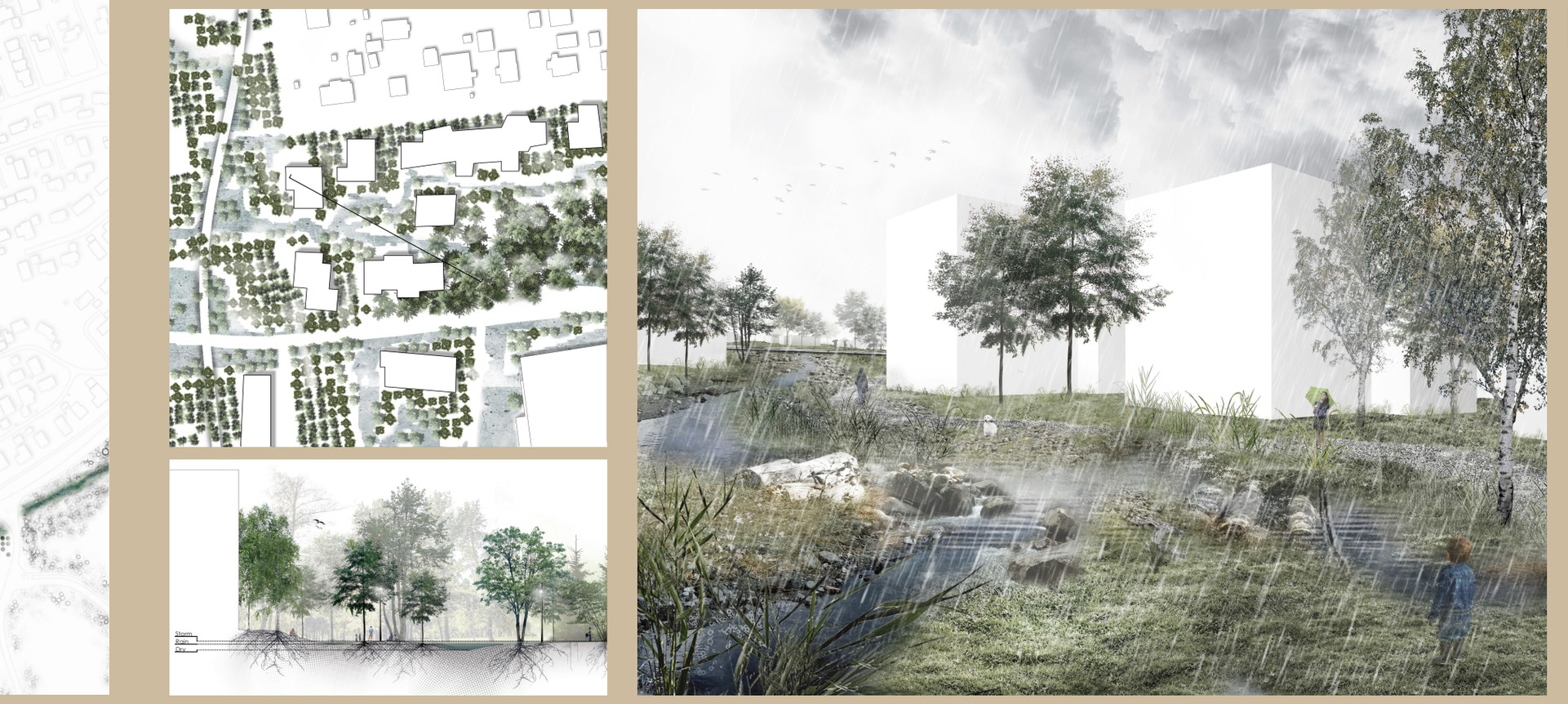

Upper epidermal cells
Mesophyll cells
Lower epidermal cells
Guard cells
Stomata
Vapor

Water flows through the inner tissue of plant foliage, released from the stomata as vapor.

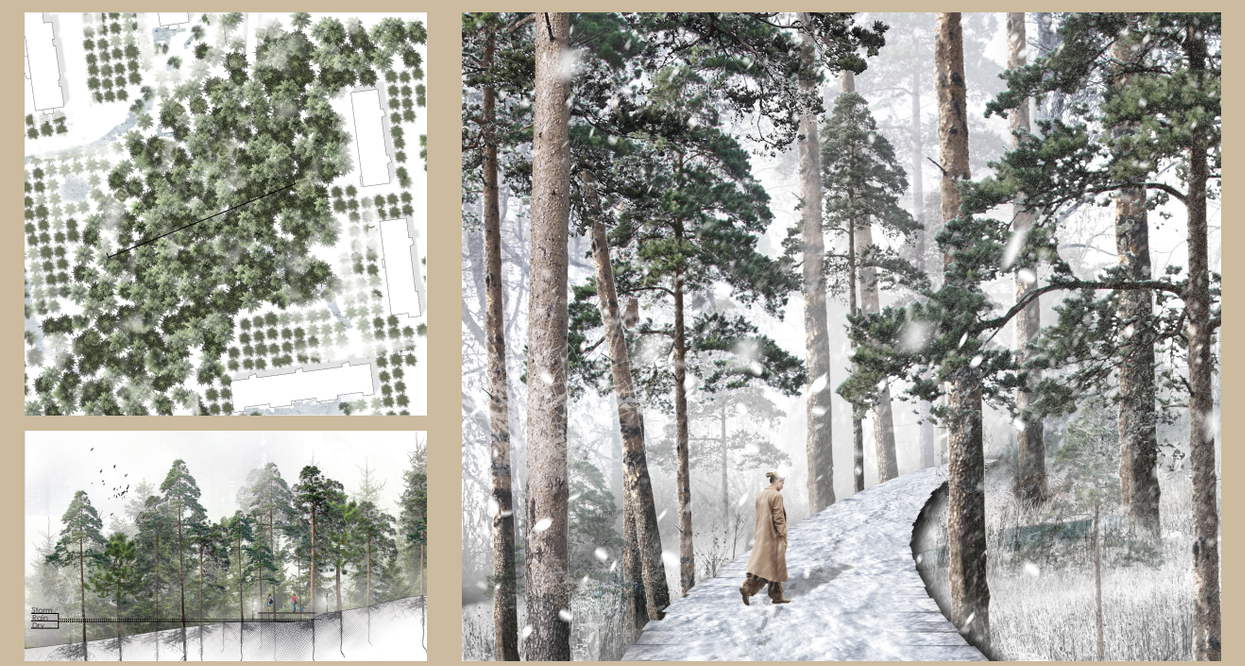
Plant principles



Zoom city centre 1:1000 Section 1:250

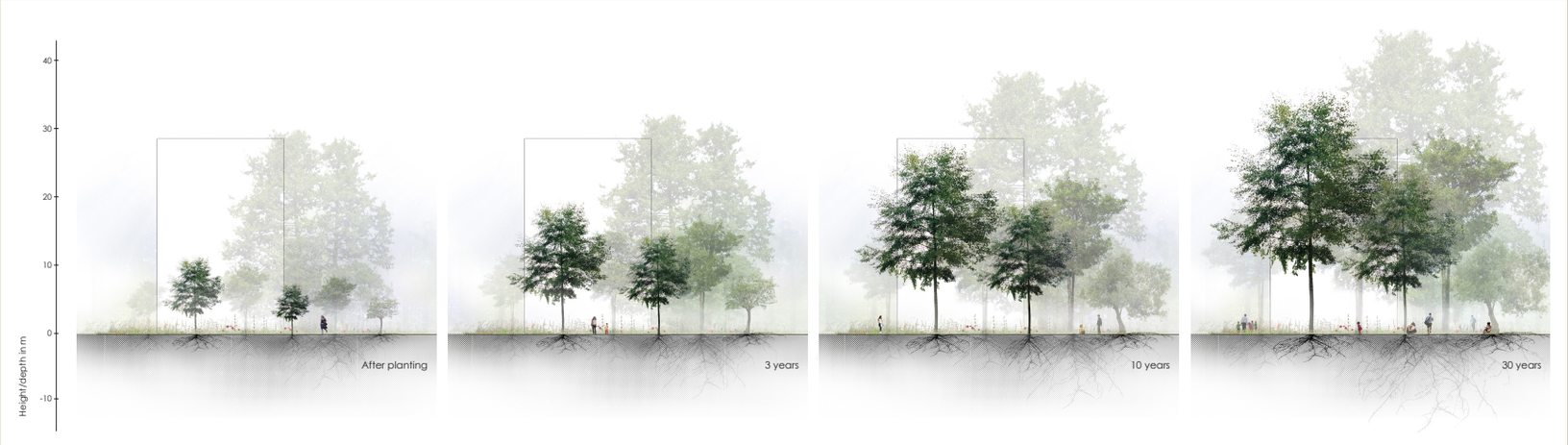


Zoom residential area 1:1000 Section 1:250

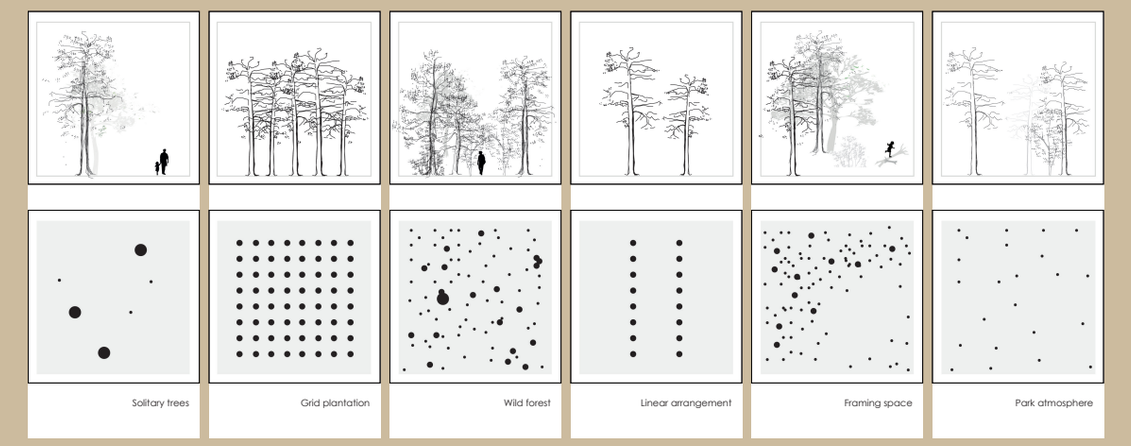


Zoom forest 1:1000 Section 1:250

Scenario drawings Invisible cities


Height/depth in m
After planting
3 years
10 years
30 years

Evolution in time


Solitary trees
Grid plantation
Wild forest
Linear arrangement
Framing space
Park atmosphere

Conceptual drawings tree language

Conceptual models tree language

Conceptual models modifying land

Model watershed 1:40000

Models zooms 1:1000