



REIMAGINE A CITY WITH WILDNESS

Rewilding for the Schijn Valley with a New Riparian Forest Corridor

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THESIS PROJECT

P4 Report

Master thesis Landscape Architecture

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Location: Schijn Valley, Antwerp, Belgium



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*"We need the tonic of wildness — to wade sometimes in marshes where the
bittern and the meadow-hen lurk, and hear the booming of the snipe; to
smell the whispering sedge where only some wilder and more solitary fowl
builds her nest, and the mink crawls with its belly close to the ground.
We must be refreshed by the sight of inexhaustible vigor, vast and titanic
features, the sea-coast with its wrecks, the wilderness with its living and
its decaying trees, the thunder-cloud, and the rain which lasts three weeks
and produces freshets. We need to witness our own limits transgressed,
and some life pasturing freely where we never wander."*

— Henry David Thoreau, Walden

Abstract

In the Anthropocene, human activity has profoundly impacted the Earth's environment, particularly in urban areas where nature is domesticated and humans dominate. Rewilding has emerged as an ecological restoration concept to create more sustainable urban ecosystems, though it faces significant challenges, especially in urban context. This graduation project proposes a new vision for urban rewilding, focusing on restoring natural processes and reducing human control over landscapes while enhancing human experiences of wildness. Using the Schijn Valley in Antwerp as a case study, the project explores the integration of ecological quality and aesthetic experiences in urban forests. Through multiscale design strategies, it aims to promote harmonious coexistence between humans and non-humans, with riparian forest corridors serving as key spatial elements that offer both ecological benefits and profound aesthetic experiences.

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1.1 Fascination
Domesticated Nature

We live in an era of constant change and upheaval, with human activity significantly impacting the Earth's environment. Throughout history, human advancement has been intertwined with the subjugation of nature. The relationship between humans and non-humans has evolved from worshiping nature to taming it, and then to mutual detachment. Moderate human disturbances have created or preserved landscape mosaics (Van Meerbeek, K. et al., 2019), providing opportunities for species that depend on such disturbances. Nevertheless, it is evident that numerous contemporary human activities have surpassed nature's inherent regenerative capacities. Rapid global changes pose fundamental challenges to the persistence of natural ecosystems and their biodiversity. The swift rise in population and economic growth has led to unrestrained urban sprawl and infrastructure expansion. The city has become a locus of power influencing the natural world, sweeping everything toward its center (Merchant, 1996). With astonishing speed, in many places, complex and fascinating ecosystems are being diminished (Monbiot, 2013), leading to a growing disconnect between people and nature. Most Current urban landscape plannings is dominated by a human-centric view, promoting short-term goals and predictable outcomes steered by a limited group. Natural systems are substituted by artificial systems that disrupt the innate order of ecosystems, affecting ecological benefits and often leading to further issues like floods and urban heat islands. Despite an increasing acknowledgment of the importance of nature and ecology, there remains a stark ‘otherness’ between humanity and nature (Perlman, 1994; Cronon, 1996a, c). Nature is culturally perceived through lenses, often aligning with picturesque conventions rather than ecological reality (Nassauer, 1995). The utopian images of harmonious coexistence within a flourishing and vibrant natural environment where people live happily, have been ingrained in our collective consciousness for centuries. People tend to appreciate the refined and delicate landscapes while concealing or masking the messiness and randomness of nature. Especially in urban environments, due to increasingly constrained and regulated lifestyles, people often lose touch with spontaneity and wildness of the broader non-human world(Tokarski & Gammon, 2016). It seems that people have forgotten the vastness, power, and magnificence inherent in nature. In this century, “eco-urbanism”, “green urbanism” and the “eco-city movement” want to take environmental planning beyond localized ecological improvements. They offer a vision of cities in harmony with nature. In an eco-city, nature, the built environment and society live in harmony and interact in a sustainable manner. (e.g., Beatley, 2012; Mostafavi & Doherty, 2010; Ruano, 1998). Green interventions, while beneficial, cannot truly repair the environmental damage wrought by modern humans, as healthy ecosystems depend on the

integrity of regional biological interrelationships, and cities epitomize artificial ecosystems. Some eco-designs may look wild (e.g., unpruned native plants in rain gardens). However, they fail to reintegrate nature and the city at a meaningful scale. Worse still, so-called eco-cities give the illusion that the dispersed natural features of the city can compensate for its inherent artificiality and have a benign effect on the planet(Laurian, L. A.et al., 2021)



Fig.1 Domesticated city and people

1.2 Topic: Rewilding

Rewilding as a Way Out

It is crucial to reevaluate and appreciate the spontaneity and vitality of nature. Ecosystems as dynamic systems whose future development cannot always be predicted, while urban environment is ever-changing, thus a dynamic approach is demanded. In fact, to a large extent, nature can look after itself better and more cost-effectively than we can. Rewilding as an alternative approach has emerged in mainstream culture within recent years. Definition of rewilding vary, although it is most ***commonly defined as the large- scale restoration of ecosystems, which aims to restore natural processes and reduce the human control of landscapes.*** The concept encourage a balance between people and nature allowing each to thrive.

The goal of rewilding is not to reach a predetermined endpoint or ideal ecosystem. Contrasting this with the traditional conservation approach, which, keeps the land in a state of heavily managed degradation, rewilding is a more process-oriented, dynamic approach. It fully respects the autonomy and complexity of nature, allowing natural processes to dominate without a fixed view of the long-term structure or composition of ecosystems. However, views on rewilding have undergone a long evolution. The timeline depicts the significant establishment of precedent, research and campaigns which have contributed to a rewilding revolution. It shows a the general trend of shift from its initial emphasis on protecting large, connected areas for key species conservation to more radical methods.

“Environmentalism in the twentieth century foresaw a silent spring, in which the further degradation of the biosphere seemed inevitable. Rewilding offers the hope of a raucous summer, in which, in some parts of the world at least, destructive processes are thrown into reverse.”

- Monbiot, *Feral: Rewilding the land, sea and human life*

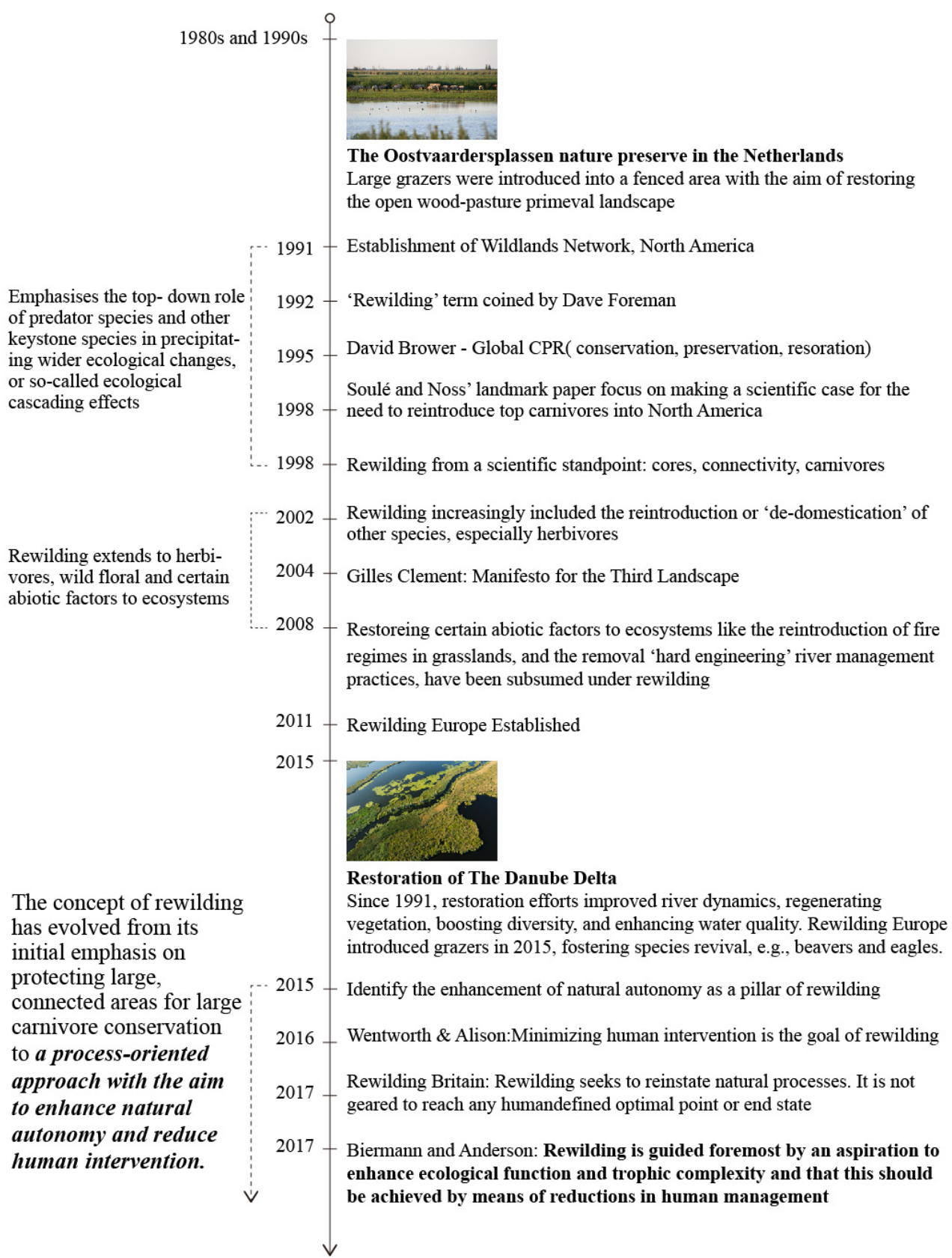


Fig.2 Evolution of Rewilding Concepts and Practices

1.2 Topic: Rewilding

Precedent Study: Oostvaardersplassen in Flevoland

Established in the 1980s, Oostvaardersplassen is an internationally renowned nature reserve. A group of ecologists led by Frans Vera wanted to slow down the growth of trees in the park to make it an open habitat for wetland and grassland birds, so they introduced large herbivores as a cornerstone of rewilding to advance the natural process. Fencing off land for rewilding was revolutionary at the time as a whole new way of working with nature. Frans Vera supported “precivilized nature rewilding” or paleo-rewilding, wild-living cattle and horses are reintroduced to mimic the grazing of extinct herbivores such as aurochs. This work drove radical changes, pushing traditional conservation towards “nature development” with large herbivores as the “ecological main structure”.

Although intended to restore natural processes, the current situation in Oostvaardersplassen is compromising the ecosystem's integrity. Humans are like stamp collectors creating things artificially to get as many species as possible. Managers follow a so-called nonintervention strategy, but if nature behaves differently from what they planned to see, then they many times still decide to take another intervention. There were other problems. As far as nature reserves go, the Oostvaardersplassen is pretty small, and the large herbivores are fenced in. With its fence limiting food availability and emigration, the project had the unavoidable outcome of needing population control, either through starvation or regular culls.

It's safe to say, nonintervention no longer applies in the Oostvaardersplassen and some have called the reserve a “failed experiment in rewilding.” But it must be recognized that the Oostvaardersplassen played a crucial role in popularizing and providing lessons for other rewilding efforts across Europe. It suggests that rewilding should be done at larger scales, with room for all the dynamics of a complete ecosystem — and with consideration of corridors and predators.



Fig.3 Masterplan of Oostvaardersplassen



Fig.4 Konik horses, which roam freely around Oostvaardersplassen



Fig.5 Tom Janssen cartoon, Caption: “Look, free nature!”



Fig.6 Animal carcasses litter the landscape of Oostvaardersplassen

1.2 Topic: Rewilding

Precedent Study: Mayfield Park in London

Mayfield Park, Manchester's first new downtown park in over a century, spans 6.5 acres and features diverse spaces connected by a winding river. The park's design carefully balances active, usable green spaces for the public with natural habitats for wildlife.

Drawing from the site's historical and industrial heritage, the park's hard landscaping incorporates restored and repurposed materials, capturing the distinctive character of Manchester.

The previously hidden River Medlock, once covered by culverts, was uncovered as part of a nature-first design approach. Now an essential wildlife corridor, the river's restoration has unlocked its potential as a significant biodiversity habitat. This effort will enhance urban ecology, attract wildlife, and contribute to Manchester's blue and green infrastructure goals.

Mayfield Park's naturalistic planting is designed to adapt to changing climatic conditions. Native plants line the river corridor, fostering an interconnected ecology for wildlife.

In addition to ecological restoration, the park includes versatile event spaces with integrated utilities. One of the park's largest sections features expansive lawns for recreational sports, play, and picnics.



Fig.7 Mayfield Vision

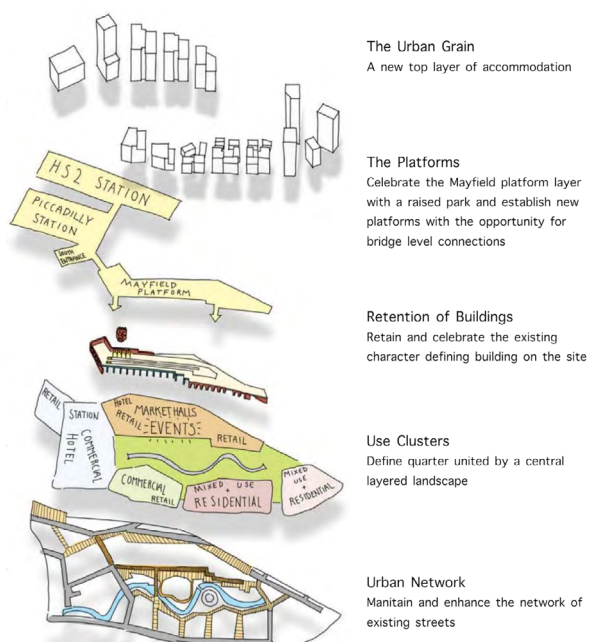


Fig.8 Mayfield Layered Masterplan



Fig.9 Ecological improvements of river edges and habitats



Fig.10 Restoration of the Industrial Heritage

1.2 Topic: Rewilding

Controversies over Rewilding

1. ‘Plastic’ word ?

In her paper ‘Rethinking rewilding’ (Jørgensen 2015), environmental historian Dolly Jørgensen discusses the “complex history and a host of meanings” of the term ‘rewilding’. She shows that whereas at first the term had a strict meaning in a scientific context, it later moved outside the realm of science and was adopted by environmental activists as a fundamentally asocial and ahistorical ‘plastic’ word without specific content.

3. Most rewilding occur in remote areas, with little urban examples

Urban areas, bearing the brunt of environmental damage during urbanization, emphasize the urgent need for a balance between urban development and natural restoration. However, urban rewilding presents distinct challenges, with competing human interests, overlapping policies, and judicial boundaries complicating environmental factors and ecological goals.

5. A notable gap between the aesthetic and ecological value in rewilding

The existing literatures and practice on rewilding has predominantly concentrated on social and ecological values associated with the process (see for example Aronson et al, 2007; Brook, 2006; Higgs, 2003; Merchant, 1991).

2. The moral problem in rewilding conflicts in cultural landscapes?

Advocates of rewilding argue that it implies a profound, non-anthropocentric reevaluation of landscapes and human history, urging a critical reassessment of cultural identities rooted in that history(Drenthen & Keulartz, 2014). But rather than leading us away from culture or history, this critique introduces something beyond human culture into the cultural realm of moral values. However, opponents argue that the long history of appropriation of and human involvement in the landscape is what has created meaningful places. Rewilding is destroying people's sense of self and sense of place(Drenthen & Martin 2018).

4. Public misunderstandings and negative perceptions

Much of the bad attention that rewilding has seen has come from it being misunderstood and negative connotations attached to it. Our disconnect from nature certainly plays a role too. It's easy to see rewilding as a scary, dangerous venture with wolf packs to be soon roaming through our streets. However, these are truly far-fetched notions. Learning more about how ecosystems work, the need for biodiversity, and the actual behaviour of animals, are the best ways to put an end to these damaging ideas.

1.2 Topic: Rewilding

Re-articulation of Rewilding in the urban context

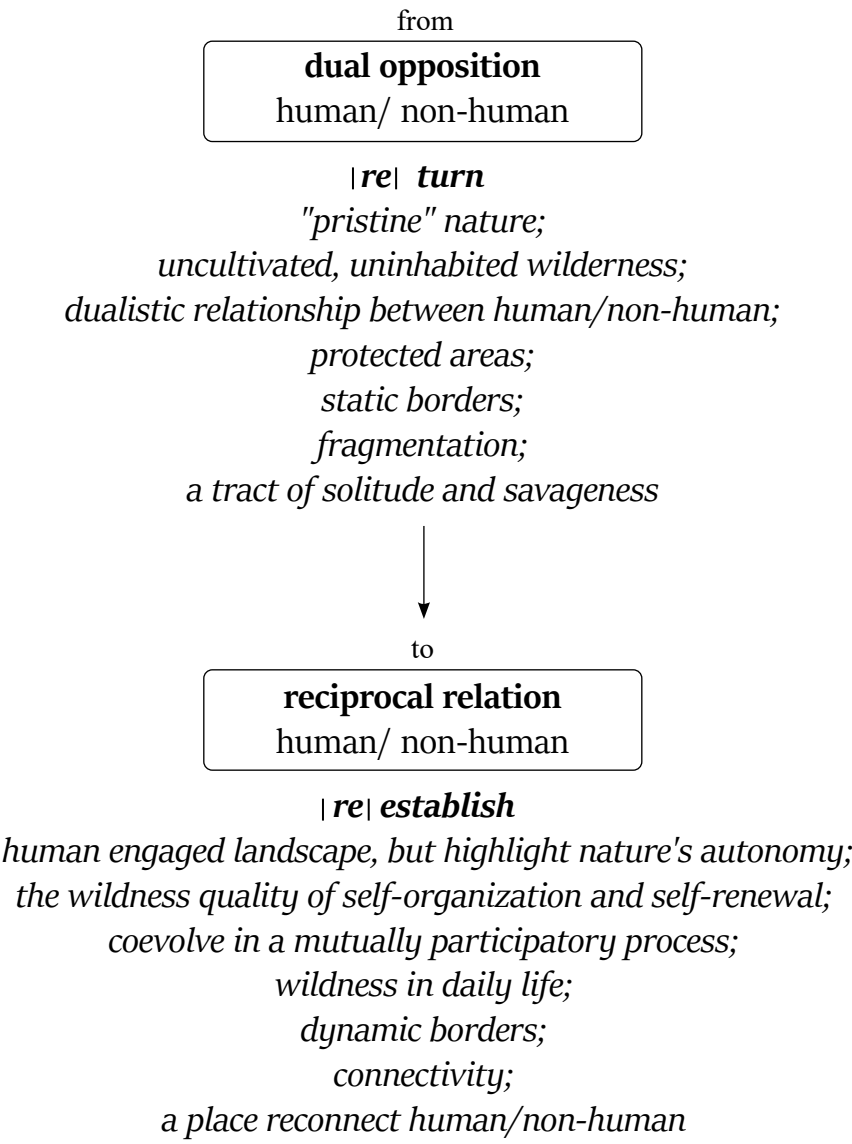
In response to controversies 1 and 2, it should be noted in particular that the purpose of rewilding is not to restore nature to a 'pristine' or 'original' state, more been seen in 'wilderness', but rather ‘bring back’ natural processes and thus ‘highlight and foreground non-human autonomy’ (Ward & Prior 2016). This relates to two easily confused concepts, “wilderness” and “wildness”.

Wilderness: a wild or uncultivated region or tract of land, uninhabited, where human industry and mechanics are absent; ‘ a tract of solitude and savageness’(Johnson).

Wildness: the quality or state of being wild or untamed; the essential ability of any creature to organize and renew itself.

While 'wilderness' is described as a measurable spatial entity, in which human and their material remnants are absent, 'wildness' is conceptualized ‘as the autonomy of the more-than-human world’ (Woods, 2005). This autonomy encompasses the capacity for self-direction and sustenance, flourishing without direct human intervention (Gamborg et al., 2010; Drenthen, 2005). Consequently, wildness is not confined to uninhabited landscapes but can be found in the cultural landscapes and are experienced at various spatial scales (Mulligan, 2001).

From Returning to the Wilderness to Re-establish the Wildness



1.2 Topic: Rewilding

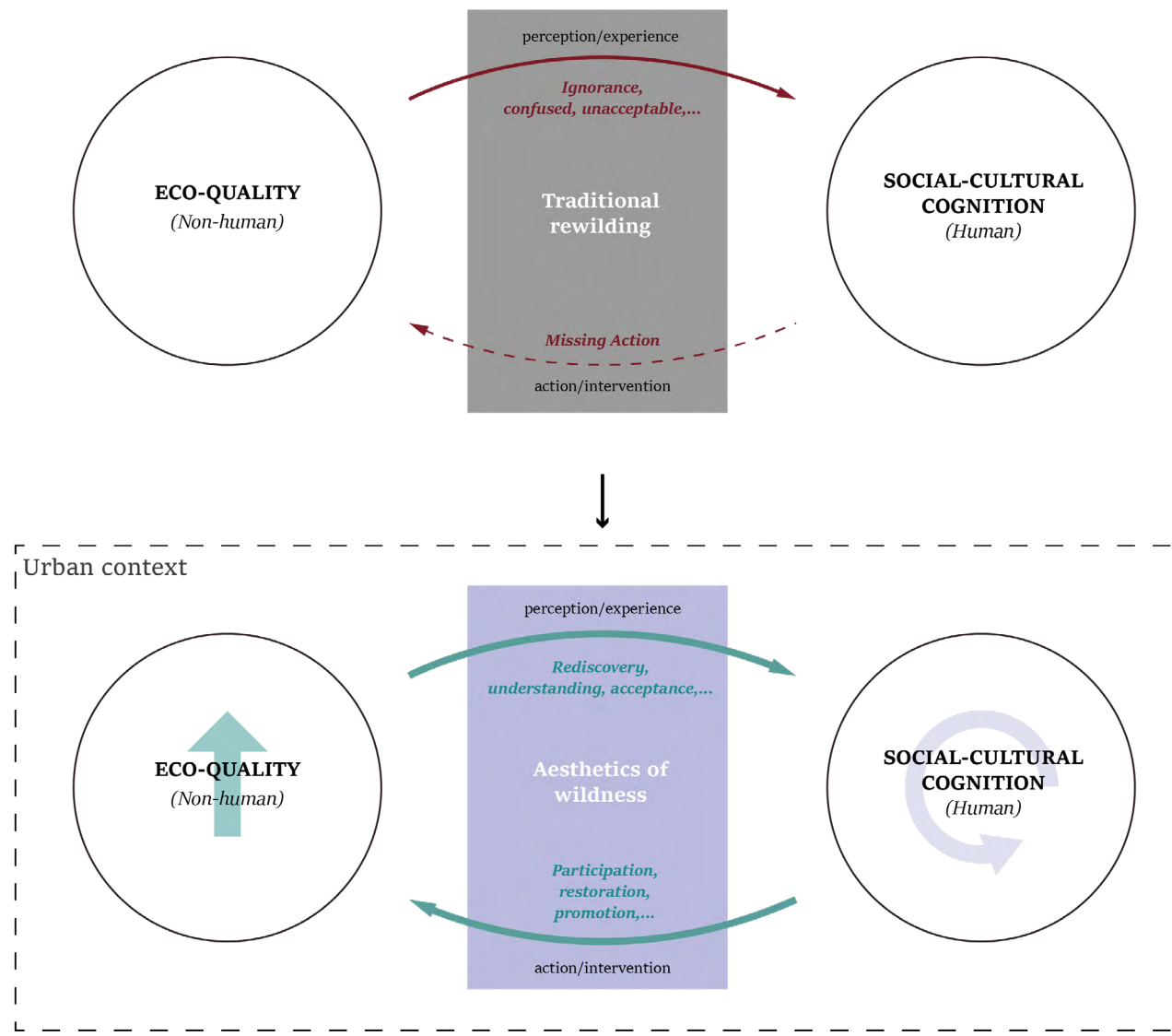
Re-articulation of Rewilding in the urban context

In response to controversies 3, there are no precise boundaries for rewilding. At a time when urbanization poses serious environmental and ecological problems, rewilding should take place in the wider built environment. Rewilding boosts the ecological value of urban areas while also enhancing social and human well-being by creating more opportunities for people to connect with nature(Holmes, 2020).

In response to controversies 4 and 5, when rewilding happens in cities, it brings about extra social impacts, altering not just the ecological environment and animal habitats, but also the living conditions and human habits. Hence, it's crucial to consider the physical, psychological, sociol, and aesthetic needs of humans. Thus, urban rewilding no longer involves only the ecological level of **"A process of restoring wild organsims and ecological process to places where they are missing or dysfunctional. The goal is to enhance self-regulation and sustainability of urban ecological environments."**(Jonathan and Emily, 2017), it **"touching a person's life with experience of wildness ."** It emphasizes the experience of emotional connection, inviting individuals to search for the missing wildness.

Overall, it encompasses a shared concern for both non-humans and humans. Ecological restoration is a fondamention aspaect, by restoring missing habitats for wildlife and plants, the non-human development get promoted. Meanwhile, rewilding in the urban context also raises the requirement of public experience and participation, only by making the rewilded landscape penetrate into people's daily life and improving the quality of people's experience, can people better know and accept rewilding. Therefore, a new aesthetics of wildness are need to be introduced, guiding people to better perceive and understandthe language of rewilded landscapes, eventually realize that apparent naturalness does not represent good ecological quality, helping the practice of the ecological restoration that may not appear picturesque and pleasing. Only when ecological quality and aesthetic experience coevolve can humans and non-humans connect better.

The demand for co-development of ecological and aesthetic aspect



1.2 Topic: Rewilding

Urban Forest: Window to the Wildness

"The enhancement of public acceptance towards wildness and their comprehension of natural processes can only be achieved through implementing programs that allow direct experiences with the wildness. Such initiatives would ultimately lead to a more favorable attitude towards "true" wildness in the long run."(Kowarik, I & Korner, 2005)

Urban forests have always occupied a unique position in urban development and green infrastructure. This distinctiveness stems from their more significant ecological role compared to that of most other city green spaces, they represent the forests as the ancient base of civilization, as 'the other' contrasting with the urban environment, as the wildest part of urban nature.

Urban forests are often seen as the closest one can get to 'wildness' inside or near a city. From a historical perspective, cities and forests are often described as opposing ends of a continuum. Harrison compares the rise of civilization to the clearing of the forest canopy. As civilization flourished,the clearing of the forest canopy grows and the forest is pushed to its borders. As a result, forests offer the opportunity for escaping from civilization and explore the roots of humanity. As such, forests have been an antidote to the city and its hustle and bustle, a window to the wider world. And the experience of being “non-controlled” in the forest is crucial to realizing this “escape”. (Konijnendijk, 2008).

A "wilder" urban forest is usually characterized by less artificial management, autonomy of natural process, and spontaneous development. Trees are the city's most visible biotic elements; **urban forest, relying on its ecological, cultural, and aesthetic properties, can be utilized by landscape architects as a tool to create spaces with more wildness.**



Fig.11 The wilder urban forests can provide adventurous experiences right on one's doorstep, such as Lighthouse Point Park in West Vancouver, Canada. Photo credit: Colin Knowles in the Inside Vancouver Flickr pool



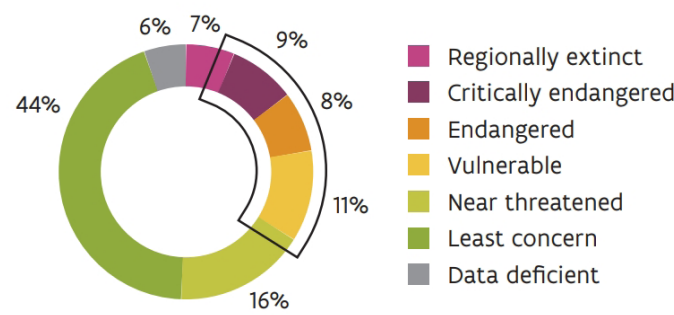
Fig.12 Natural processes as an important driver for the emergence of new woodland landscapes in the Ruhr region of Germany Photo credit: Michael Latz, 2014

1.3 Context Research

Antwerp: Sprawling Metropolis

The context research start from Antwerp, Belgium. In response to the growing social and economic complexities, resorting to dispersal policies is quite common in Europe. Boundaries are established between those inherently connected areas, undermining their interrelationships. Antwerp exemplifies a region where the traditional natural and cultural elements have experienced significant disruption. Uncontrolled urban development have reshaped the city from a compact core on the Scheldt into a metropolitan. The sprawl invaded large parts of the territory in an unprecedented manner, leading to a heterogeneous urban carpet with fragments from different periods and of a very different nature. The robust construction including harbor expansion, transport infrastructure disturbed the once pure congruence between topography, landscape and urbanization, giving rise to series environmental and ecological issues. Of particular concern is the fact that habitat loss due to fast-changing land use and fragmentation are preventing significant biodiversity from developing.

Endangered Species



Change in Flora

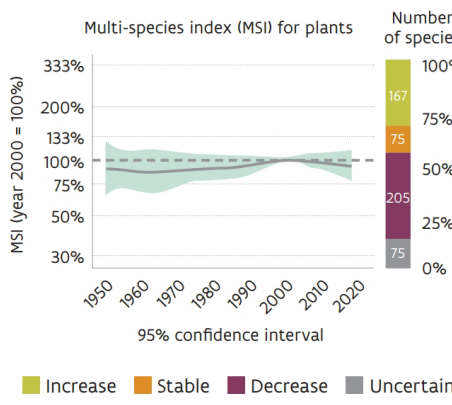


Fig.13, 14 Biodiversity is under pressure in Flanders, data from Nature report Flanders 2020

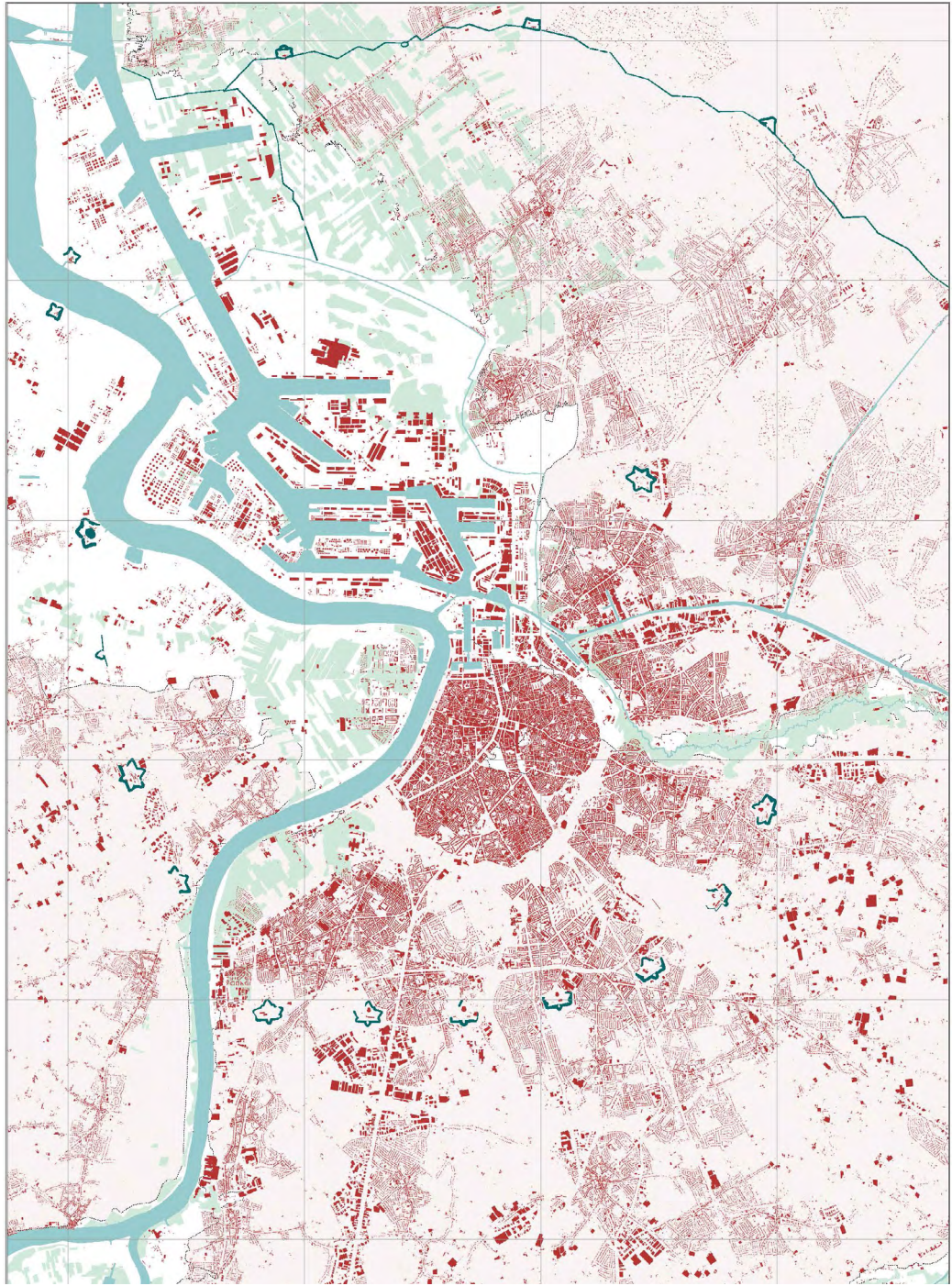
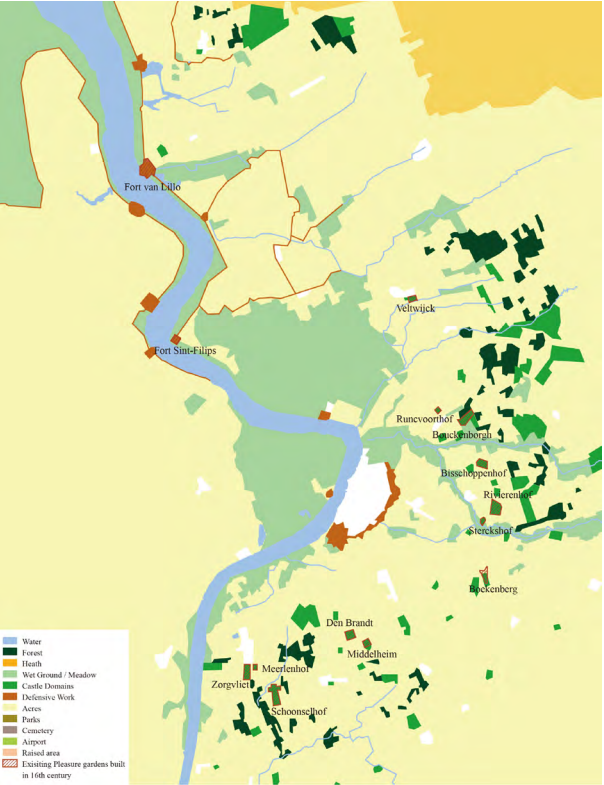


Fig.15 The Metropolitan Antwerp, Verhaert, I., Vanobbergen, T., Dehaene, M., Van de Velde, V., Boudry, L., & Grafe, C. (2015). Lab XX : opting for the twentieth-century belt. Antwerpen: Stad Antwerpen.

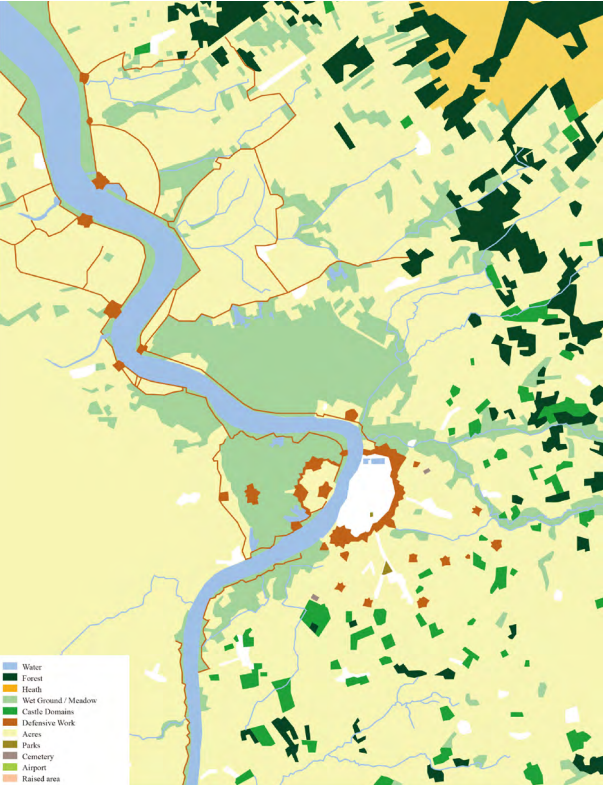
1.3 Context Research

Landscape Evolution: Fragmentation



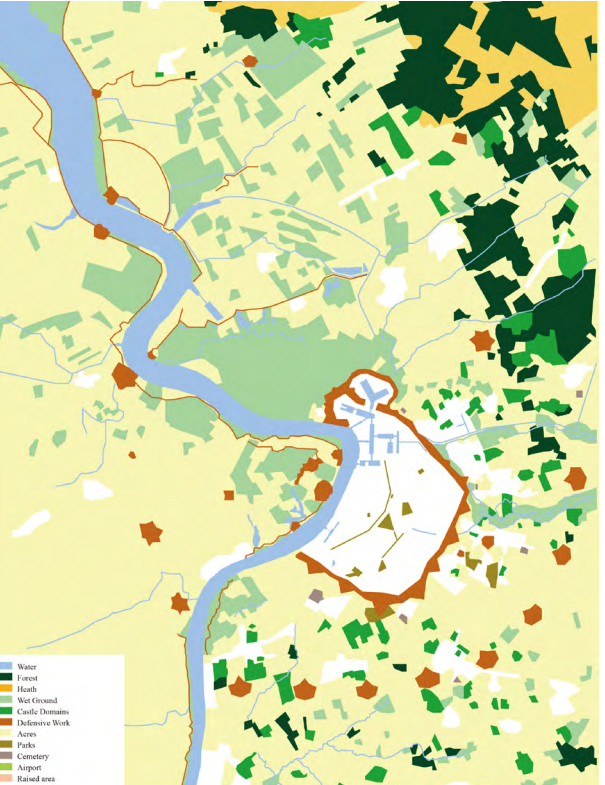
1775

The Schijn valley was a continuous structure with parallel streams and scarce forests.



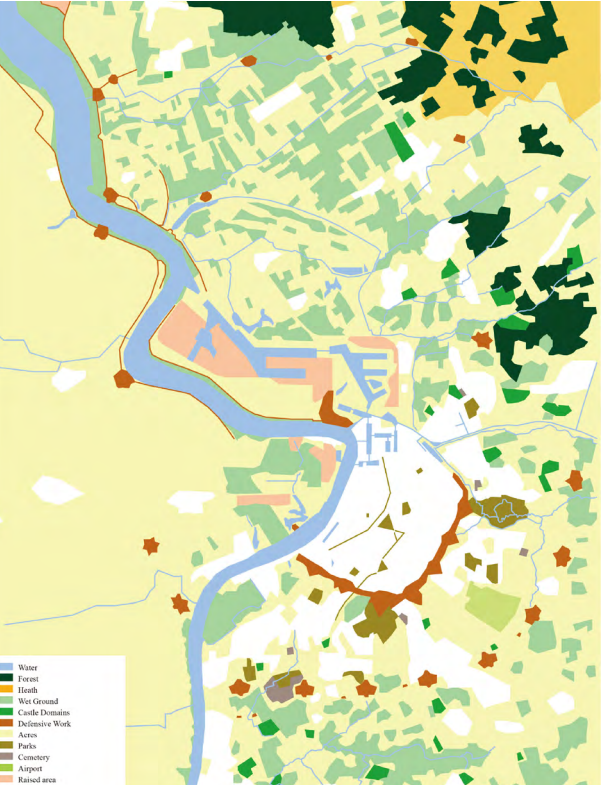
1830

The afforestation of coniferous forests on the sandy soils of the Kempen plateau.



1900

The Albert Canal and fortifications disrupted the natural stream course. Forests in the north-eastern hinterland have changed from productive to consumptive functions.



1948

Meadows along the Scheldt and Schijn disappeared or be transformed to be park. Deforestation due to suburbanization.

Antwerp resort to dispersal policies. Boundaries are established between those inherently connected areas, undermining their interrelationships. This fragmentation impacts species diversity through habitat loss, edge effects, and isolation, while also hindering the creation of a continuous and uninterrupted landscaped experience across the vast urban expanse. Particularly, the alterations in the water network's configuration have led to a succession of changes in landscapes associated with the water network. The wetlands and forests alongside watercourses have decreased, the once continuous green area was cut into various small isolated, and therefore fragile snippets. Rapid land use change and fragmentation have led to serious habitat loss problems.

1.3 Context Research

Antwerp: City by the Water



Antwerp has been a focal point of flows for centuries. Water appears not only as a separate flow, but also as a dominant spatial structures of the city, an essential carrier for other flows.

1.3 Context Research

Disruption of the Natural Riparian Systems

In a way, Antwerp has lost the fragile balance between estuary, harbor and city over the centuries. From the 1970s to the present, the harbor has evolved to a major world-class harbor, which has grown in economic importance and is significant for national employment. However, high rates of modernization have crowded out space, with serious impacts on nature and the environment, as well as on the livability of cities. In my travels to Antwerp, the presence of the natural system of rivers and streams was barely perceptible. The city maintains a distance from the river. The harbor creates distance rather than acting as a connecting space. Antwerp seems to have forgotten that it is a city with streams. People have also forgotten how water improves environmental quality, habitat and ecosystem function.

The Schijn river, the dominant water structure in eastern Antwerp, has historically flowed naturally, open connecting to the Scheldt before eventually joining the sea. The ebb and flow of tides, ships docking and departing, fostered a natural symbiosis between the rivers, the city, and the harbor in the past. Due to the expansion of the city and the harbor, the natural course and structure of the river has been disturbed. Streams were diverted, pumped into canals and further canalized.

An artificial system of pipes, siphons, sluice gates and pumping systems maintains the connectivity of the water system, and the city appears to be in harmony with nature. However, the risk of flooding and water pollution is actually increased, and the living space for natural organisms such as fish is compressed.

The reconnection of the natural water structure of the Schijn-Scheldt river offer Antwerp the opportunity to truly embrace the concept of 'flow' within the city. Therefore, the Schijn valley will serve as the central research site for this project, and the resoration of the riparian system of the Schijn Valley will be the main design objective.



Fig.16 Reconstruction of the stream valley based on the Ferraris map of 1774.

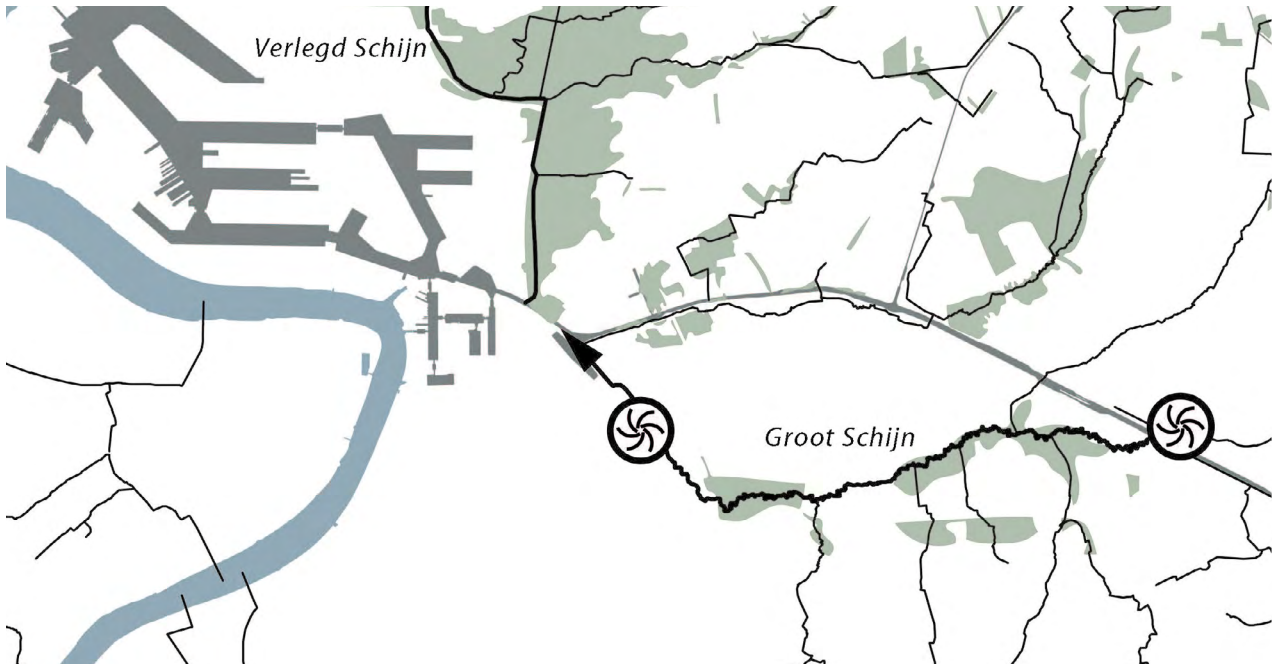
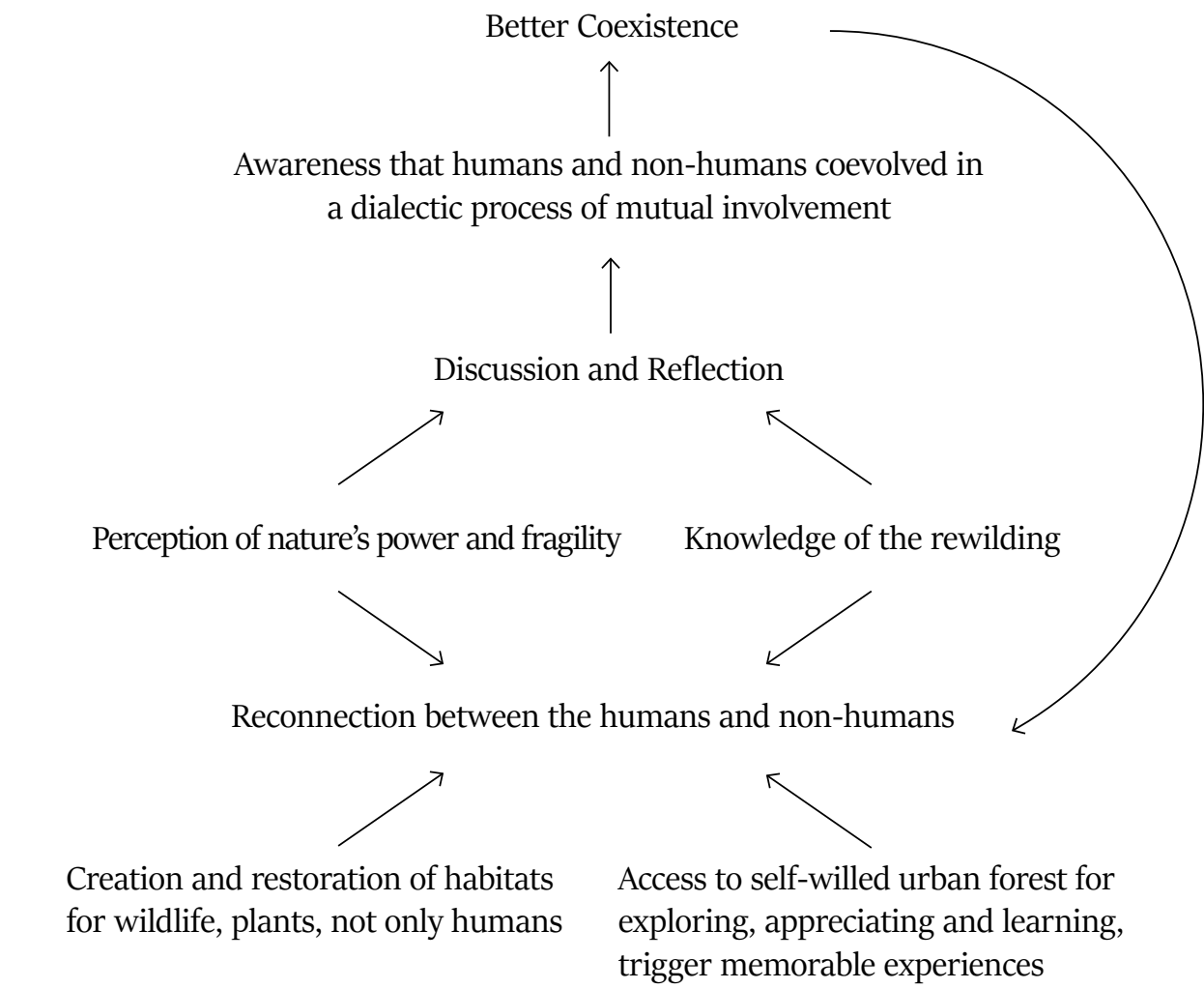


Fig.17 Schijn river system and flood risk areas (green). Water from the streams is pumped onto the canal.

1.4 Research Questions and Objectives

Research Objectives

This graduation project is an exploration of how to rewild the urban environment, using the urban forest as a landscape design tool. For this purpose, the urban forest is a space that connects humans and non-humans, a hybrid that provides diverse habitats for wildlife while also offering a wide range of meanings and wild experiences.



Research Questions

Urban rewilding is a progressive approach to nature restoration, encompassing initiatives or programs aimed at encouraging ecosystem functionality, biodiversity, and support the survival of native species in urban environments(Holmes, 2020). Its ecological benefits including habitat expansion and the reintroduction of wildlife have been widely recognized. The innovation of this project is how to bring back the wildness to the city through rewilding, challenging the traditional elaborate and pleasing landscape design and the aesthetically packaged ecological patterns. Therefore, ecological and aesthetic experiences, viewed respectively from the perspectives of non-humans and humans, need to be considered together to convey the message of a authentic ecological struggle that exist, providing a critical perspective on the "all-too-human" condition. Meanwhile, the urban forest are expected to serve as an agenda/tool for better implementing the concept of rewilding into spatial landscape design. The main question is thus as follows:

How can rewilding reimagine a better coexistence and reconnection between humans and non-humans in the urban forest?

When the macro socio-ecological context is materialized to the site, based on the intentions for rewilding the Schijn Valley and the expectations for restoring the riparian ecosystem, the following subquestions are raised:

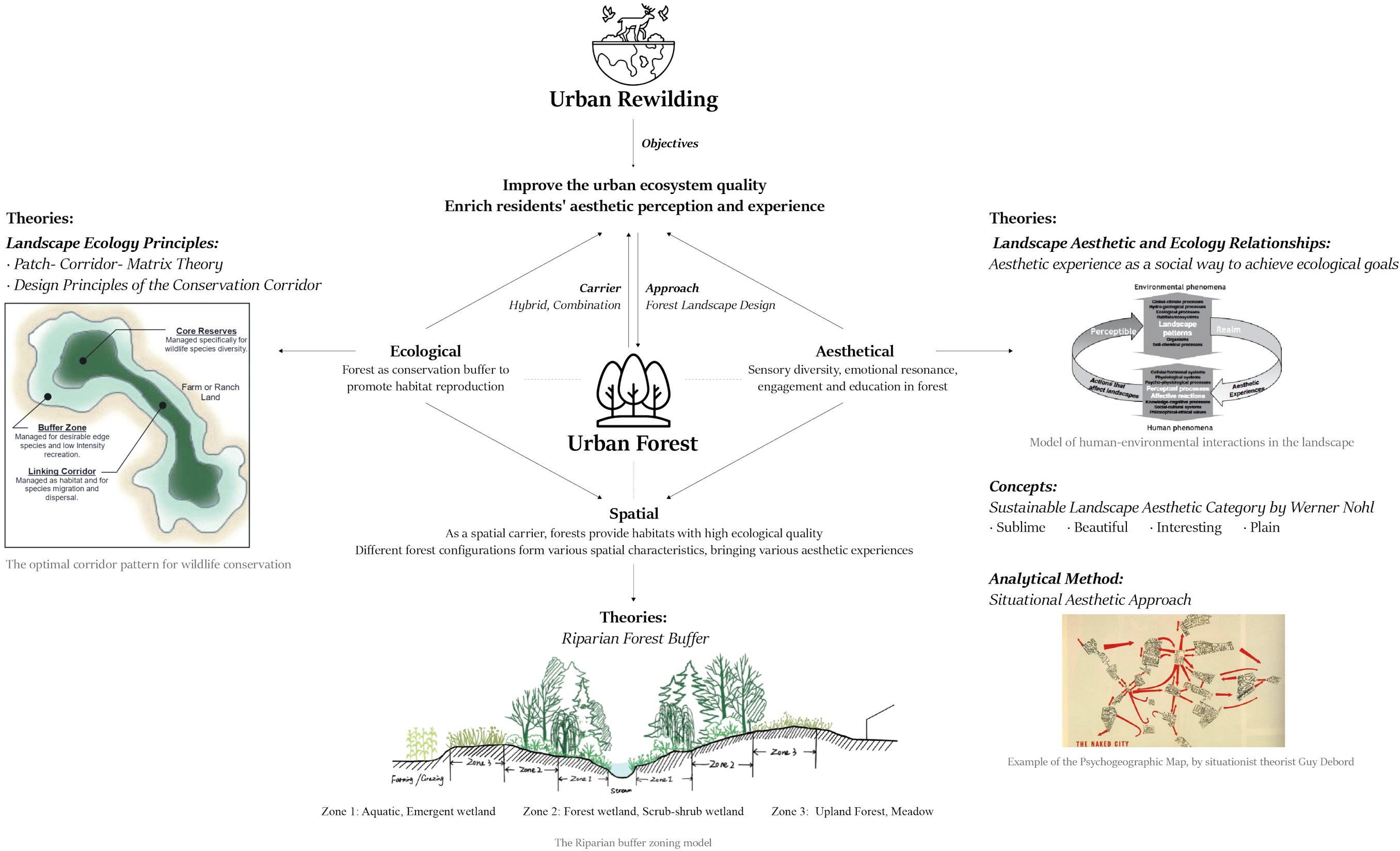
How can the urban forest play a role in rebuilding the continuity and integrity of riparian ecosystems?

How can wildness as an alternative landscape aesthetic principle be operationalized in landscape analysis and design?

What kind of wildness experience can the urban forest provide through different landscape spatial design?

How can ecological restoration and wild aesthetic experience be spatially integrated in an urban riparian corridor design?

1.5 Theoretical Framework



1.5 Theoretical Framework

Landscape Ecology Principle:
Patch - Corridor - Matrix Theory

The patch-corridor-matrix theory is a framework in landscape ecology that describes the structure and function of landscapes. Landscape ecologists Forman and Godron point out in 1995 that a landscape is a heterogeneous land area consisting of three fundamental elements: patches, corridors, and a matrix.

Patch: Generally a plant and animal community that is surrounded by areas with different community structure; however, a patch may be devoid of life.

Corridor: A linear patch that differs from its surroundings.

Matrix: The background within which patches and corridors exist (the matrix defines the flow of energy, matter, and organisms).

Corridor Planning & Design Concepts

Planning and designing wildlife reserves and corridors at a watershed scale should focus on preserving, linking, and buffering high-value nodes (Bentrup, Rol, 2023) . This approach is based on three fundamental concepts:

- Core reserves (nodes)
- Buffer zones
- Linkages

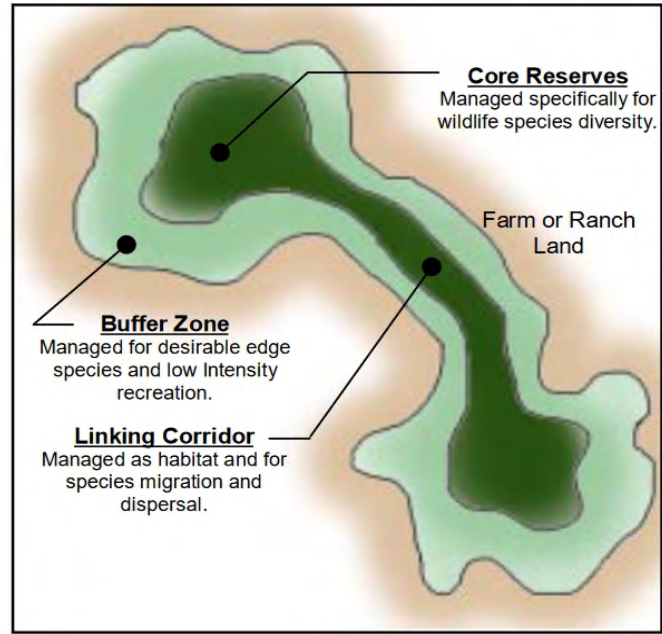
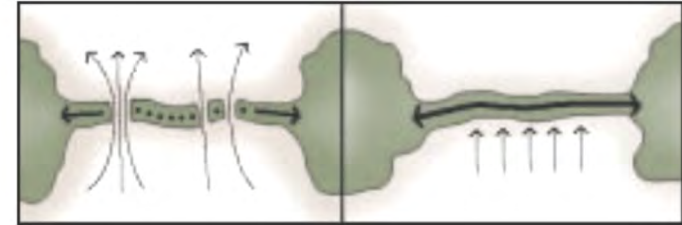


fig.18 Core Reserves, Buffer Zones, and Linkages (after Adams and Dove, 1989)

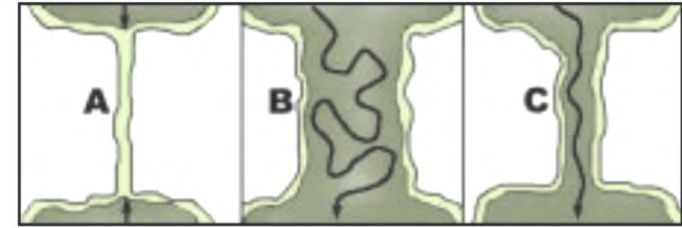
An optimal pattern for wildlife conservation would involve preserving key nodes (core reserves), creating corridors (linkages) between these nodes, and establishing multiple-use buffer zones around both the nodes and corridors. This design meets the needs of wildlife and mitigates potential adverse impacts from the surrounding matrix. Additionally, it allows for low-intensity human activities within the buffer zones around the reserves (Figure).

Corridor Planning & Design Principles

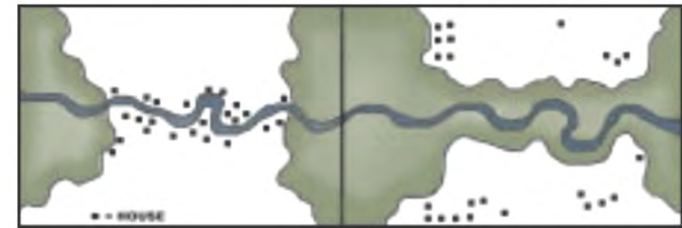
- Continuous corridors are better than fragmented corridors.



- Wider corridors are better than narrow corridors.



- Natural connectivity should be maintained or restored.



- Two or more corridor connections between patches are better than one.

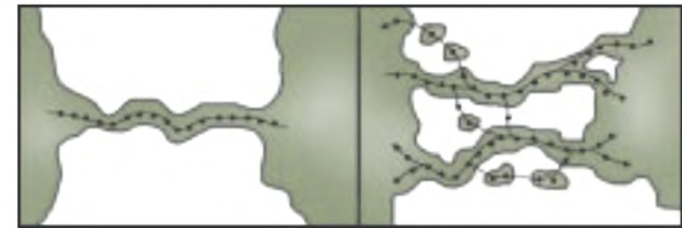


fig.19 Corridor Planning & Design Principles (Palone & Todd, 1998)

1.5 Theoretical Framework

Riparian Forest

Riparian areas, adjacent to water bodies, are vital for ecosystem services like cleaner water and increased wildlife. They facilitate runoff, support aquatic habitats, and aid wildlife migration. Forest restoration in these zones will significantly enhances water quality and wildlife populations, even if the buffer is as narrow as 30 m (Bentrup et al.). Forested riparian buffers, or streamside forests, are riparian buffers that include a functional forest ecosystem. These forest buffers are considered the most beneficial type of buffer due to the wide range of environmental benefits they offer (Palone et.al. 1998).

The major benefits includes:

- Strengthening riverbanks and preventing erosion of waterside areas.
- Acting as a buffer to reduce sediment deposition and facilitate uniform settling.
- Enhancing surface water infiltration and soil nutrition.
- Regulating land surface evaporation and maintaining groundwater levels.
- Improving water quality.
- Creating habitats for plants and animals.

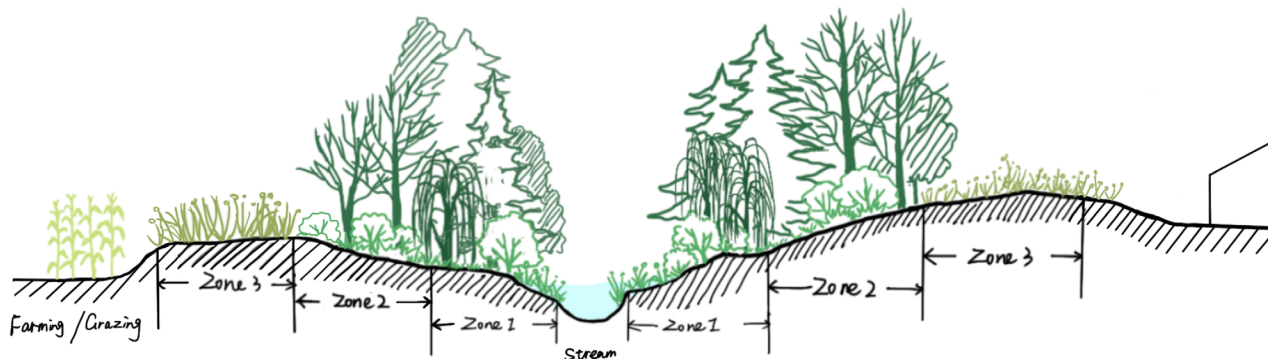
The three-zone concept is a tool has been developed to help plan riparian forest buffers.

Zone 1: A narrow strip along the riverbank, often comprising local trees, shrubs, and grasses adapted to the specific hydrological conditions, primarily serves to stabilize the riverside and provide essential ecological resources for aquatic life, forming the foundation of the food pyramid.

Zone 2: It is wider than Zone 1, consists of fast-growing trees and shrubs that tolerate periodic flooding. Their function is to extract and retain nutrients and sediments from the water. Fallen trees and trunks in this zone help slow water flow. Additionally, this zone can be managed for economic benefits.

Zone 3: It contains grass filter strips and other control measures that slow runoff, filter sediment and chemicals, and promote water infiltration. These strips protect wooded areas, enhancing the forest buffer's effectiveness.

The Composition of the Riparian buffer zoning model can be seen in figure



Zone 1: Aquatic bed, Emergent wetland
Vegetation Type: waterloving tree and shrub species (introducing climate-robust trees), aquatic plants
Typical Plants: Metasequoia glyptostroboides (watercypress), Taxodium distichum (moerascipres), Salix alba (willow), Cyperaceae, Juncaceae, Potamogeton

Zone 2: Forest wetland, Scrub-shrub wetland
Vegetation Type: slow-growing hardwood tree species interspersed with shrubs (natural succession)
Typical Plants: Alnus glutinosa (alder), Fraxinus excelsior (ash), Aesculus hippocastanum (horse chestnut), Sambucus nigra, Rubus fruticosus (bramble)

Zone3 : Upland Forest, Meadow
Vegetative Type: mixed deciduous- coniferous forest trees, grasses
Typical Plants: Populus nigra, Betula pendula, Quercus robur, Pinus sylvestris, Picea abies

Fig.20 The Riparian buffer zoning model

1.5 Theoretical Framework

Interactions between Landscape Aesthetic and Ecology

As mentioned earlier in the elaboration of the new imagination of urban rewilding (1.2.4), designing from a non-anthropocentric perspective requiring public acceptance of wildness in urban areas. To achieve this, a tool is needed to enhance the understanding of landscape language while embodying the attitudes and design process of rewilding. In this context, aesthetics will serve as the framework. Nassauer et al. describe the importance of aesthetics in understanding and influencing landscape change, and the ways in which aesthetics and ecology may have complementary or contradictory influences on landscapes, and to help make sense of these issues they summarize a conceptual model of human-environmental interactions in the landscape.

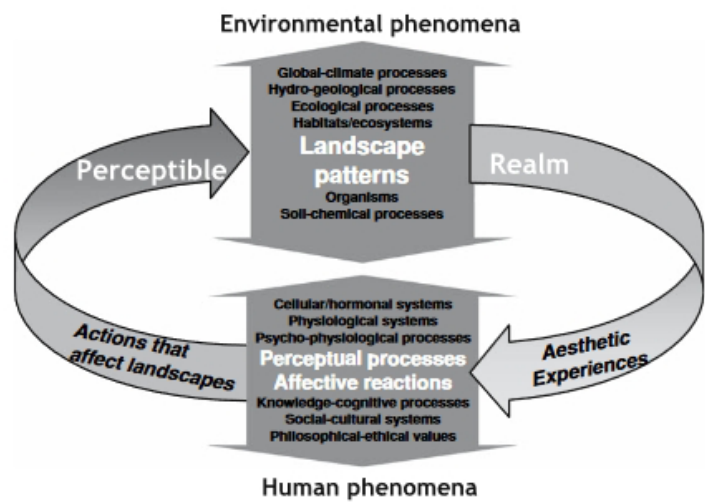


Fig.21 Model of human-environmental interactions in the landscape

Aesthetic experiences are triggered by affective processes, which are shaped by evolved physiological and psychological energies. The knowledge and cognitive processes can alter perception. Evolving landscapes influence individuals' aesthetic experiences and, consequently, behavior. Therefore, the ways in which people perceive and experience change, guided by landscape design, may result in shifts in ethical awareness, fostering a more complementary relationship between aesthetic experiences and ecological benefits.

1.5 Theoretical Framework

Sustainable Landscape Aesthetic Category

Nohl(2001) in his research on the aesthetics of sustainable landscapes, mentions that the enhancement of landscape aesthetics is related to the sustainability of the landscape. He points out that true sustainability can only be achieved if the economic, ecological and cultural aspects of the landscape are harmonized in such a way that human-oriented processes can be carried out without interfering with nature-oriented processes. This means that our new landscapes really should include areas where nature is allowed to develop spontaneously. This is also consistent with the connotations embodied in rewilding. Subsequently, he describes the process of human aesthetic perception as a fundamental cognitive process, explains how aesthetic pleasure is generated, and distinguishes between four main levels of knowledge or sensation at which aesthetic information can be accessed, which include: the perceptual level, the expressive level, the symptomatic level and the symbolic level. The perceptual level consists of the sensory experience, i.e. everything the beholder sees, hears, feels, tastes or smells. The expressive level is about the emotions evoked through this sensory experience, such as pleasure and fear. The symptomatic level is about the viewer's understanding and assumptions about the landscape that have not been directly experienced. Finally, the symbolic level is about imagined experiences. In order to achieve this aim of more sustainable landscapes, Nohl introduces four (new) categories of landscape aesthetics:

- the beautiful
- the sublime
- the interesting
- the plain

The manifestation of these four aesthetic categories at four levels of aesthetic perception, as well as the prototypes of sustainable landscapes that will evoke the corresponding four aesthetic experience are also proposed (as seen in Figure). These four prototypes can be serve as the most important aesthetic prototypes of the future landscapes. Nohl only give an overall picture of these categories, there is still a need to establish workable indicators for each category as a basis for landscape planning.

aesthetic perceptual category	narrative aspects of landscape as aesthetic percept (perceptual and symptomatic effects of landscape)	poetic aspects of landscape as aesthetic percept (expressive and symbolical effects of landscape)	landscape prototype
the beautiful	culturally caused typical patterns of order, consisting of natural and man-made elements, allowing an easy recognition	<ul style="list-style-type: none">blissful feelings (eudaimonic feelings) of harmony, identity, of being part of a whole;symbol of ‚home‘, safety, and of being socially integrated	traditional cultural landscape
the (new) sublime	unusual patterns of spontaneous, wild or overgrown nature, demonstrating self-dynamics, self-organisation and self-productivity of landscape	<ul style="list-style-type: none">pleasant feelings towards „disharmony“, „disorder“, unsteadiness, and surprisingness;symbol of freedom, of the alien and the different	succession landscape
the interesting	chaotic multiplicity of (apparently) desintegrated elements and structures mostly of technical origin	<ul style="list-style-type: none">thrill (exciting feelings) for risk, uncertainty, and (limited) „catastrophe“;symbol of necessary technical progress	urban-industrial landscape
the plain	simple, coarse-meshed patterns with repetitive, yet rich and natural (subdividing) structures	<ul style="list-style-type: none">comforting feelings of contentment, of gratitude;symbol of existential usefulness, of the reconciliation of technical progress with nature	rural functional landscape (e.g. modern agricultural landscape)

Fig.22 Aesthetic perceptual categories under sustainable landscape conditions

1.5 Theoretical Framework

Situational Aesthetic Approach

In reviewing the last 35 years of scholarship and research in landscape aesthetics, Nassauer et al. (2007) found that particular landscape types consistently evoke different aesthetic responses. Even for the same person, situational context may evoke different landscape aesthetic experiences under different circumstances. Therefore, in addition to quantitative analysis of the spatial qualities of the landscape, the aesthetic assessment of the landscape should incorporate some more subjective situational analysis. There is a need to introduce theories related to Situationism and situational aesthetics. This involves the concept of psychogeography and the “psychogeographic” map, a method of representing constructed situations and possibilities.

Psychogéographie (Psychogeography)

Developed in 1995 by Debord, a co-founder of Situationism International, psychogeography is a philosophy that involves exploring the modern city through improvisation and play in its urban landscape. It documents how urban geography influences individuals' emotions and behaviors as they drift and wander through the city. Unlike traditional maps, psychogeography maps convey a social or existential truth, revealing the fragmented spatial experience and emotional intensity of the walk. Arrows on the map guide the emotional journey of the walker.

Dérive (Drift)

One way of exploring psychogeography is the practice of urban wandering known as "Dérive," a Debord defines Dérive as a "technique of rapid passage through varied ambiances," where "ambiance" refers to perceptible elements such as light, sound, temperature, smell, and tactile sensations.

Psychogeographic Map

By depicting the city as a series of situations, the psychogeographic map was created as an alternative way of viewing the city. The “surreal disorientation of their drift” (Sadler 1999) is represented by the scattering of map fragments. Bold red arrows are placed between the maps to show the natural flow. These maps demonstrate “the subjective and temporal experience of the city, rather than the seemingly omnipotent perspective the planimetric map” (Sant 2004)

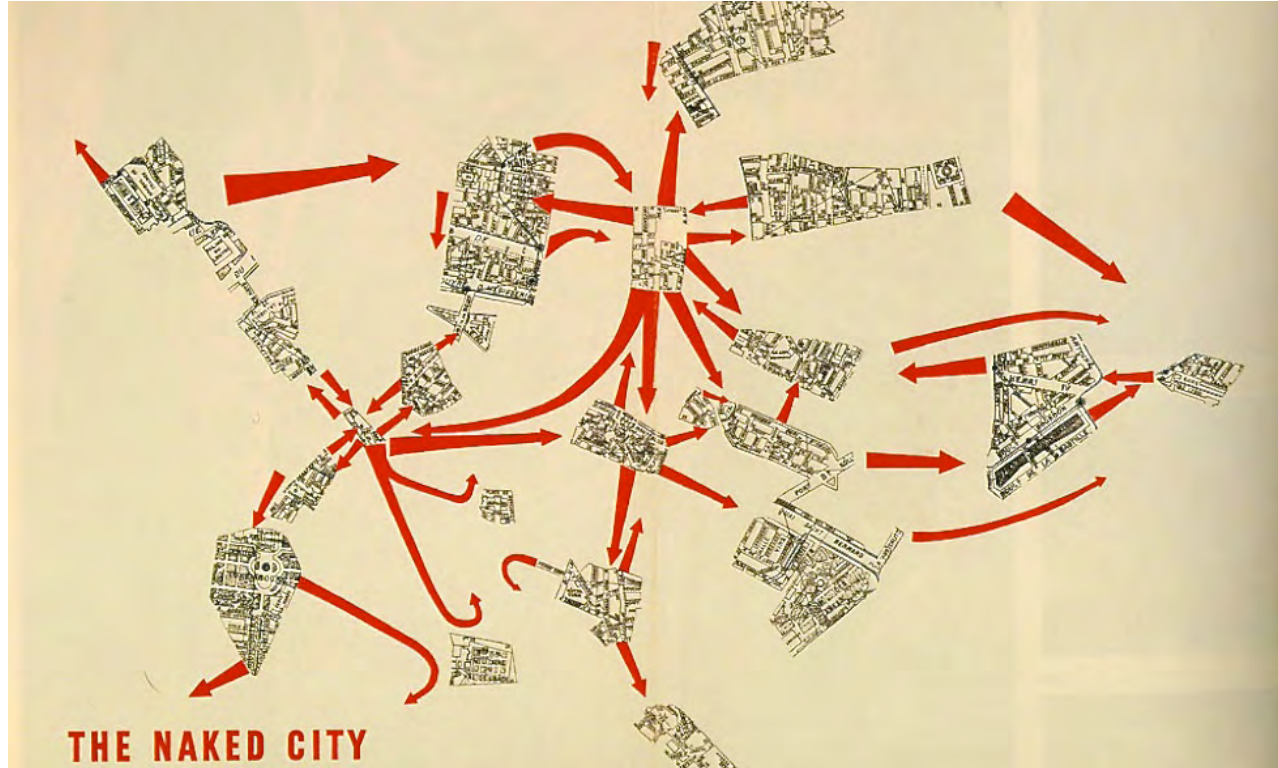
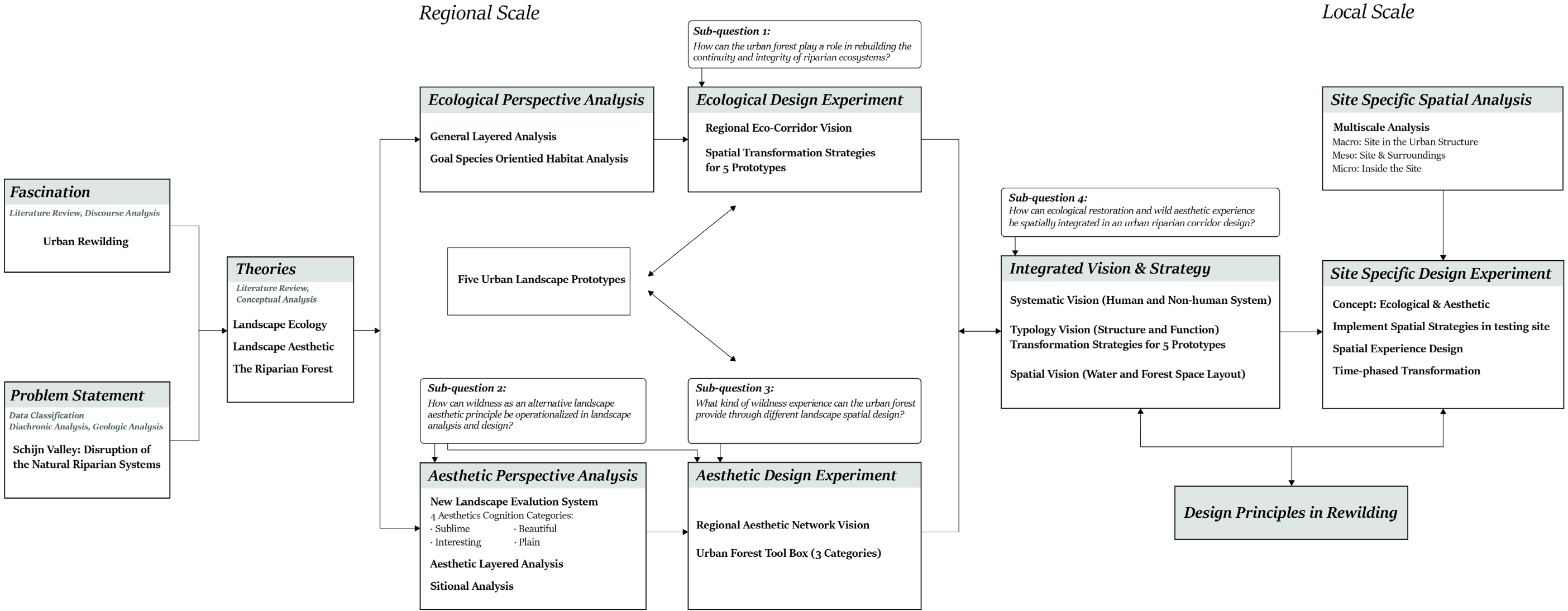


Fig.23 “The Naked City” created by Guy Debord

1.6 Methodology



REWILDING THE SCHIJN VALLEY

2.1 Site Description and Landscape Prototypes

- 2.1.1 Disruption of the Natural Water Systems
- 2.1.2 Urban Spatial Structure
- 2.1.3 The Relationship between the Water, City and Green
- 2.1.4 Five Urban Landscape Prototypes

2.2 Ecological Restorations for Non-humans

- 2.2.1 Ecological Layered Anlysis
- 2.2.2 Specific Habitat Analysis
- 2.2.3 Ecological Riparian Corridor Vision
- 2.2.4 Ecological Spatial Strategies for 5 Prototypes

2.3 Wild Aesthetic Experience for Humans

- 2.3.1 New Landscape Evaluation System
- 2.3.2 Aesthetic Layered Analysis
- 2.3.3 Situational Analysis
- 2.3.4 Aesthetic Network Vision
- 2.3.5 Urban Forest Tool Box

2.4 Ecological and Aesthetic Hybrids

- 2.4.1 Synergies & Conflicts
- 2.4.2 Combined Strategies for 5 Prototypes
- 2.4.3 Systematic Vision of human and non-humans
- 2.4.4 Structural and Functional Vision
- 2.4.5 Spatial Vision of Urban Forest
- 2.4.6 Sequential Experiences

2.1 Site Description and Landscape Prototypes

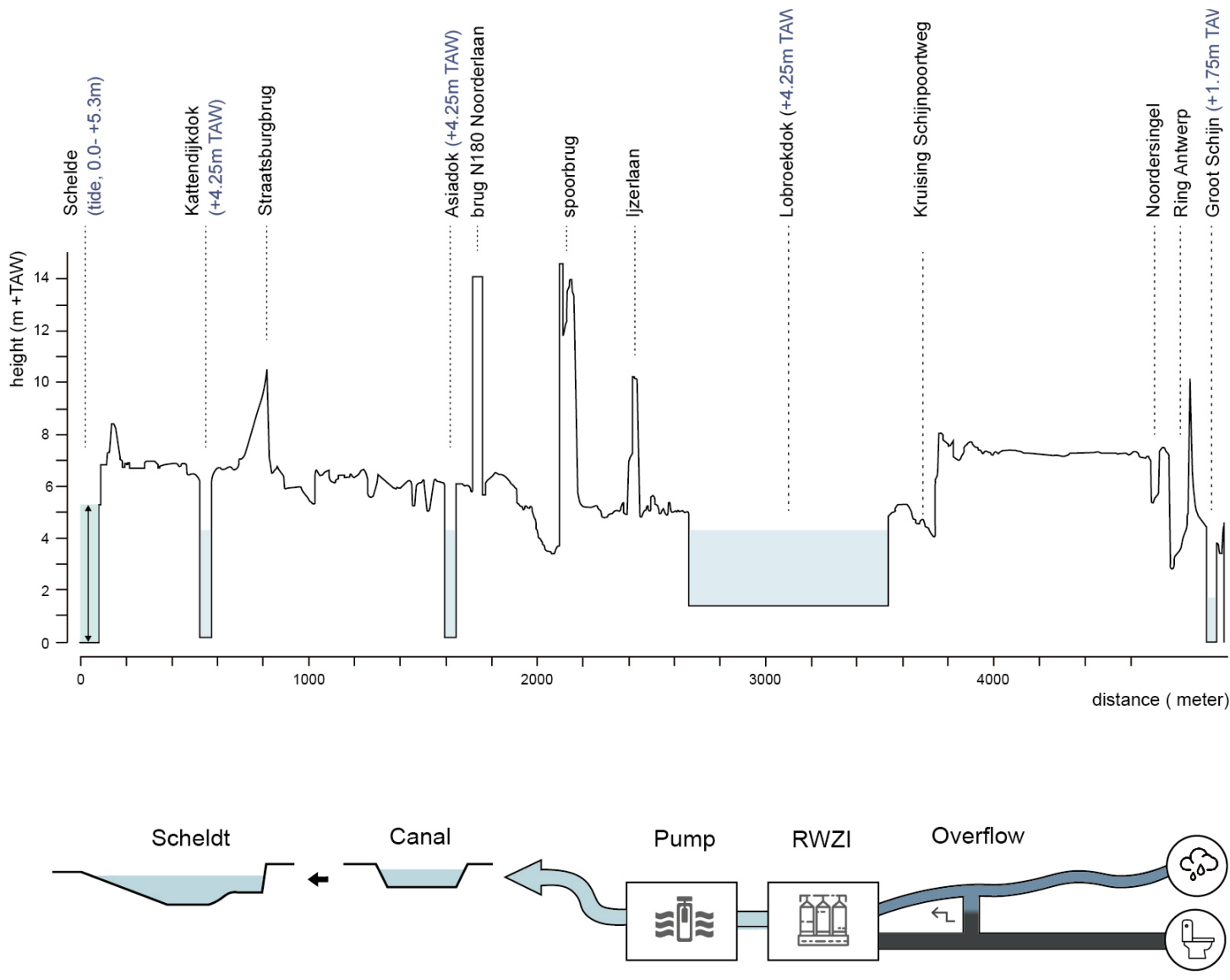
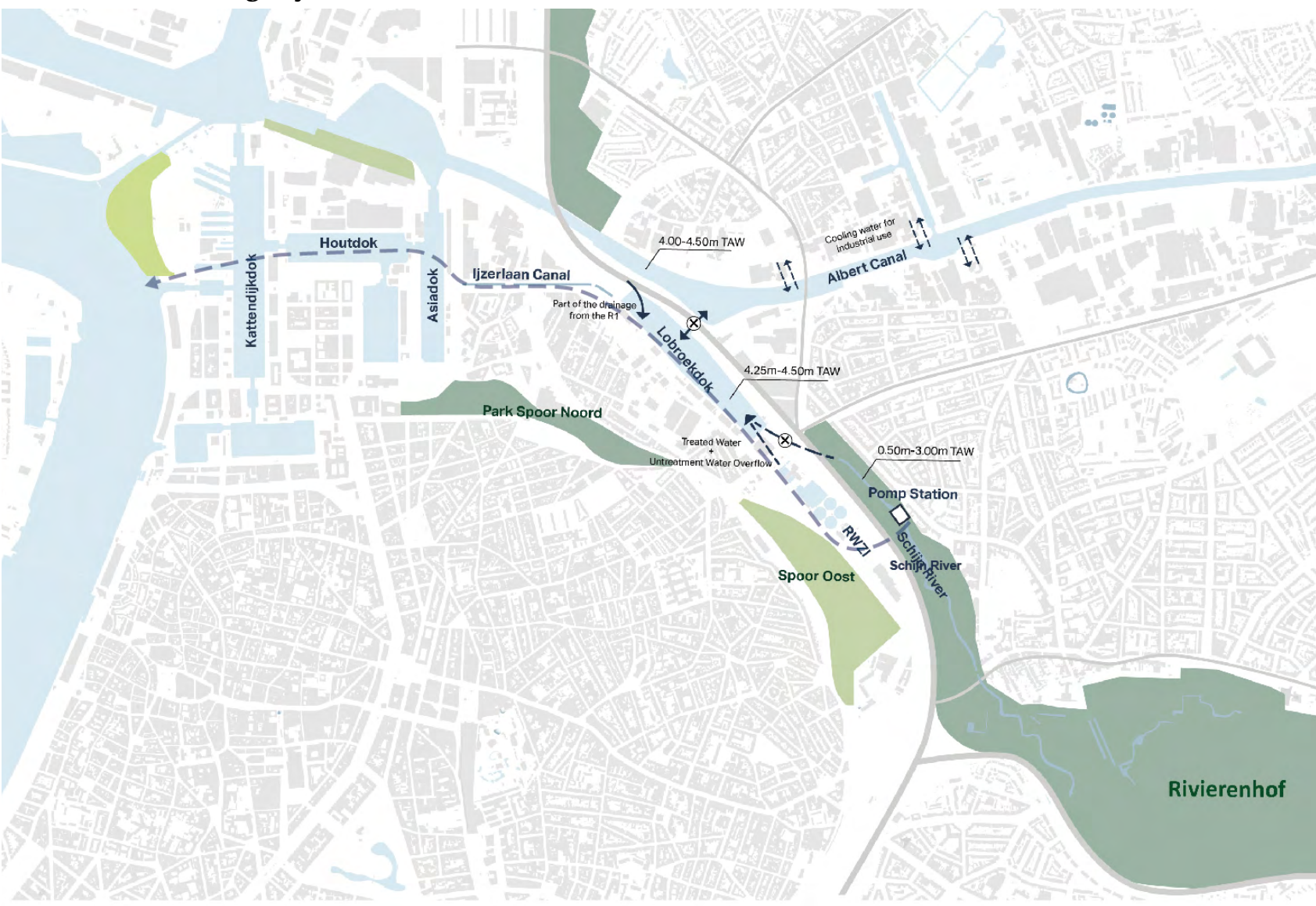
Disruption of the Natural Water Systems

The natural course and structure of the river has been disturbed by the expansion of the city and harbour. The original natural gravity connections between the Schijn-Scheldt have been replaced, the rivers have been straightened, diked and deepened. Upstream in the Schijn valley, large stretches of the fragmented valleys are densely cultivated and dewatered with dense canals. The fragmented coniferous forests on the sandy ridges have lost their productive function, but in winter they produce large amounts of evaporation, which affects infiltration. The upper reaches of the valley have low buffering and storage capacity, while the middle and lower reaches are highly urbanised, with large quantities of rainwater being discharged through the sewerage system to sewage treatment plants and then to rivers. Artificial drainage is overly reliant on pumps and pipes, and climate change is expected to bring more extreme rainfall, increasing urban flood risks. Meanwhile, the lack of rainwater and wastewater separation has resulted in the mixing of clean water from the Schijn River with grey water from the Lobroekdok, diminishing the potential for clean water utilization and exacerbating drinking water shortages. There is a need to enhance the infiltration and buffering capacity of the valley landscape.

The Water System of Schijn Valley



The Artificial Drainage System



2.1 Site Description and Landscape Prototypes

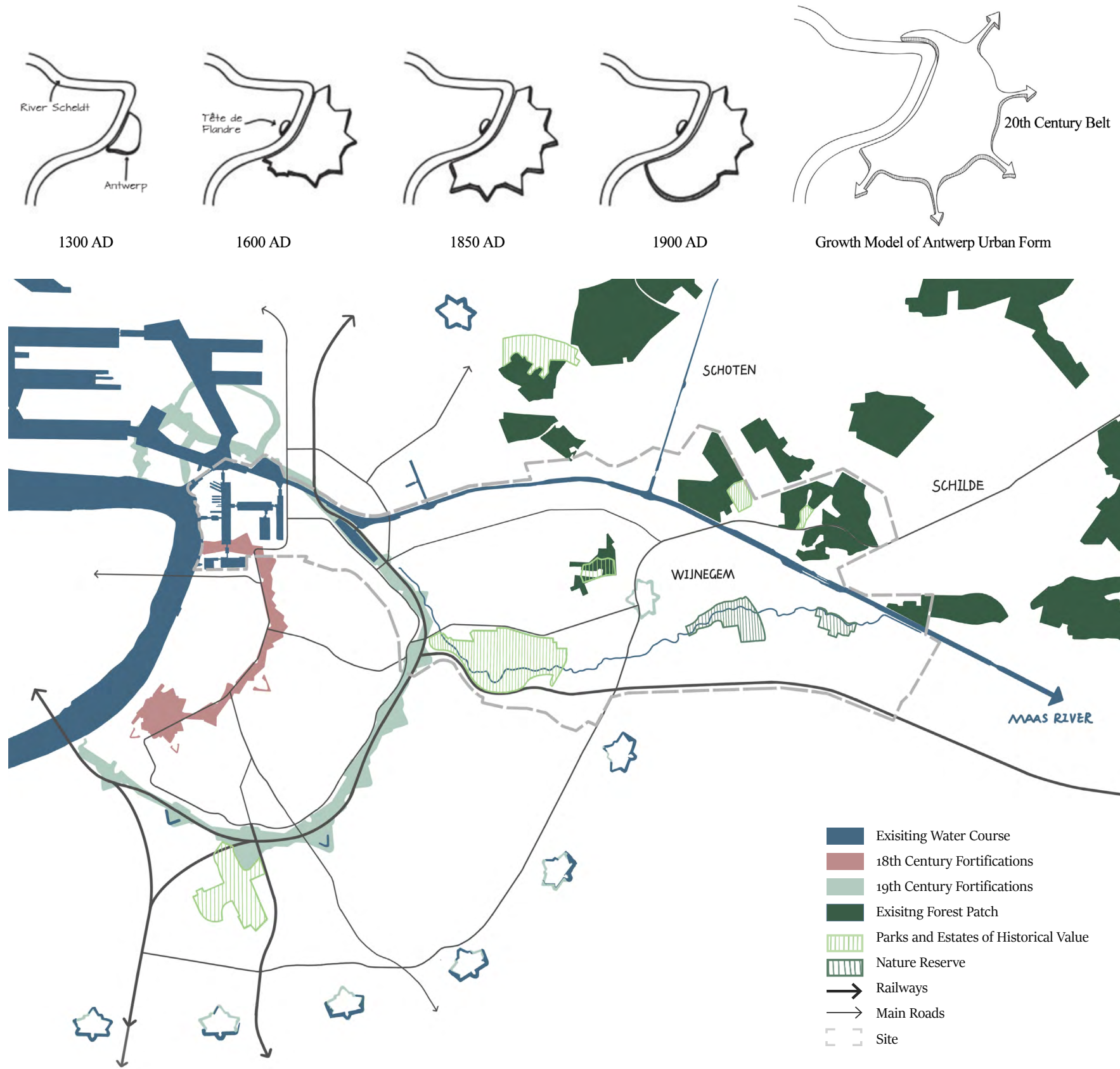
Urban Spatial Structure

Antwerp, initially a medieval town on the right bank of the Scheldt River, expanded over the centuries with outward shifts of its fortification walls. Downtown is located within the 18th-century Spanish city walls and the 19th-century Brialmont Fortress, which included a rampart that roughly followed the route of today's Ring and Singel. The natural course of Schijn River was also incorporated into the canal surrounding the city within the 19th-century fortifications.

The Schijn valley is therefore mainly located in the 20th century belt on the periphery of the city, which is still being further developed.

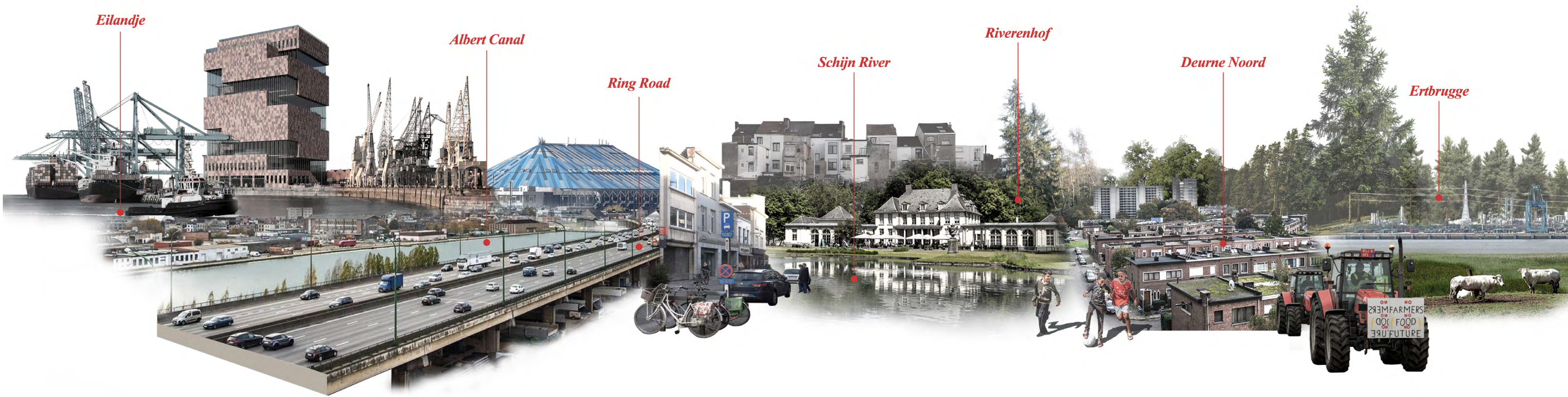
The urbanization of the 20th century belt is a systematic transformation process from rural to urban.

In the Kempen region, the forests continued to make way for endless urbanization. However, important open space structures have been preserved in this process, as they form the 20th century belt and contribute to its identity. Water largely determines the formation of these open space structures. The Schijn valley has a strong separating function, as evidenced by the major infrastructural fault lines that extend to the north and south of the city. The Albert Canal was built in 1930, offering the required industrial development and served as a corridor and important barrier to the urbanization process. Green spaces such as the Rivierenhof, which was preserved as a forested pleasure garden built in the suburbs in the 16th century and characterized by a castle-like opperhof and a moat, now represent the intrinsic opportunity to develop a green landscape structure on the scale of the entire urban region.



The urban fringe of Antwerp largely mirrors the radial layout of its historical main roads, with public transport networks primarily following this pattern, serving the needs of the city center. However, this radial growth has led to limited interconnectivity between villages in the twentieth-century belt (Merksem, Deurne-Noord, Deurne-Zuid, Borgerhout), resulting in restricted access to amenities.

On the other hand, densification along main arteries has caused larger-scale infrastructure like railways and motorways to be situated in intermediary spaces, disconnected from the network. Thus, the Schijn Valley is characterized by homogenized local cores surrounded by heterogeneous intermediate areas, including industrial zones, transformed historical centers, parks, undefined residual spaces, and remnants of rural landscapes.



Drought dock

On the border between the city center and the port, as part of the 'island' where new city districts will be developed in the future and as an end to the Scheldt quays.

Ring road and Lobrokdok

The segment is located in the north-east characterized by large-scale industry and infrastructure, the dominant presence of the Sportpaleis, and densely populated residential areas. The industry separates neighborhoods and fragments the urban fabric.

Park Area

A green belt of parks along the Grote schijn, connected by the Ring Park, Rivierenhof, and Rugeveld Park. Due to the large roads and infrastructure, which are not pedestrian-friendly, residents are psychologically distanced from these quality open spaces.

Peripheral Residential Area

The peripheral area faces challenges of decay, aging, and segregation, marked by an absence of identity or assets. Presently, it experiences both increasing migration from new arrivals and encroaching gentrification.

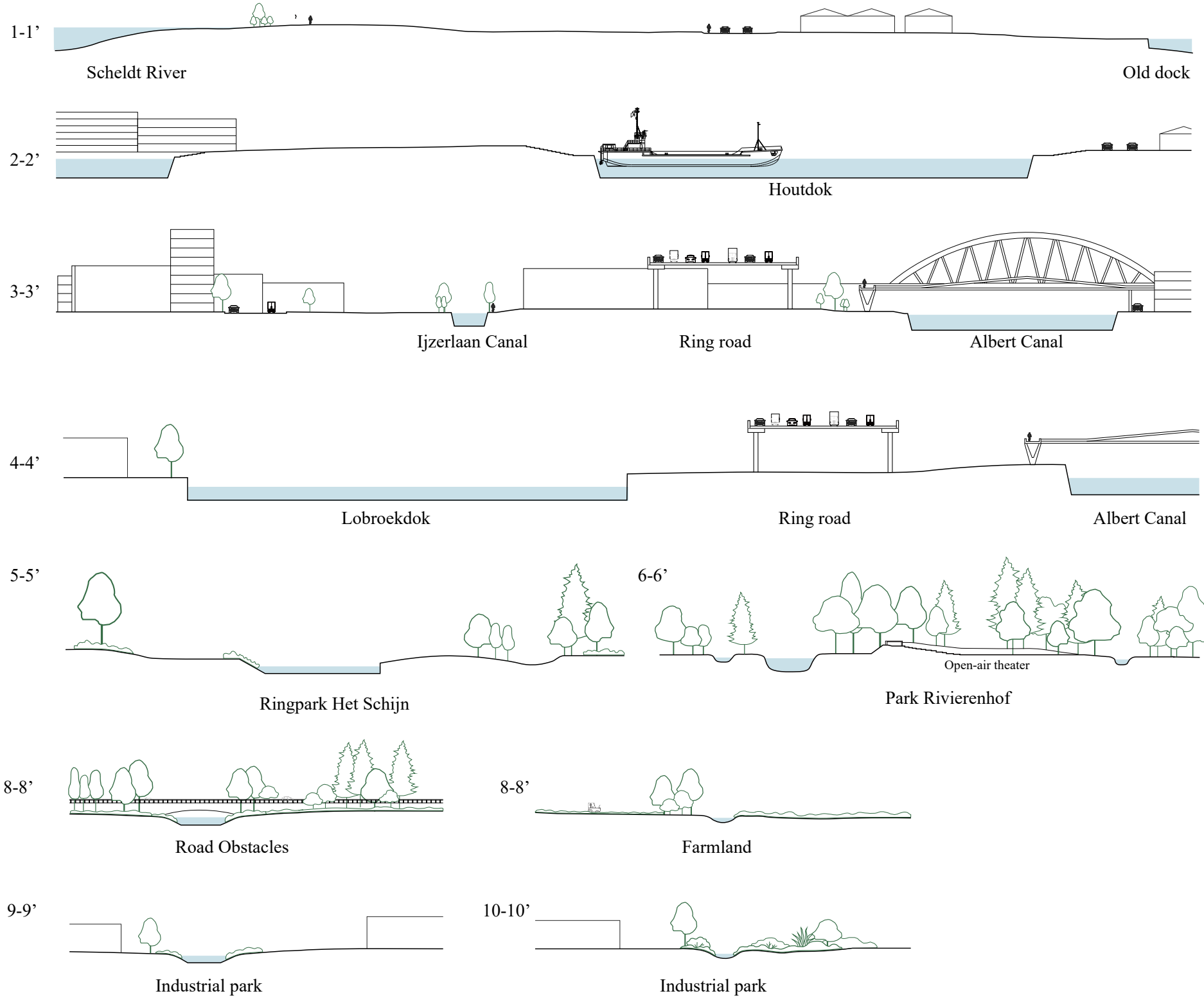
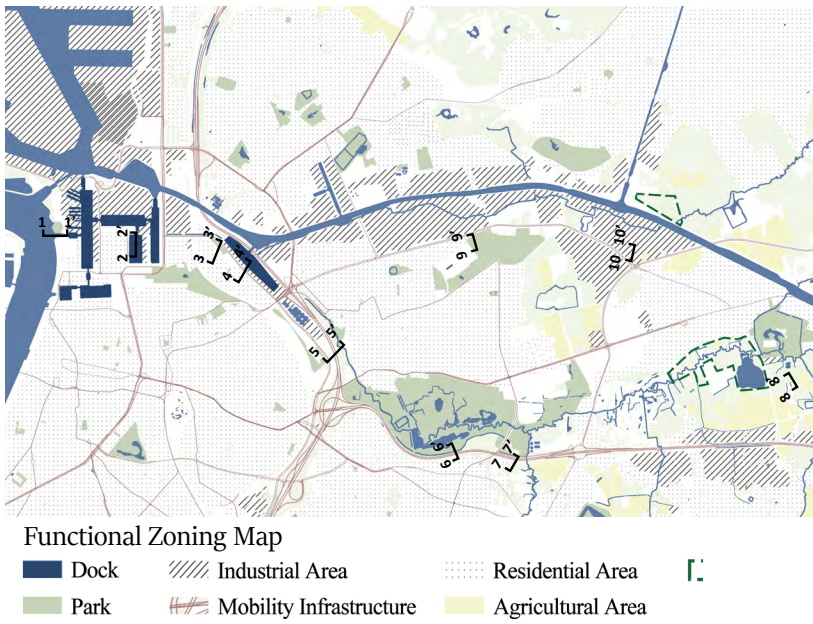
Agricultural Area

Flat, highly fragmented and irregular small open spaces and complex interweaving of open spaces with buildings and agro-industry.

2.1 Site Description and Landscape Prototypes

The Relationship of the Water, City and Green

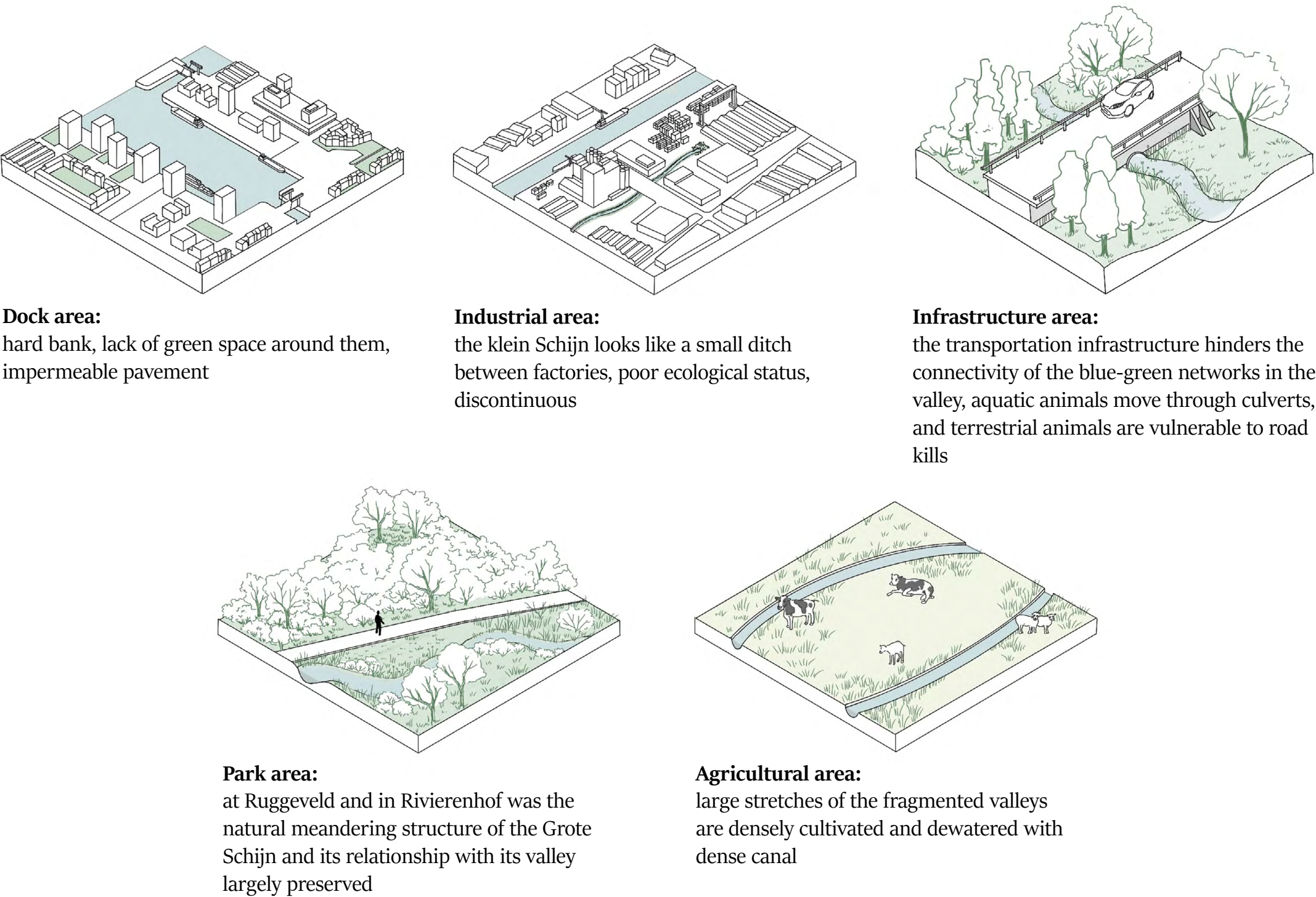
A continuous profiles are made along the Grote Schijn and Klein Schijn from the Scheldt river. The Grote Schijn flows mainly through a series of parks, wastelands, golf courses and farmland; the Klein Schijn downstream flows mainly through the Albert Canal industrial park, which has been largely transformed into ditches or an underground pipeline, with these two streams converging at Lobroekdok. The Eilandje old dock, as the missing link between Schijn and Scheldt, is completely hardened, a stark contrast between the natural weakness and the heavy construction and foundation of the dock can be seen; the Grote Schijn meanders naturally through the parks, with lush vegetation along the bankd, but in the agricultural area it is ditched and narrowed, and the sewage from agriculture and villages is discharged to it, and there is no vegetation to form a buffer zone.



2.1 Site Description and Landscape Prototypes

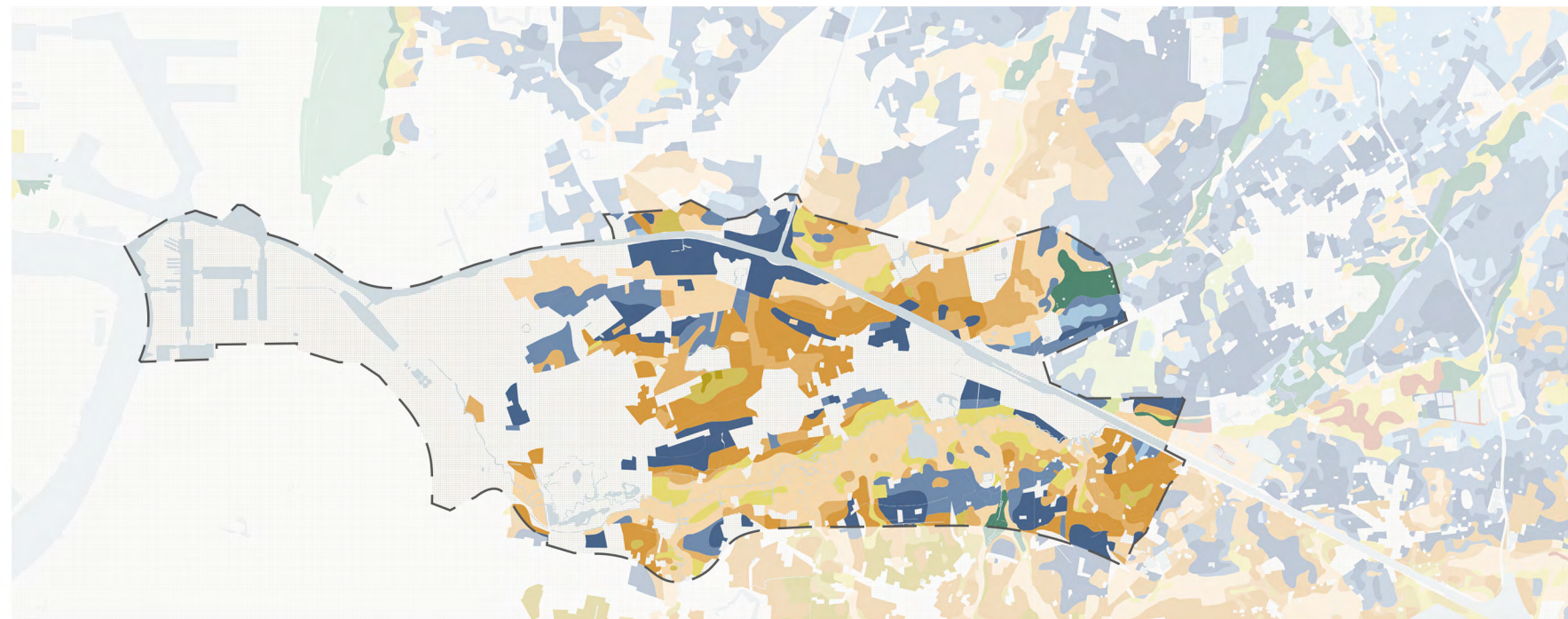
Five Urban Landscape Prototypes

From the successive profiles, it can be seen that Schijn river mainly flows through the dock area, industrial area, park area and agriculture area. In these areas, the blue and green flows interact with the city either strongly or weakly. Huge transportation facilities like highway, motoway, as artificial flows that hinder the connectivity of the river, are one of the places where the conflict between the river and the city is the most serious, and are therefore also mentioned separately. Therefore, five Prototypes are summarized to show the relationship between the Schijn river and the city. At the same time it is evident that the Schijn river is almost completely isolated from the residential areas, and on a human scale it has no accessible and friendly interaction with people.



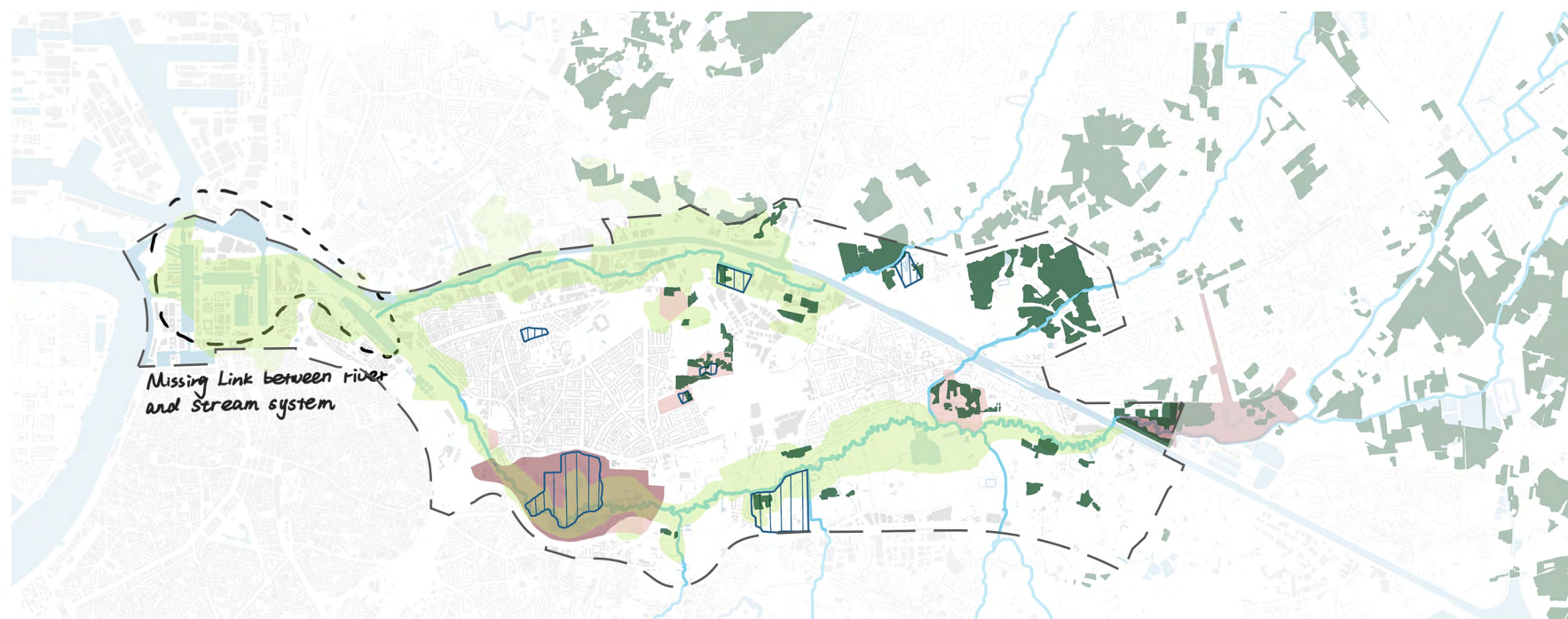
2.2 Ecological Restorations for Non-humans

Ecological Layered Anlysis



Soils in the Schijn Valley consist primarily of sandy loam soil, which dries out from the stream water body to the sides.

- Soil Type
- Dry light sand loam
 - Moist light sand loam
 - Wet light sand loam
 - Dry sand loam
 - Moist sand loam
 - Wet sand loam
 - Heavy clay
 - Clay
 - Dry sand
 - Moist sand
 - Wet sand
 - Built-up area



The old forests are mainly located in Ertbrugge and Schoten, in the Klein Schijn and dock areas, where wetlands and meadows historically existed along the banks of the river but disappeared as a result of the harbor and the construction of the Albert Canal. Some of the historic landscape such as the Rivierenhof has been preserved.

- Historic landscape elements
- Forest for more than 100 years
 - Riparian wet ground/ meadow in hiostory
 - Protected landscapes historic landscape
 - The most valuable heritage landscape ensembles
 - Point relicts: castle domains

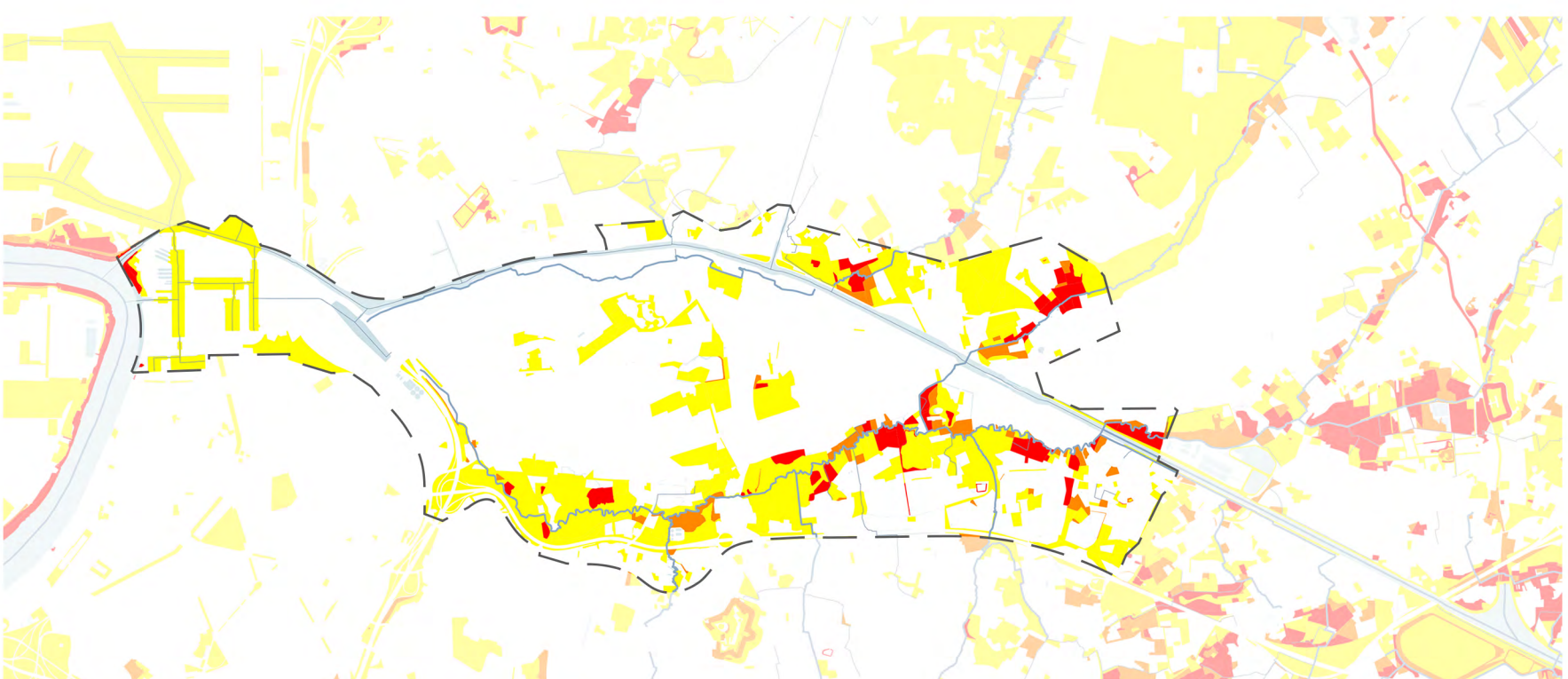
2.2 Ecological Restorations for Non-humans

Ecological Layered Anlysis



Patches of high ecological value are distributed mainly along the river, but are small, fragmented and scattered.

- Ecological Value
- Complex of biologically valuable and highly valuable elements
 - Biologically very valuable
 - Biologically valuable
 - Complex of biologically less valuable*and highly valuable elements
 - Have little ecological value



Most of the ecotopes with high ecological value are sensitive to desiccation, eutrophication and acidification. Because these ecotopes are fragmented and not well connected to support a well-developed ecosystem.

- Biological Vulnerability
- Hardly vulnerable
 - Little vulnerable
 - Vulnerable

2.2 Ecological Restorations for Non-humans

Ecological Layered Anlysis: Habitat Types

The stream valleys are characterized by sandy loam soils. The vast majority of stream valleys are dominated by the habitat types:

- Plantimngs and park(PLPRK)
- Acid mesophilic forest(BOSZ)

The green spaces along the river do not form a continuous structure, with habitats cut into a variety of isolated and fragile fragments, with vast areas dominated by artificial parkland landscapes and agricultural landscapes. The acid mesophilic forest as a kind of high ecological value habitat type is mainly concentrated in the north-eastern part of the site, cut off by the Albert canal. There is a need to connect the outside areas to the urban core to enhance species exchange.



Biotope

- Acidic mesophilic forests
- Young,developing deciduous forest
- Planting and park
- Mesophilic forests with springtime flora
- Swamp forests and shrubs
- Shrublands
- Specie-rich cultivated grasslands
- Glassland with scattered bio value
- Species-poor grasslands and fields
- Eutrophic ponds
- Swamps
- Small landscape elements

Ecologically valuable complexes

(with spatial coherence and mutual influence between specific habitat types and populations of plants and animals)

Stream Valleys

Characterized by sandy loam soils. On the wettest parts are usually located the pastures and flow fields, while on the less wet parts mainly arable land is cultivated. The vast majority of stream valleys are dominated by the habitat types: 1.Plantation and park (PLPRK) 2.Acidic mesophilic forest (BOSZ)

Ertbrugge Plain

Transfer area from the low Scheldt valley to the high sandy Kampen. Former drifting sand dunes with dry ground and slight undulations turn into versatile habitat and restore forest fragments.

Natural Area

1. Het Veer

This area consists of pocket forest, coppice, sedge vegetation andwet marshes. There are also a number of canals running through it with beautiful aquatic vegetations.

Precious species:

reed warbler, whitethroat, marsh-marigold, lesser whitethroat, eurasian bee beetle, kestrel, primulal, map butterfly



2. Beemdkant

Nature thrives in Shine Valley with aquatic plants, thickets of thistles, nettles, cleavers and grasses, a portion of forested areas, meadows along the Schijn, and ponds with a rich ecosystem.

Precious species:

ijsvogel, water violet, buzzard, kestrel, wild teasel, broad-bodied chaser, orange tip, grey heron



3. Het Wijtschot

To the north of the nature reserve is a young forest planted in 1998. It offers diverse habitats including young trees like oaks, lime trees and other native tree species, numerous berry bushes.

In the aquatic depressions which was a former sand depot, there is a shallow pond with rare wreaths and desmids. The area is ideal resting and foraging area for passing birds in winter and during bird migration.



2.2 Ecological Restorations for Non-humans

Ecological Layered Anlysis: Essential Species

The ecological function of an area can be read from the species of flora and fauna present. Per habitat type, species can be designated that are characteristic for the occurring ecotopes. Not only is the presence of characteristic species important, but also the conditions that are necessary to ensure the occurrence of the species in a sustainable manner. Some characteristic species are more critical of their habitat and are more sensitive to changes in condition. As a result, they are a good indicator of the ecological functioning of the area.

This green plan s Both indicator and goal species for each core area of different habitat types are identified according to the Groenplan Antwerpen.

Indicator Species				Goal species			
BOSZ PLPRK MBOS							
AGR HPGS XHB							
MOER							

Data from: Een groenplan voor de Stad. A. (n.d.). <https://www.antwerpen.be/nl/info/52d5052439d8a6ec798b4a4c/een-groenplan-voor-de-stad> publisher, Fabric. this. (2018, March 30).

2.2 Ecological Restorations for Non-humans

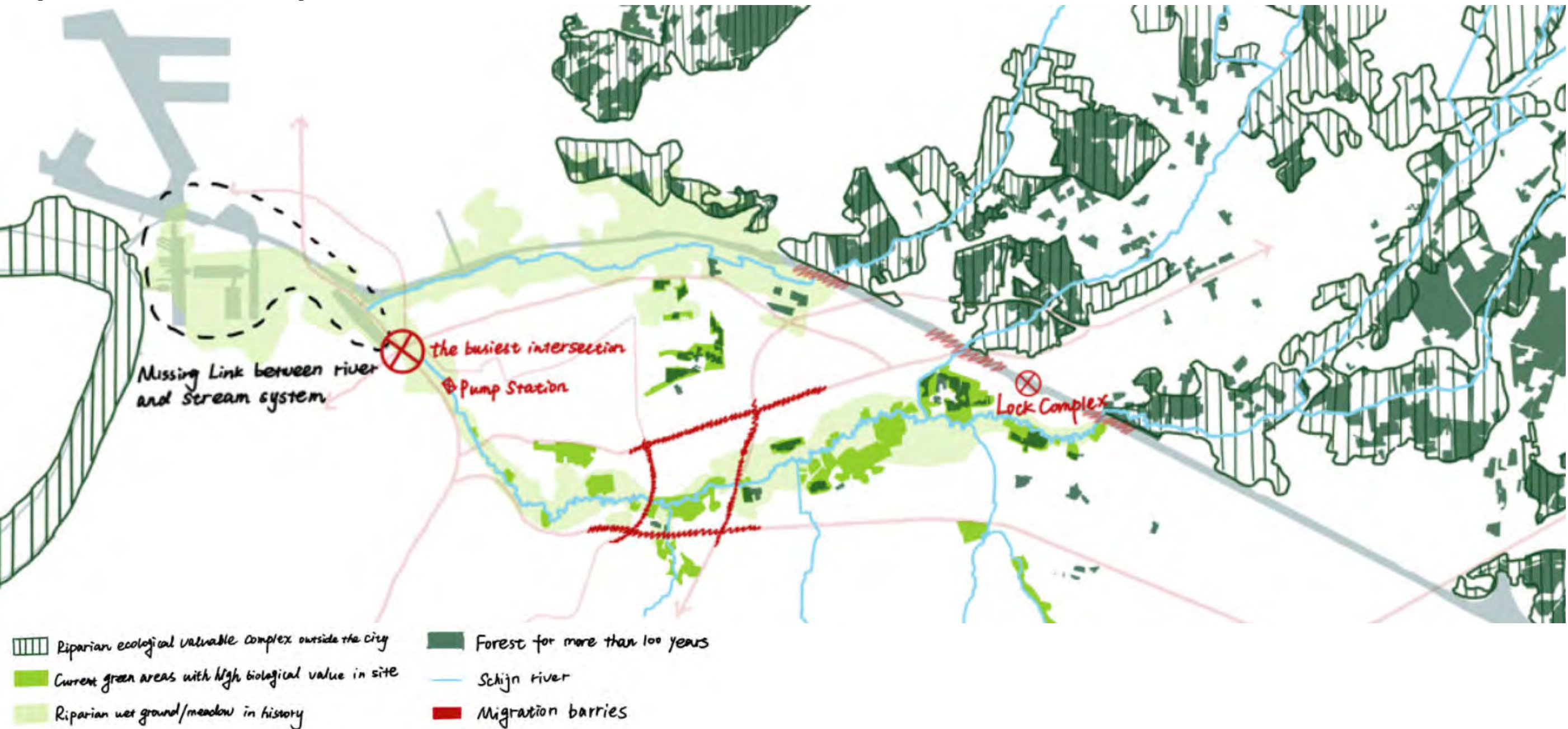
Ecological Layered Anlysis: Conclusion Mapping

Challenges:

- Increasing flood risk and desiccation
- Habitats are isolated and fragile, with vast areas dominated by artificial parkland and agricultural landscapes
- Large road infrastructure acts as megration barriers

Opportunities:

- Habitat fragments of high ecological value are predominantly found in riparian
- At Ruggeveld and Rivierenhof was the natural meandering structure of the Grote Schijn and its relationship with its valley largely preserved



2.2 Ecological Restorations for Non-humans

Specific Habitat Analysis: Eurasian Otter as Example

To enhance biodiversity in the Schijn valley, targeted designs are needed to improve the survival conditions of wildlife. The Eurasian otter, a top predator in aquatic ecosystems, is critically endangered in Belgium. Meanwhile, otters are sensitive to changes in water quality and habitat degradation. Their presence or absence can serve as an indicator of the overall health of aquatic ecosystems. To analyze the riparian environment of the Schijn valley more specifically and effectively, the Eurasian otter is chosen as the target species. By restoring otter habitats and creating suitable urban environments, the recovery of animals and plants in its upstream and downstream biological chains can be promoted. Additionally, this approach can lay the foundation for reconstructing urban environments suitable for the survival of many other wildlife species. Furthermore, Otters engage in engineering behaviors such as dam-building and channel modification. These activities can alter the flow of water and create diverse habitats, benefiting a wide range of aquatic species.

PRESSURE AND THREATS

1.Habitat Degradation:

- Canalisation of rivers
- Removal of bank side vegetation
- Dam construction
- Drainage of wetlands
- Aquaculture activities

2.Water Pollution

- Acidification of rivers and lakes
- Organic pollution from fertilizers, untreated sewage, or farm slurry

3.Habitat fragmentation and isolation:

- Road kills

ECOLOGICAL BENEFIT

1. Habitat Modification

Provide shelter not only for otters but also for a variety of other species

2. Keystone Predator

By regulating prey populations, otters help maintain a balanced ecosystem

3. Water quality improvement

Influence the growth and distribution of aquatic vegetation and indirectly help improve water quality

4. Engineering Behavior

Dam-building and channel modification



Lutra lutra (Eurasian otter)

A top predator and key component of a rich community of life in aquatic ecosystems, it is particularly sensitive both to water pollution and the destruction of riverine landscapes.

POPULATION: about 10 in Belgium, about 350 in the Netherlands and 2,000 in Germany

STATUS: Near threatened in Europe and critically endangered in Belgium

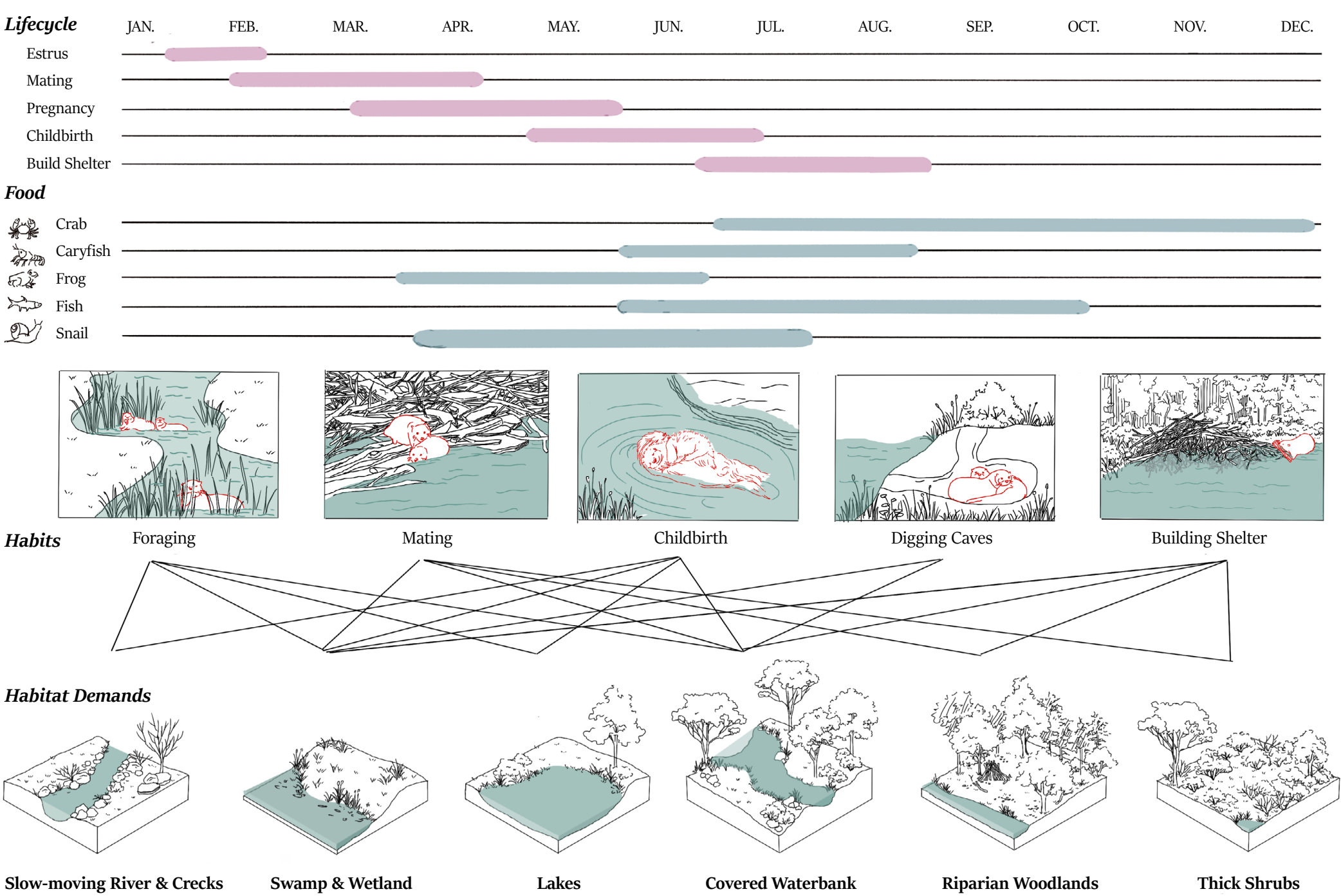
FOOD CHAIN



2.2 Ecological Restorations for Non-humans

Specific Habitat Analysis: Habitat Requirements of Otter

Starting from the needs of otter's whole lifecycle, otter's behavior and food were studied in depth, the main habitat types they need were summarized based on their living and behavioral habits.



2.2 Ecological Restorations for Non-humans

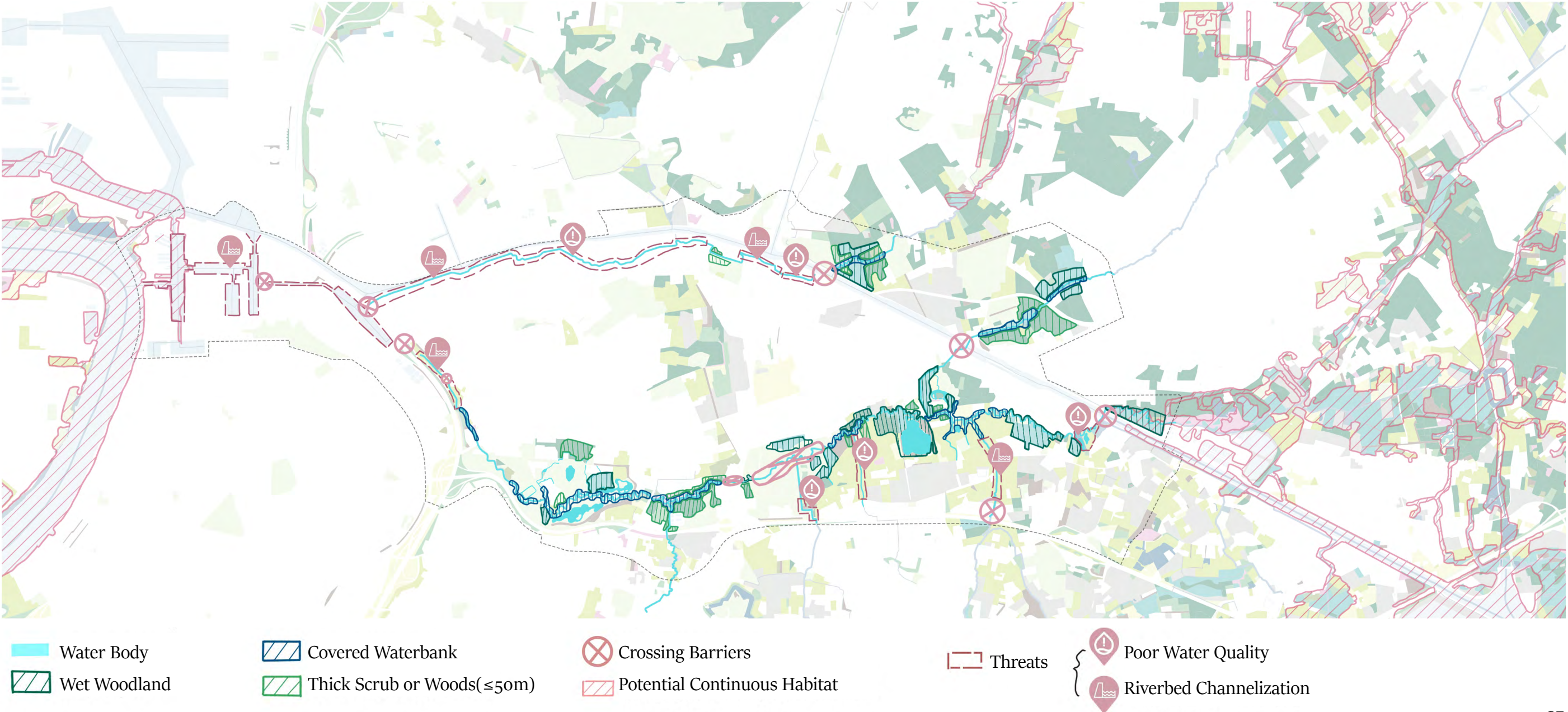
Specific Habitat Analysis: Otter Habitat Mapping

Opportunity:

In the Schijn valley, mapping out locations that currently have Wet Woodland, Covered Waterbank and Thick Scrub or Woods as potential habitat for otter.

Challenges:

- The potential continous habitats are located in the countryside north of the Albert Canal and the left bank of the Scheldt
- Potential habitat within the site is small and fragmented
- Road infrastructures create a lot of crossing barriers
- Habitat threats due to poor water quality and streambed canalization



2.2 Ecological Restorations for Non-humans

Ecological Riparian Corridor Vision

In response to the main challenges of Schijn Valley:

1. A ditched and piped watercourse that relies on artificial systems for drainage, with poor infiltration and buffering capacity and high flood risk
2. Poor ecological quality, particularly the lack of green space within the city, which provides poor ecological services and does not provide suitable and sufficient habitat for wildlife
3. Fragmented green spaces, with higher quality habitats mainly in riparian areas, but with low capacity and lack of connectivity between them
4. Infrastructures occupiea lot of space and form obstacles to animal migration.

The ecological restoration of the Schijn valley consists of two main aspects: the natural connection of the Schijn- Scheldt river and the restoration of forests in the riparian areas, with improving connectivity and ecological quality as guiding principles.

Hydrological measures include:

- 1.Reconnect the embanked rivers in the open valleys to their floodplains and raise the water level in the built-up valleys to ground level to conserve the groundwater.
2. In the urban area (downstream of the Rivierenhof), the old docks as the missing link between the river and the stream system, will be reused as urban reservoirs to connect different water flows. The Lobroekdok transports water via the IJzerlaan to the Asian dok. There, the clean water from the RWZI is post-purified and made biologically active. Houtdok forms the new bed of the Schijn. Kattendijkdok serves as a tidal mudflat, where water from the river is preserved or discharged into the Scheldt.

Following the Patch - Corridor - Matrix Theory, the

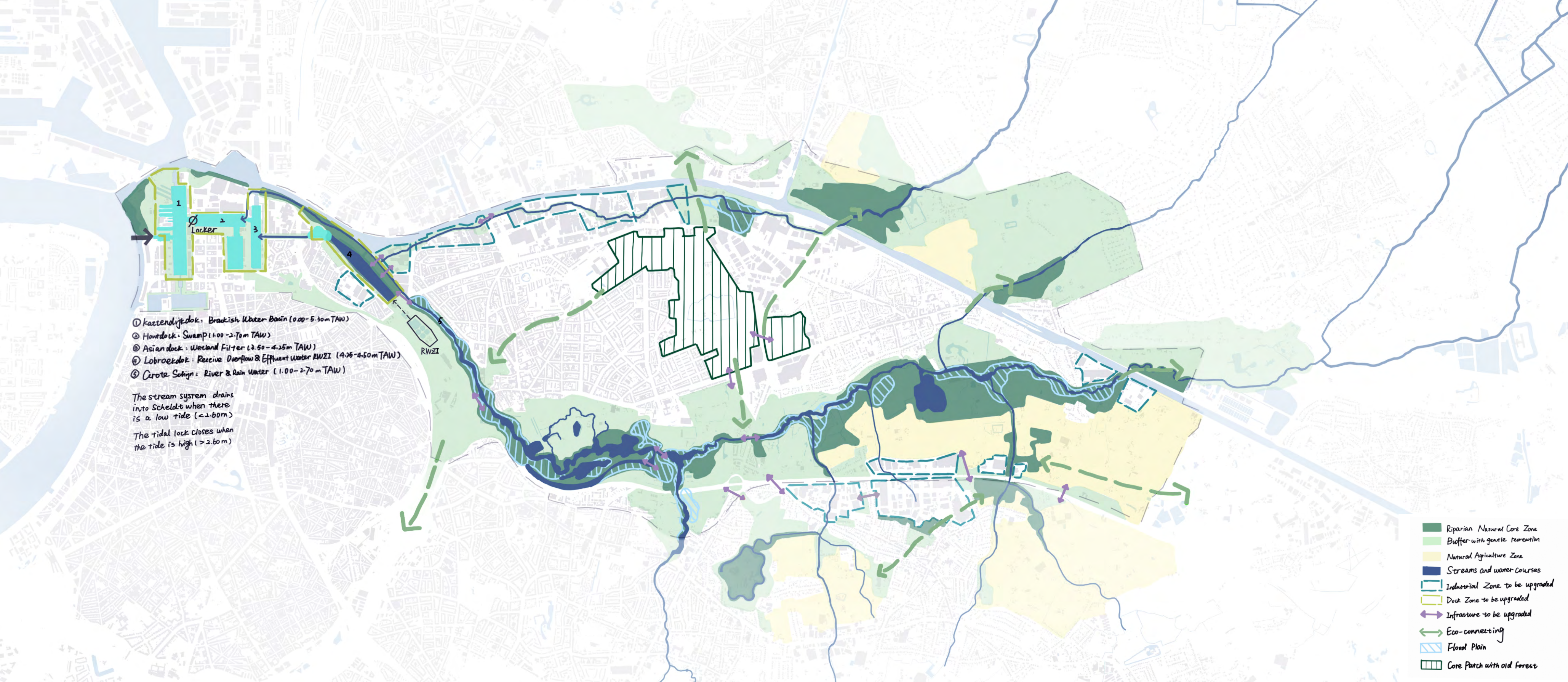
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overall spatial structure is:

Two Riparian corridors along the Grote Schijn and Klein Schijn, connecting the city to the larger habitat patches of the Kampen Plateau as well as connecting the fragmented riparian habitats. The old forest of Ertbrugge will be preserved as an ecologically important patch, which will be connected to the corridors by small linkages.

The re-naturalization of water creates continuous dynamic gradients of wet to dry, with more swamps and marshes forming. According to the idealized model of the corridor, the river and the floodplain on both sides will serve as the core zone, forest consists of waterloving tree and shrub species. Where the terrain is higher and the soil is drier, it serves as a buffer zone, consisting mainly of dry forests and parks that can have some recreational function. Add more filter grass strips to agricultural and pasture land. Released ditches in the meadows can be used in the formation of small wetlands that serve as small habitats and also make agriculture more sustainable.

Specifically, the Grote Schijn will serve as the primary ecological corridor due to its greater width and habitat richness. The re-excavated and connected Klein Schijn, which is located in a dense industrial area and has a low flow rate, has a small width of riparian forest and serves as a secondary corridor, mainly utilizing the successional processes of the Willow forest to mitigate nitrate and phosphate pollution from the industrial area.

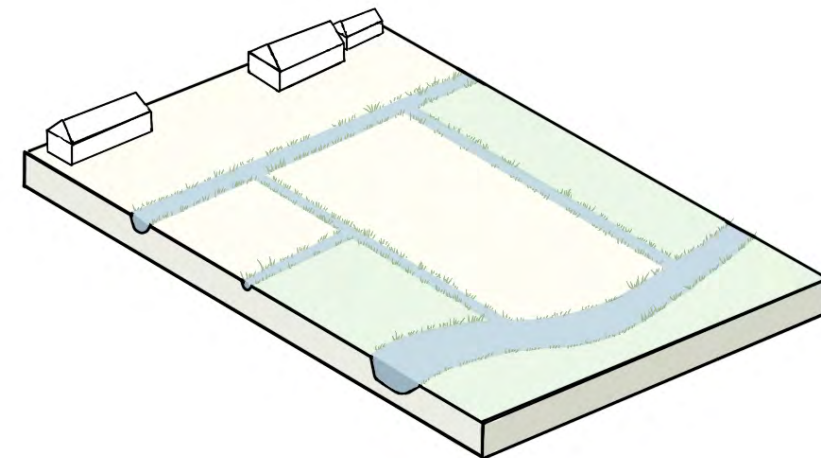
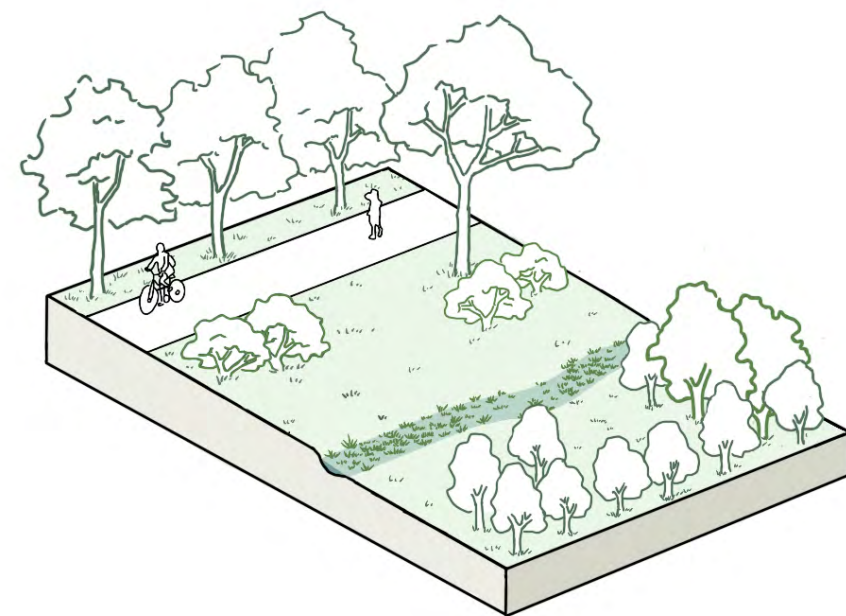
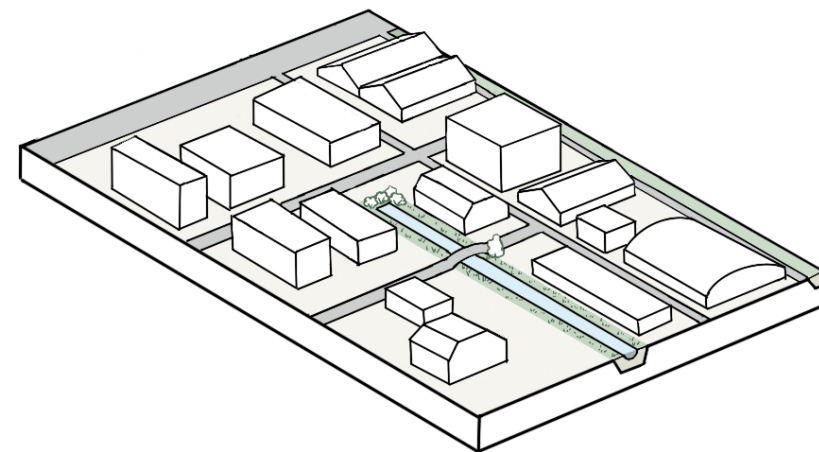
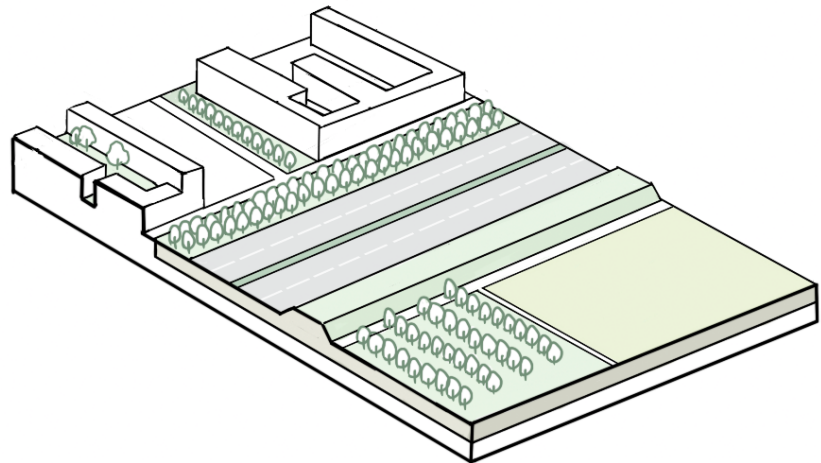
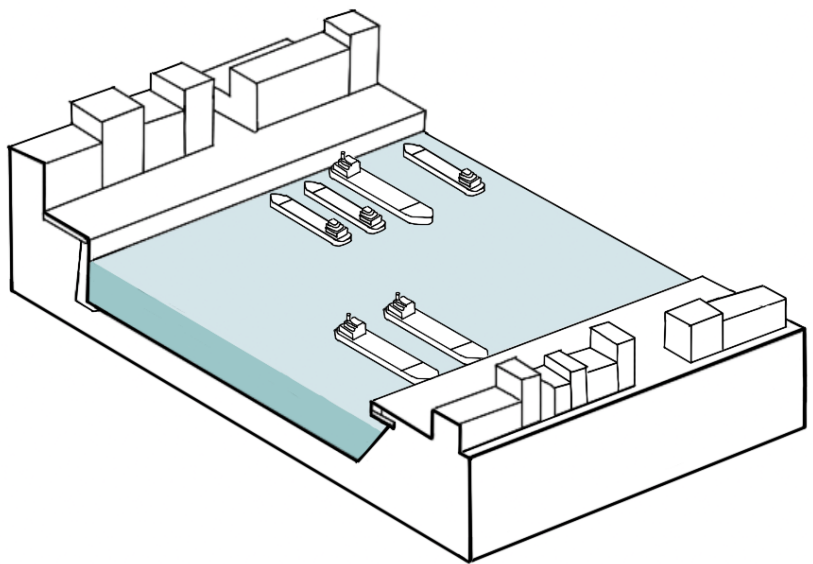


2.2 Ecological Restorations for Non-humans

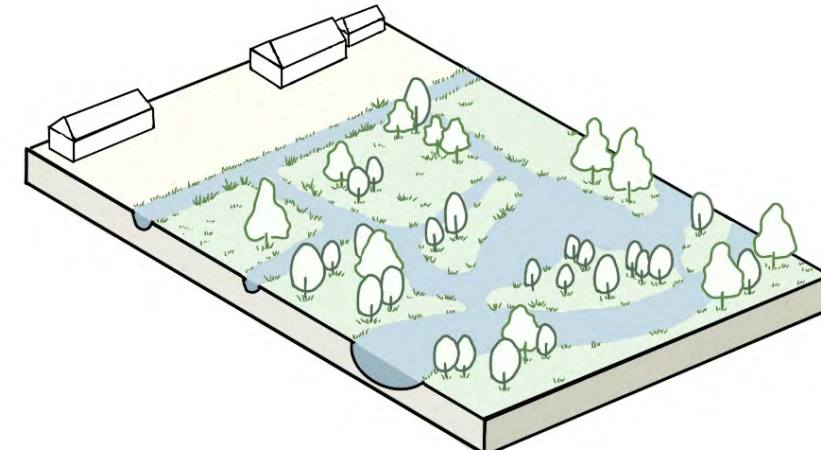
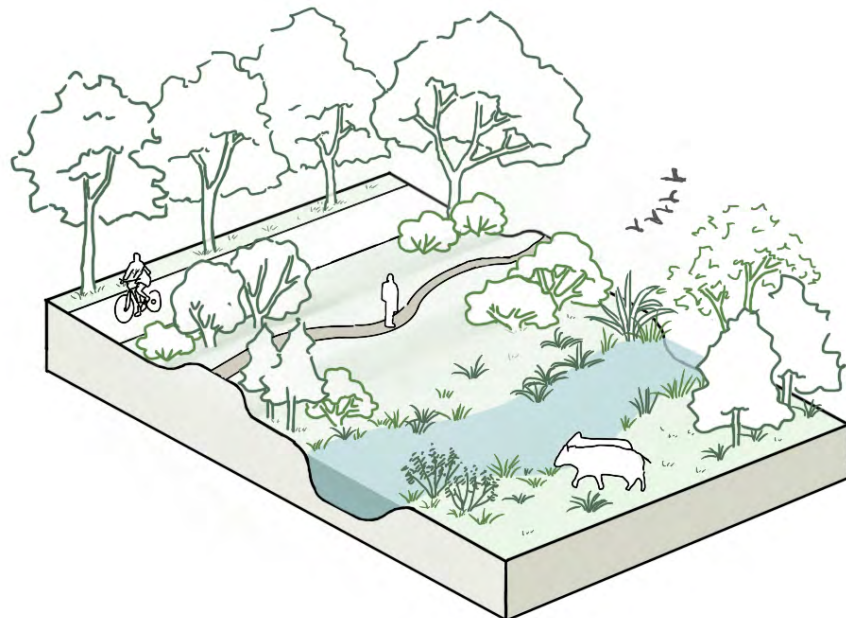
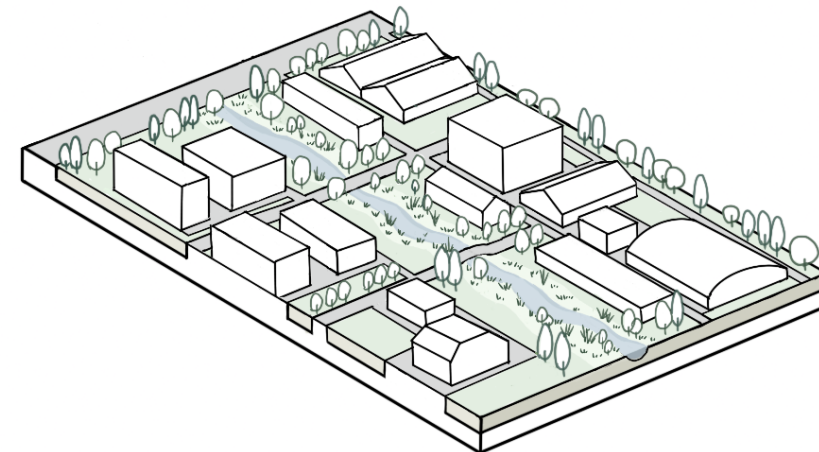
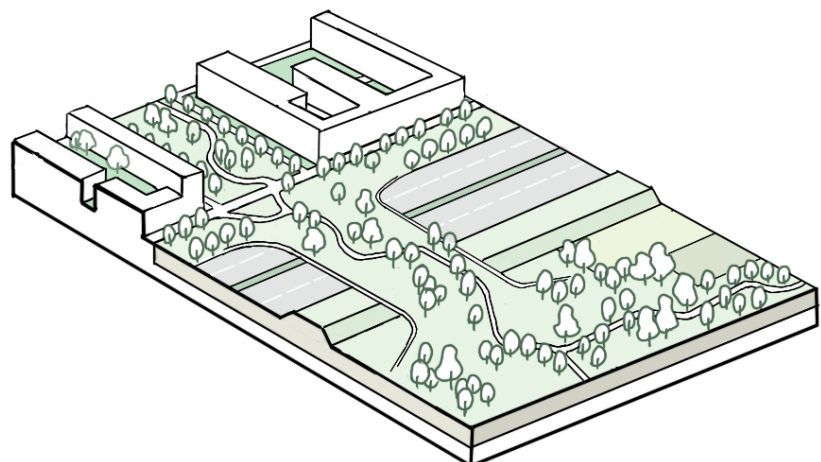
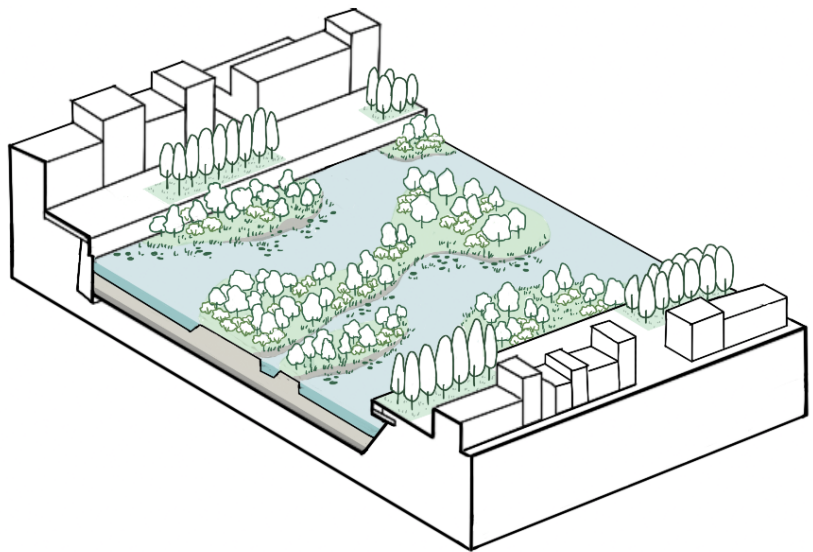
Ecological Spatial Strategies for 5 Prototypes

Corresponding spatial transformation strategies have been devised for the five landscape prototypes along the Schijn River, creating conditions for the development of riparian forests.

BEFORE



AFTER



Dock Area:

- Design new water bed for the old dock to form mudflats and marshes
- Allow natural succession to form willow-mangrove forests

- ⇒ · Habitat for aquatic animals and amphibians
· Enhance urban water retention and storage capacity

Infrastructure Area:

- Create connections such as ecological bridges and sunken gardens
- Create some small stepping stones

- ⇒ · Separate animals from human interference
· Improve animal survival and migration environment

Industrial Area:

- Create room for streams and plants
- Restore covered underground ditches to natural streams
- Create compact pockets of forest between plants

- ⇒ · Form linear riparian forests along the stream
· Phytoremediation of industrial pollution

Park Area:

- Set clear boundaries between wildlife living zone and human activity area
- Soil digging and filling operations for water scraping and the formation of a sloping

- ⇒ · Insulate the area from human interference and facilitate the establishment of forest and the habitat

Agricultural Area:

- Release ditches to allow rivers to meander and form marsh
- Introducing water buffalo to ensure that the reservoir marshes do not become landlocked

- ⇒ · Keep the water holding capacity of the marsh
· Create new sustainable livestock productions

2.3 Wild Aesthetic Experience for Humans

New Landscape Aesthetic Evalution System

Based on Nohl's four categories of sustainable aesthetics (1.5-4), a new landscape evaluation system has been established. Nohl's four aesthetic categories only provide an overall picture, so more specific indicators are needed to help people better understand them.

The refinement of the aesthetic categories incorporates perspectives from various scholars. Related to the aesthetic experience of nature is the concept of wonder. Robert Fuller states, "Wonder most often occurs as a response to things that impress us as striking, real"(Fuller, 2012, p. 70). In a sense, this is consistent with the experience of the sublime. Fred D. Ledley describes the sublime as a feeling that evokes excitement and awe. William Wordsworth describes such experiences as "impressions of power, feelings of apprehension, fear, dread or wonder" (Ledley, 2009, p. 248). Thus, wonder and awe are summarised as the two main manifestations of the sublime at the symptomatic level. Furthermore, Wonder motivates humans for reflection and further search for insight (Sæther, 2017). Thus, in understanding the sense of wonder evoked by nature, it can inspire ethical awareness and a deeper connection with nature. At the Symbolic level, sublimity expresses a moral sense that sees nature as lifelong value, celebrating non-human autonomy.

Beautiful, on the other hand, expresses a sense of balance and familiarity, with no great variation or diversity in their elements. Burke (1757) believes that beautiful is found more in pleasure. In beautiful landscapes the viewer experiences themselves as part of the natural environment - there is no clear distinction between man and nature (Nohl, 2001). Care is typically recognised in the neatness of a landscape (Nassauer, 1988), it is more commonly found in traditional cultural landscapes, such as carefully maintained farmland. Thus, harmony and unity are summarized as the two main manifestations of beauty at the symptomatic level. At the symbolic level, beauty manifests as a sense of care for nature.

Interesting is developed as an aesthetic experience attracted by the diversity and organised chaos of mixture of natural and artificial, which at the symptomatic level is expressed as a curiosity, and at the symbolic level, it represents human creativity and engagement in nature.

Plain is something can arouse feelings of contentment and gratitude, at the symbolic level, it expresses an intention of reconciliation between natural and artificial.

In order to o scientifically use these four aesthetic categories as a basis for landscape

evaluation, different aspects of landscape spatial indicators are introduced. The perception-based method is supported by psychological and philosophical approaches to evaluating landscape aesthetics (Melluma & Leinerte, 1992). The design objective method assesses landscape aesthetics by analyzing visual structure, patterns, diversity, harmony, and other elements used in planning and composition (Ziemelniece, 1998). Therefore, an evaluation matrix is formed from different aspects of the landscape elements: order, diversity, access, depth and enclosure, light and shadow.

The combination of these landscape components and perceptual elements is represented by drawings as prototypes.

Combining these landscape components and perceptual elements, they are represented through drawings as prototypes.

Finally, about the relationship between these four aesthetic categories with the wildness. Løvoll, Sæther et al. (2020) summarized that dimensions of beauty and the sublime were identified as core features in situational wildness experiences by means of a questionnaire survey of wilderness adventure participants regarding their nature experiences, sensory states, and aesthetic aspects of the experience.

Therefore, enhancing and improving landscape designs that bring about aesthetic experiences of the sublime and beautiful will become one of the goals of rewilding.

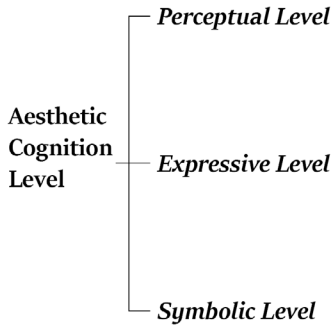
Regarding how to use these four new aesthetic categories as a landscape evaluation system, specifically, the aesthetic analysis of Schijn Valley based on these categories will be conducted in layers focusing on Plant space, Type of woodscape, Green use and accessibility, Urban space and function these four aspects. Within each layer, different landscape types will be categorized into the four aesthetic categories according to their spatial and perceptual elements, resulting in an aesthetic mapping for each layer. Finally, these different layers will be overlapped to obtain a comprehensive aesthetic evaluation mapping for the area.

New Landscape Aesthetic Evalution System based on Aesthetic Cognition Categories

Aesthetic Cognition Level

1. Perceptual Level (sensory: viewing, hearing, smelling)
2. Expressive Level (mood, feeling)
3. Symbolic Level (idea, imagination, meaning)

Aesthetic Perceptual Categories



Sublime

Vast, rugged, obscure and gloomy, solid

Wonder Evoked by something surprising in nature; motivate humans further search for insight

Awe A pleasure that nature's capacity overwhelm our power

Symbol of freedom, autonomy of nature

Beautiful

Small, delicacy, smooth and polished, clear and bright

Blissful feeling of harmony and identity, feel safe and agreeable

Symbol of home, safety and unity

Interesting

Chaotic, incoherent, technical, mix of bizarre and usual

Exciting, thrill feeling for uncertainty and risk, confused and curious about the future technological developments

Symbol of necessary technical progress, human creativity and engagement

Plain

Simple, repetitive, monotonous and reductional, void and empty

Comforting feeling, wish for "alliance-techniques" with nature, brings the productivity of nature back into play

Symbol of existing usefulness

Cognitive Landscape Prototypes

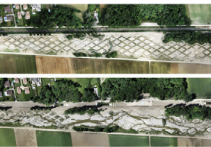
Spontaneous landscape (fallow lands, succession areas, spontaneous woods)

Traditional cultural landscape (park, garden...)

Urban-industrial landscape (construction places, urban fringe, suburban hotchpotch, derelict areas)

Rural functional landscape (modern rural agricultural landscape)

Examples of Prototypes



River Aire, Geneva



Vondelpark, Amsterdam



Suburban Detroit, in the process of urbanization



Windpark Noorddoostpolder

Indicator of Landscape Perception	Color				
	Light & shadow				
	Order				
	Diversity				
	Enclosure Threshold				
	Texture				
	Sound				
	Smell				

2.3 Wild Aesthetic Experience for Humans

Aesthetic Layered Analysis: Type of Plant Space

The space-shaping function of plants is the first consideration, followed by ornamental characteristics and other factors. Plant space is mainly composed of three dimensions: base surface, vertical surface and covering surface, and the space shaping function of plants is mainly divided into three categories: enclosure, interface and channel. According to the different characteristics of these spatial compositions, seven types of plant space can be identified: open plant space, semi-open plant space, covering plant space, completely enclosed space, vertical plant space, theater plant space and young tree arrays. Based on their spatial characteristics, each type of plant space is then classified into the aesthetic experience categories.

Type of Plant Space

Open space: Human sight is above the plants, with no coverage limitation. Vertical surfaces are represented by ground-level vegetation and low shrubs as spatial constraints.

Semi-open space: A transitional area between open and enclosed spaces, where the enclosing surfaces can restrict people's line of sight, guiding the direction of this gaze.

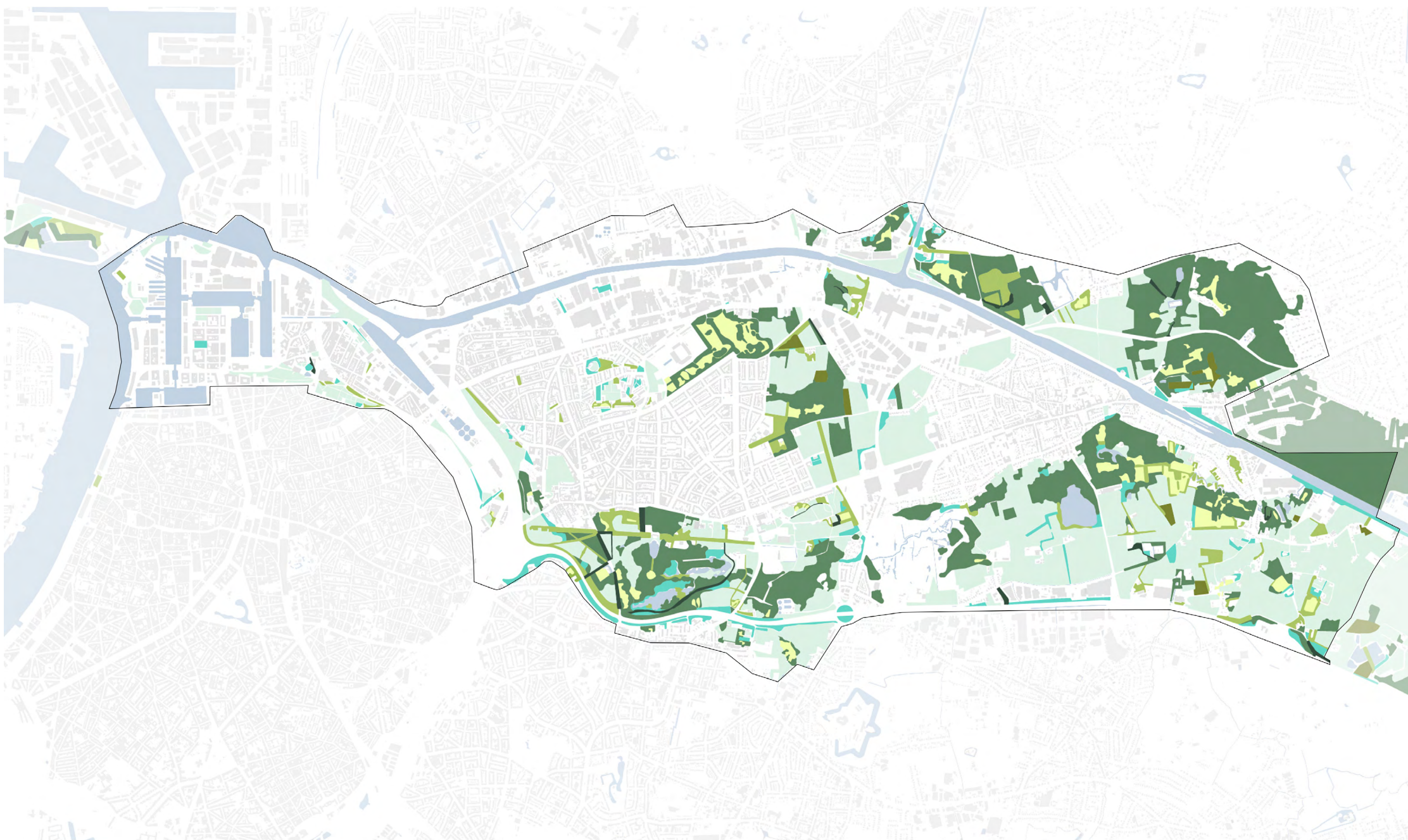
Covered space: between the tree canopy and the ground, the varying heights of branching points and the dense leaves form the scene of space. The view is permeable horizontally and shaded vertically.

Completely enclosed space: large deciduous trees curve as a canopy, surrounded by shrubs and ground cover, forming the most complex community structure.

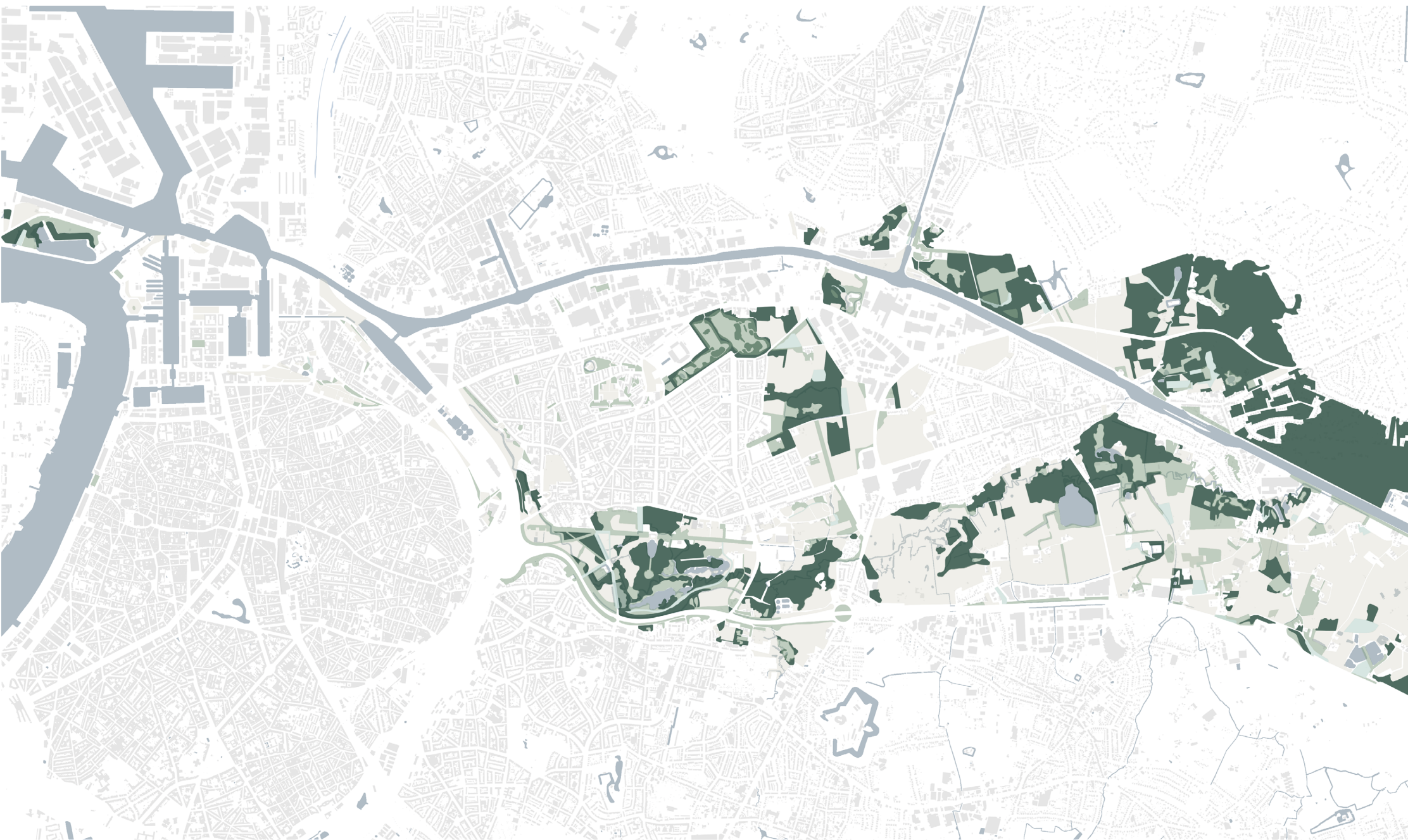
Vertical Space: vertical surfaces are enclosed by vegetation, the top surface is open, guiding the view forward and upward, emphasizing the axis.

Theater Space: enclosed by trees, the interior space is a wide room, trees serve as a background forest.

Young tree arrays: rows of trees that are below or slightly above people, with small gaps between them, commonly found in corridors, outdoors and newly planned open spaces.



- Plantspace
- Open Space
 - Semi-open space
 - Covered space
 - Enclosed space
 - Vertical space
 - Theater space
 - Young tree arrays

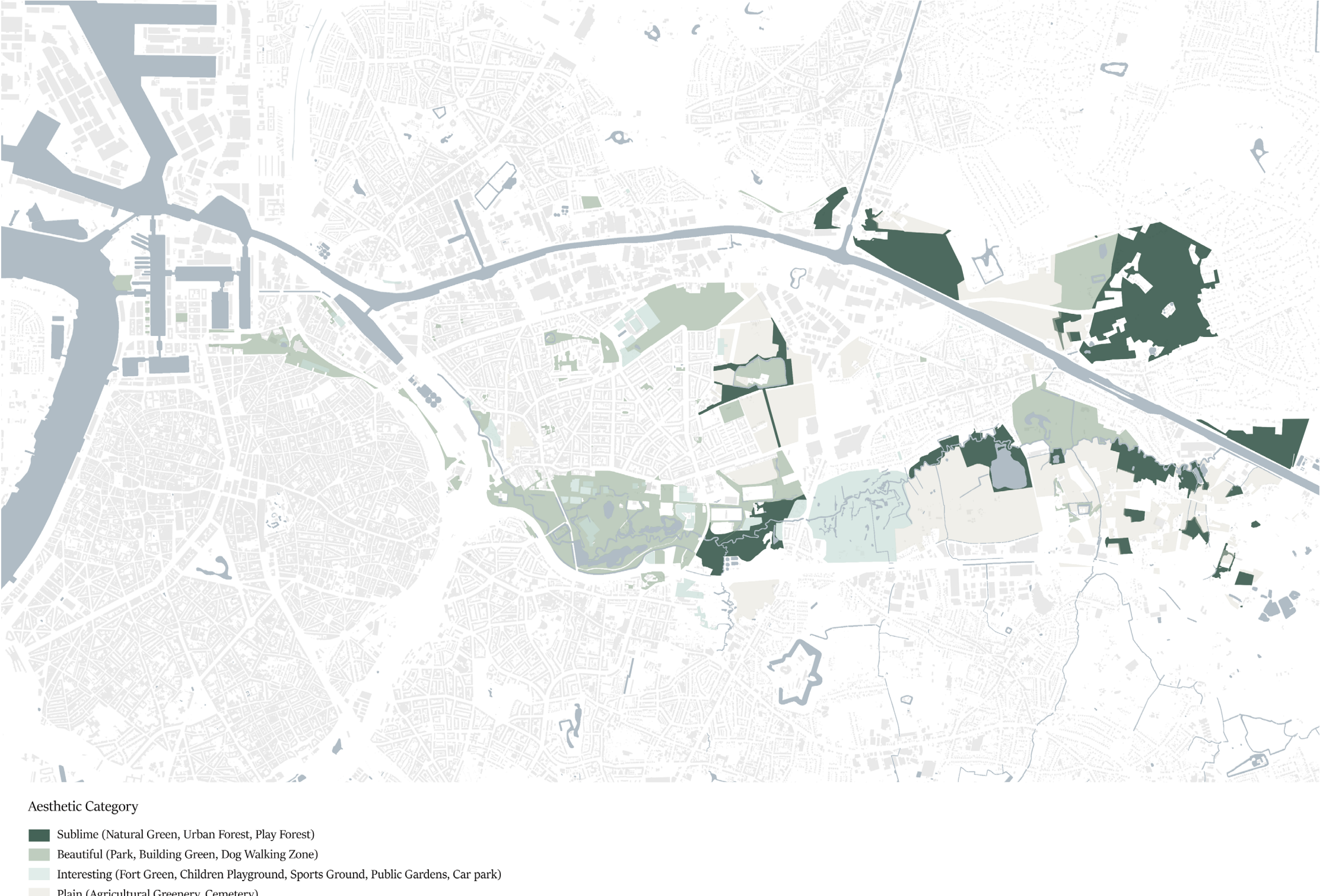
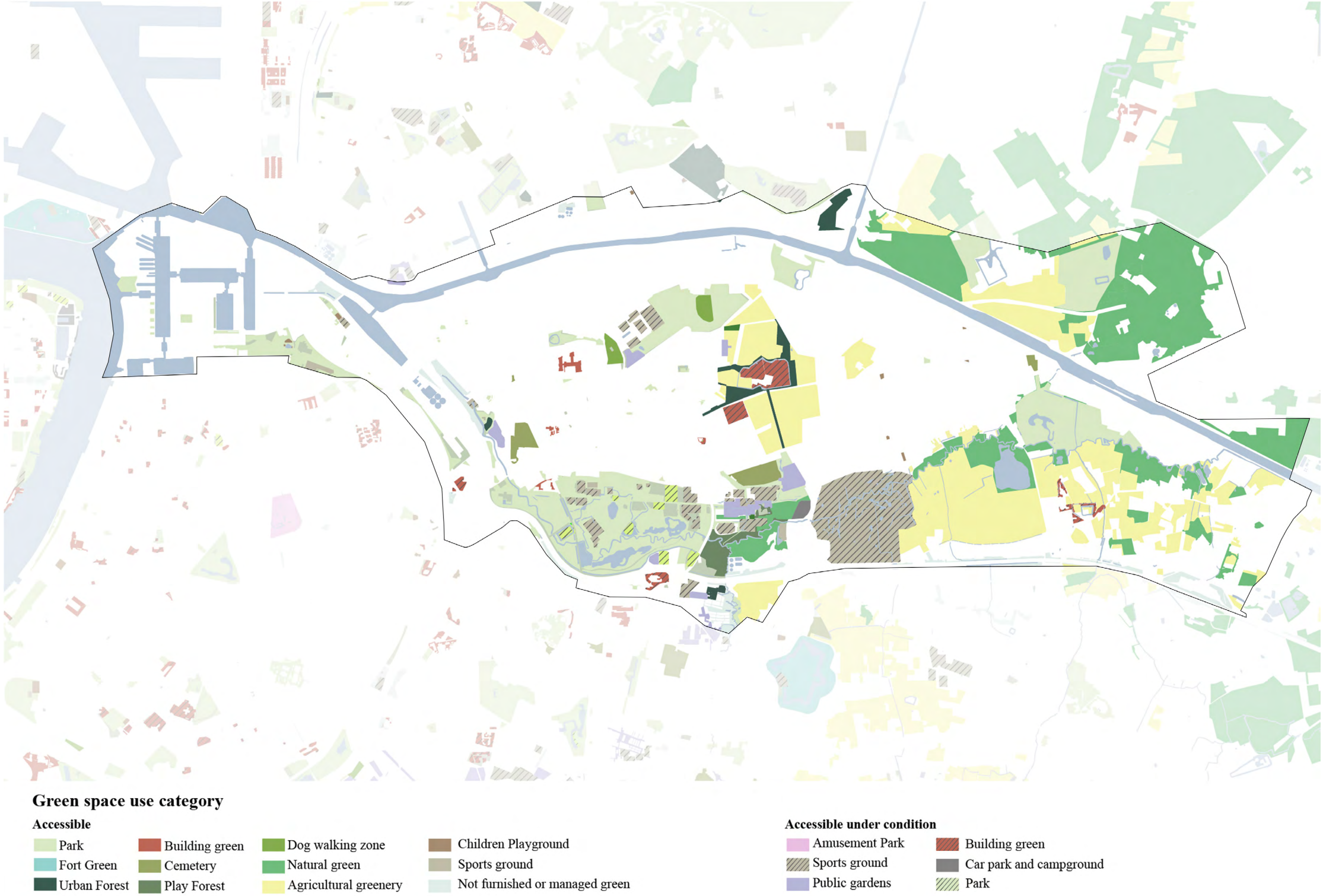


- Aesthetic Category
- Sublime (Enclosed space)
 - Beautiful (Semi-open space, Covered space)
 - Interesting (Young tree arrays, Vertical space)
 - Plain (Open space)

2.3 Wild Aesthetic Experience for Humans

Aesthetic Layered Analysis: Green Use and Accessibility

The spatial structure and distribution of the landscape throughout the area, as well as their function and accessibility, also have an important influence on the aesthetic experience. The different landscape green space types are categorized with reference to the cognitive landscape prototypes corresponding to the four aesthetic categories.



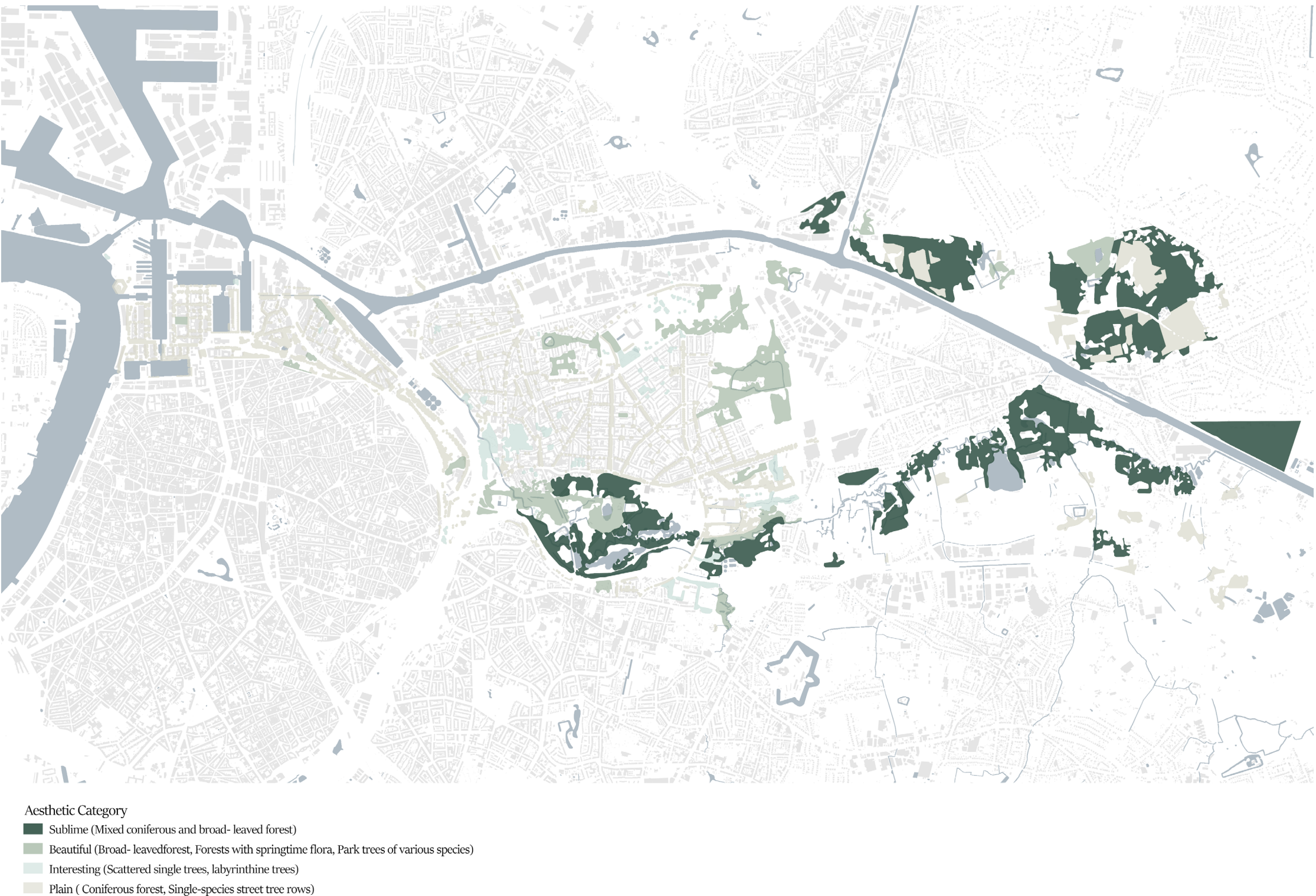
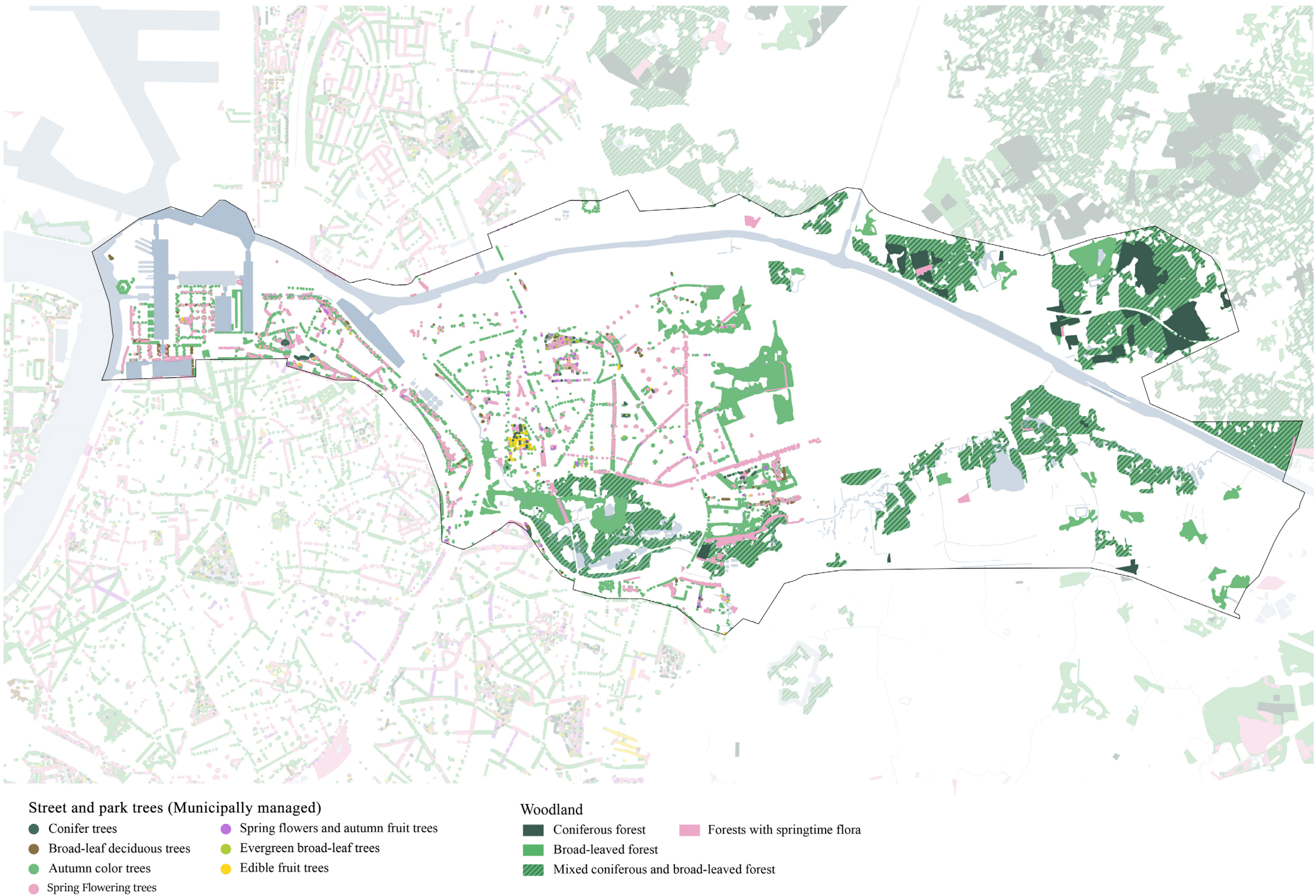
2.3 Wild Aesthetic Experience for Humans

Aesthetic Layered Analysis: Type of woodscape

Next, the types of trees and their ornamental characteristics are considered. The analyzed objects consists of street and park trees that are managed by the municipality of Antwerp, as well as patches of woodland. The street and park trees are classified into seven categories: Conifer trees, Broad-leaf deciduous trees, Autumn color trees, Spring Flowering trees, Spring flowing and autumn fruit trees, Evergreen broad-leaf trees and Edible fruit trees. The woodland are classified into four categories: Coniferous forest, Broad-leaved forest, Mixed coniferous and broad-leaved forest, Forest with springtime flora.

After integrating the ornamental characteristics and distribution of these trees, different woodscape types then classified into the aesthetic experience categories.

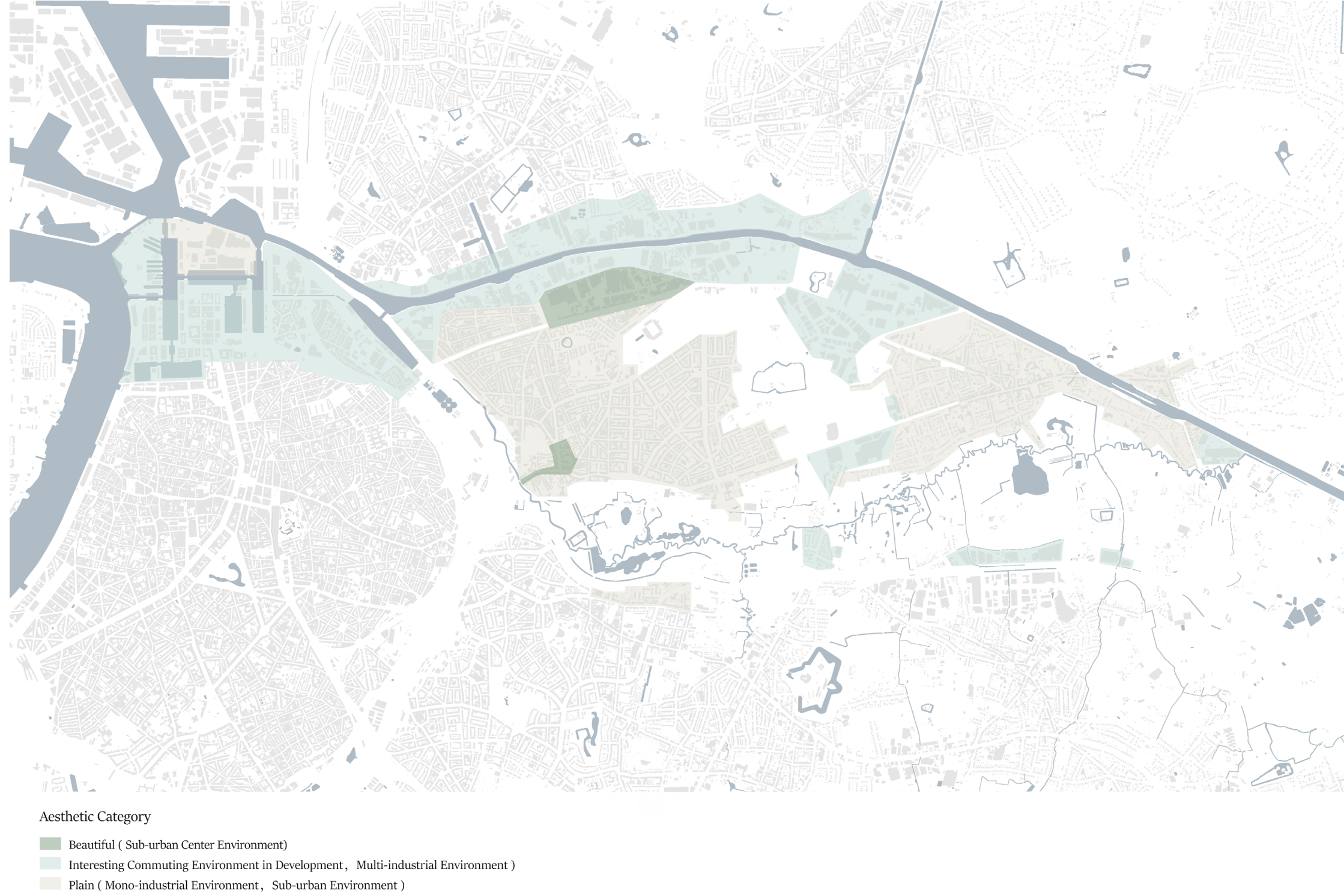
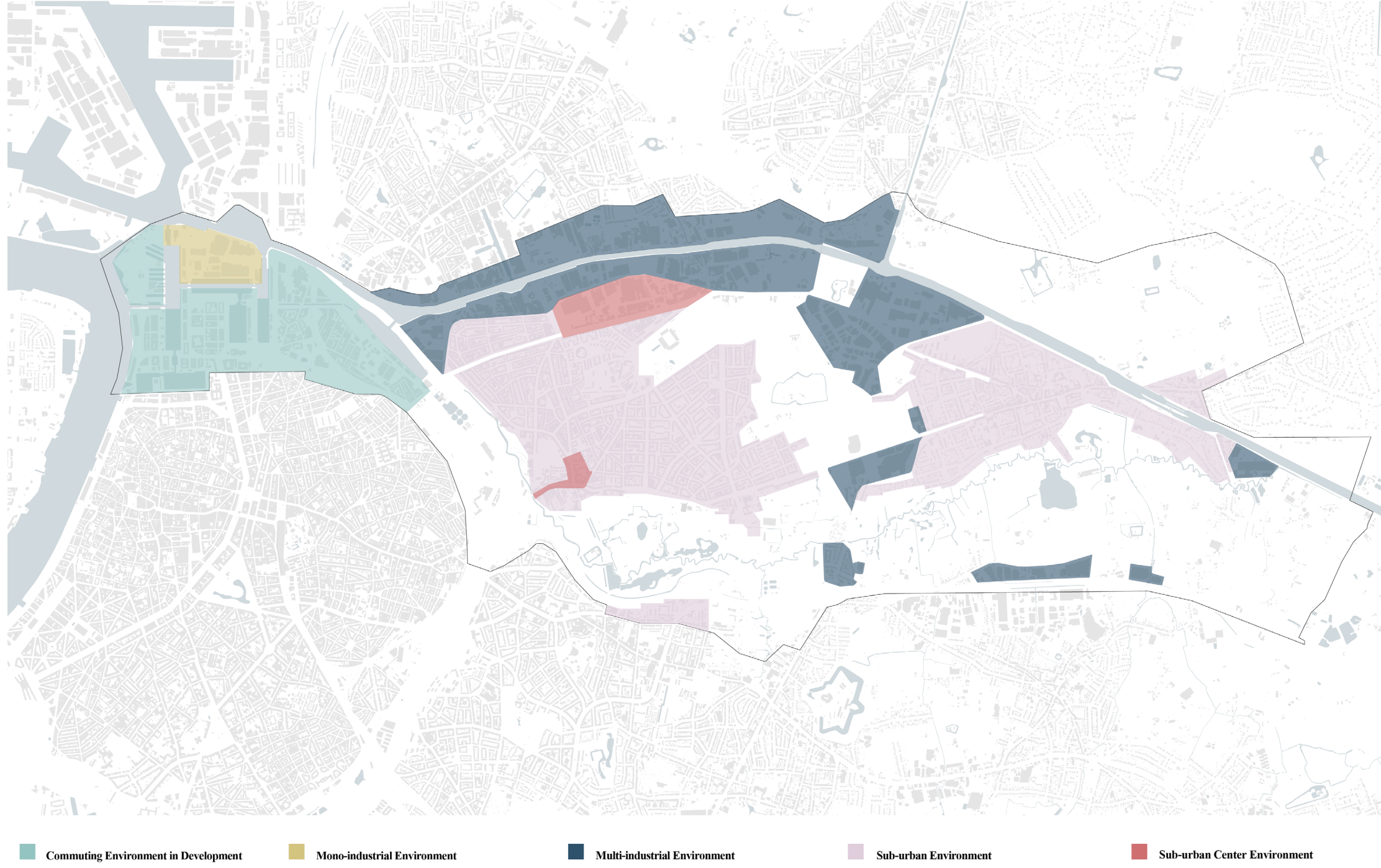
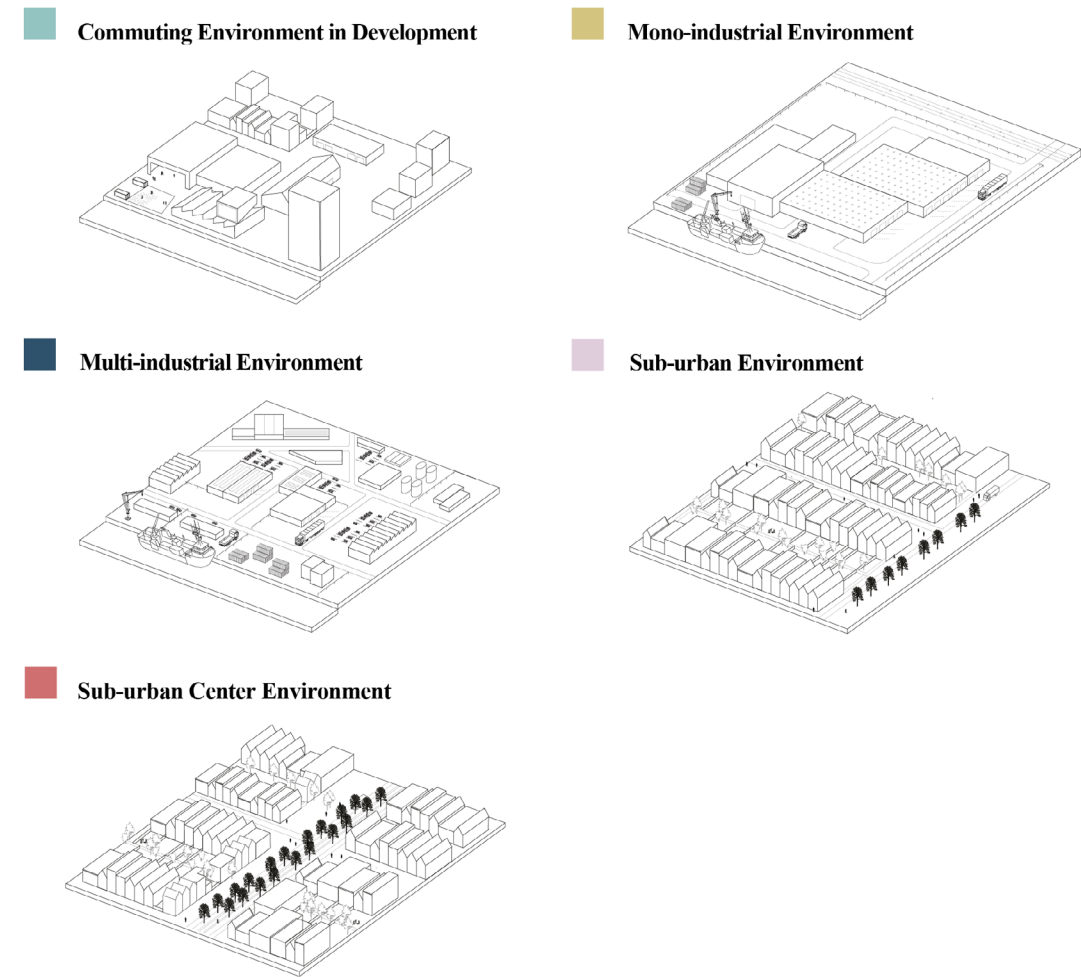
Sublime: Mixed coniferous and broad forest
Beautiful: Broad-leaved forest, Forests with spring time flora
Interesting: Scattered single trees, labyrinthine trees
Plain: Coniferous forest, Single- species street tree rows



2.3 Wild Aesthetic Experience for Humans

Aesthetic Layered Analysis: Urban Space and Function

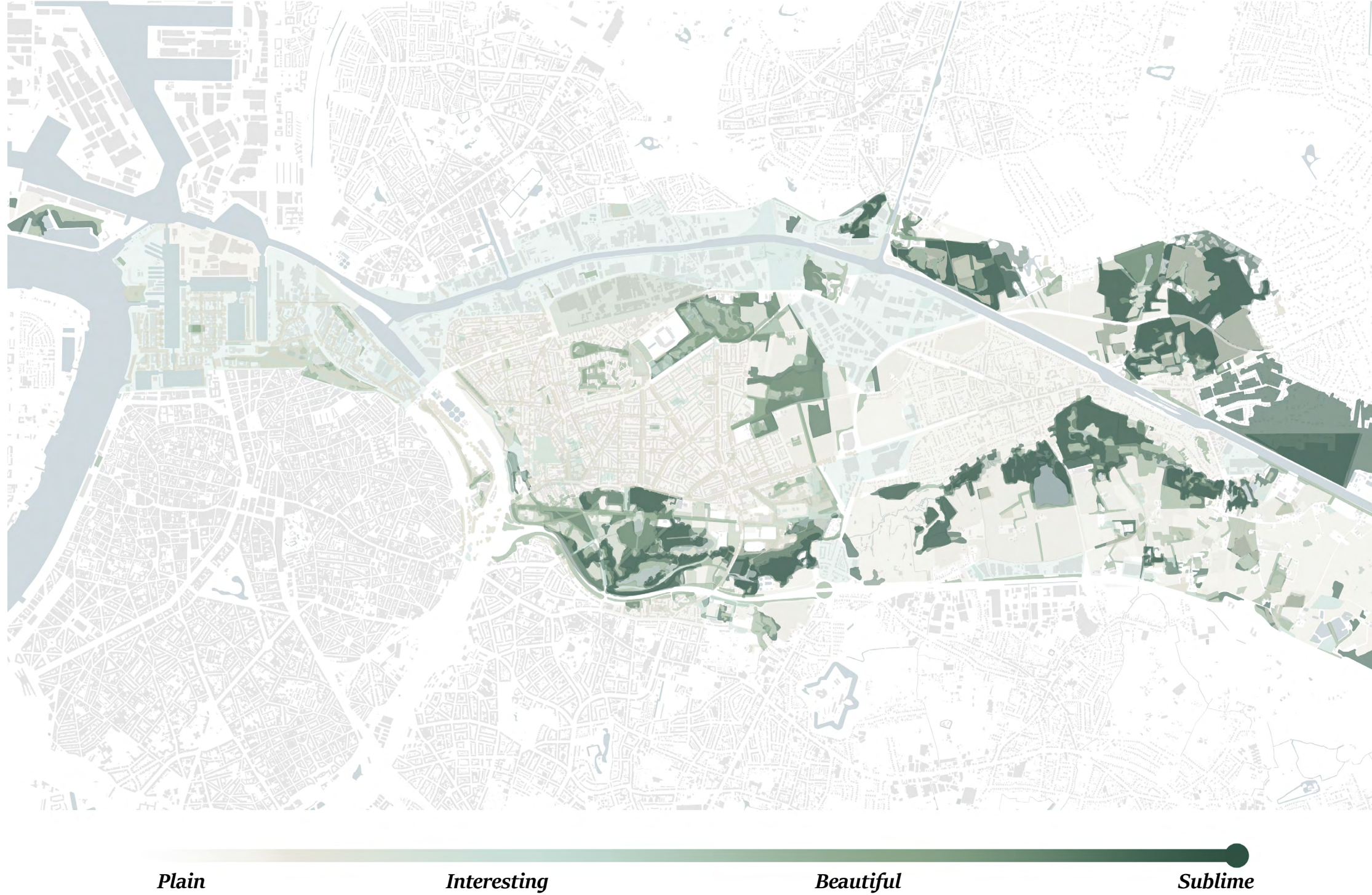
Based on the spatial characteristics and programmatic mix, at least five urban spatial and functional mix types can be distinguished in Schijn Valley. In these built-up environments the sublime is difficult to be experienced. In Sub-urban environments the possibility exists for some beautiful experiences. Whereas the aesthetic experience of interesting occurs more often in Commuting environments in development and Multi-industrial environments. Whereas in Mono-industrial environment and Sub-urban environment, it is more often presented as plain.



2.3 Wild Aesthetic Experience for Humans

Aesthetic Layered Analysis: Overlapped Aesthetic Map

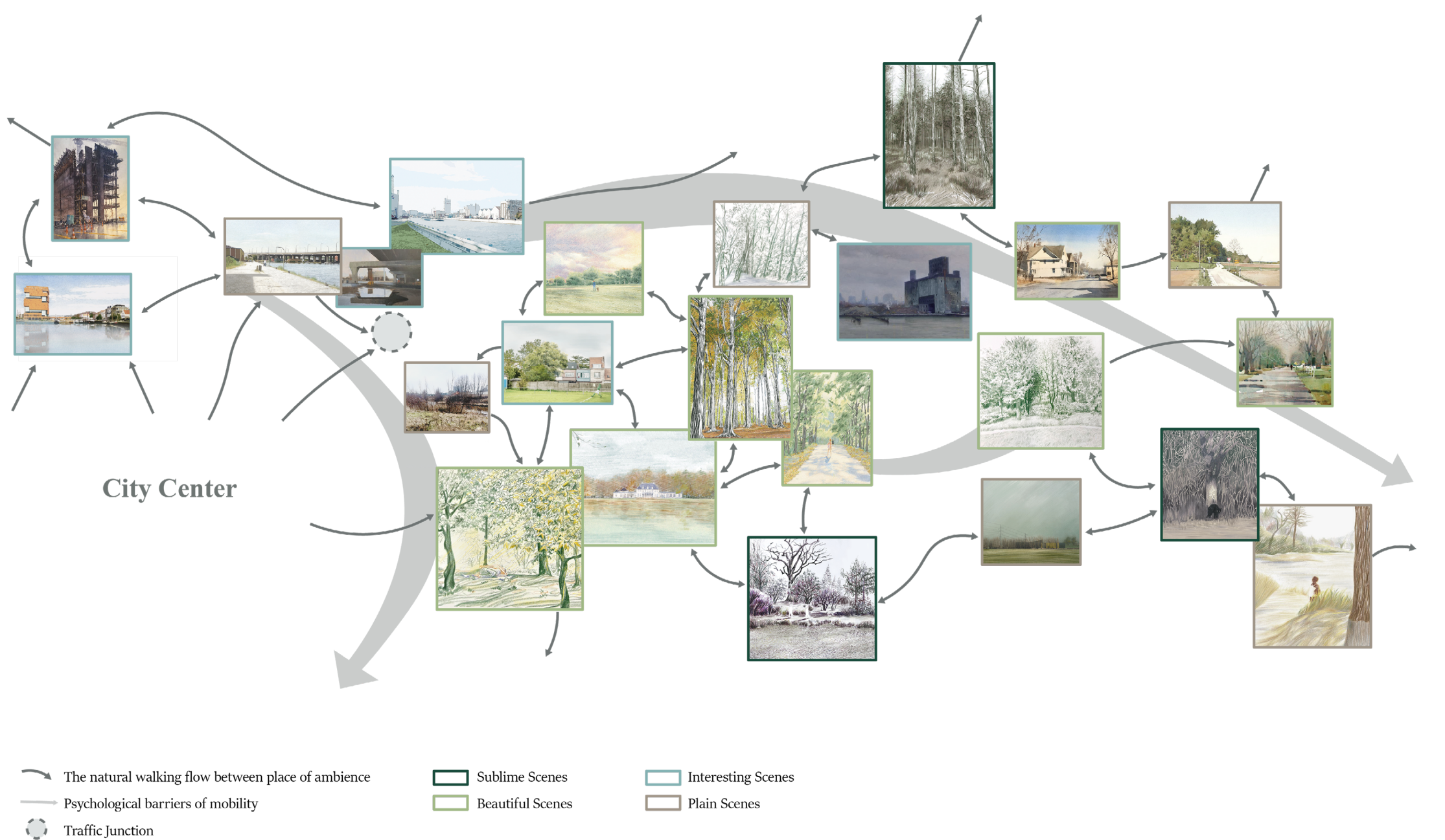
Overlaying the different aspects as discussed before, has created the aesthetic map of the current state. The darkest areas can be classified as sublime, the medium dark as beautiful, the light yellow area as interesting, the almost transparent area as plain.



2.3 Wild Aesthetic Experience for Humans

Situational Analysis: Situational Aesthetic Experience Mapping

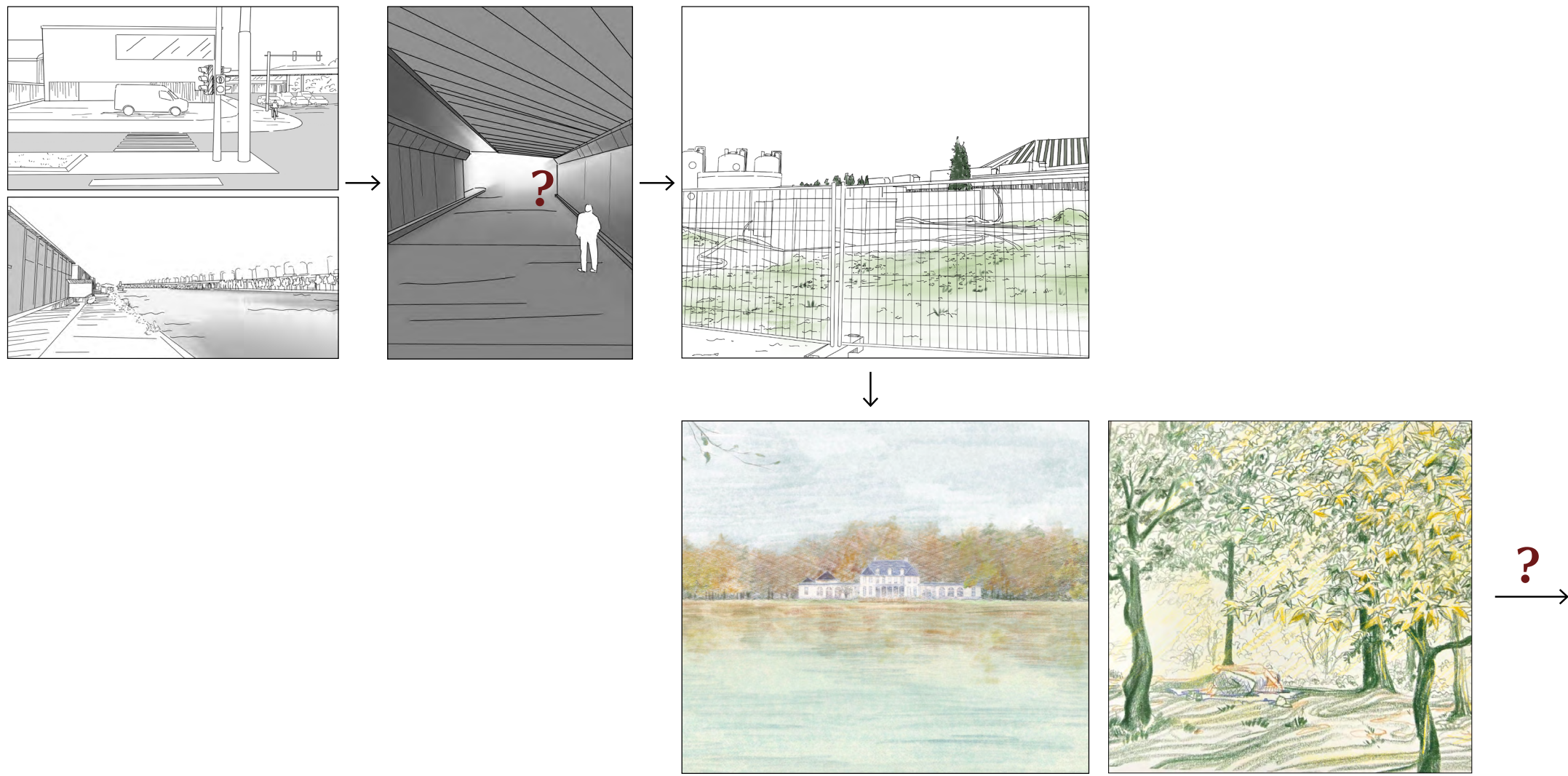
During four field trips to Antwerp, I explored the Schijn Valley through the way of Dérive, and documented places of ambience through drawings and a few short descriptions of the landscape and feelings. Because drawing is subjective, it expresses the various spatial qualities in a particular situation (season, weather, activities, The state of the beholder...) as well as the perceptions and experiences they bring about, through different colors, tones, and brushstrokes.



2.3 Wild Aesthetic Experience for Humans

Situational Analysis: Situational Aesthetic Drawing

Drifting along the Schijn River from the city center, there are mostly homogeneous and uninspiring streetscapes, completely artificial river channels, and a lot of disorienting and confusing mega-infrastructure. In urban fringe, sometimes, people can meet places that are undergoing urbanization, where nature and the city are in contention, creating some interest. Crossing the huge ring road, one seems to be in another world, rivierenhof shows a picturesque urban park, but everything seems to be carefully designed, raising suspicions about the ecologically realistic. And after stepping out of the park, disorientation strikes again: the rivierenhof seems to be the end point of access to nature, or the valve of an orderly urban civilization. After this, one can deeply experience the fragmentation and dispersal of suburban landscapes, with plain, intensively cultivated farmland and pastures, less accessible wild forests, and unexpectedly appearing exquisite small parks.... It's hard to find some kind of sequence or get some kind of deep feeling from it.



2.3 Wild Aesthetic Experience for Humans

Situational Analysis: Landscape Perception Investigation

Individuals perceive landscapes very differently, so I created a Aesthetic Perception Survey, inviting close friends and classmates, as well as elders, to write about how they felt after seeing these Situational landscape drawings, and they were asked to think in terms of sensory and spatial dimensions as much as they could; as well as, after learning about the basic connotations of the new four aesthetic categories, to choose the aesthetics that best represent what the aesthetics they perceived each painting to exhibit. I wanted to explore how the common person would relate to some of the landscape elements and feelings about these four aesthetic categories if they did not have an adequate knowledge base of aesthetics. These spatial elements will also guide the subsequent landscape design to present wildness.

Aesthetic Investigation	1	2	3	4	5	6	7	8	9	10
Basic Information	Layered bushes along the parkway	Beech forest	Mixed coniferous and broadleaf forests	Beech avenue, unpaved trails	Oak trees and lawn in the park	Farmland, pasture	Artificial lake in front of the castle	Unexpected appearance of small animals	Newly planted slender trees woodland along the road	Dog walking park, flat and wide rooms surrounded by trees
How do you feel about this landscape? (some words)	peaceful, structured, open and enclosed, harmony but mysterious, sense of cultural remains edge of the forest, edge of the civilization and wilderness	covered space, autumn Warm, bright and cozy golden fall, exploring in the forest	scratchy, novel, quiet but cold Sluggish and deep In the harsh winter season, the trees wither	ordered, shaded, Strong visual guide, clear, safe The sun is shining brightly, the green trees provide shade Walking on the road leading to the distance feels full of hope	relaxing, understory space, safe and comfort, sleeping under the tree Cool, relaxing, nostalgic Spring and sunrise, healing	idyllic, like the sunny afternoon in the winter time, Open, and will not gaze here, the disorientation of the vision warm, wind is roaring the grass and trees are dancing in the wind	Symmetrical, elegant, 对称的, 优雅的小布谷鸟鸣声 "地景的一角一角" The reflection on the lake surface	mysterious, grey colour, ominous, surprised, evocative and memorable Orav, Olomou	messy and creepy, Common lowland landscape elements, the landscape is downstairs of my home Disorderly	freedom, Framed space, the "usual" park, empty, but the excess of emptiness stimulates the imagination "A normal place to do all the abnormal things." the green space is full of joy
Do you think the landscape is beautiful/sublime/interesting/plain?	beautiful	beautiful, sublime	sublime/interesting	plain	beautiful	plain	beautiful, plain	sublime, interesting	plain	beautiful plain
Basic Information	Farmland, factories and farmland in the distance	Pine forest, dead wood	Exploring forest forest	schijn river	sand quarry along the Albert Canal	Lobroekdijk	Albert Canal	Street of Deurne	Community open green space	A path along the edge of a woodland
How do you feel about this landscape? (some words)	simple Melancholy, Lonely 人景相依的孤独感, 天空压顶了一切	adventure, sharp branches mysterious Wabi-sabi	vertical, desolate, pillar hall of dark temple overgrown weeds, the pine needles have fallen	wasteland, desolate, wild 沼泽地 The banks of the river are not well planned and organized	Heavy industrial vibe, inhuman scale "Dreantscore" 打破了时代感真的回肠 The Fall of the Grand Narrative Heavy industrial pollution	Calm waters, deserted A space for urban wanderers ecologically chaos Transportation hub	Industrial city, magnificent a prosperous metropolis no identity		The Stage of Life daily landscape nostalgia 城市中有最真实的生机, 不论是出去散步还是晒太阳的时刻	Rustic, peaceful 微风在耳边吹, windy Walking on the country road, the colors are bright
Do you think the landscape is beautiful/sublime/interesting/plain?	plain/sublime	sublime	sublime	interesting/plain	plain/interesting	plain/interesting	plain/interesting	plain	plain/interesting	beautiful plain

Fig. 24Aesthetic Perception Investigation Table

2.3 Wild Aesthetic Experience for Humans

Situational Analysis: Psychogeographic Map

Findings:

- For the overall spatial structure of the Schijn valley, its spatial boundaries are largely defined by water and vegetation areas.
- Scattered landscapes offer varied aesthetic experiences with underlying connections.

Goals:

- Create connections
- Expand and develop Sublime and Beautiful
- Enhance landscape and spatial quality with a rich, fluid aesthetic experience

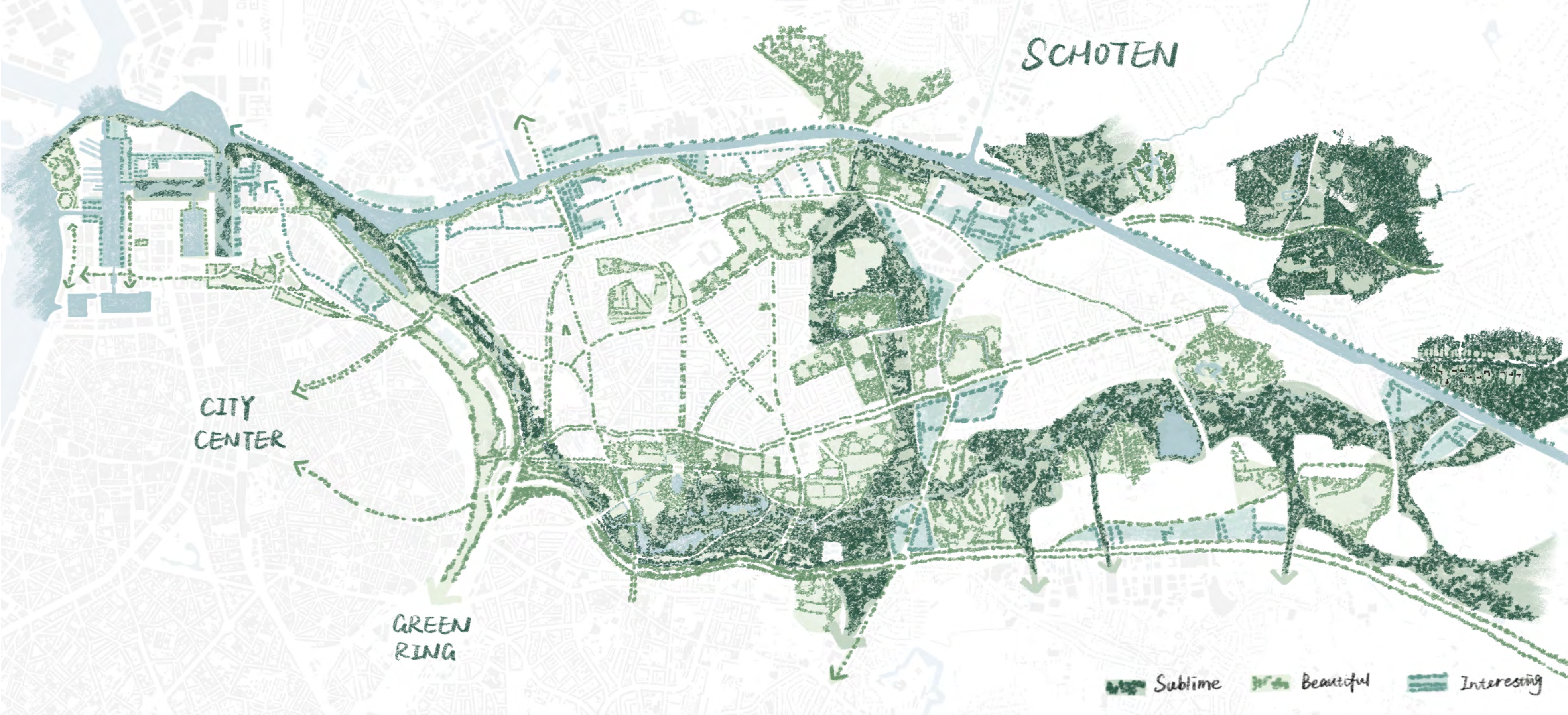


2.3 Wild Aesthetic Experience for Humans

Aesthetic Network Vision

Principles:

1. Connecting, enhancing the sublime corridor along Grote Schijn.
2. Most of the beautiful character of the existing park are maintained and stitched to both sides of the corridor, enriching the corridor experience and acting as a buffer.
3. The original beautiful fragments have been connected by beautiful boulevard.
4. In the industrial area, utilizing the interstitial and linear spaces between factory buildings to develop more interesting forests. Re-establishing along the winding banks of the Klein Schijn River in the industrial area, a new riparian forest emerges, characterized by spontaneous succession and possessing sublime qualities.
5. In the old dock area, the materiality and temporality of post-industrial ruins will create the aesthetics of sublime. New construction work will also bring unknown surprises, transforming the landscape into a mix of the sublime and the interesting.
6. The plain fragment in agricultural and residential areas will be upgraded into interesting and beautiful, thus helping the structure of sublime and beautiful to form a robust continuity throughout the city.



2.3 Wild Aesthetic Experience for Humans

Urban Forest Tool Box: Sublime

Forest Composition

- Natural, informal planting
- Dense, old Forest
- Multi-layered (tree-shrub-herb)
- A great variety of species

Spatial Composition

- Large or sudden contrasts (narrow or vast)
- Unclear, rough borders

Human Intervention

- Natural succession (light management)
- Limited accessibility for people
- Less man-made elements

Atmosphere

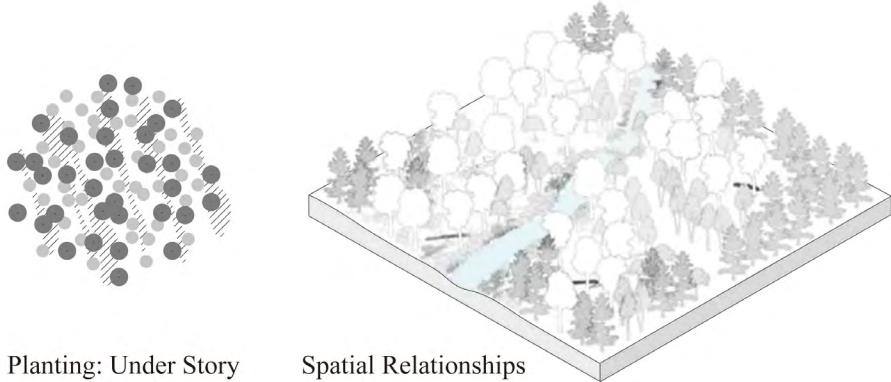
- Mysterious, Uninviting, Ominous, Chancy

Ideal Trees

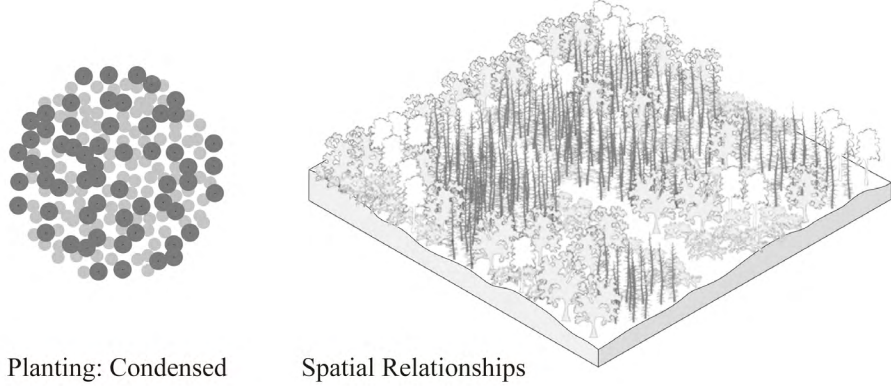
- Combination of stright high branched trees and crooked trunk trees,
- Vines, thorny underbrush,
- Allows for dark or stark light

- *Pinus sylvestris*
- *Juniperus communis*
- *Alnus incana*
- *Fraxinus nigra*
- *Crataegus monogyna*
- *Quercus robur*
- *Prunus spinosa*
- *Ulmus glabra*
- *Abies alba*
- *Rubus fruticosus*

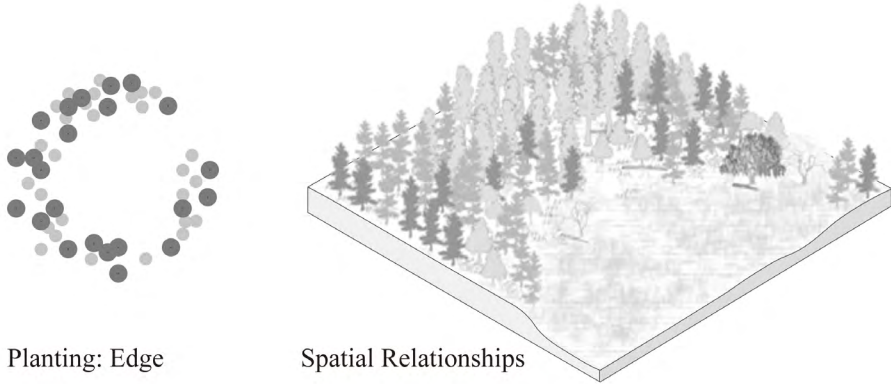
Sublime Multi-layered Riparian Forest



Sublime Impenetrable Forest



Sublime Edge Forest



Forest Features

- Multiple herbaceous layers
- Dynamic vegetated ground plane
- Shadow casting canopy
- Moving water or riparian edge
- Fallen logs, moss, ferns, wildflowers contribute to complete cycle of forest

The Experience

- Habitat for various creatures
- A place of discovery, full of small surprise
- Contrast with the rush of life, a place of disconnection and contemplation

Forest Features

- Strong threshold
- Low intertwining canopy
- Rough ground plane
- Dark structures

The Experience

- No clear path
- Dark curious spaces with brambles
- A spooky arduous challenge for adventure seekers

Forest Features

- Dynamic , ragged Edge
- Diverse tree species
- High dappled canopy
- Uninviting, deep entrance

The Experience

- The condensed maze of trees make people wonder and explore
- More spontaneous phenomena of plants
- Strong contrasts between light and dark
- Strong contrasts in the opening and closing of space

2.3 Wild Aesthetic Experience for Humans

Urban Forest Tool Box: Example Drawing of the Forest Experience

Sublime Multi-layered Riparian Forest



Sublime Impenetrable Forest



Sublime Edge Forest



2.3 Wild Aesthetic Experience for Humans

Urban Forest Tool Box: Beautiful

Forest Composition

- Mix of formal and informal planting
- More sparse planting
- Less understory plants (lawn with woodland)
- Variety of species

Spatial Composition

- Open, roomy space
- Clear, smooth boundaries

Human Intervention

- Adequate maintenance
- Available for people
- Picturesque facilities

Atmosphere

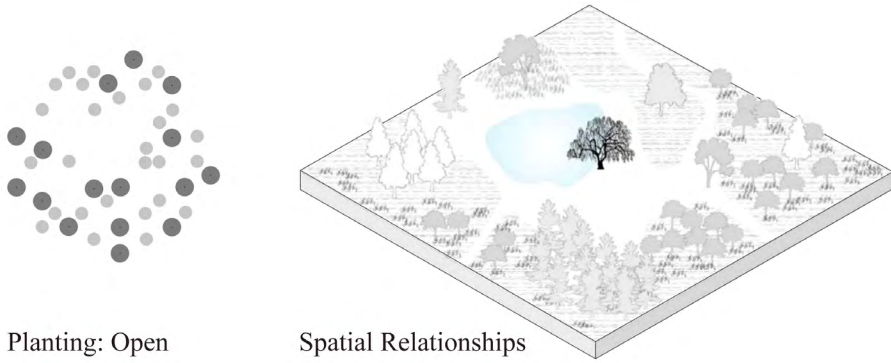
- Homey, Comforting, Fasinating, Tranquil

Ideal Trees

- Soft light filtering canopy
- Welcoming branching
- Great fall color leaves or spring blooms
- Soft, delicate textures

- *Taxodium distichum*
- *Acer saccharum*
- *Cornus controversa*
- *Fagus sylvatica*
- *Liriodendron tulipifera*
- *Tilia europaea*
- *Prunus cerasifera 'nigra'*
- *Robinia pseudoacacia*
- *Pterocarya fraxinifolia*
- *Platanus hispanica (x)*

Beautiful Open Riparian Forest



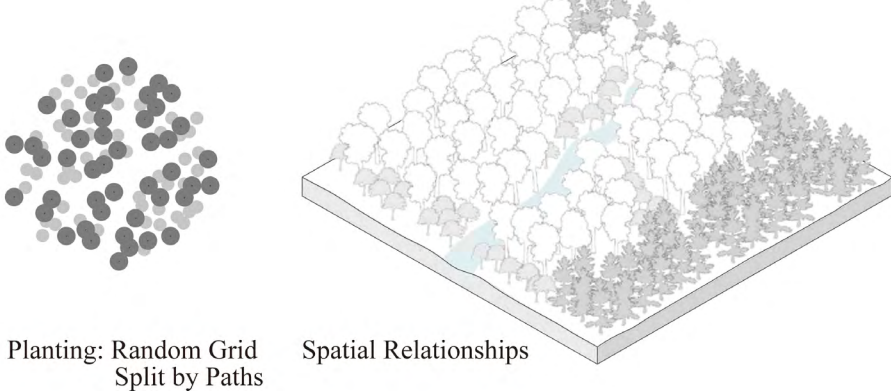
Forest Features

- Varied canopies and densities
- Widely spaced trees
- Mostly open and soft ground plane
- Moving/quiet water
- Ornamental trees

The Experience

- Invite open play and imagination
- Multiple paths can be ventured
- A sense of safety allowing for free roaming
- Bathe in the sun or nap under the shade

Beautiful Enclosed Canopy Riparian Forest



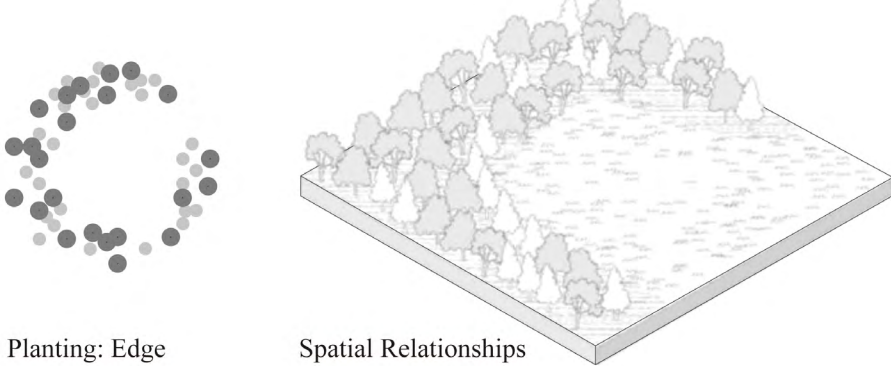
Forest Features

- Strong threshold
- High dappled canopy
- Moving water
- Expressive/soothing seasonal colors

The Experience

- A magical forested room
- Sparkling light interact with the ground
- Encompass the feeling of escaping to another place and time

Beautiful Edge Forest



Forest Features

- Clear, soft and permeable threshold
- Graduated, multi-layered border
- Flowering ground cover and shrubs in the forefront
- Dappled canopy
- Open and soft ground plane

The Experience

- A safe backrest
- A sense of envelopment without oppression
- Feel free to wander along the edge

2.3 Wild Aesthetic Experience for Humans

Urban Forest Tool Box: Example Drawing of the Forest Experience

Beautiful Open Riparian Forest



Beautiful Enclosed Canopy Riparian Forest



Beautiful Edge Forest



2.3 Wild Aesthetic Experience for Humans

Urban Forest Tool Box: Interesting

Forest Composition

- Formal planting
- Ordered planting
- A little variety of species

Spatial Composition

- A variety of small spaces
- Cut by line or grid
- Unsettled borders

Human Intervention

- Interaction with buildings
- Recreation on hard surface
- Unpredictable, difficult to maintain

Atmosphere

- Unsettled, Captivating, Curious, Guardian

Ideal Trees

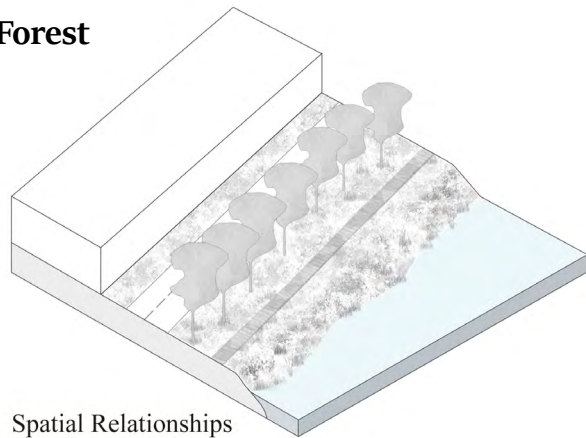
- Combination of rounded and quirky canopies
- Fun shaped leaves
- Bright colors

- *Acer rubrum*
- *Aesculus hippocastanum*
- *Buxus sempervirens*
- *Ceris candensis*
- *Koelreuteria paniculata*
- *Sequoia sempervirens*
- *Buddleja davidii*

Interesting Linear Forest



Planting: Rows

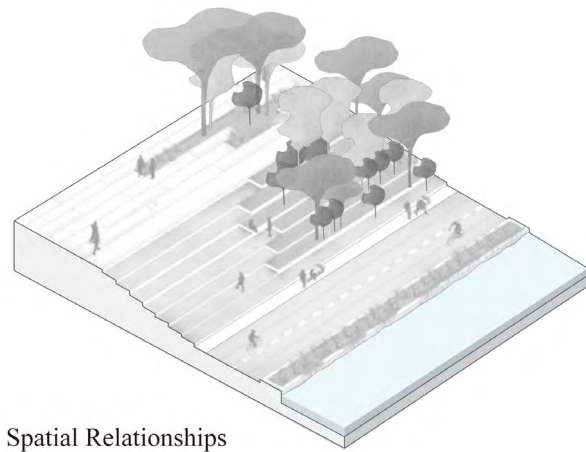


Spatial Relationships

Interesting Edge Forest

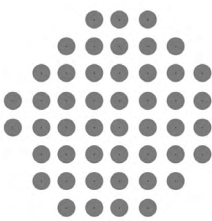


Planting: Edge

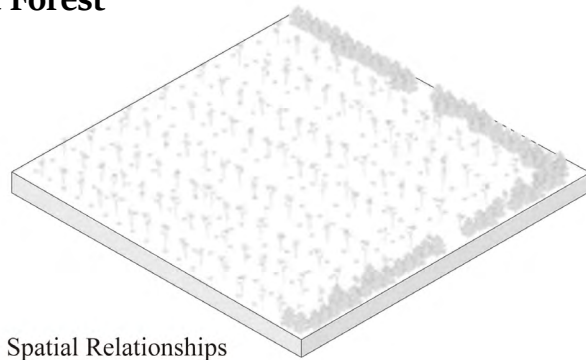


Spatial Relationships

Interesting Cleared Forest



Planting: Grid



Spatial Relationships

Forest Features

- Tall, straight trunk
- Adjacent to or interacting with man-made facilities
- Novel ways of pruning (Pollarding)

The Experience

- Recognizable, help with way finding
- Feel safe and confident
- Captivating and impressive while doing city activities

Forest Features

- Clear, neat boundaries
- Stop at arbitrary linear boundaries leaving a vertical wall of trees
- Edges defined by ditches and banks with managed hedges

The Experience

- Abrupt transition
- Vertical tree walls provide a clear sense of separation

Forest Features

- Stumps
- Saplings
- Protective Boundary

The Experience

- A found forest that is reinventing itself
- Find new growth and continue the story

2.3 Wild Aesthetic Experience for Humans

Urban Forest Tool Box: Example Drawing of the Forest Experience

Interesting Linear Forest

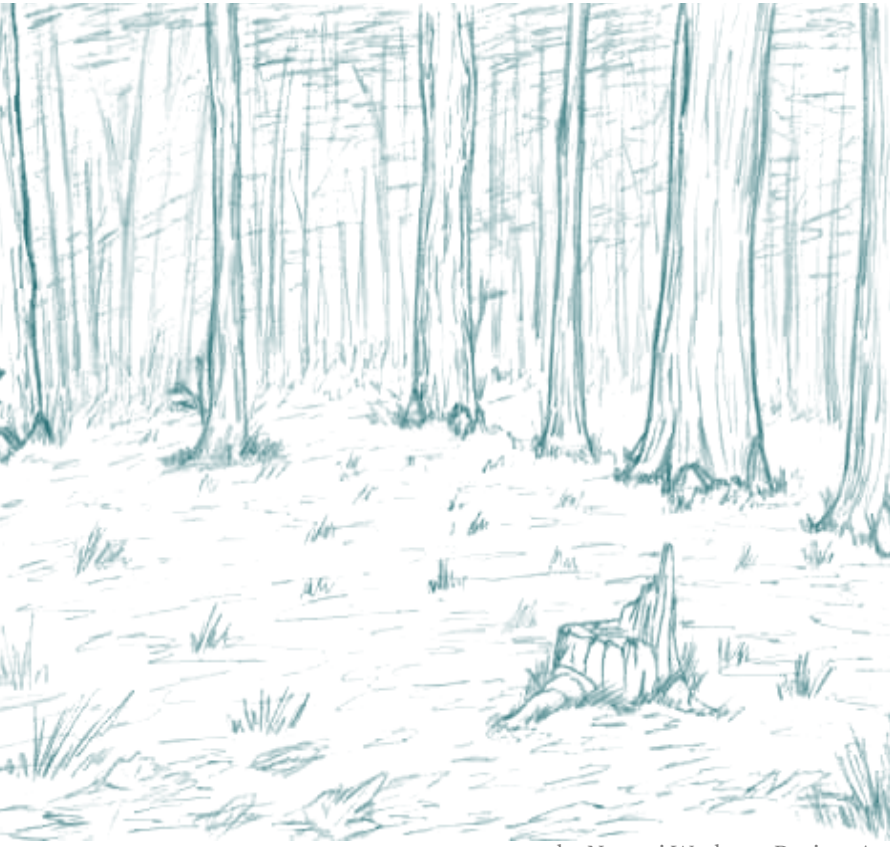


by i.banh Instagram @i.banh_art

Interesting Edge Forest



Interesting Cleared Forest



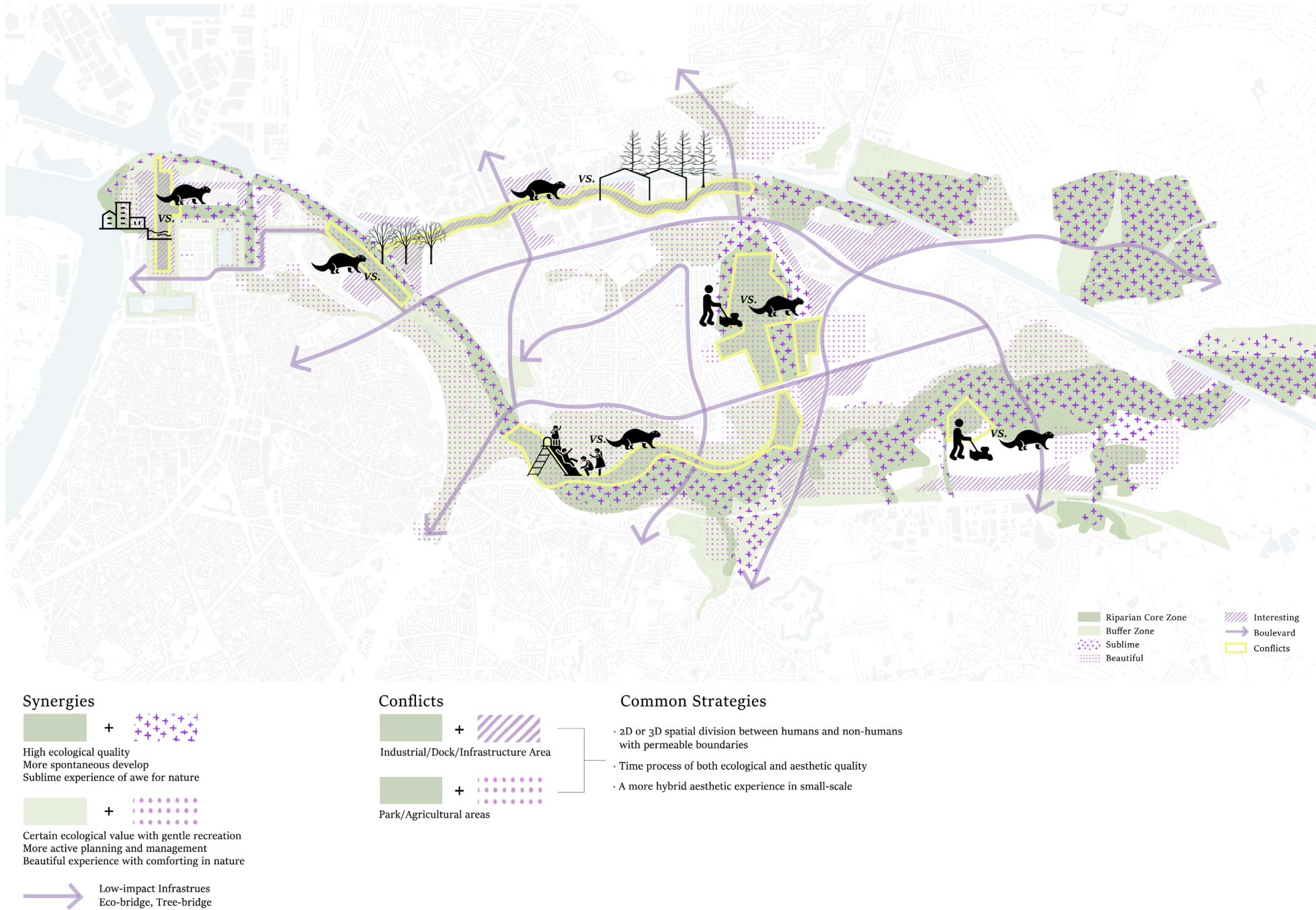
by Nezumi Works on Deviant Art

2.4 Ecological and Aesthetic Hybrids

Synergies & Conflicts

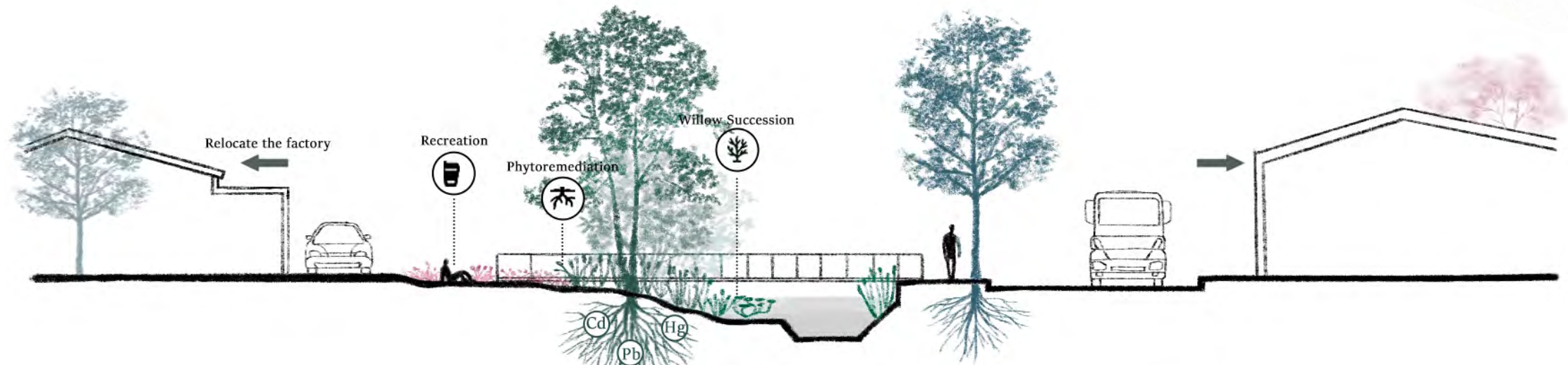
After establishing the spatial vision that combines ecological restoration and aesthetic experience, it is necessary to consider the areas of synergy and conflict between the two. The sublime aesthetics, guided by the principle of wildness, encourages natural autonomy with minimal human intervention, aligning with ecological goals of high quality and sustainable development. This alignment is more evident in the Grote Schijn. Meanwhile, the buffer area of the riparian forest corridor is more artificial, with open forests and grasslands that can develop synergistically with aesthetic features, commonly seen in existing park areas.

However, conflicts also exist, such as those posed by developing industrial, dock and infrastructure areas, which currently align more with the characteristics and developmental potential of interesting. In the built environment, the natural flow of rivers and the establishment of riparian forest buffers face challenges. At the same time, the high ecological requirements of ecological core areas sometimes conflict with the aesthetic demands for beauty, particularly at the edges of parks and agricultural areas. Specific spatial strategies will be given to address conflicts in different areas, but there are also common approach, such as the division of humans and non-humans in two-dimensional or three-dimensional spaces with permeable boundaries; the time process of both ecological and aesthetic quality; and a more hybrid aesthetic experience on a small scale.



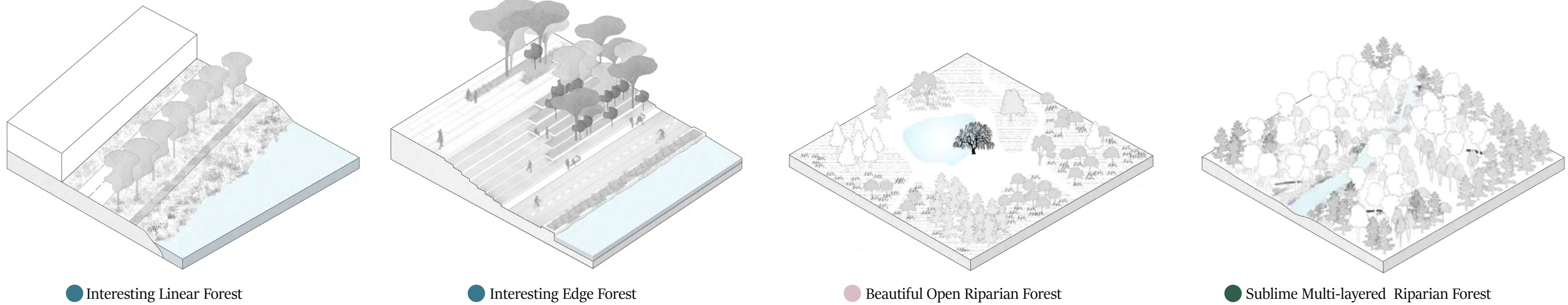
2.4 Ecological and Aesthetic Hybrids

Transformation Strategies for Industrial Areas



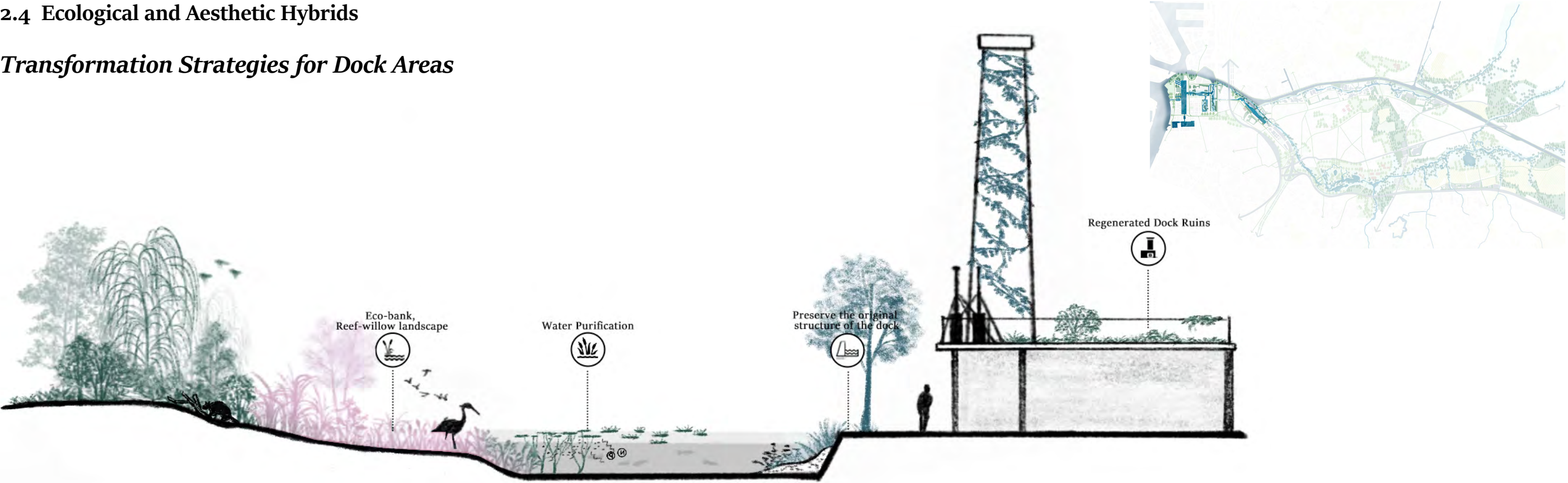
- Create room for natural river flow, foster ecological growth
- Allow the willow forest succession for phytoremediation of pollution, demonstrate ecological service benefits
- Steep bank on the side of the road, more space is created on the shallow bank for rest and recreation
- Hybrids of interesting and sublime experience

Main Applied Forest Prototypes:



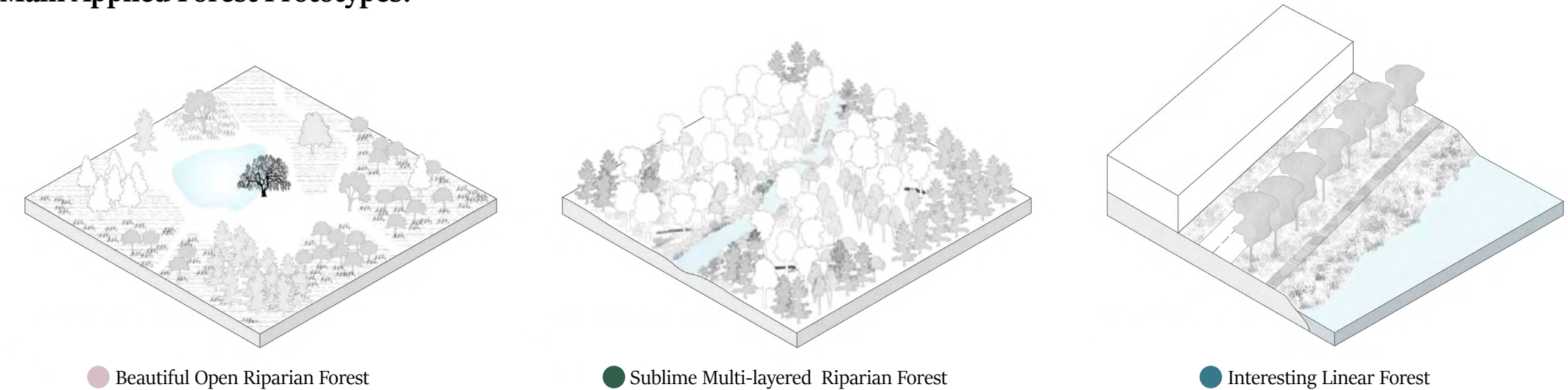
2.4 Ecological and Aesthetic Hybrids

Transformation Strategies for Dock Areas



- New riverbeds develop and vegetate, forming dynamic willow reef landscapes.
- Linear plantings along the dock emphasize the geometric patterns of the industrial landscape.
- Regenerated dock ruins serve as a place of memory, showcasing the traces of time.
- Strong contrasts between man-made and natural landscapes

Main Applied Forest Prototypes:



68

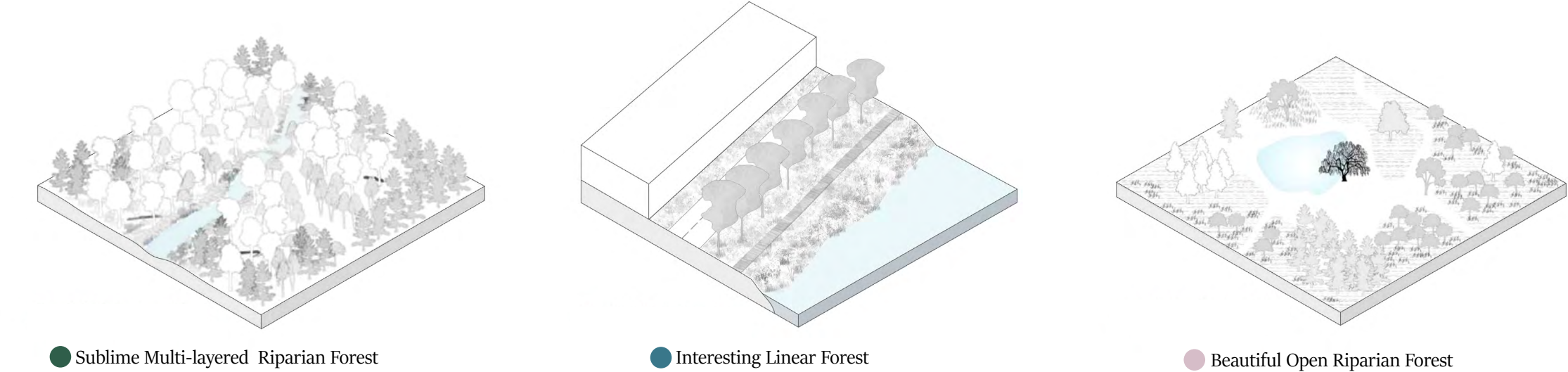
2.4 Ecological and Aesthetic Hybrids

Transformation Strategies for Infrastructure Areas



- Human space gives way to non-human space, low impact infrastructure, secondary forest restoration
- Clear lines or boundaries between rough, wilder patches of green, establishing a cue for care
- Technology, habitats on high-rise facilities, sky gardens

Main Applied Forest Prototypes:



69

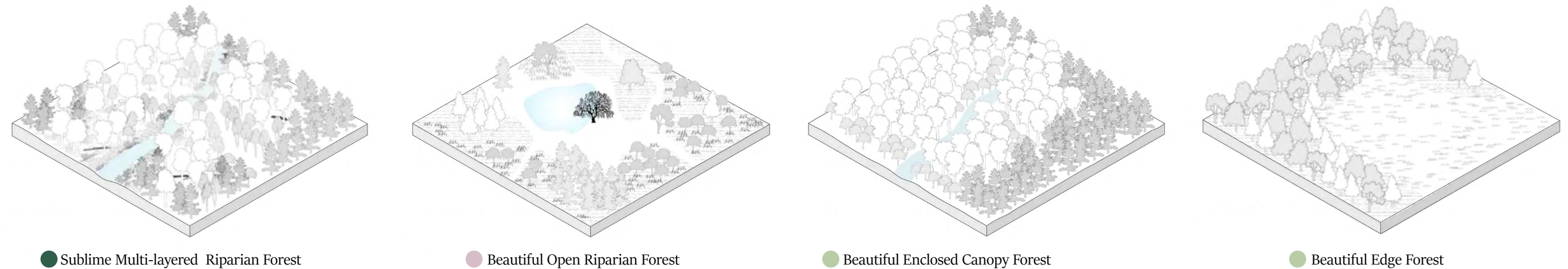
2.4 Ecological and Aesthetic Hybrids

Transformation Strategies for Park Areas



- More open and semi-open spaces shaped by plants, tall trees along the path creating narrow, shaded and confined spaces.
- High, steep slopes and dense undergrowth form natural barriers.
- Low-impact water-friendly platform and elevated pathway.

Main Applied Forest Prototypes:



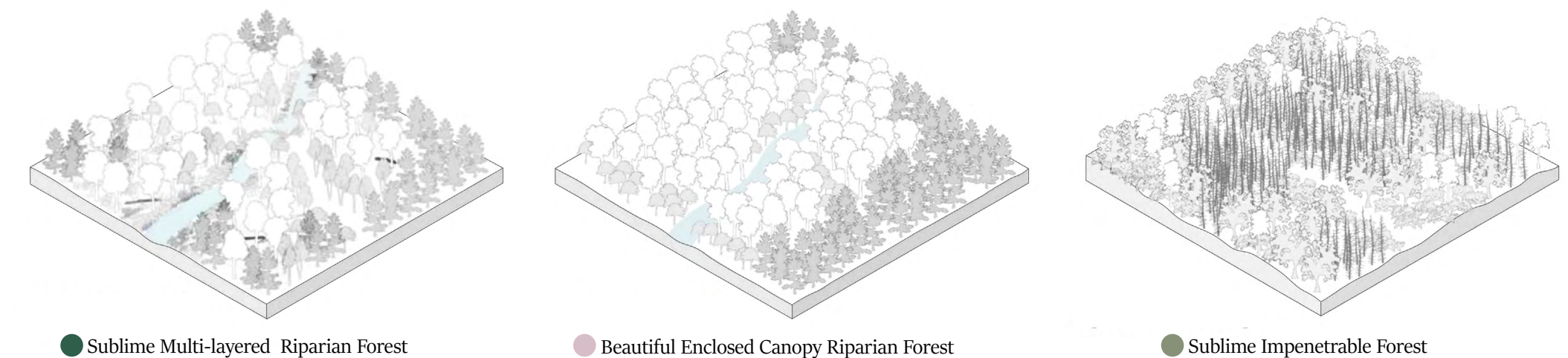
2.4 Ecological and Aesthetic Hybrids

Transformation Strategies for Agricultural Areas



- Ditches become meandering rivers and marshes, more space for natural succession.
- Open road with dense woodland and peaceful field scenery on two sides.
- The swamp forests in floodplain are planted with water-resistant trees like bald cypresses and dawn redwoods, creating a deep and tranquil atmosphere.

Main Applied Forest Prototypes:



2.4 Ecological and Aesthetic Hybrids

Systematic Vision of Human & Non-humans

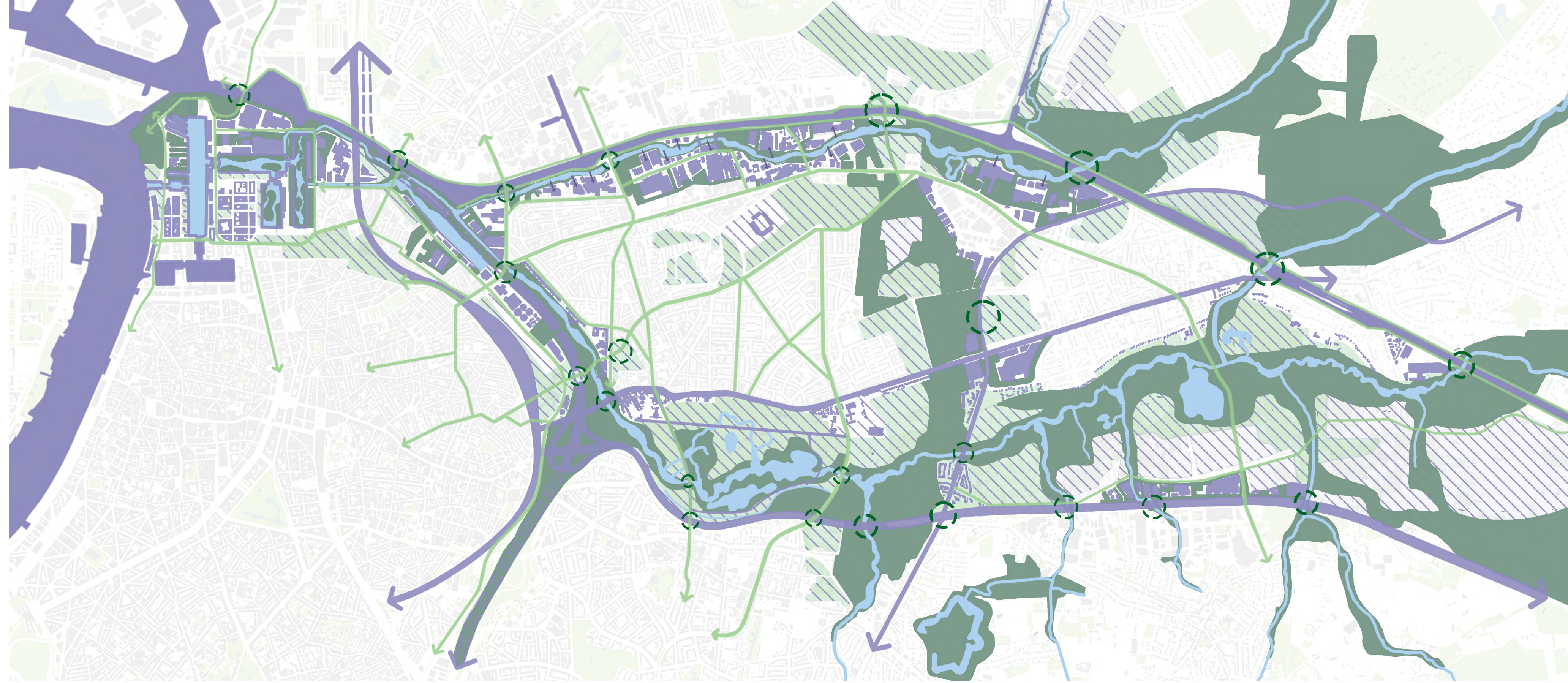
This vision mainly showcases the relationship between artificial systems and non-human systems in the city. Newly designed riparian forest corridors cut through the city, wedging large areas of natural ecological green space on the periphery of the city (Kampen Plateau) into the city center. By considering the relocation and transformation of some functional areas, vacant land is connected with the surrounding natural environment, bringing coherence to the fragmented urban fringe zone.

In Grote Schijn, a continuous and robust riparian forest conservation buffer is created, passing through a series of parks, forests, and wetland areas transformed from docks, and connecting with the Scheldt River system. This provides diverse habitats and migration corridors for wildlife. Additionally, using tributary waterways as a medium, the boundaries of the E13 motorway and the N12 regional road are broken, forming green veins that infiltrate residential areas and farmland from the main corridors.

In Klein Schijn, large amounts of unused land in industrial areas are utilized to create room for the river, forming a riparian forest corridor parallel to the Albert Canal.

With Ertbrugge as the green core, the two corridors connect north and south, breaking the disorderly radial sprawl of the city center.

- Feralized Non-human Dominant System
- Water System
- Human System as Constrains
- Non-human & human System Coexistence
- Green Linkages
- Stepping Stones
- ▨ Functional Landscape
- ➔ Create room for River



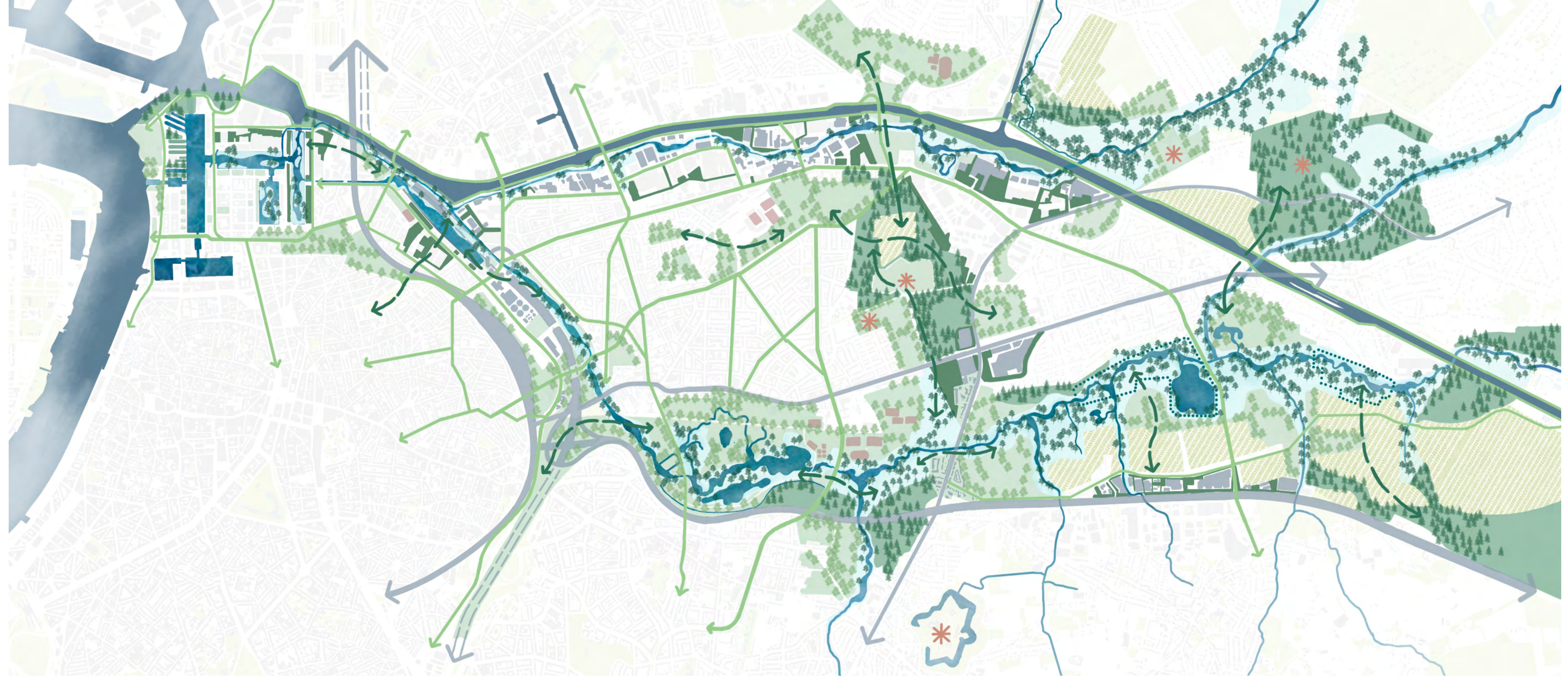
2.4 Ecological and Aesthetic Hybrids

Structural and Functional Vision

The vision focuses on showcasing the overall network of ecology and aesthetics in Schijn Valley. (The hatch here does not show the exact forest space). The landscape design intervention is guided by the following principles:

1. The broad structure follows the “Two riparian forest corridors along the Schijn river + The old forest of Ertbrugge as the central ecological parch of the city + Tree-lined paths as green veins”.
2. Seek integration between floodplains and city space. Give the river space, release ditches, design new water bed for the old dock and re-excavate filled waterways, allowing for natural water flow. Expand more urban floodplains and reservoirs. Allow natural spontaneous growth in the floodplains, and develop riparian forests with sublime aesthetics.
3. Release the fenced, isolated nature reserve along the Grote Schijn and connect fragmented dry forest patches. The coniferous forests that have lost their productive function will be developed into more diversified mixed woodlands. Wildlife will be allowed to migrate freely. Promote a more robust wild corridor along the Grote Schijn.
4. Preserve orderly features of existing cultural landscapes like parks and golf courses, while allowing some spontaneous development on a small scale. Provide recreational features while delivering a beautiful experience.
5. Develop linear forests and pocket forests with interesting features in the periphery and gaps of industrial areas. The riparian forests along Klein Schijn allow for spontaneous succession, but require more human management to keep them open.
6. Utilize boulevards and small stepping stones to penetrate the hard boundaries of the urban infrastructure and connect fragmented green spaces, while also linking the Schijn valley to the city center and larger ecological fabrics, providing a more coherent landscape experience.

- | | |
|---|--|
| Schijn-Scheldt River Connection | Boulevard / Ecological Bridge |
| Riparian Forest with Sublime Aesthetics | Urban Constructions as Main Constraints for Rebuilding |
| Dry Forest with Sublime Aesthetics | Historical Heritage |
| Park/Other Culture Landscapes with Beautiful Aesthetics | Demolish the Boundaries of Nature Reserves |
| Regenerated Industrial Complex Forest with Interesting Aesthetics | Smooth Landscape Connectivity |
| Ecological Agriculture | |



2.4 Ecological and Aesthetic Hybrids

Spatial Vision of Urban Forest

This vision imagines an urban landscape benefiting from the presence of forests. The dense and impenetrable forests that grow on the wet, often flooded lands of the floodplains. These closed forests permit urban settlement only at their edges or in clearings. Forests on less fertile sandy soils formed a more open forest structure. Urban development can coexist and synergize with these open forest areas.



2.4 Ecological and Aesthetic Hybrids

Sequential Experiences along the Forest Corridor



2.4 Ecological and Aesthetic Hybrids

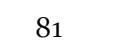
Sequential Experiences along the Forest Corridor



Sequential Experiences along the Forest Corridor



Sequential Experiences along the Forest Corridor



ZOOM IN DESIGN: LOBROEKDOK

- 3.1 Multiscale Site Analysis
 - 3.1.1 Macro: Lobroekdok area in the Urban Structure
 - 3.1.2 Meso: Site & Surroundings
 - 3.1.3 Micro: Inside the Site
- 3.2 Analysis Conclusion
 - 3.2.1 Layered Challenge Matrix
 - 3.2.2 Challenge and Opportunity Mapping
- 3.3 Design a Riparian Forest on Lobroekdok
 - 3.3.1 Concept Drawing
 - 3.3.2 Design Generation
 - 3.3.3 Masterplan
 - 3.3.4 Applied Planting Tool Box
 - 3.3.5 Space & View & Experience
 - 3.3.6 Landscape Sequence
 - 3.3.7 Rewilded Dock in the City
- 3.4 Time Process
 - 3.4.1 Nature-driven Development
 - 3.4.2 Active Management & Spontaneous Development
 - 3.4.3 Co-evolution of Ecology and Aesthetics

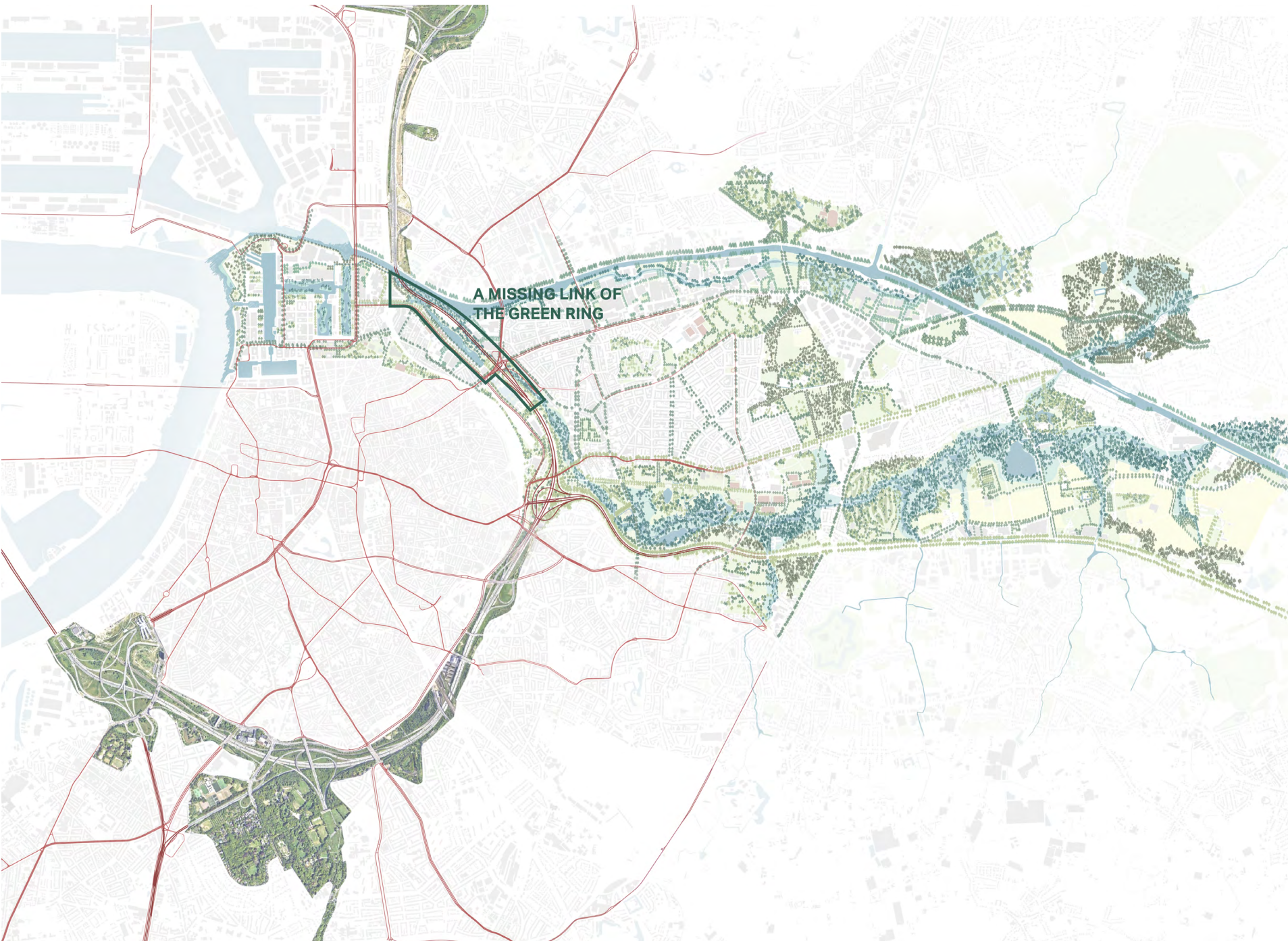
3.1 Multiscale Site Analysis

Macro: Lobroekdok area in the Urban Structure

The site is located around Lobroekdok, northeast of Ring road. It is a bottleneck enclosed by the ring road viaduct, the railway in the Dam districts, the slachthuislaan and the Schijnpoort.

In terms of the macro urban structure, it is:
"One of the places where the spatial and infrastructural complexities of the ring zone confront each other the most."
"The last part of the vision note' Green Singel' ."
"A crucial missing link in the main ecological structure around Antwerp."
"Remaining historic fragments of 19th century fortifications."

Therefore, it makes for a suitable starting point of the rewilding transformation. As one of the places where human infrastructure occupation and spatial conflicts are most prominent in the urbanization of Antwerp, the design experiment will be carried out here to verify whether the regional ecological restoration and aesthetic experience strategies proposed in the previous section can be implemented in a complex urban environment. If the rewilding strategy can be practiced in this hotspot where conflicts are more severe, Lobroekdok will be a good example of rewilding in Antwerp, and will also provide a strong case for answering the research questions.



3.1 Multiscale Site Analysis

Macro: Opportunity given by the Oosterweel Link

'De Grote Verbinding' is the future project with which the Flemish government is building a city and region where it is good to live, work, do business and visit. It includes 18 livability projects, these projects together make up seven Ring Parks and a Scheldt Bridge. These ring parks will be connected to form a continuous Green Singel, connecting communities to each other and providing more greenery and cleaner air. The Oosterweel Connection is part of 'De Grote Verbinding'. By building Oosterweel, the Antwerp Ring, the R1, will be completely completed. Much of the Oosterweel connection running in tunnels and deep trenches. A green lung is created above the tunnels, freeing up a huge space for greenery, recreation, cycling and walking paths, sports and games. The Lobroekdok is located in the northeast of Green singel. According to plans for The Oosterweel Connection, where the Merksem viaduct is demolished and disappears into a tunnel, the Expressway will be connected via tunnels under the Albert Canal with the R1 at Merksem and Deurne. The covering of the expressway creates opportunities to bridge large infrastructures such as the railroad, the Albert Canal and the Lobroekdock, while at the same time freeing up a great deal of space. These potential green spaces offer a unique opportunity to completely transform the entire area, creating pleasant green spaces and public spaces that are safer and more comfortably connected to the surrounding neighborhood.

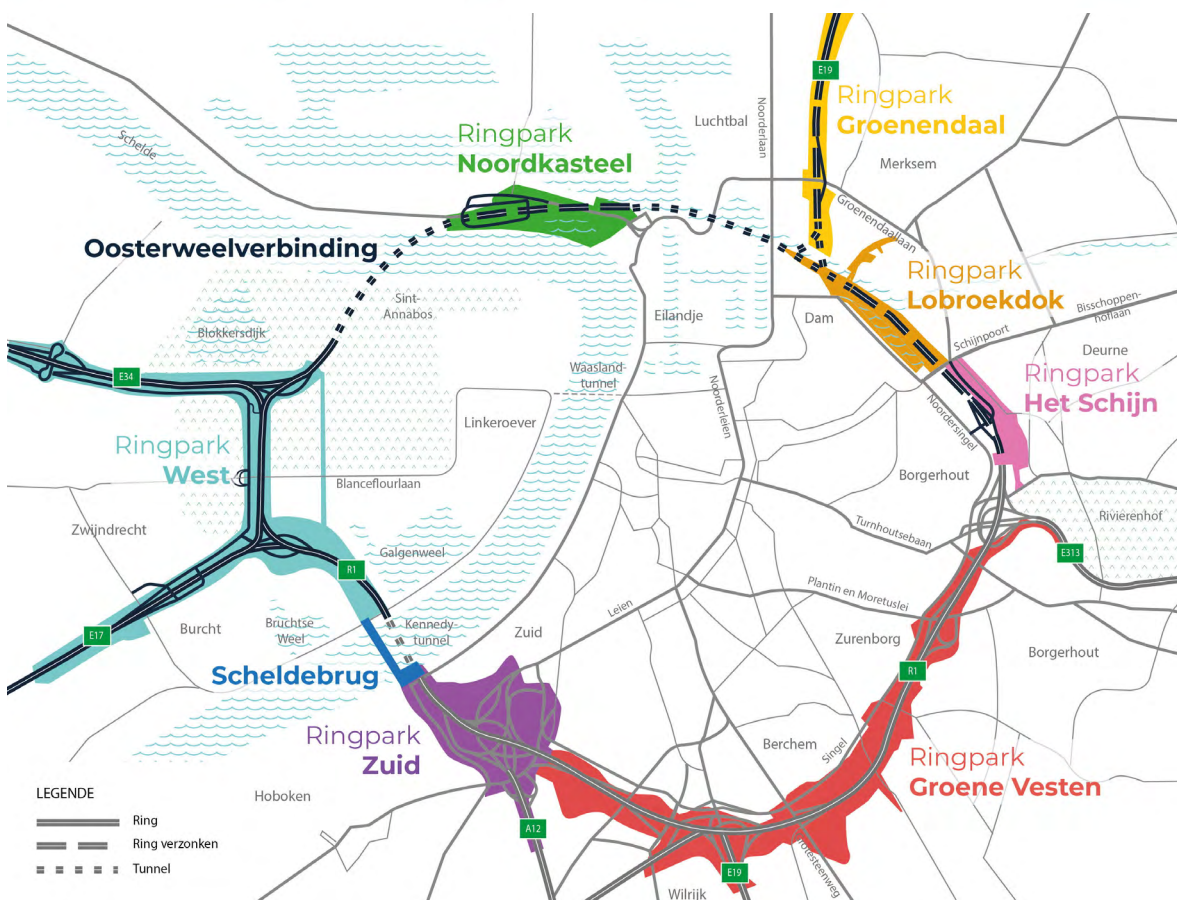


Fig.25 The Great Connection brings the Oosterweel Connection together with the 7 Ring Parks and the Scheldt Bridge into one whole.



Fig. 26 The oost of the ring, 51N4E / H+N+S / NDVR



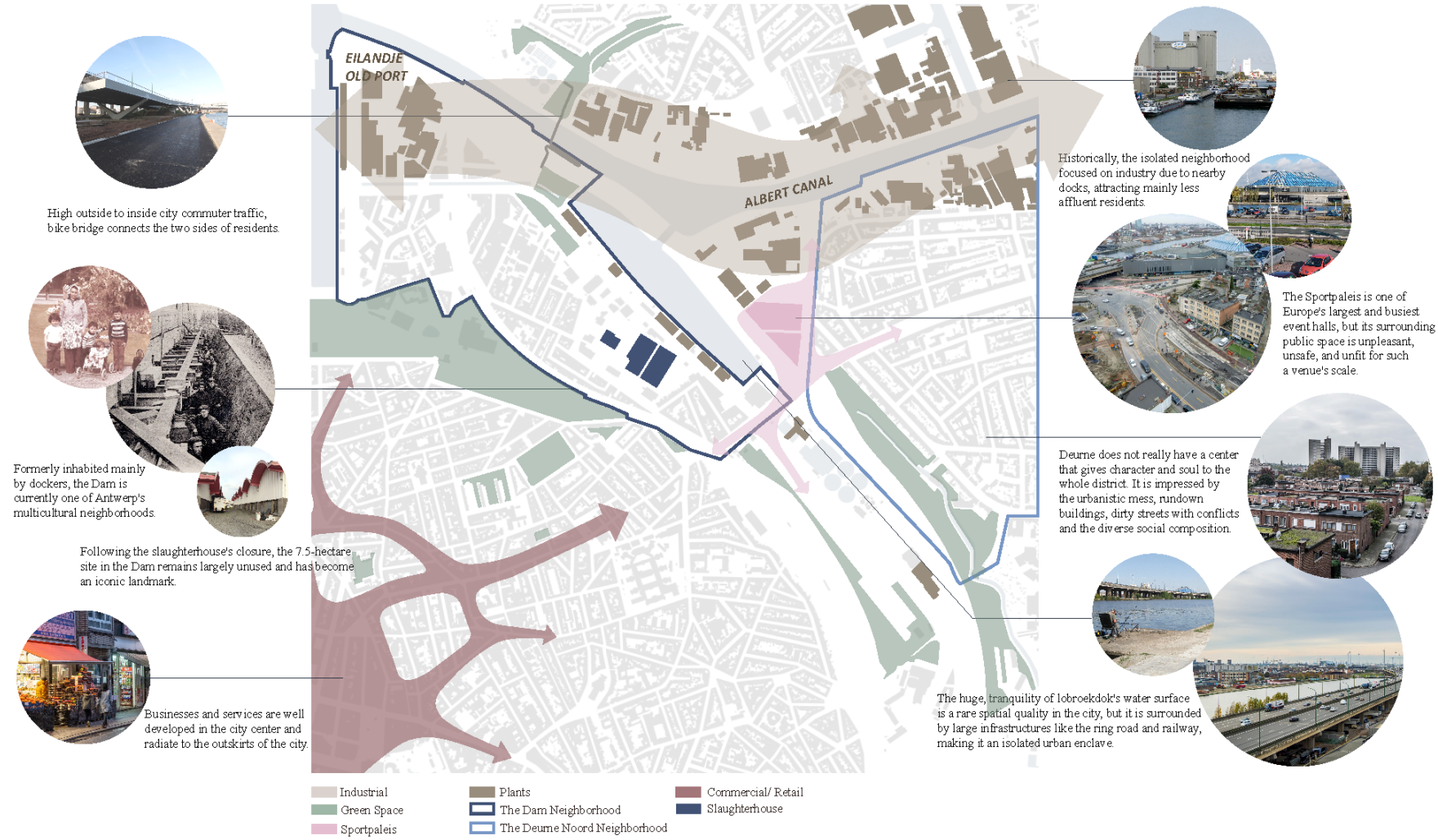
Fig.27 Ringpark Het Schijn, De Urbanisten/ OMGEVING/ WITTEVEEN+BOS

3.1 Multiscale Site Analysis

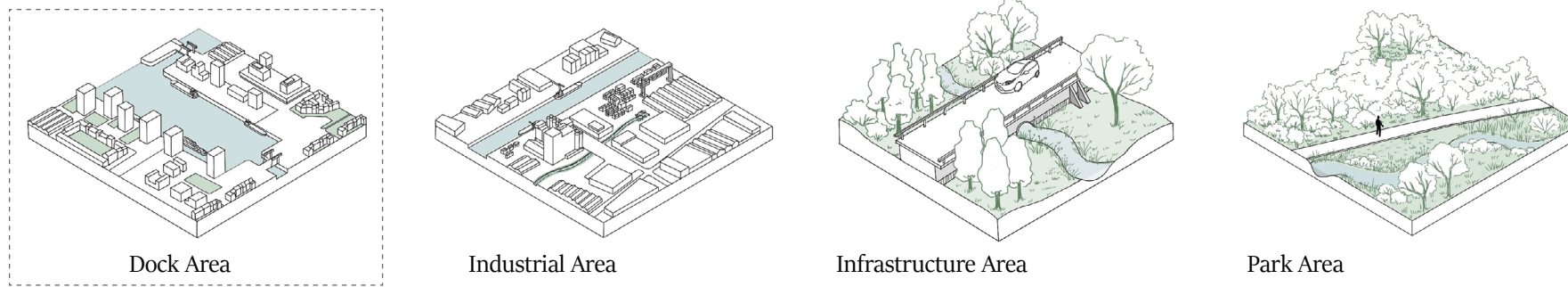
Meso: Site & Surroundings

The area is in the chaotically structured peripheral area, on the border between the 19th century belt and the 20th century belt. Located between the Albert Canal and the port area, it serves as a hinge between the city and its industrial backbone. About the development track, Commerce extends mainly from the city center, with a continuous industrial park along the Albert canal, and Sportpaleis as a major landmark. The Dam and Deurne neighborhoods were developed as post-war communities, attracting mainly poor people and immigrants, with a poor environment and serious social problems. The lack of space planning and functional connections between neighborhoods have also led to a series of social problems. The area faces challenges of decay, aging, and segregation. It is remarked by the real poverty and soulless housing, many busy traffic axes and interchanges, the abrupt transition between residential dwellings around parks and industrial parks, and surrounding spaces that do not match the scale of the Sportpaleis, the largest event hall in Europe.

Development Track



Mixture of Different Landuse



3.1 Multiscale Site Analysis

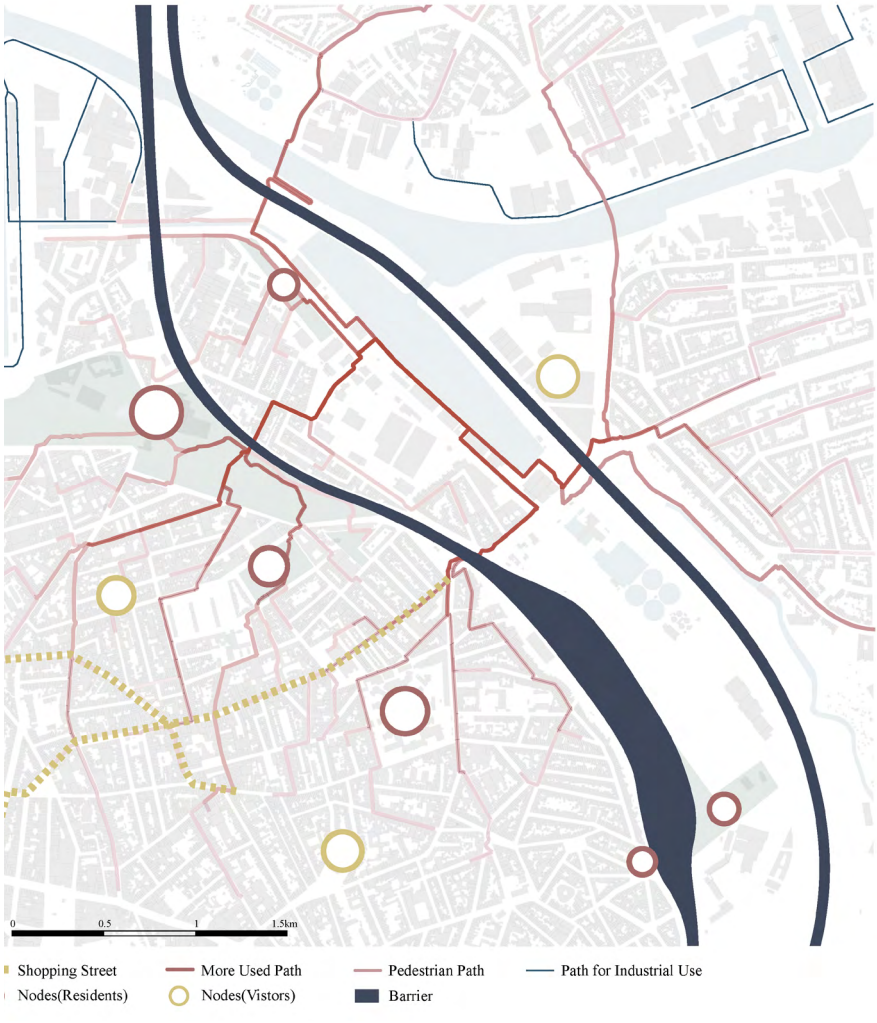
Meso: Site & Surroundings

Amenties



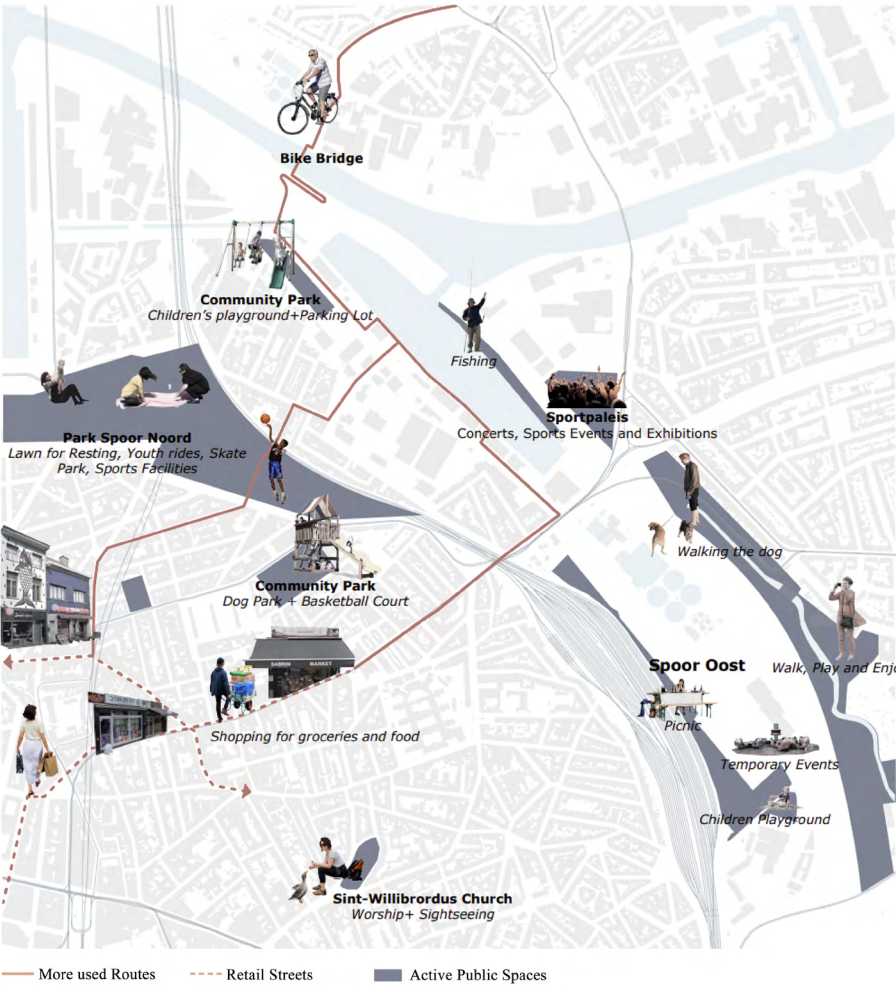
Dam and Deurne, dense urban areas, lack public spaces for community engagement, featuring only scattered green pockets. Historically, they've been mixed neighborhoods, hosting various commercial activities such as breweries, factories, and cafes. However, there's a deficiency in public facilities and businesses, highlighting the need for more integrated work-life space.

Pedestrian Accessibility



Slachthuislaan as the main inner city road, is a source of noise pollution and traffic congestion, high speed through traffic further questions pedestrian safety and accessibility. The lobroekdok is accessible mainly by underpasses and bridges, with poor walkability and experience.

Resident Behavior and activities on Public Space



The existing public space are fragmented and dispersed, missing connections at the neighborhood level. While Lobroekdok offers a vast tranquil water surface, it is not connected to neighboring areas, only serving as a buffer between the residential and industrial areas. Creating public spaces with variety of activities could prove to be a catalyst for bringing together different communities.

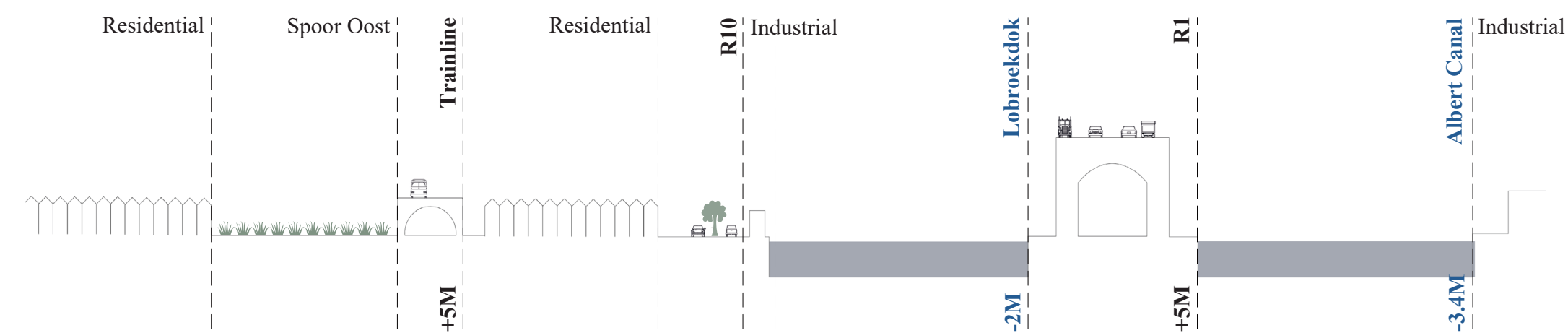
3.1 Multiscale Site Analysis

Micro: Inside the Site

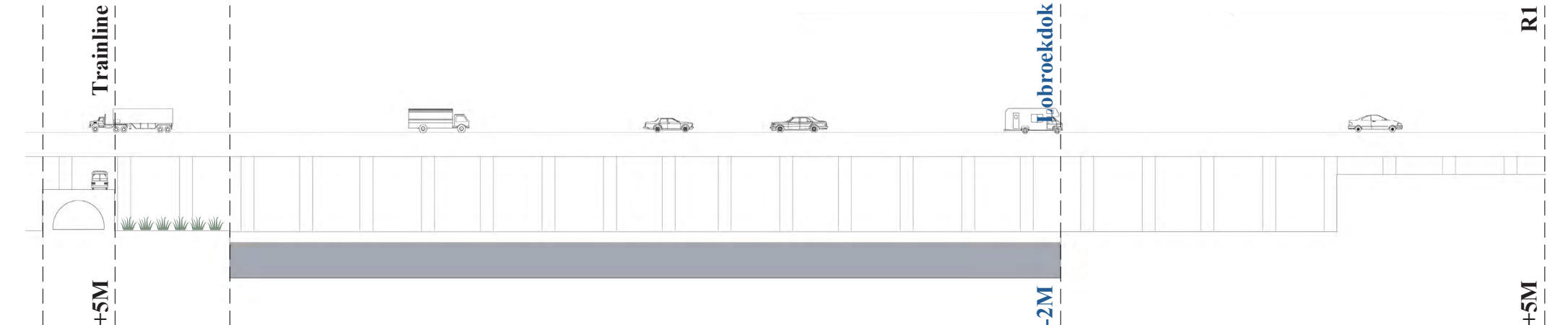


The site now is a bottleneck/enclave enclosed by a railway, highway, and the Albert Canal, these vast infrastructures create physical and perceptual barriers.

A-A' PROFILE

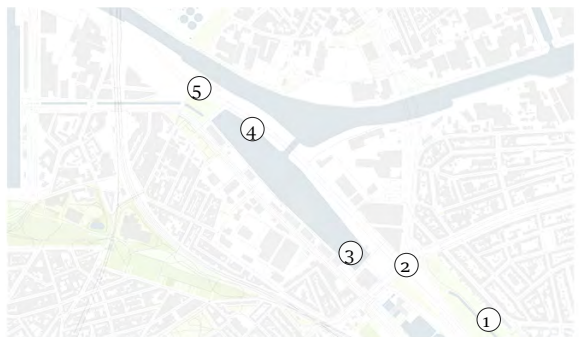


B-B' PROFILE



3.1 Multiscale Site Analysis

Micro: Inside the Site



1. Pompstation Groot Schijn



2. Schijnpoortweg



3. Water Surface of Lobroekdok

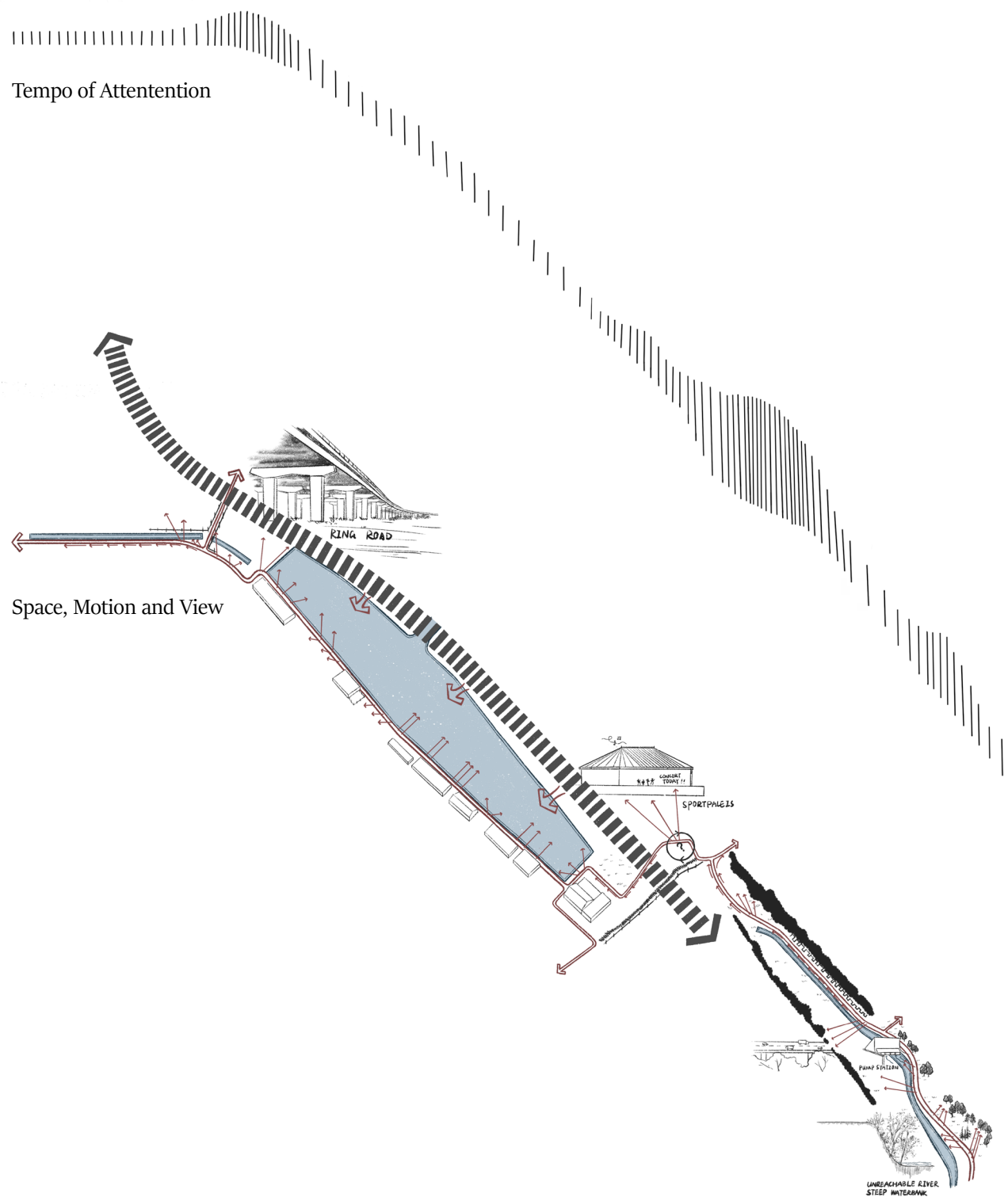


4. Space under R1 Viaduct



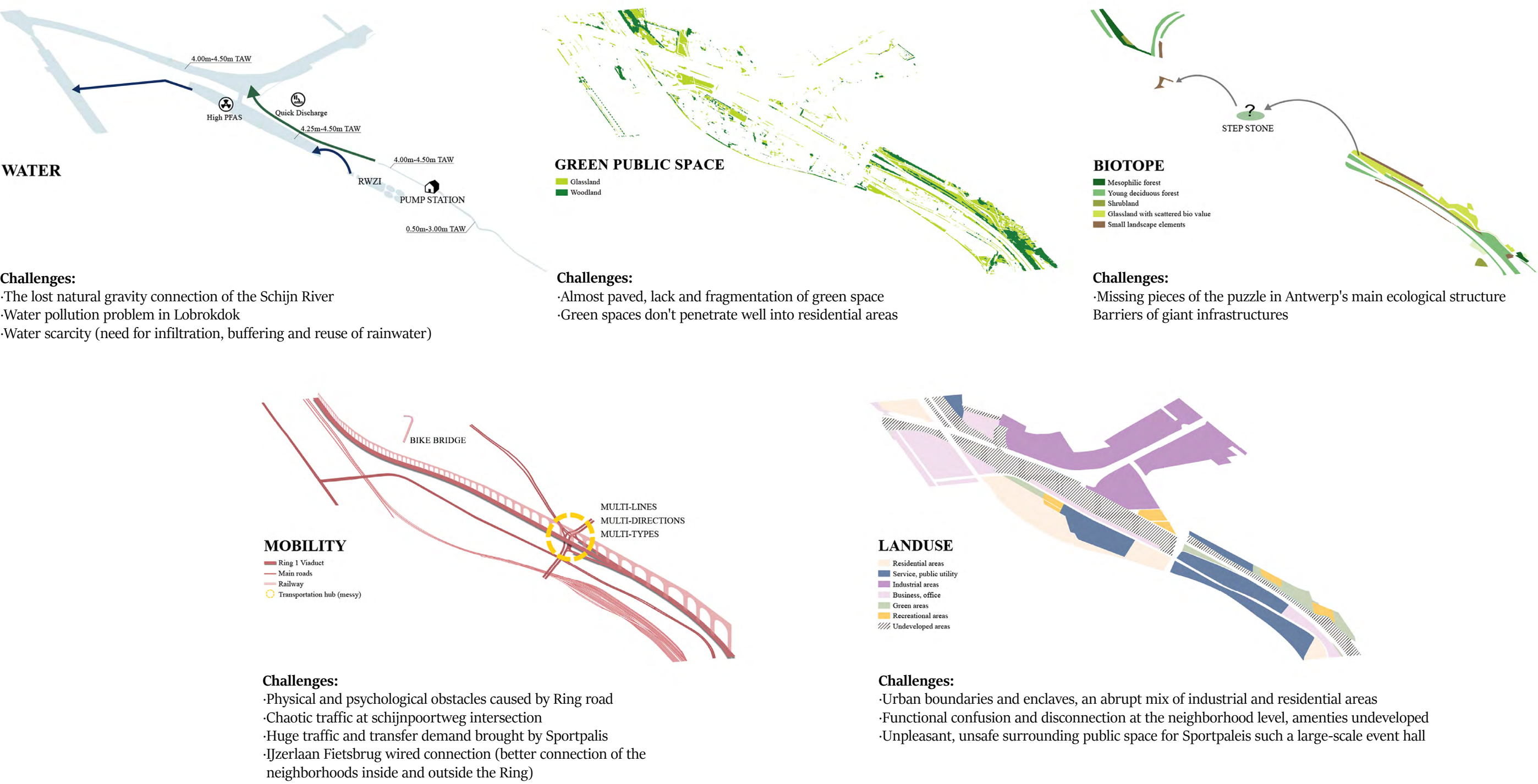
5. IJzerlaan Bicycle Bridge

Walking along the Schijn river towards Lobroekdok offers few attractive views or spaces suitable for rest or activities. The dock is abandoned, with its surrounding space mostly paved and lacks vitality and functionality. The landscape is monotonous, not human scale, all of these presents an atmosphere of emptiness, desolation and messy.



3.2 Analysis Conclusion

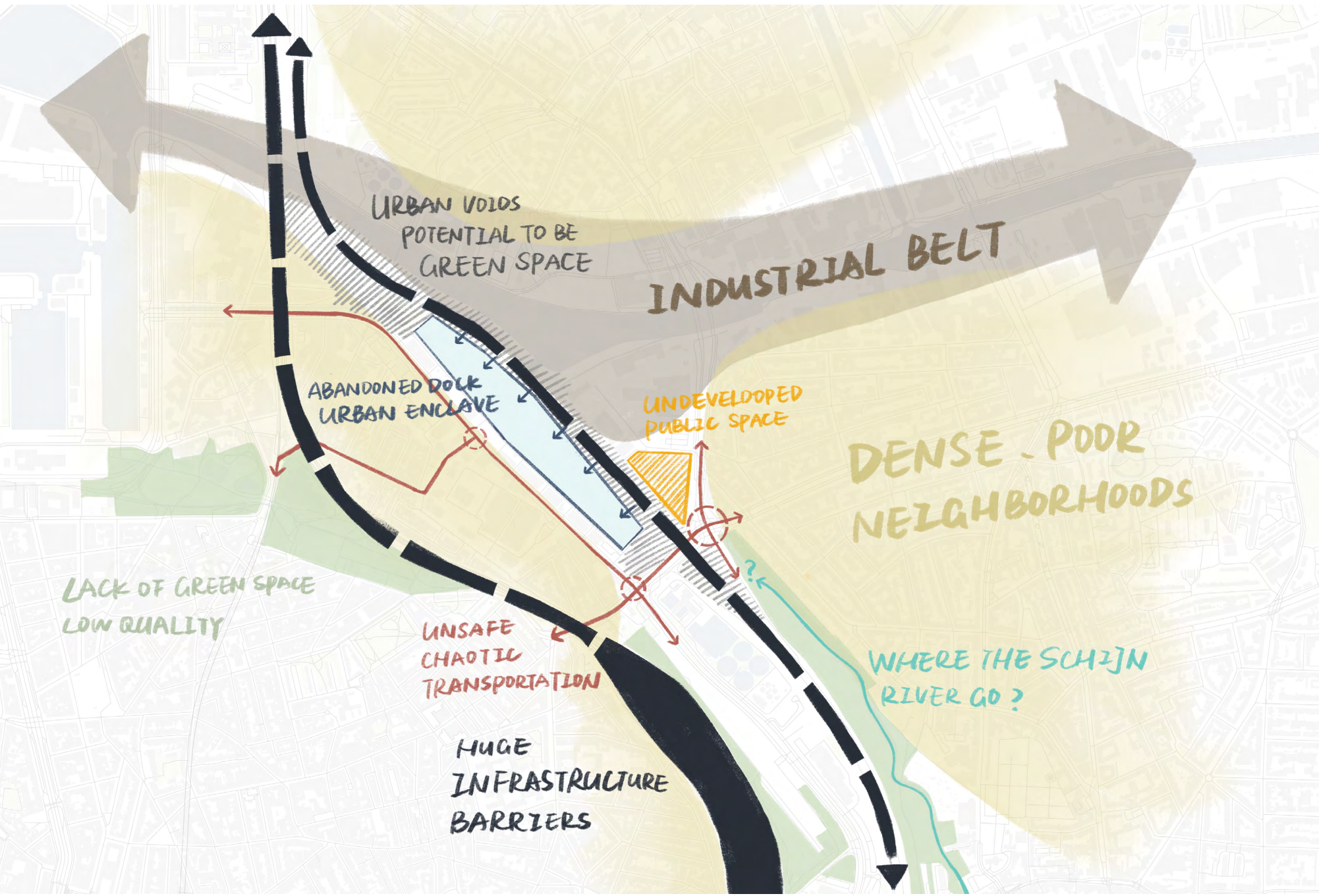
Challenge Matrix



3.2 Analysis Conclusion

Challenge and Opportunity Mapping

- MAIN CHALLENGES:**
1. Lack of green space, low quality in both ecological and aesthetic aspect.
 2. As an urban enclave, there are many huge linear infrastructures as barriers, lead to poor walkability and experience.
 3. Industrial, run-down immigrant districts, Abandoned dock, Railways, Sportpaleis... spaces with different functions mixed up, make the surrounding environment messy and unpleasant.
- OPPORTUNITY:**
1. Removing the viaduct will free up a huge amount of space.
 2. Water defines the nearby neighborhoods as the traditional bargee neighborhoods, offering a chance to redefine their relationship with it.
 3. Connected by all transportation modes, has the potential to become a hub.

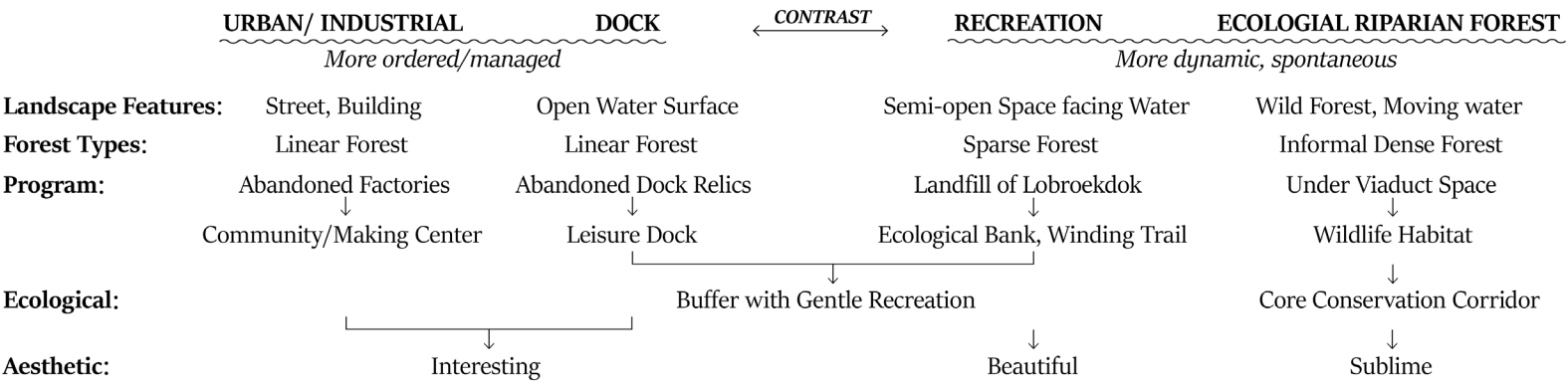
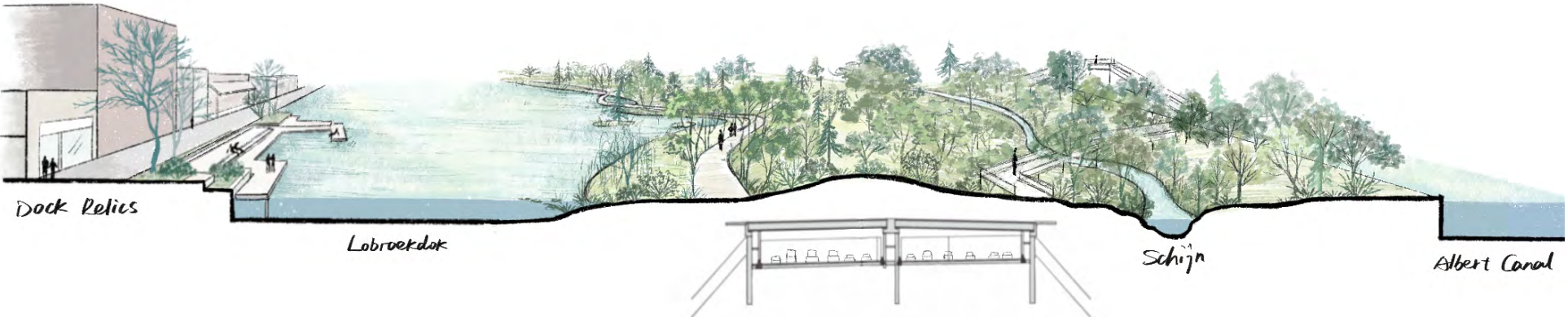


3.2 Design a Riparian Forest on Lobroekdok

Concept Drawing

The goal of the project is to promote harmonious coexistence between humans and non-humans, whereas in Lobroekdok, humans and nature are separated or in conflict: the large water surface and the Schijn river are cut off by large infrastructures or buildings that do not provide ecological and aesthetic functionality. Consequently, the concept will be abstracted into "interwine".

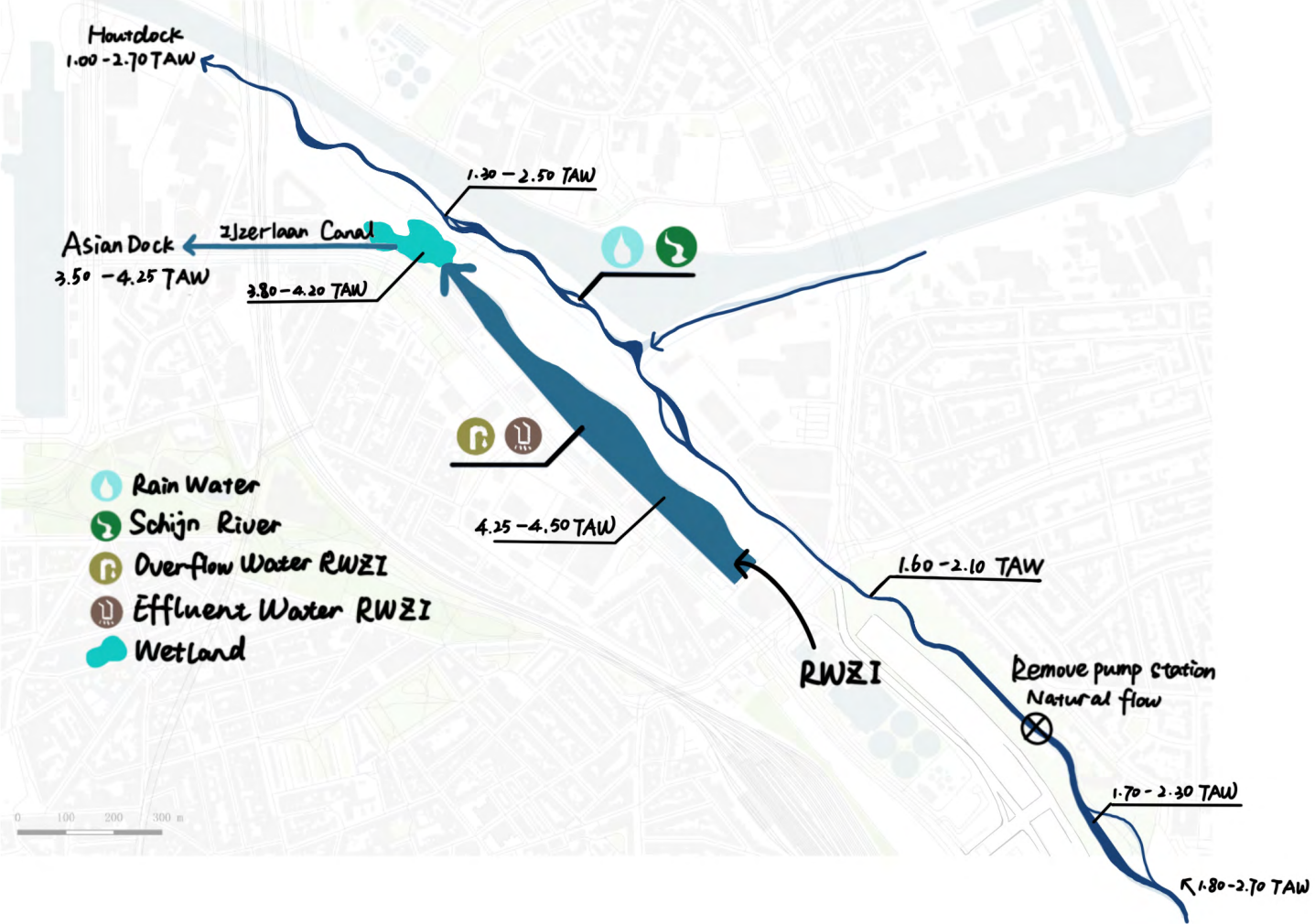
It is the *INTERWINE*
of Human Public Space & Wildlife Habitat
of Dock History & Untamed Nature
of Ecological Function & Aesthetic Experience
of Sublime & Beautiful & Interesting



3.2 Design a Riparian Forest on Lobroekdok

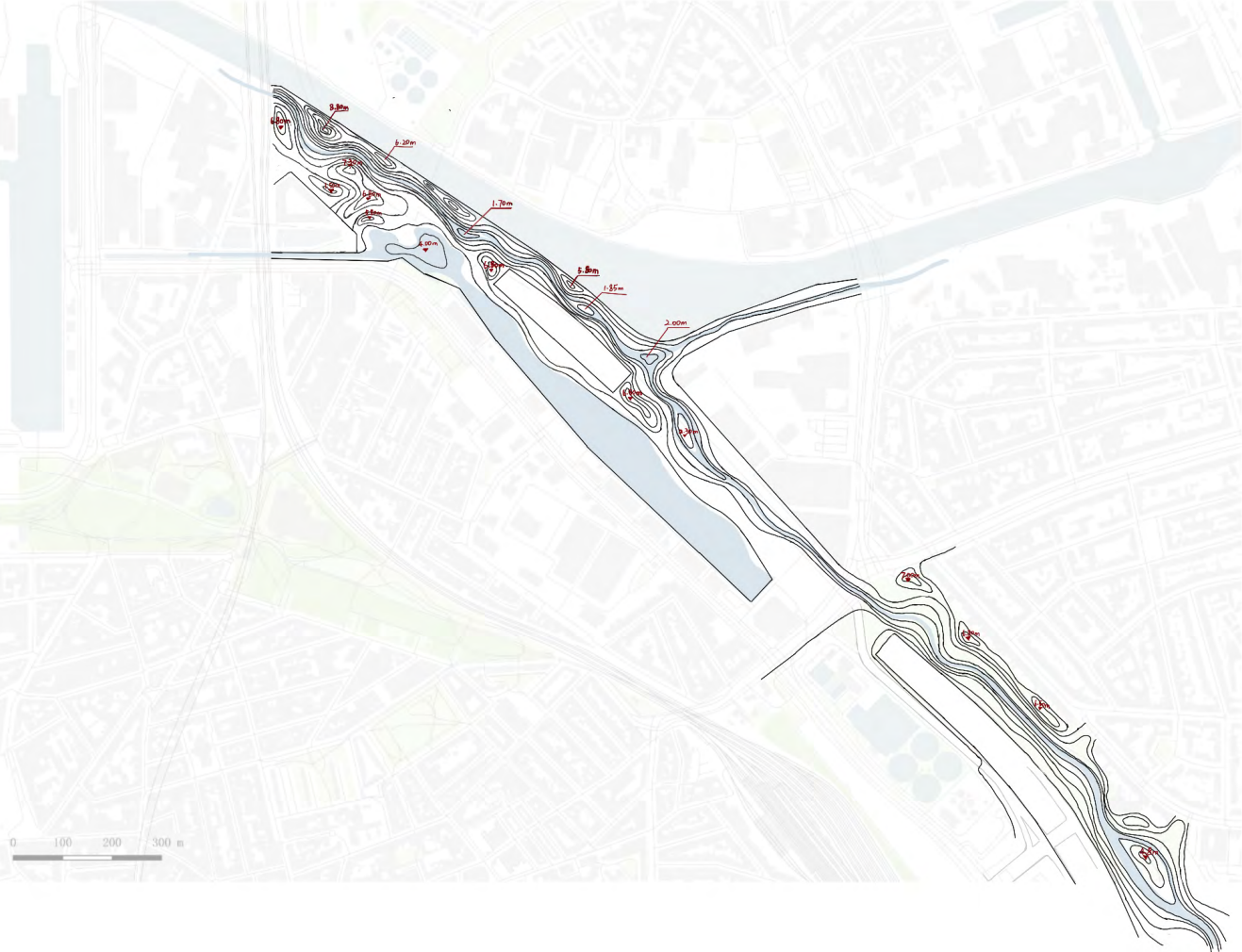
Design Generation

Natural Gravity Connection of the Schijn River



Water will be considered first as a significant natural flow on the site. The natural Schijn-Scheldt connection is considered in more detail here. The Schijn river with expected relatively good water quality will be separate discharged in a lower water level. the effluent and overflow water are drained via the wetlands with purification capacity and the IJzerlaan canal to the Asia dock. The Lobroekdok docks will be used to increase the buffering capacity of the Schijn-Schelde connection.

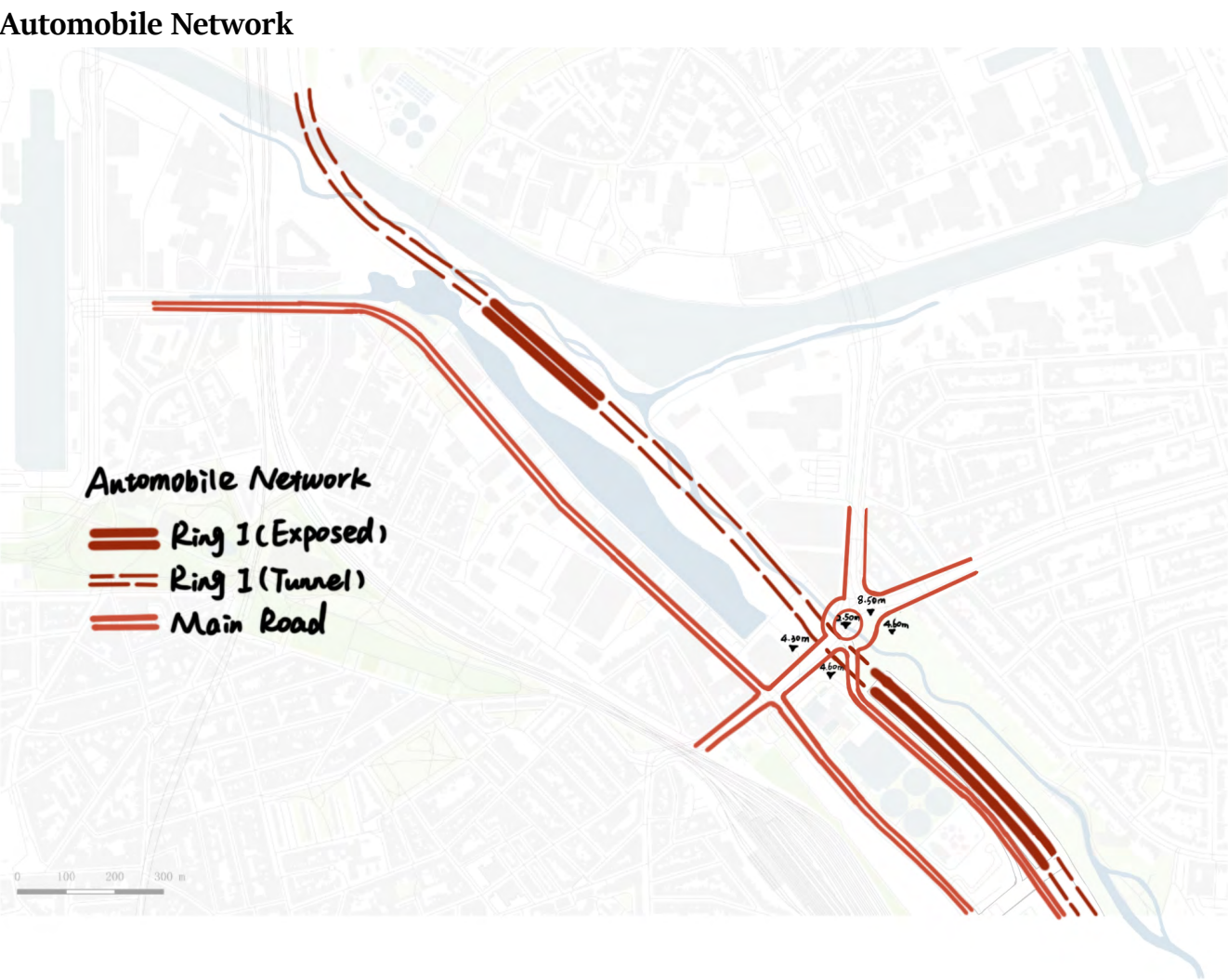
Reconfigure the Soil



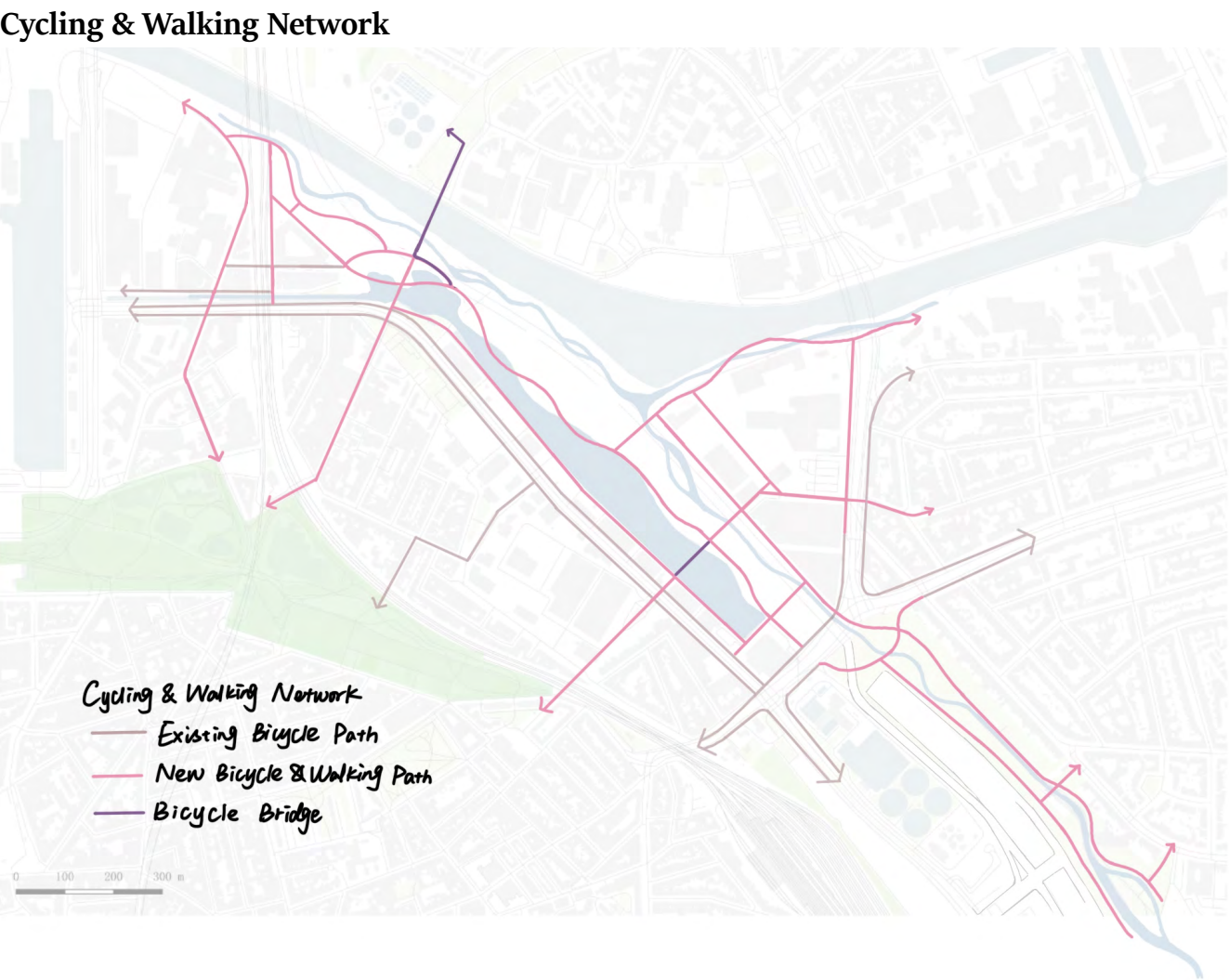
In order to achieve the natural gravity connection of the Schijn river, the terrain needed to be modified. Through cut and fill operations, the water returns to the site and act naturally. The movement of soil and re-naturalization of water creates continuous dynamic gradients of wet to dry, creating a wide range of different conditions for the development of the forest. At the same time, the reconfigured terrian can help to create a more interesting, spatially diverse landscape. The height difference can both hide and express views, or emphasize lines of sight.

3.2 Design a Riparian Forest on Lobroekdok

Design Generation



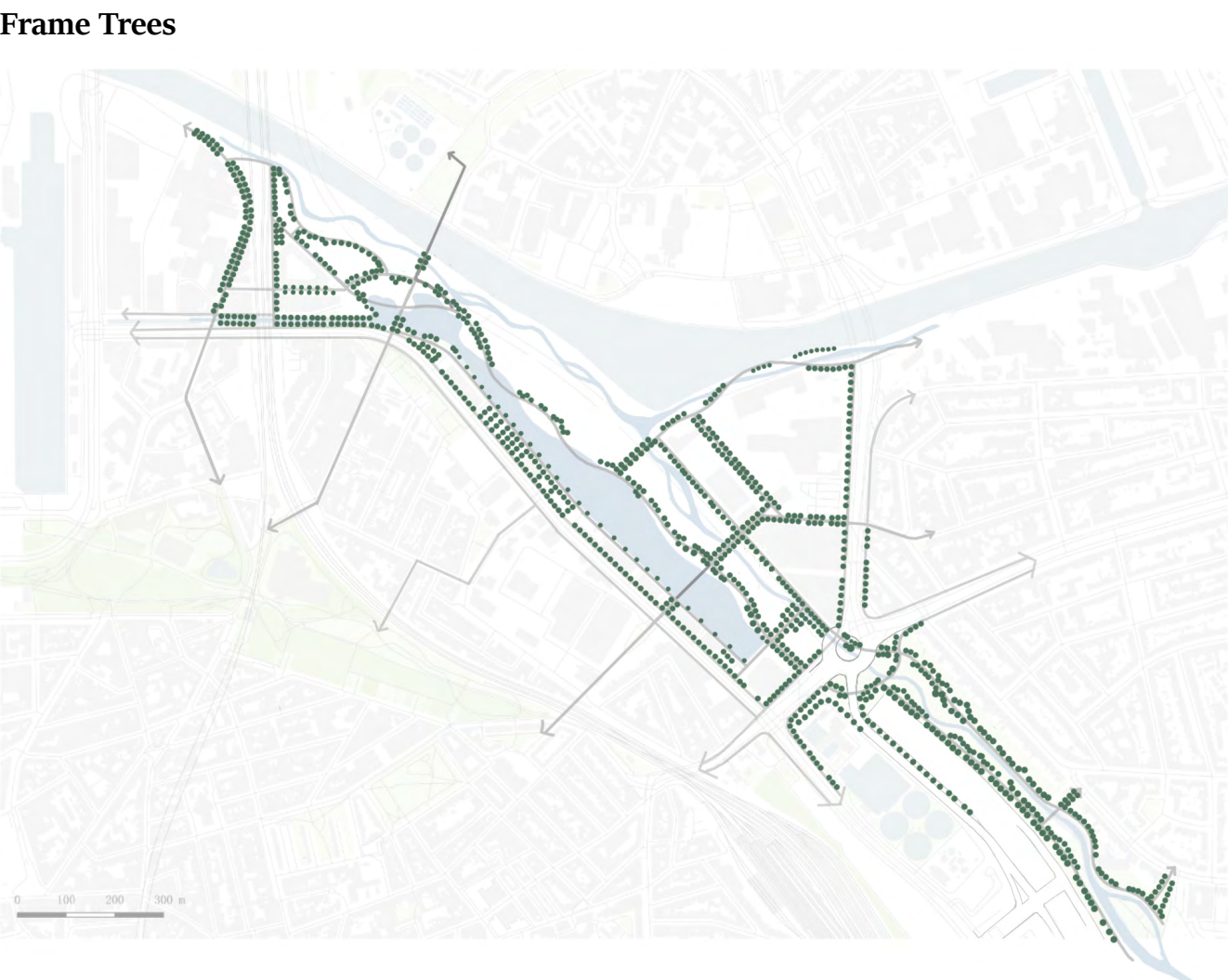
The Ring road will be converted into an underground tunnel. Simultaneously, the alteration in terrain will create conditions for the vertical layering of natural system and artificial infrastructures. At Schijnpootweg, three-dimensional traffic will be introduced for motor vehicles, ensuring the natural flow of the Schijn river on the surface and eliminating obstacles for animal migration.



Safe bicycle and pedestrian connections will be established, both along the water and in the transverse directions between neighborhoods. The new bike path along the waterfront starts at ringpark het Schijn, crosses under the new overpass at Schijnpootweg, connects to the north bank of Lobroekdok, and finally connects to the IJzerlaan Bicycle Bridge, with a rich variety of landscape changes along the route. The cycling and walking network connect surrounding neighborhoods, and are conceived as a succession of little squares and open spaces that give place to neighborhood facilities.

3.2 Design a Riparian Forest on Lobroekdok

Design Generation

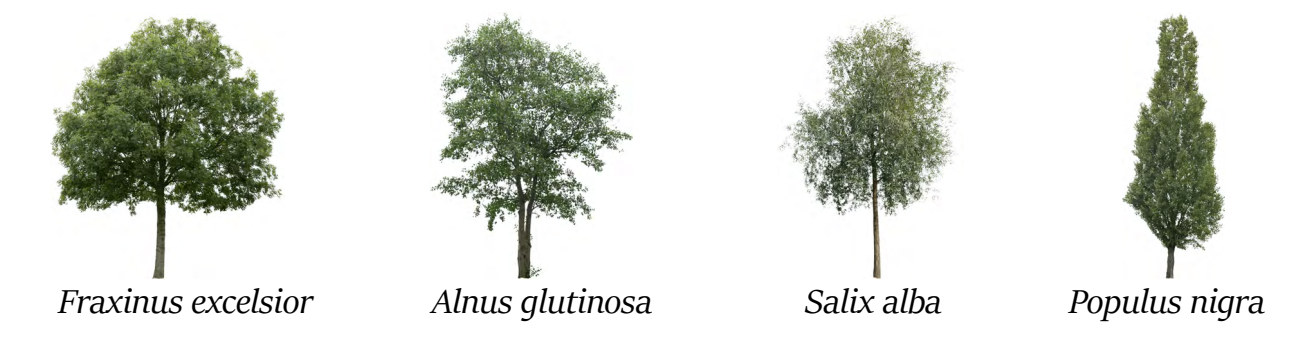


Framed trees are planted along the linear infrastructure that is well maintained, helping to form the structure of the site over a large scale, also defining resilient and living boundaries between people and wildlife. The trees are mainly trees commonly found in the existing landscape and cultivated species in the predicted forest types.

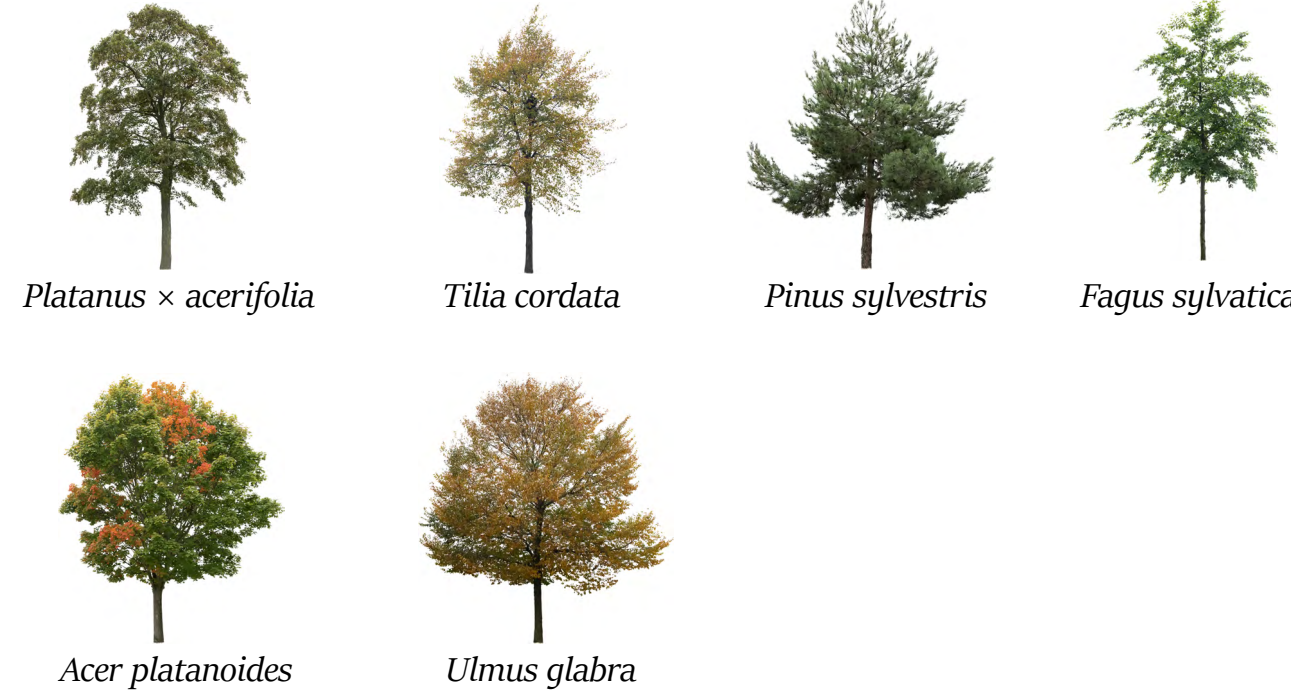
Native Lane Trees + Specimen Trees

(Tree species under the category of Interesting and Beautiful)

Wet-tolerant species:



Dry-tolerant species:

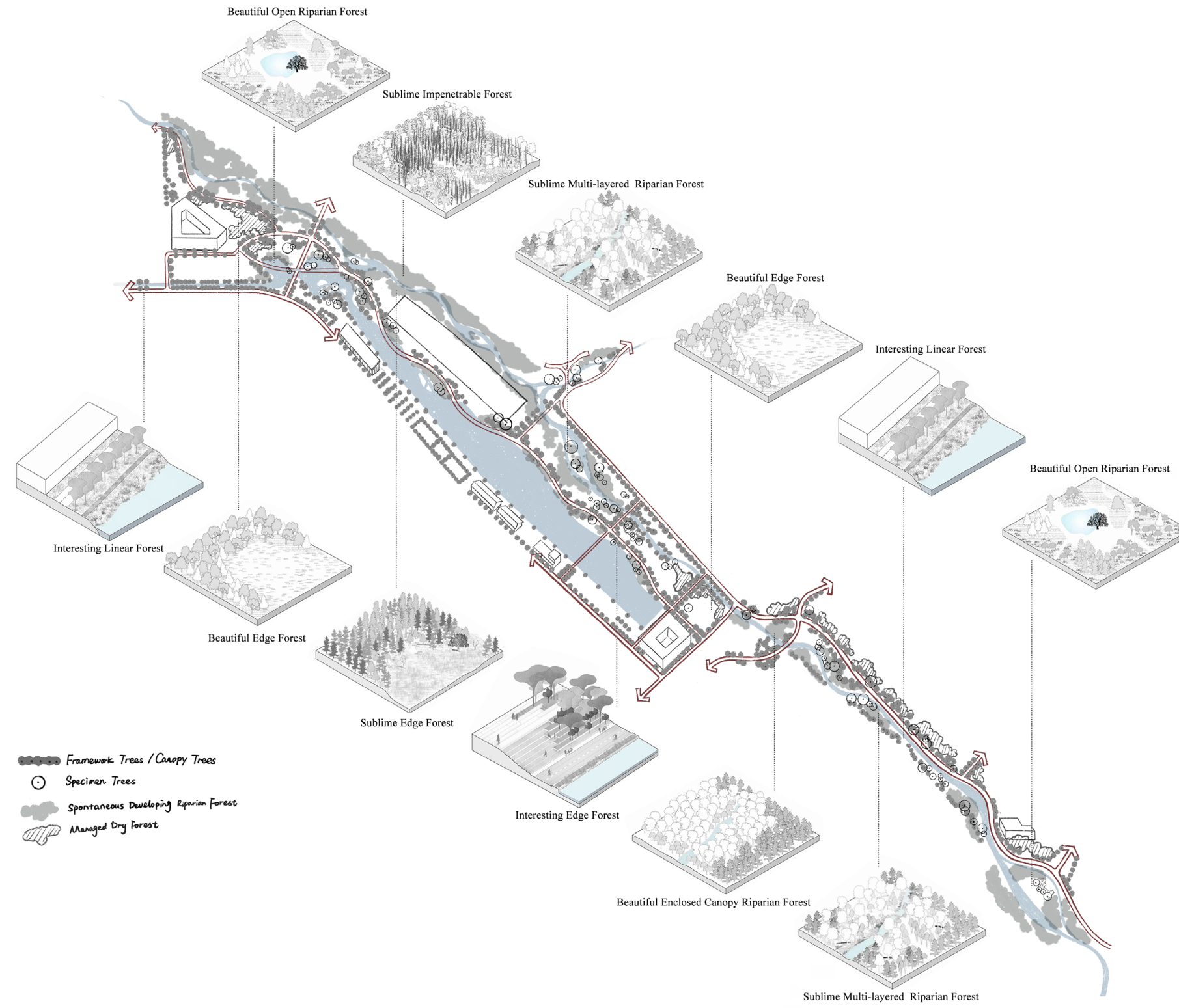
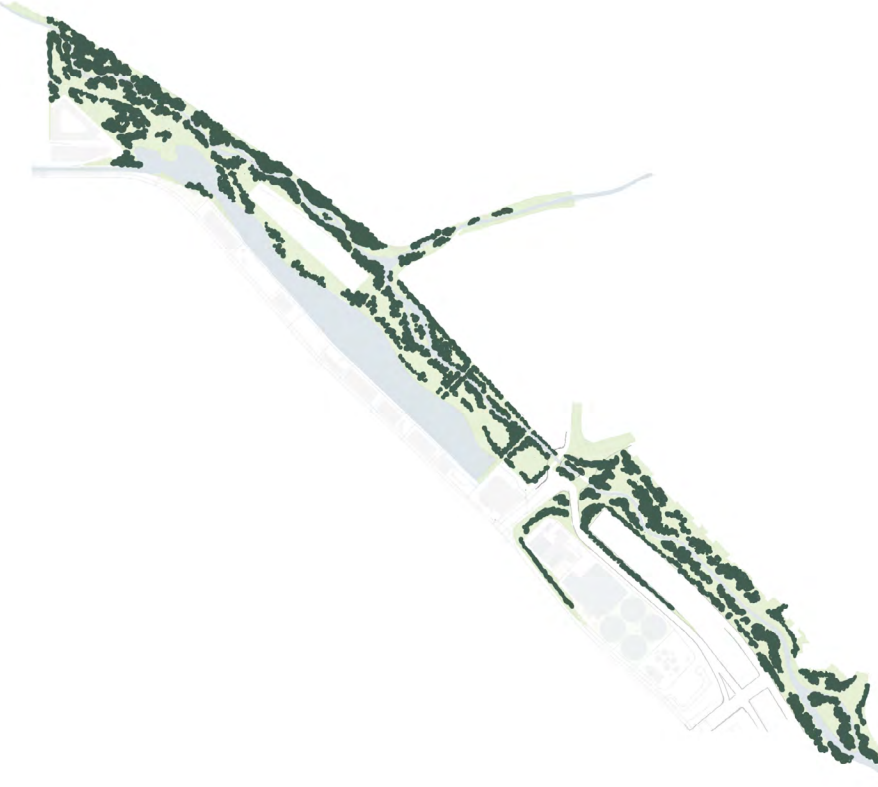


3.2 Design a Riparian Forest on Lobroekdok

Applied Planting Tool Box

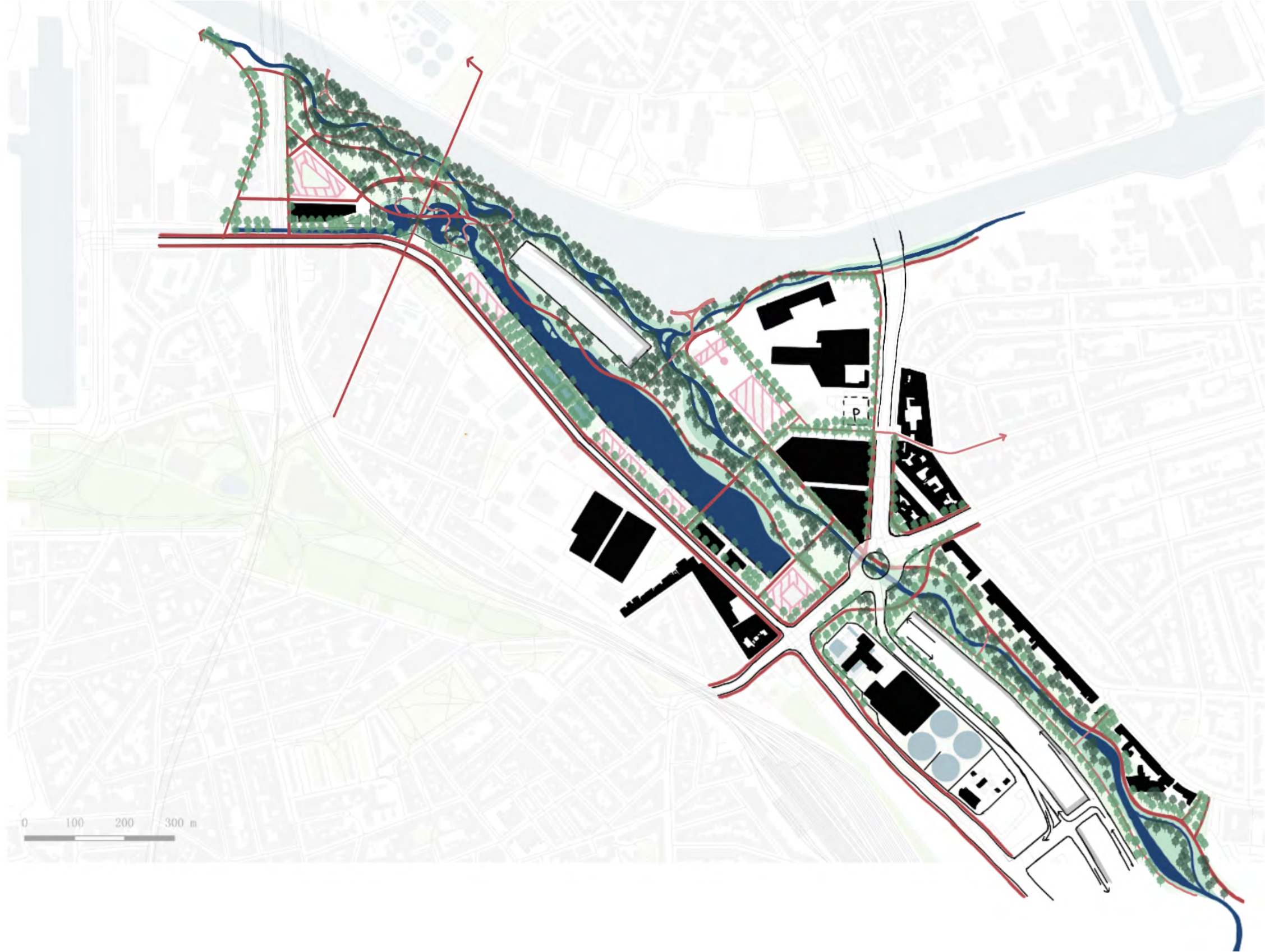
The forest toolbox controls large structures without restricting small-scale growth. Frame trees set boundaries, allowing spontaneous forest growth along the Schijn river, with sublime forest types applied for natural succession into natural multi-layered woodlands. Beautiful and interesting forest types applied near Lobroekdok, Sportpalies, and the Dam neighborhood, to create open recreational spaces, contrasting with the dense forests. This creates a coherent yet diverse landscape.

Forest Structure



3.2 Design a Riparian Forest on Lobroekdok

Masterplan (≥ 30 years)



3.2 Design a Riparian Forest on Lobroekdok

Space & View & Experience

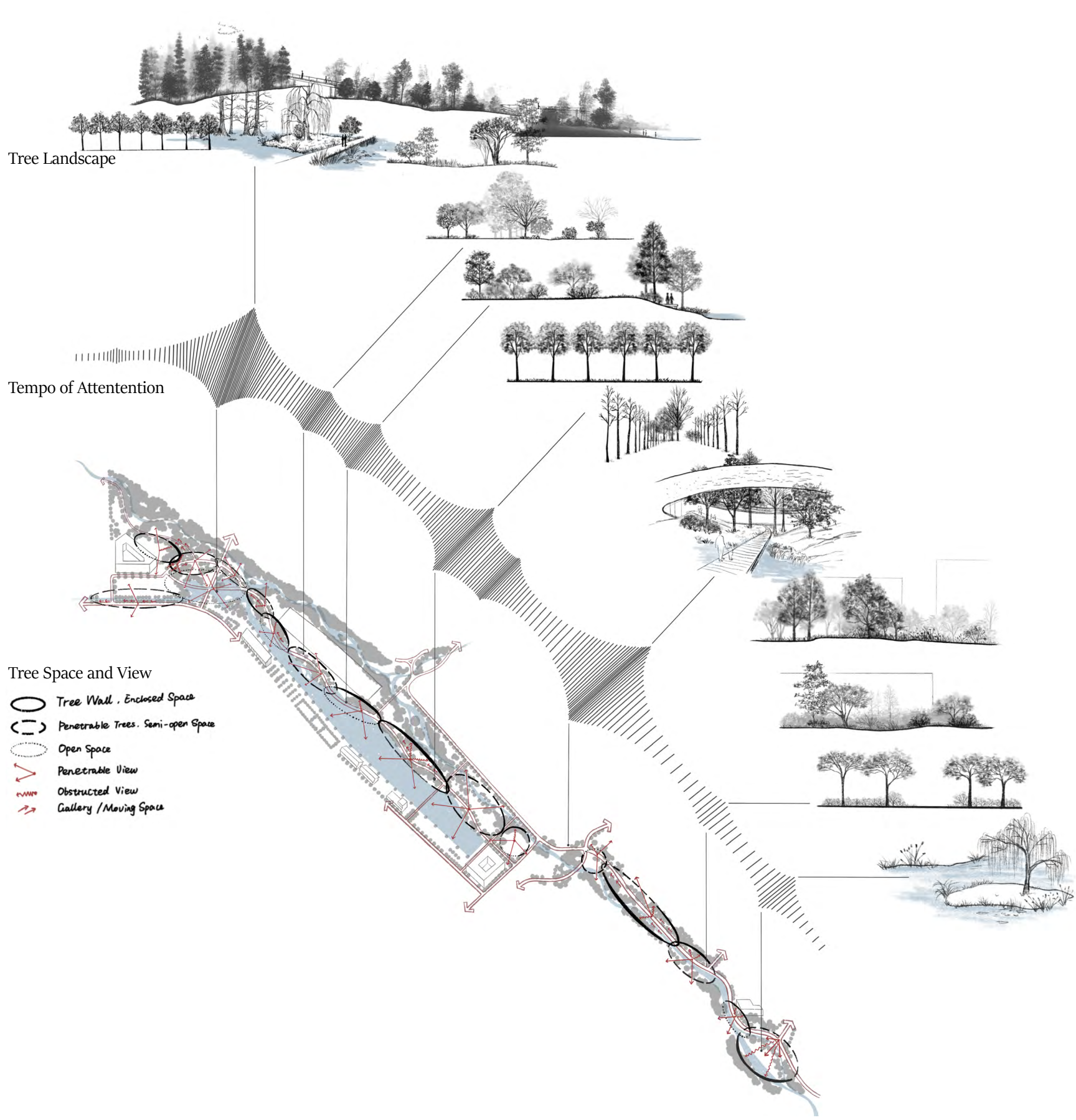
Frame trees ensure large spatial relationships.

On the site, the planting creates a variety of spaces: narrow confined spaces created by impenetrable walls of trees, shaded pathways created by the arrangement of street trees with their graceful canopies, and semi-open spaces created by beautiful clusters of trees that obscure the view and force the eye to turn towards the open water.

Trees enclose, connect, and combine with the topography to emphasize or diminish the space formed by topographic changes on the plane, creating a certain spatial rhythm. When a person suddenly walks from the narrow tree corridor to the open lawn, the great contrast of space, light and shadow will make people feel surprised and awe, thus obtaining some kind of sublime experience; the theater space formed by the enclosure of trees provides a place for people to meet, where people feel cozy and a sense of belonging, thus obtaining the beautiful experience.

At the same time, trees can also guide the sight. In some places, trees and shrubs are layered to form a barrier, block the views; solitary trees at the water's edge attract the line of sight; the network of tree branches creates a sense of mystery and enriches the layers of the landscape.

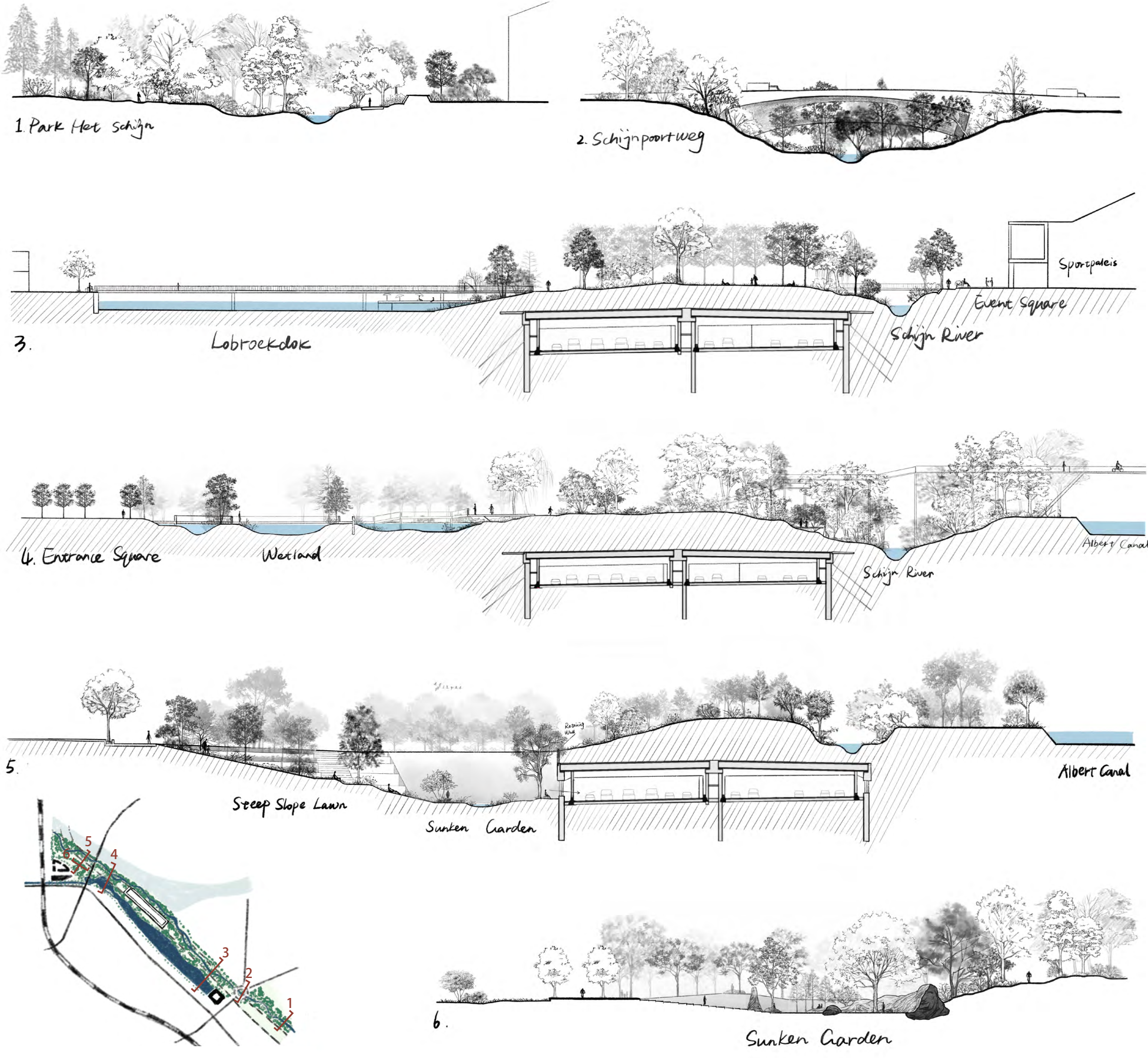
The trees form a rich spatial sequence that guides the eye, and people's attention and spirit are constantly refreshed, leading to a new level of experiences.



3.2 Design a Riparian Forest on Lobroekdok

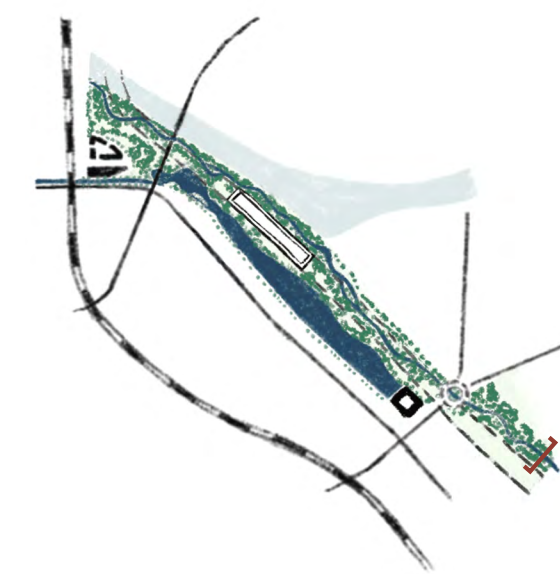
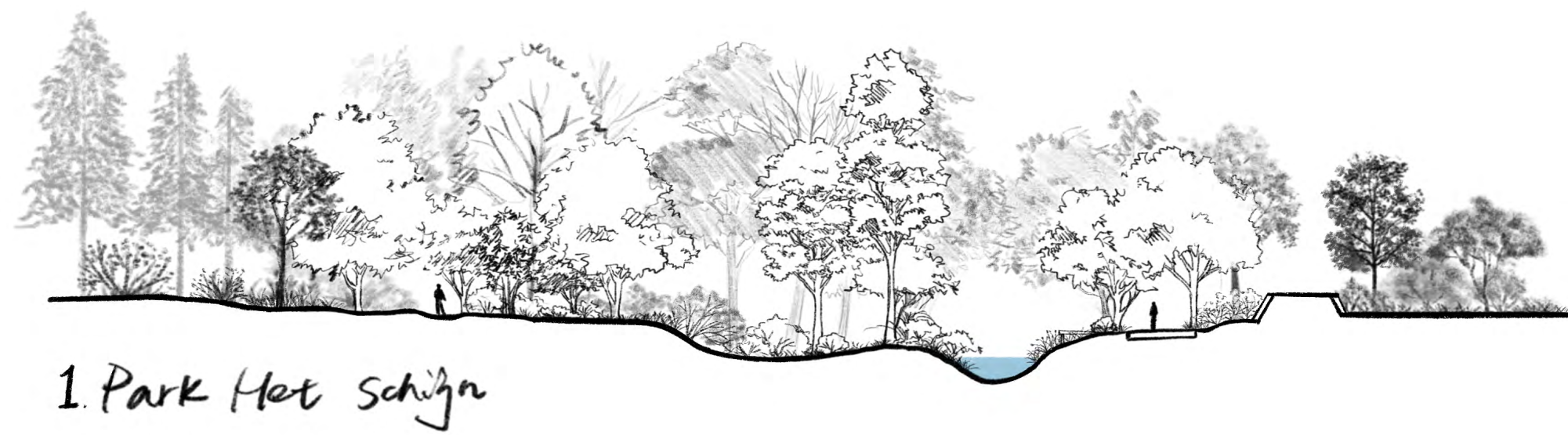
Landscape Sequence

Plants combine with the topography to form a continuous and varied landscape sequence, with spaces that are either open or enclosed, liberated or neat.



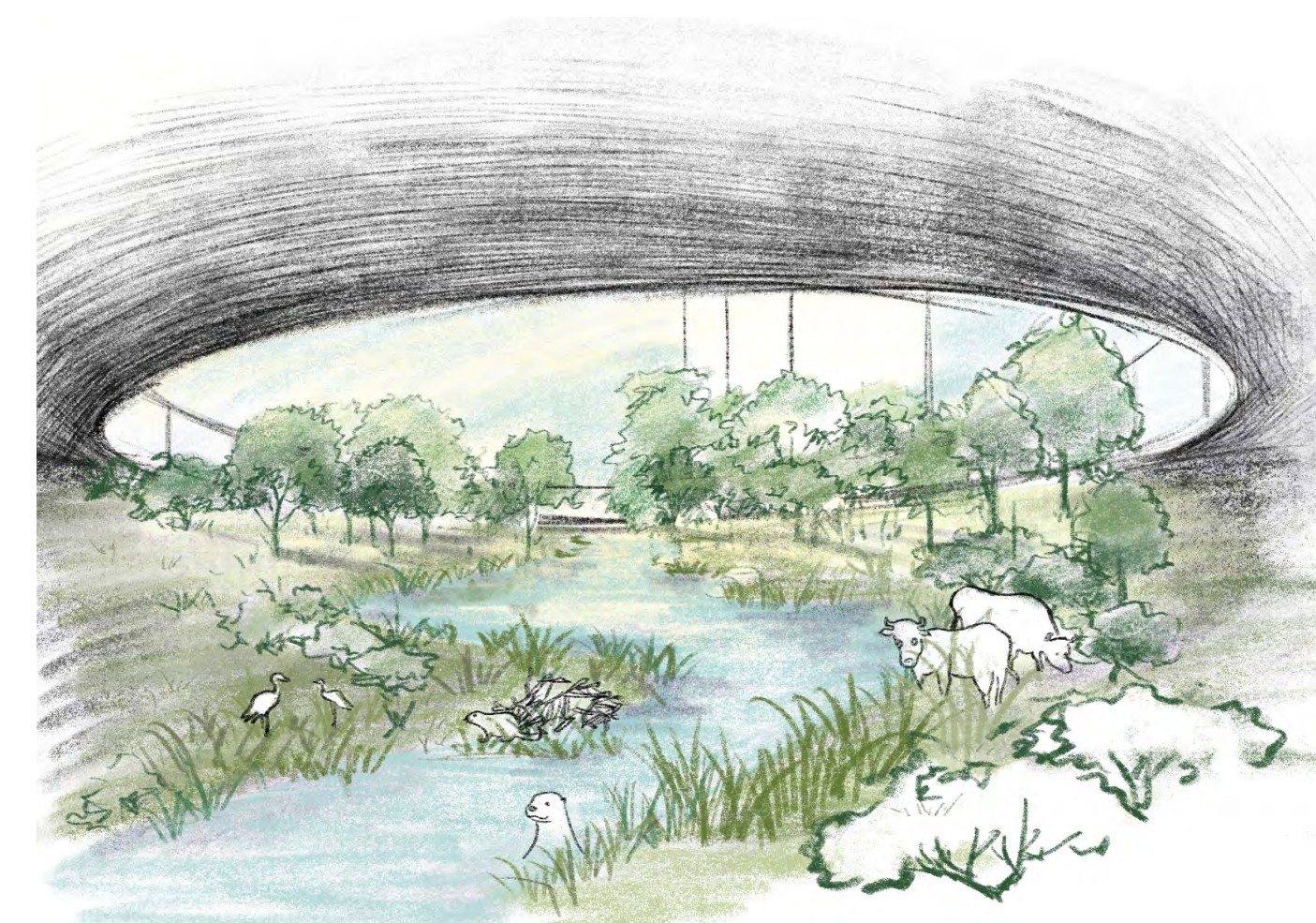
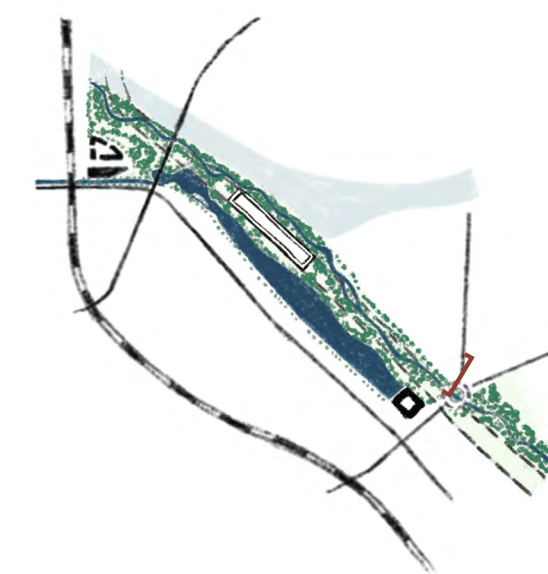
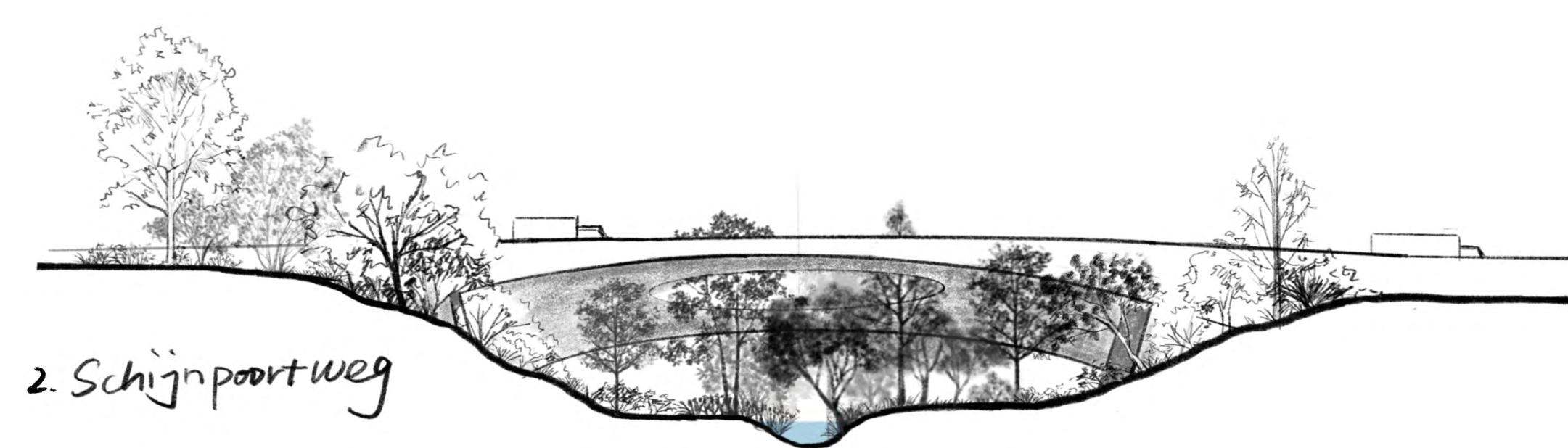
3.2 Design a Riparian Forest on Lobroekdok

Landscape Sequence



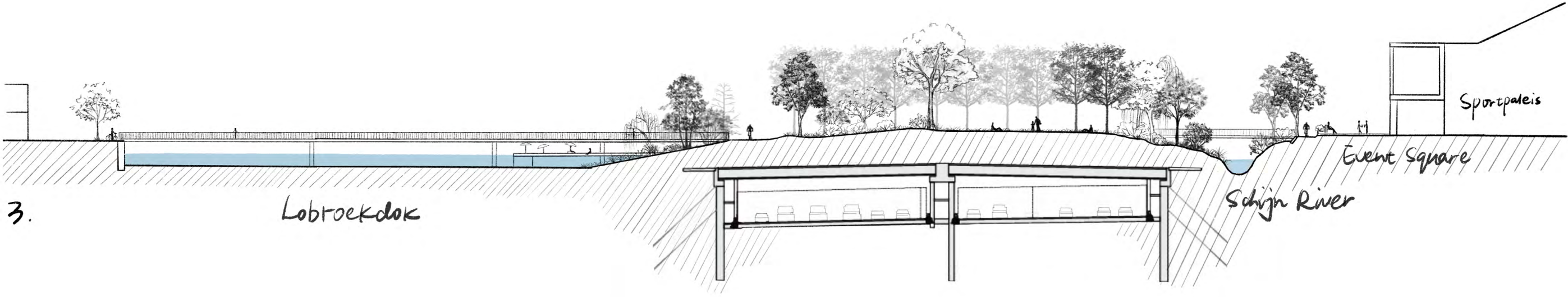
3.2 Design a Riparian Forest on Lobroekdok

Landscape Sequence



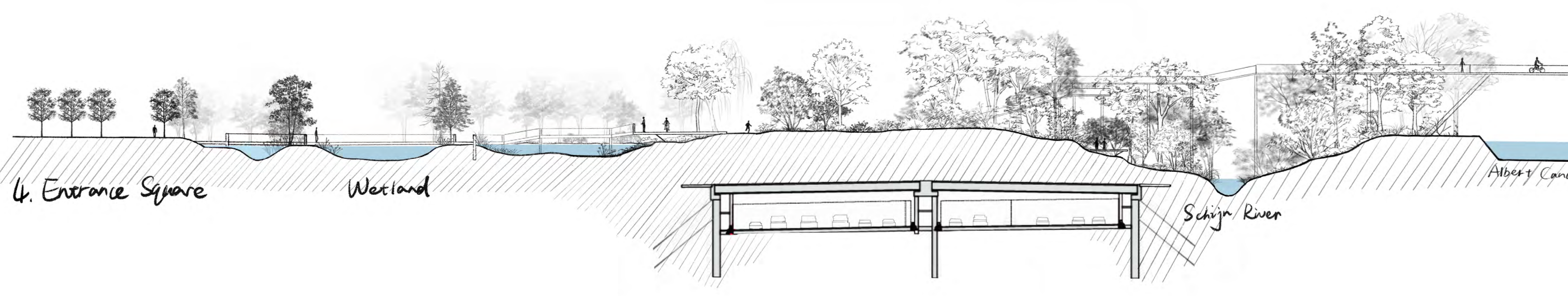
3.2 Design a Riparian Forest on Lobroekdok

Landscape Sequence



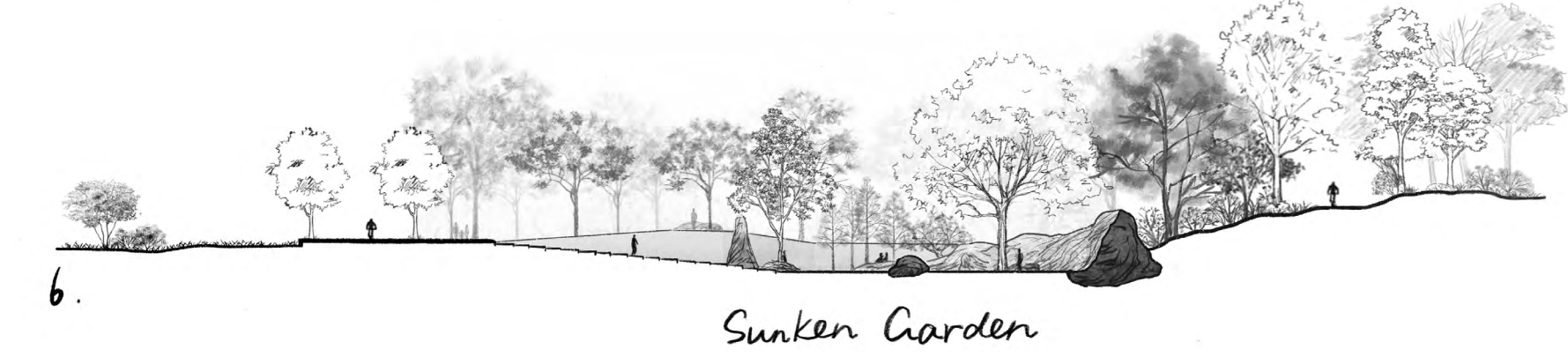
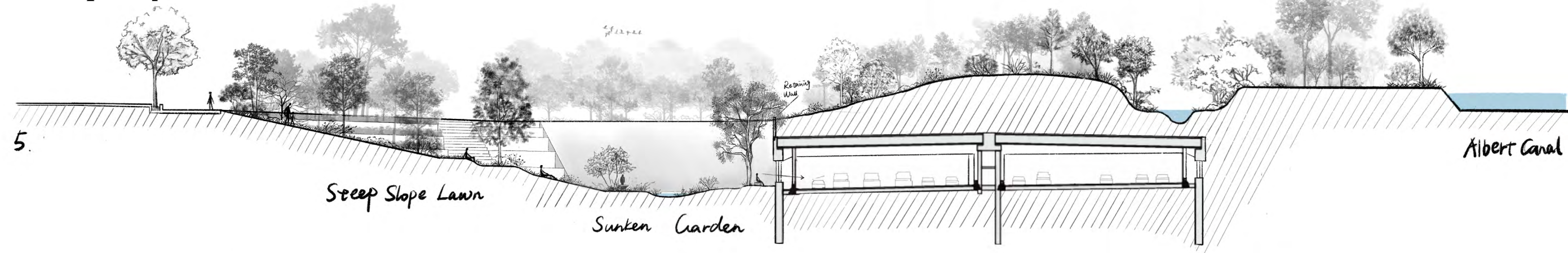
3.2 Design a Riparian Forest on Lobroekdok

Landscape Sequence



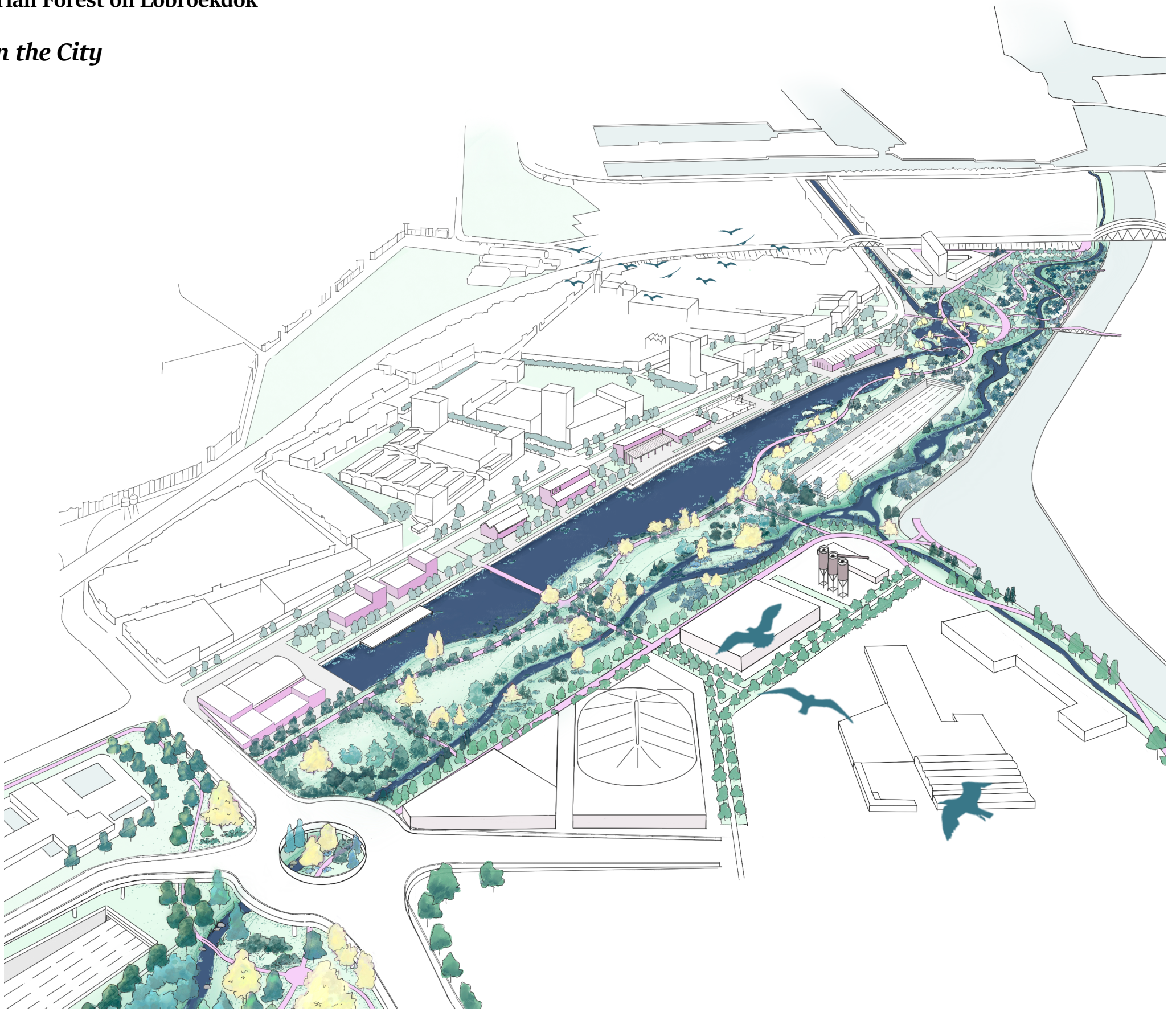
3.2 Design a Riparian Forest on Lobroekdok

Landscape Sequence



3.2 Design a Riparian Forest on Lobroekdok

Rewilded Dock in the City



3.3 Time Process

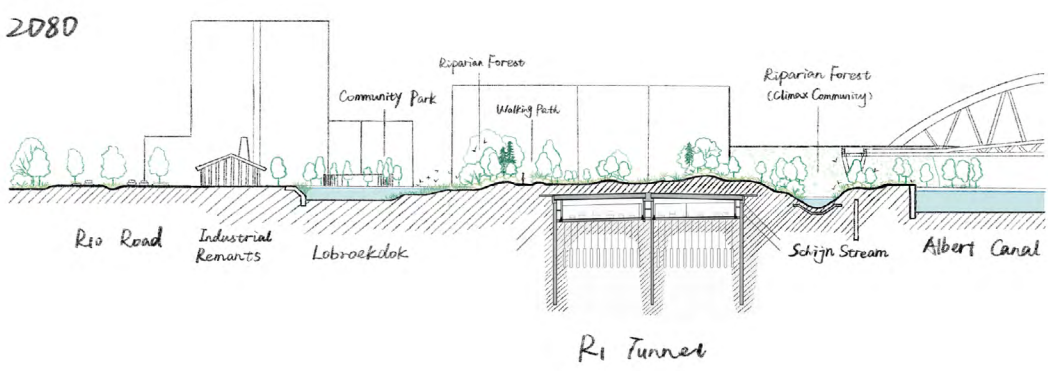
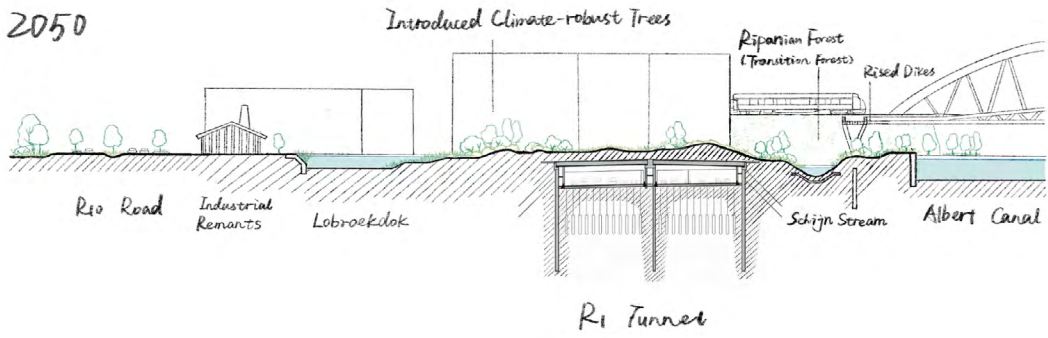
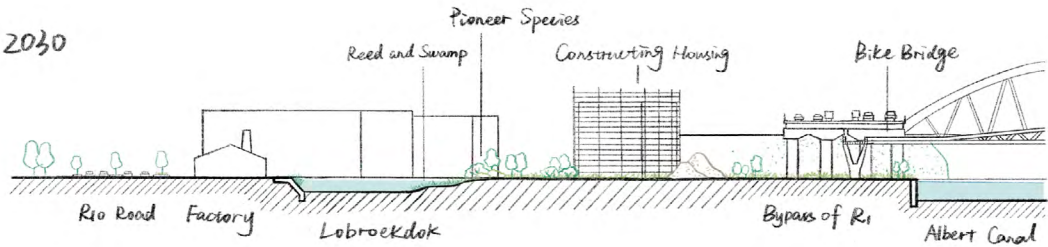
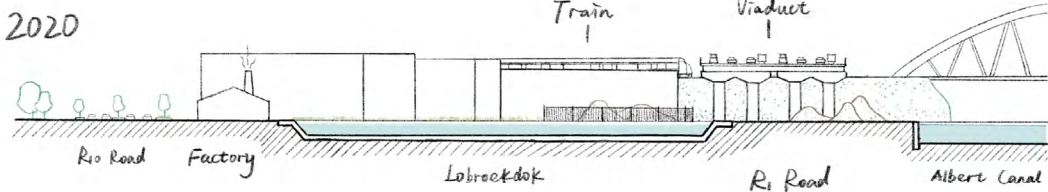
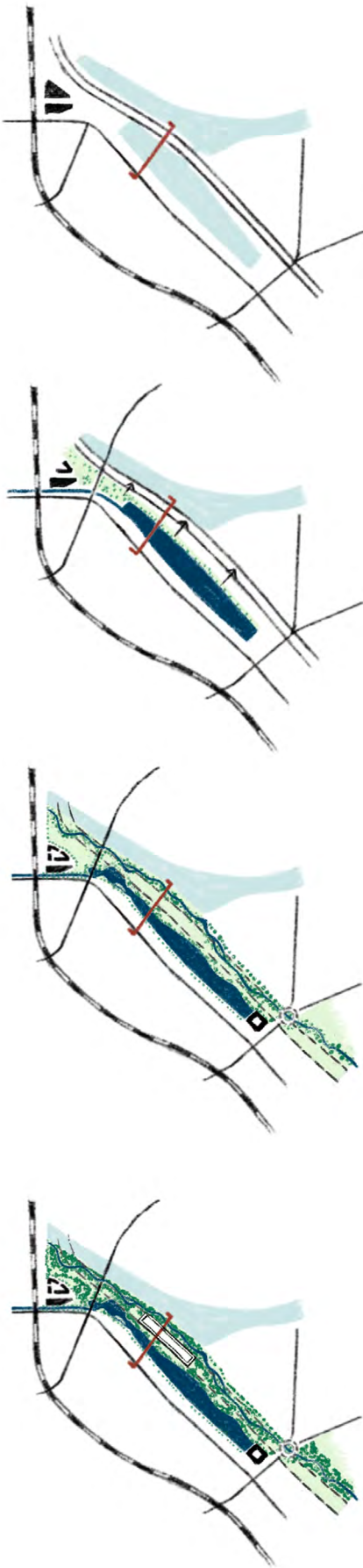
Nature-driven Development

Development strategies are built around flexible forest development. We will never be able to accurately describe how nature evolves over a long period of time. With long-term thinking and development in mind, soil and hydrological conditions are modified and infrastructure is improved to allow space and time for forest development. Subsequently, the principle of nature dominance is followed, but with human guidance on a small scale. The development stages are roughly as follows:

By 2030, the construction of the Ring road bypass is completed, reserving space for the establishment of underground tunnels. Terrain reshaping begins, and the urban wetland is drawn in. Pioneer species such as reeds and willows are introduced on an experimental basis on the north bank of Lobroekdok to guide the natural aquatic succession.

By 2050, terrain reshaping is completed, and the earthwork for the Oosterweel underground tunnel is roughly finished, reserving space for the natural flow of the Schijn river. Frame trees are planted along the contours and built infrastructure. The north bank of Lobroekdok gradually evolves into a natural ecological bank, with much of the ground already covered in a variety of herbaceous vegetation and occasional scrub.

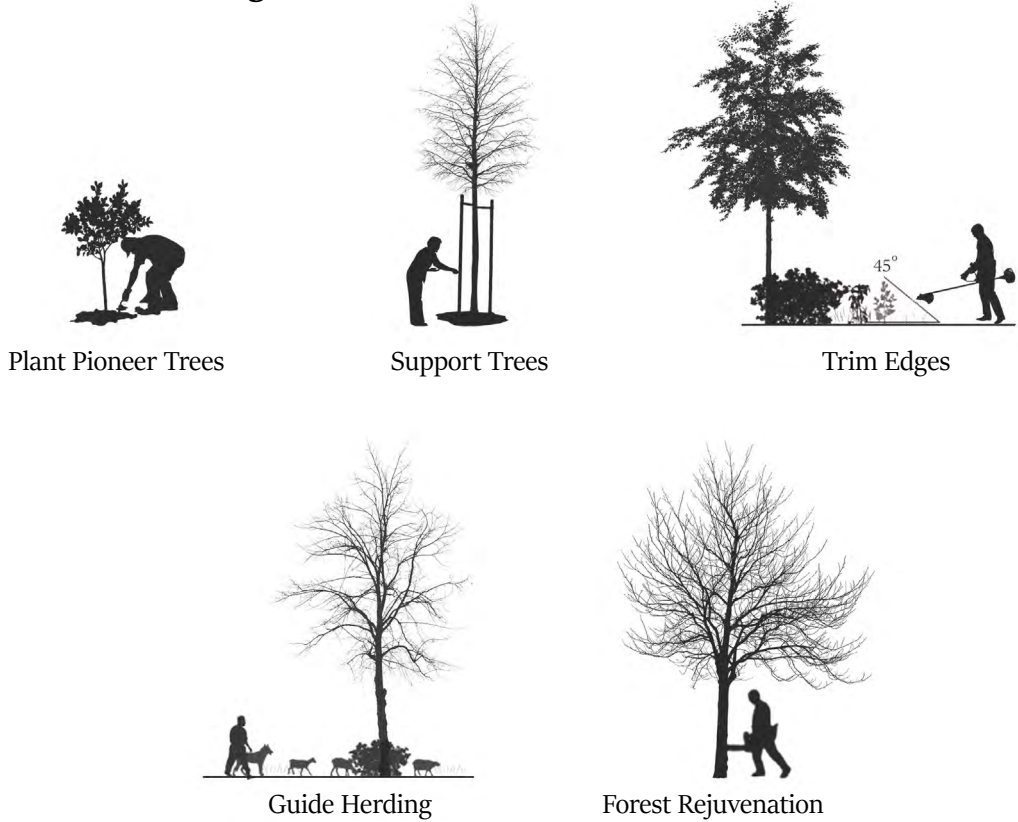
By 2080, the Lobroekdok area has developed into an urban and the natural succession will have come to an climax stage, especially along the banks of the Schijn river, where dense woodland will form. However, spaces for residents' recreation and activities are also reserved.



3.3 Time Process

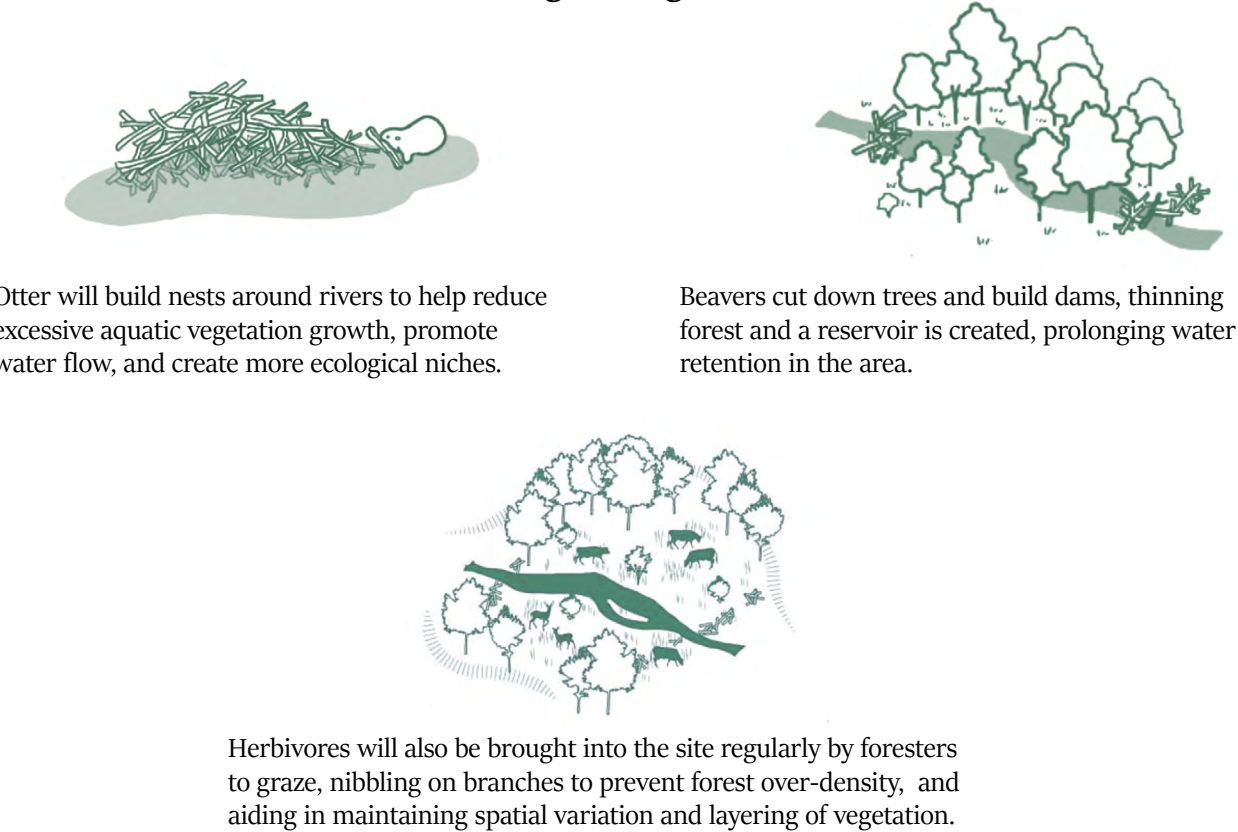
Active Management & Spontaneous Development

Urban Forester: Guiding the Process



At different stages of forest development, on-site management is still needed. Urban foresters will be the mediator between ecological and social needs. In the early stages of development, foresters are needed to select and support trees. Once natural succession begins to advance towards its climax stage, much of the forest will transition into woodland. Since the goal is diversity, and overly dense forests may impact the urban landscape and sensory experience, leading to perceptions of gloominess and insecurity, “doing nothing” is not optimal and the intervention of an urban forester is needed. This involves forest rejuvenation and preserving layeredness. By strategically rejuvenating climax forests, we allow early succession stages to permeate the entire development process structurally. Simultaneously, foresters are required for the daily maintenance of frame trees, including trimming edges, pruning lane trees, and guiding grazing.

Reintroduce Otter and Beaver: Ecological Engineer



Otter and beaver will be reintroduced. On the one hand, the riparian environment is restored, providing habitat for the survival of these wildlife. At the same time, they will act as ecological engineers, providing natural cycles of accretion and degradation. Beavers cut down trees and build dikes. These dams create reservoirs between them, prolonging water retention in the area. Trees submerged by the reservoirs will die, preventing overgrowth. Otter will build nests around rivers to help reduce excessive aquatic vegetation growth, promote water flow, and create more ecological niches. Herbivores will also be brought into the site regularly by foresters to graze, nibbling on branches to prevent forest over-density, and aiding in maintaining spatial variation and layering of vegetation.

3.3 Time Process

Co-evolution of Ecology and Aesthetics

The left profile shows the expected 100-year hydraulic succession on the north shore of Lobreokdok. It is a combination of artificial intervention and natural succession. The first stage is to create wetlands, ‘kick start’ the natural development process by seeding the land with pioneer plants like reed, willow and alder. As sediment accumulates in the water body, the open water area diminishes, prompting the inward movement of vegetation types, the swamp develop to scrublands, wet woodland and eventually climax community. As design intervention, animals like beavers and otters acting as ecological engineers, helping to maintain waterbody by clearing dead wood and leaves, while thinning forests by biting trees off, thus preventing progression to overly dense, dry forest.

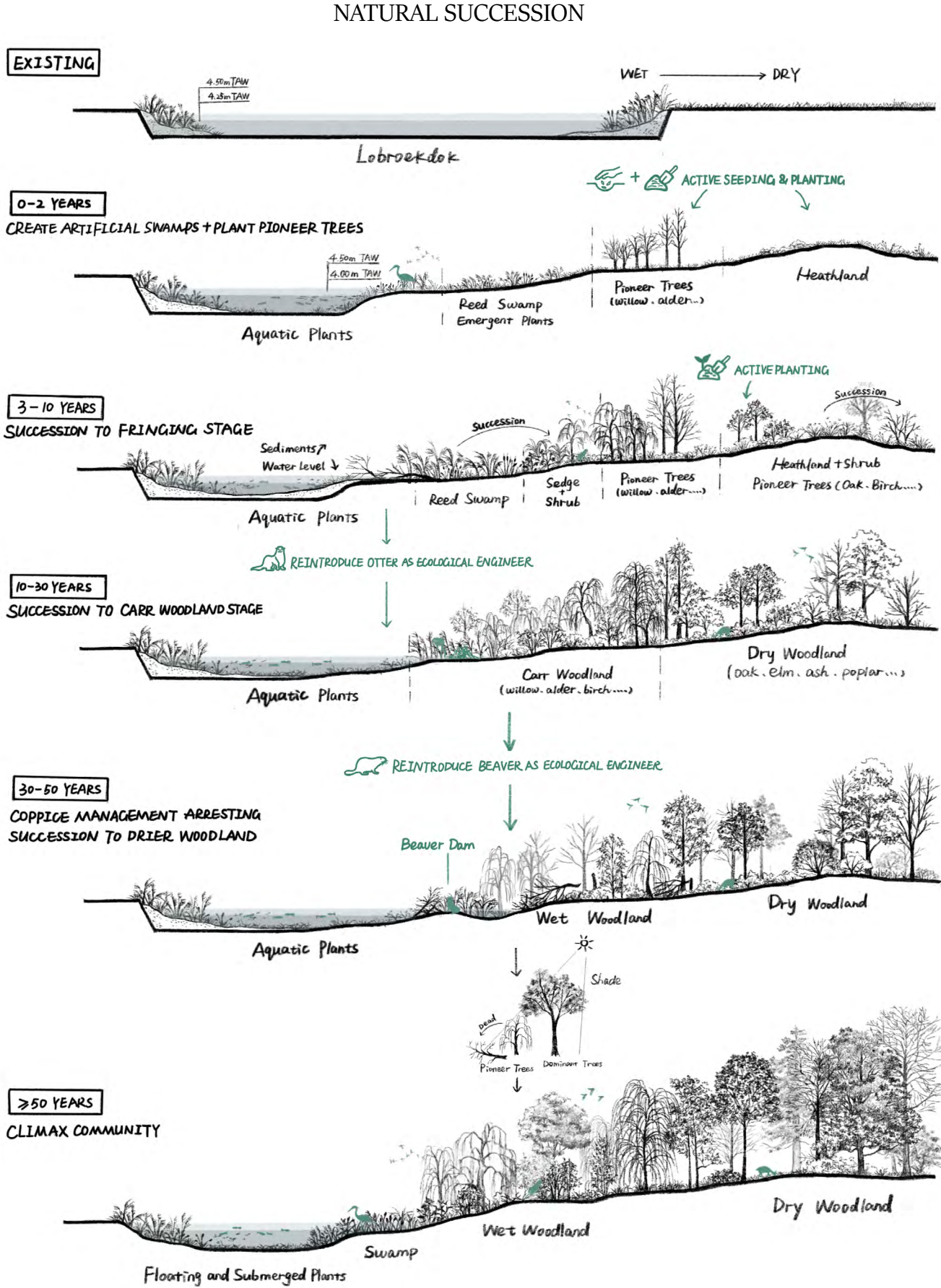
These profiles illustrate the changes of morphological characteristics of the trees - hierarchical structure, density, species abundance and spatial gradients resulting from abundance changes. The trees are drawn in a realistic approach to show the subtlest changes, in which interspecific interactions, reactions and structures are revealed. The change in forest space will also result in a rich and varied landscape. As a result, the entire site will be a heterogeneous and diverse landscape where different stages of forest development coexist, resulting in a rich experience.

It’s now a monotonous, plain and unattractive view, during the construction, it will be interesting show people’s creativity and curious about future. As the design allows for spontaneous development, it is expected that in 50 years it will be more multi-layered woodland landscape that reveals its wildness and provokes experiences of wonder and awe.

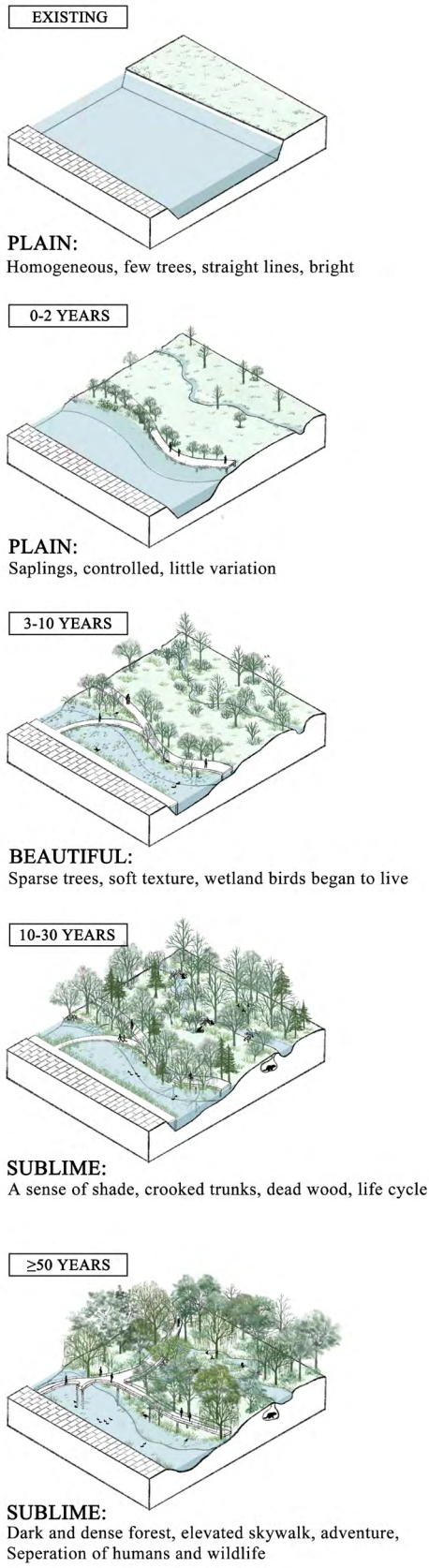
The urban forest will present itself in the daily lives of city dwellers, appearing as an unmanicured wilderness, a dense and flourishing thicket, and a forest that is open but resistant to human intrusion. Humans would stay on the periphery of the dense undergrowth, or walk through it, aware of entering nondomesticated spaces, such as the river banks that are isolated by high, steep slopes and dense undergrowth.

The overgrown wildness is an aesthetic effect that expresses the strangeness of nature's inhumanity.

In these ways, the urban forest reveals a liberated nature that has reclaimed part of its territory and must contend with it, but at the same time struggles to survive in the urban canyon.



AESTHETIC EXPERIENCE



CONCLUSION & REFLECTION

4.1 Conclusion

4.2 Reflection

4.1 Conclusion

Sub-question 1: How can the urban forest play a role in rebuilding the continuity and integrity of riparian ecosystems?

Urban forests play a crucial role in restoring the continuity and integrity of riparian ecosystems by implementing strategic landscape design and ecological restoration methods.

In the specific planning and design process in the schijn valley, firstly, at the topology level, follows the corridor theory of landscape ecology and riparian forest design principles to give a regional structural plan. By **Reconnecting Watercourses** and **Creating a Riparian Forest Corridor**, the continuity of the habitat is enhanced by connecting the fragmented green space and integrating the urban open space. At the same time, **Developing Dynamic Gradients** from wet to dry zones along rivers fosters diverse forest habitats, enhancing biodiversity and ecological integrity.

Secondly, corresponding spatial transformation strategies have been devised for the five landscape prototypes along the Schijn River, creating conditions for the development of riparian forests. Each landscape prototype has a basic transformation strategy as the design principle to guide the local design, while also responding to the overall landscape ecological structure and ensures the integrity and connectivity of the corridor. Specifically, **Enhancing ecological processes:** To promote ecological processes such as natural succession and hydrological dynamics within forest corridors, it is essential to allow natural processes to occur. This approach helps the ecosystem become self-sustaining and resilient. Key actions include restoring wetlands, promoting natural flooding regimes, and encouraging the development of natural forest ecosystems.

Reintroduction of the key species as ecological engineer: The restored riparian environment providing habitat for the survival of these wildlife. Meanwhile, they will act as ecological engineers, providing natural cycles of accretion and degradation.

Sub-question 2: How can wildness as an alternative landscape aesthetic principle be operationalized in landscape analysis and design?

The concept of wildness, central to rewilding, diverges from traditional landscape design's pursuit of harmony and order. By using aesthetics as a medium and tool to enhance the understanding of landscape language, while embodying the attitudes and design

processes of rewilding, this project aimed to make the concept of wildness tangible and applicable, particularly within the regulated context of urban environments.

Two main methods were employed to operationalize the concept of wildness in landscape analysis and design:

1. Development of the New Aesthetic Categories:

Building upon Nohl's new sustainable landscape aesthetic categories (sublime, beautiful, interesting, plain), this program expanded landscape spatial elements as indicators and established a new aesthetic evaluation system. Aesthetic assessments for Schijn Valley focused on plant space, type of woodscape, green use and accessibility, and urban space and function. These aspects were overlaid to create an aesthetic map, with sublime and beautiful established as primary aesthetic goals. Urban forest types within different aesthetic categories were created as a toolbox for subsequent landscape designs.

2. Integration of Situational Analysis:

In addition to explicit indicators, aesthetic evaluation often relies on specific circumstances. Utilizing the concept of drift and the method of Psychogeographic Maps proposed by Guy Debord, the study conducted site drifting practices and gathered public perceptions through drawing records and questionnaires. This supported a situationist aesthetic analysis of the site, conducting a Psychogeographic Map combining the four aesthetic categories. Perceptual elements influencing the wildness experience, gathered through drawing processes and public investigations, were incorporated into the spatial composition of urban forests.

In the design process, experiments were conducted at various scales. At the regional scale, the sublime and the beautiful, which represent the experience of wildness, have been expanded mainly through the formation of larger continuous structures. The five landscape prototypes were also developed with corresponding wild space transformation strategies, and the urban forest toolbox was applied to these prototypes to reflect diverse spatial characteristics and qualities.

Further exploration into spatial and aesthetic experiences required zooming into the local scale. The design of Lobroekdok is guided by the spatial strategies of dock area, infrastruacture area and park area and the corresponding forest tool boxto design a variety of forest aesthetic experiences. The design encourages and supports the autonomy

of nature, avoiding excessive design to dominate or control natural development processes. Instead, the focus is on creating more suitable conditions for the spontaneous growth of the forest (soil, water), or through some interventions to form a structure (frame trees to form the overall forest structure of the site), guiding the process (select and support trees) to accelerate the successional process, thereby facilitating a more flexible and wild forest.

Sub-question 3: What kind of wildness experience can the urban forest provide through different landscape spatial design?

This project mainly through formulating forest tool boxes as design principles to create different aesthetic experiences. Based on the definition of aesthetic categories and the corresponding spatial indicators three types of urban forest tool box are established according to the three aesthetic categories. Sublime and beautiful were identified as core features of the wildness experience, while interesting was acknowledged for offering a variety of landscape experiences.

Because the forest experience is primarily defined by the spatial characteristics and qualities of the landscape, the tool box includes five levels of interpretation: forest composition, spatial composition, human intervention, atmosphere, and ideal tress Building upon this, forest prototypes were defined. The sublime category includes Sublime Multi-layered Riparian Forest, Sublime Impenetrable Forest, and Sublime Edge Forest, aiming to create places of discovery with small surprises, places of disconnection and contemplation, and strong contrasts between light and dark, and opening and closing of space. The Beautiful category includes Beautiful Open Riparian Forest, Beautiful Enclosed Canopy Riparian Forest, Beautiful Edge Forest, which are designed to create a sense of safety allowing for free roaming, places inviting open play and imagination, and interactions between sparkling light and the ground, creating magical forested rooms. However, these forest prototypes cannot comprehensively cover all forest aesthetic experiences; they serve as references for designing wilder forest experiences.

Sub-question 4: How can ecological restoration and wild aesthetic experience be spatially integrated in an urban riparian corridor design?

After establishing a vision combining ecological restoration and aesthetic experience, we must consider their synergies and conflicts. Sublime aesthetics promote natural

autonomy with minimal human intervention, aligning with high ecological quality and sustainable development, particularly evident in Grote Schijn. Beautiful aesthetics seek harmony between humans and nature, mixing natural and artificial elements, suitable for existing park areas.

Conflicts arise in developing industries and dock areas, which prioritize 'interesting' characteristics. In built environments, natural river flow and riparian forest buffers face challenges. Additionally, aesthetic demands for beauty can conflict with the high ecological requirements of core areas, especially at the edges of parks and agricultural zones. Specific spatial strategies can balance open and closed areas through artificial management, ensuring corridor continuity and diverse experiences. This necessitates a shift in mindset towards holistic and long-term thinking, as it seemingly involves human systems conceding to natural systems. However, riparian forest corridors not only provide habitat for wildlife but also offer high-quality ecological services, such as mitigating urban flood risks.

In specific design contexts like the Lobroekdok area, addressing challenges like extensive transportation infrastructure barriers, water pollution, and fragmented green spaces, the design starts with ecological considerations, solving soil and hydrological problems firstly. These measures not only create different conditions for forest development and help to create diverse habitats, the reconfigured terrain and naturally meandering rivers can help to create a more spatially diverse landscape. Besides, balancing dense forests with open spaces through diverse forest tool boxes shapes dynamic tree landscapes and landscape sequences.

However, this co-development of ecology and aesthetics takes time and may not synchronize at specific time points. It requires patience and ongoing efforts to achieve a harmonious integration of ecological restoration and aesthetic experience in urban riparian corridor design. At the same time, this also reflects that the sublime, beautiful, interesting, and plain have a certain gradient over time; plain and interesting can develop into beautiful and sublime through natural processes and human intervention.

4.2 Reflektion

Based on the answers to the sub-question, they make up and support the answer to the main question.

Main question: How can rewilding reimagine a better coexistence and reconnection between humans and non-humans in the urban forest?

First of all, this program pursued a holistic approach integrating ecology and aesthetic experience throughout the analysis and design process. This approach inherently considers the interests of both humans and non-humans.

On a spatial level, at a macroscopic systemic or structural level, continuous forest corridors, forest networks, or stepping stones can facilitate the entry of non-humans into urban environments. Permeable and resilient boundaries can be established between the two systems to facilitate interaction. Forest corridors, serving as spatial carriers, not only enhance ecological continuity and provide high-quality habitats, but also serve as places for various projects and activities, creating continuous and diverse aesthetic experiences. However, this kind of top-down planning cannot fully take into account the real situation of each piece of land, in local scale, human and non-humans face more specific conflicts. Rewilding advocates for nature-led and spontaneous development with less human intervention, necessitating a shift away from anthropocentrism towards prioritizing the integrity and connectivity of ecosystems, sometimes at the expense of functionality and convenience. In spatial terms, coexistence is facilitated through intertwining living spaces, utilizing features such as varying topography, tree walls, and elevated pathways to ensure three-dimensional coexistence while minimizing interference. This intertwining generates dynamic spatial characteristics and landscapes, where the natural forest acts as a window to the wild, contrasting with the organized urban environment and providing a different quality to the traditional urban landscape.

However, achieving this balance requires time for natural growth and for the public to gradually realize the benefits of rewilding. This brings attention to the temporal dimension, where the development of forests, water, cities, humans, and non-humans is dynamic and cannot be precisely described. At certain stages of development, more human intervention and guidance is needed, where humans seem to dominate development, but at certain stages, nature dominates. This requires a long-term view of the relationship between humans and non-humans with the goal of sustainable development: they coevolved in a dialectic process of mutual involvement.

Academic Relevance: Rewilding as a critical concept

The project begins with reflecting the Anthropocene's impact on Earth's environment due to human activity. This manifests in biodiversity loss and ecological degradation, while rapid urban development exacerbates the disconnection between humans and the non-human world. People lose touch with the wildness of nature and it also leads to a lack of experience about what kind of nature is really “good”. Thus, urban landscapes need rewilding. We should embrace inevitable changes, seize the opportunity to create real sustainable landscapes, and focus on fostering self-willed landscapes.

Rewilding emphasizes nature's autonomy and allows spontaneous development, which seems to conflict with the 'design.' However, rewilding doesn't aim to erase human history or revert to untouched wilderness. It's a call to reclaim the lost wildness in human history, offering a critical perspective on our place in the world.

It is appropriate to explore and imagine Antwerp as a rewild city. As one of the sprawling metropolises of Western Europe, it faces severe ecological and environmental tests.

On the other hand, historically it tied to nature water system now either gone or domesticated. Through applying rewilding and working with rewilding I however also discovered new challenges and opportunities for landscape design practice.

1. In practical terms, rewilding might be most suitable for areas where the historic fabric has largely disappeared. In places where natural features have been damaged, causing environmental issues and urban survival challenges (such as flooding), this can be an opportunity or excuse to redesign the natural landscape, making rewilding relatively uncontroversial.

2. Urban rewilding faces multiple challenges, requiring designers to adopt a firm non-anthropocentric perspective and a more radical approach to transforming urban landscapes. This might involve sacrificing human interests for sustainable urban development and avoid over-designing, allowing more space and time for natural processes.

3. To integrate rewilding into landscape design, there is a need to broaden the design language. Aesthetics can be a powerful tool to enhance the understanding of landscape language while embodying the attitudes and design process of rewilding

4. Wildness, as an alternative landscape aesthetic principle that truthfully depicts nature's power and struggle, is subtle and challenging to implement in actual landscape design. It also faces social and public acceptance issues, as a provoker of traditional picturesque

aesthetics. It is up to the planners as pioneers to advocate for this manifesto, convincing that it will bring longer term benefits.

5. Rewilding doesn't simply respond to inevitable landscape changes; it can also actively initiate and drive changes. It can reshape urban experiences, prompting designers to create impactful landscapes that raise public awareness, spark discussion, and shift urban residents' understanding of city nature, setting a new trend in landscape design. And there are some principles in urban rewilding summarized:

Inclusive Approach:

Integrated ecology and aesthetic experience, considering the interests of both humans and non-humans.

Urban Forests as Key Tools:

- Urban forest play significant ecological role, supporting urban ecosystem sustainability, and improving residents' quality of life.
- It is a robust tool to create impressive space, contrasting with controlled areas.
- Permeable and resilient forest boundaries promotes interaction between human and non-human systems.

Temporal Dynamics:

The development of forests, water, cities, humans, and non-humans is dynamic and requires a long-term view. The goal of rewilding can be achieved in stages.

Develop new aesthetic framework:

- Tool to enhance public understanding and acceptance
- Tool to make the aesthetic of wildness be operationalized in landscape analysis and design

Bottom-up, Place-based Development:

- The conflict between humans and non-humans needs to be specifically addressed.
- Total rewilding can lead to new homogenization, and erase cultural and functional attributes.

Social Connection:

- Demonstrate the benefits of ecological services.
- Need for more public participation.

Social and Ethical Dilemmas

On a cultural and moral level, as previously mentioned, rewilding calls for a radical, non-anthropocentric re-evaluation of landscapes and human history. Instead of distancing us from civilization and culture, it integrates non-human elements into our cultural moral values. Therefore, this project adopts a place-based, inclusive approach that considers both natural and cultural benefits.

Both the sublime and the beautiful as aesthetic categories of wild experience are extended and continuous at the site, while the interesting as human creativity and engagement in nature, is also used as a complement to the diversity of the site, enriching urban ecosystems which support certain species and enhance biodiversity, while the built environment offers varied experiences. The cultural and functional attributes of landscape space have not been completely erased, especially on a large scale, and a total rewilding would only lead to new homogenization. Parks, industrial parks, farmland, etc. provide new spaces for non-human existence through corresponding spatial transformation. Social connection is also a crucial aspect of rewilding projects. To increase public acceptance, it is essential to demonstrate the benefits: wilder forests offer various ecological services that support urban ecosystem health and sustainability, while also improving residents' quality of life. Meanwhile, Aesthetic experience, a product of human engagement with the landscape, is also crucial. Landscape design should provide spaces for freedom and adventure, contrasting with safe, controlled places. This helps people relieve stress, restore attention, and importantly, feel part of and sometimes subordinate to, 'non-human' nature, strengthening their connection to the surrounding environment. The more impressive the nature, the greater the effect.

Public participation is something that is currently lacking in this project. In the aesthetic experience analysis, interviews were used to absorb the public's perception of landscape aesthetics. In the design phase, more suggestions from the local people are needed, especially where the rewilding has affected their living environment.

Methodology and Design

1. Rewilding as a urban forestry project

Urban forests play a unique role in urban development and green infrastructure, acting as ecological havens and connecting us to the ancient roots of civilization. They offer a contrast to urban environments, providing an escape from city life and a link to nature's

wildness. This aligns with the concept of rewilding, making urban forests not only effective tools for improving urban ecology but also valuable spaces for designers to create wilder, more aesthetically engaging experiences in this project.

2. Two threads of ecology and aesthetic experience

The focus on domesticating nature at the beginning of the project highlighted the disconnect between ecological quality and aesthetic perception. People have become desensitized to seemingly "natural" ecological projects, but remain unaware of the true fragility and power of nature. An intact, high-quality ecosystem is not always pleasing to the eye. Rewilding is more than ecological restoration, and only landscapes that are accepted by the public can be truly meaningful. By providing a mystical or disinterested experience, people can grow to understand and embrace rewilding, thereby increasing ecological awareness. Therefore, this project takes the two threads of ecological and aesthetic experience in its analysis and design, and tries to combine the two scales (regional scale and local scale). However, in practice, there are certain problems. In Conclusion, in the answer to sub-question 4 in Conclusion: "How can ecological restoration and wild aesthetic experience be spatially integrated in an urban corridor design?", it is mentioned that in the regional scale, the sublime connotation is consistent with the ecological goal, allowing for a smooth integration; however, in some other places, such as the industrial area, there are certain conflicts, and the designer needs to make a certain trade-off. Therefore, from a non-anthropocentric perspective, rearranging industrial factories to make way for the connectivity and integrity of the riparian corridor. Nonetheless, efforts are also made to harmonize both aspects. The corridors in industrial zones require more human intervention to ensure the openness of the forest while also providing recreational and entertainment functions. Such judgments and choices are subjective and site-specific, and cannot be fully presented in a graphic vision, strategy or tool box, but need to be understood by the audience.

3. The Establish of the New Aesthetic Categories

In the process of applying the new aesthetic matrix, there are several problems: 1. The public's understanding of aesthetics requires a certain amount of knowledge and is limited by human subjective judgment. In my aesthetics investigation using my drawings, under the premise of conveying the meaning and characteristics of each aesthetic

category, the understanding of aesthetics conveyed by the drawings still varies from person to person, and there is a great deal of difficulty in conveying the aesthetic message between the designer and the viewer. 2. On the regional scale, it is difficult to accurately grasp or describe the aesthetic characteristics, it is situational, place-based, whether the structure of large generalizations on a regional scale is really meaningful 3. There is a certain temporal correlation between these four categories, or expresses a certain natural process, plain and interesting can be rewilded to become beautiful and sublime, and thus the vision of aesthetic development should not be fixed.

4. Extraction and Formulation of Five Landscape Prototyps

Before analyzing the site separately from the perspectives of ecology and aesthetic experience, a basic analysis of Schijn Valley's characteristics and issues was conducted. Water, as a dominant spatial structure in the site, is the most important disrupted natural system in the city of Antwerp. Using the water as a starting point, I analyzed its palimpsest and discovered the historical symbiotic relationship between the river and the city. The continuous sections along the watercourse also reveal the interactions between water, the city, and the forest. Water touch the city's dock area, industrial area, park area, agricultural area, and infrastructure, sometimes harmoniously and sometimes in conflict. These different functional zones are dispersed in the Schijn valley, forming a heterogeneous urban carpet. Thus, five landscape spatial prototypes were established. Each prototype received targeted spatial transformation strategies based on its characteristics. Additionally, by creating networks and corridors, these spatial types were better connected and reorganized on a regional scale.

For the extraction of the five prototypes, there are certain problems.

On the one hand, by adapting the five most typical and characteristic prototypes, the basic riparian area can be covered, ensuring the general structure. But on the other hand, some small fragments, such as the golf course and the campsites, have been subjectively excluded. In the consideration of the regional scale design, the transformation of golf courses mainly follows the strategy used for park prototypes, setting boundaries with slopes, while the campsite is directly transformed into a riparian forest. These planning and design appear to be too rough, without considering the uniqueness of the site, the real needs behind its function, and the property ownership attributes of the site.

5. The Instruments of Design Representation

Improving ecological coherence and integrity is fundamentally based on landscape ecology theory (M-P-C theory). This large-scale spatial pattern and topological relationship are well-expressed through planimetric mapping. These objectives are concretely reflected in spatial interventions across five prototypes, involving the principled arrangement of spatial elements (vegetation, water, and soil). Therefore, axonometric drawings—illustrating two spatial dimensions simultaneously with a summarizing approach—are suitable for this expression.

On the aesthetic level, the new aesthetic system is based on the cognitive level, where landscape design influences perception through spatial composition, triggering feelings. Therefore, the analysis of the spatial composition and the structure of the area is expressed in planes; In contrast, aesthetic experience, being a subjective human perception, is multidimensional and condensed. The eye-level drawings presenting not only objective realities but also various subjective feelings and atmosphere, imbued with emotional depth and essence. The technique of drift was utilized according to the suggestion of my first tutor Rene. I learnt from the 'psychogeographic map' proposed by Situationist theorist Guy Debord, it illustrates how urban geography influences individuals' emotions and behaviors as they drift through the city. These maps reveal "subjective and temporal experiences of the city, rather than the seemingly omnipotent perspective of plan maps" (Sant, 2004). Drift as a practice of urban wandering offers new ways of perceiving the city. The randomness, transience, ambiguity, and fleeting nature of spatial experiences are subjectively translated through these maps.

In expressing the integrated strategy based on the five prototypes for both levels, section drawings are used to accurately and clearly depict the role of trees in spatial shaping and the spatial gradient centered on water bodies. In the place-based design proposal, besides using sections to precisely showcase spatial interventions, eye-level drawings are included to express the aesthetic experience of specific locations, better revealing the spatial quality created by the interventions.

6. Multi-scale Analysis and Design

The project involves regional watershed, local, and human-scale node designs. It begins with providing systematic vision of spatial structural transformation at the regional level.

Lobroekdok is designed as a starting point to test the proposed spatial strategies. Because it serves as a place where spatial conflicts are most severe in an urban environment, if the rewilding strategy can be practiced in this hotspot where conflicts are more severe, it will provide a strong case for demonstrating rewilding feasibility in an urban environment. Meanwhile, this place-based design reflects the real conflict and bottom-up thinking: It needs comprehensively considers the coordination of natural elements such as water, soil, and forests with urban features like roads, buildings, and bridges, while also taking into account the needs of the community and aesthetic pursuits.

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