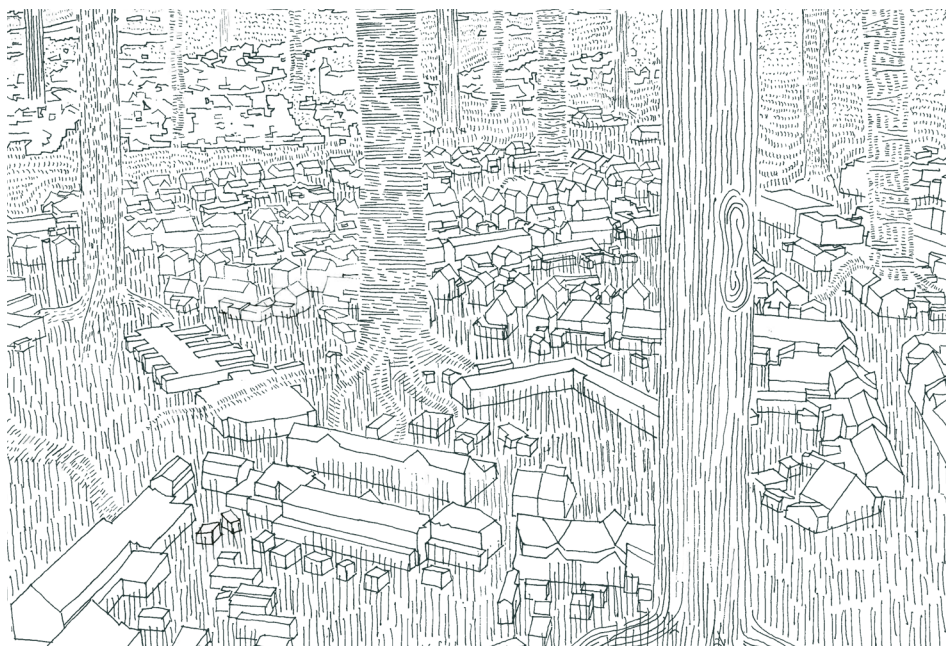

The forest formerly known as

Reimagining forest infrastructure as an agent of care

Master thesis Landscape Architecture
September 2022 - July 2023

Lea Johanna Hartmeyer

First mentor: René van der Velde
Second mentor: Leo van den Burg
Exam committee: Ate Snijder

Delft University of Technology
Facultury of Architecture and the Built Environment

Flowscapes Studio
Urban Forest- Forest Urbanism lab

Location: Parkstad, The Netherlands

Unless stated otherwise all pictures and graphics by author





House along edge of
Caumerbeek valley, Heerlen

**The language of landscape is our native language.
Landscape was the original dwelling; humans evolved among plants and animals, under the sky, upon the earth, near water.
Everyone carries that legacy in body and mind.
Humans touched saw, heard, smelled, tasted, lived in, and shaped landscapes before the species had words to describe what it did.**

The Language of Landscape
Whiston Spirn (1998)

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Abstract

The Anthropocene challenges us to rethink the way in which care for and take care of the world we are part of. To acknowledge our entanglement with biotic and abiotic beings, but also our dominance over them and with that our responsibility for them. Employing this notion of responsibility, as well as care thinking as critical concepts for the built environment has manifold consequences for how we conceptualize, approach and transform it. Regarding landscape and landscape architecture three realms of caring emerge as especially relevant: *Repairing* (reviving ecosystems humans have damaged), *Relating* (strengthening the human-nature and landscape-city relationship) and *Reducing* (limiting the anthropogenic impact on the environment).

Starting from this conceptualization of care, this graduation project is a speculative exploration of how the forest and forestry could be utilized to imagine a more caring relationship between human and landscape within the Zwischenstadt of Parkstad in Southern Limburg (NL). Forestry here is employed due to its multiscale and multidimensional characteristics – it has spatial, environmental, ecological, socio-cultural and economic benefits. While the Zwischenstadt is chosen as a test case due to its ubiquity in the European, as well as global context. This dispersed type of urbanization is furthermore in need of alternative development strategies and trajectories, which careful and caring design can answer to. By working out a territorial forest strategy and masterplan, as well as localized design projections, the aim is to understand how forest infrastructure can revitalize the Zwischenstadt as an agent of care.

The result is a design proposal that reimagines the whole territory – from residential areas to industrial terrains etc.- as a forest, which can take on a variety of ecological and spatial forms. This forest becomes the principal agent of development for the Zwischenstadt, not only transforming the region environmentally and ecologically (*Repair*), but also reframing it spatially (*Relate*), while providing alternatives for the current shrinking condition (*Reduce*). Through this "all forest" approach the project questions supposed distinctions between landscape and city, the nature of urbanization and urbanity, the human commitment to landscape and ecosystem in the 21st century, as well as representation methods in (landscape) architecture.

Keywords
Anthropocene
Care
Zwischenstadt
Forest infrastructure
Forest urbanism

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Anthropocene
Proposed name for a new geological epoch in which humans have become the "dominant force shaping Earth's bio-geophysical composition and processes" (Chua, 2022). The term was coined by Paul Crutzen in the year 2000.

Care
Joan Tronto and Bernice Fisher define care as "a species activity that includes everything we do to maintain, continue, and repair our 'world' so that we can live in it as well as possible. That world includes our bodies, ourselves, and our environment, all of which we seek to interweave in a complex, life-sustaining web" (1990).

Counter practice
A counter practice can be considered as a way of working or thinking about a particular subject or sentiment that runs in opposition to (Johansson & Vinthagen, 2019) to the most common way of approaching this subject or sentiment.

Degrowth
Sekulova et al. have defined degrowth as a "a collective and deliberative process aimed at the equitable downscaling of the overall capacity to produce and consume and of the role of markets and commercial exchanges as a central organizing principle of human lives" (2013).

Dispersed Territory
Dispersed territories or dispersed urbanization are hybrid spaces with both rural and urban fragments and spaces. Within the European context these spaces have emerged especially since the second half of the 20th century when cities started spreading and the growing population increasingly opted to move out of the inner city and inhabit these hybrid areas (Wandl, 2020).

Ecosystem Services
Ecosystem services describe the benefits that various functions of ecosystems can provide for humankind (CBS, n.d.-a). They can be broken down into three groups: provisioning services (providing a product to humanity, such as food or water), regulating services (climate mitigation and adaptation services, such as carbon storage, air purification etc.) and cultural services (human activities in and around nature, such as recreation and tourism).

Forest Urbanism
There is no clear-cut definition of forest urbanism (Wambecq, 2019). It is an emerging field within landscape architecture and urbanism, that understands the forest and the city as fundamentally interdependent and intertwined entities both in respect to their historical development, as well as design projections regarding their future.

Heuvellandsschap
Landscape typology found in Southern Limburg in the Netherlands characterized by wide plateaus, relatively steep slopes, and narrow stream valleys.

Landscape Infrastructure
Landscape infrastructure views landscape space and processes as a type of infrastructure (Strang, 1996) that facilitates aesthetic, functional, social, and ecological relationships between natural, cultural, and human systems. With that it redefines infrastructure beyond a strict utilitarian function, while at the same time allowing "landscape design to gain operative force in territorial transformation processes (Section of Landscape Architecture, 2022). .

Spatial Planning
Spatial planning is very shortly put the planful regulation of land and space use (de Klerk & van der Wouden, 2021). It focusses on more abstract functional allocations as well as setting up policy documents that focus on spatiality, but also economic and social concerns (van der Wal, 2020). For this it draws on a variety of fields from politics and sociology to architecture and engineering. It can be differentiated from urban design which focusses more on designing form and liveability.

Urban forestry
Miller defines urban forestry as 'the art, science and technology of managing trees and forest resources in and around urban community ecosystems for the physiological, sociological, economic and aesthetic benefits trees provide society' (1997).

Urbanity
Anton Zijderveld describes urbanity as an urban mentality or culture which is made up of a certain economic and civic culture that subsists on diversity of inhabitants, backgrounds, ideas, and interests (Hermans, 2022).

Urbanization
Urbanization refers to the physical and built environment of the city, as well as the (historical) development thereof (Hermans, 2022).

Zwischenstadt
Term coined by Thomas Sieverts to describe dispersed territories specifically in the West-German context. Literally means "city in between"- a type of urbanization between landscape and city, which calls into attention the landscape and everyday qualities of this dispersed territory (Sieverts, 2000; Gheysen & Leemans, 2022).



Washing, June 13, 1974 by Mierle Laderman Ukeles, (Schwartz, ca. 2008)

Motivation and fascination

On mending broken things

I started this graduation project because I am sceptical. Sceptical of the techno-fixes we ascribe to fix the ever-worsening climate crisis. Sceptical of electric cars and hydrogen tanks. Sceptical of the widely internalised ethos of growth. Sceptical of ever ongoing urban expansion. Sceptical of one million new houses in the Netherlands. Sceptical of how we define ecological enhancement in cities. Sceptical of bird boxes and insect hotels. But most of all I am sceptical of my role as a landscape architect in all of this. And so, I wonder, what are other stories, alternative narratives that we can tell of our cities and our landscapes?

An average tree in a Dutch city is 40 years old – even though especially climax species can grow hundreds of years old. It is policy in the Netherlands to redo public spaces and streets every 30 years and with that fell the trees that stood there. New trees, fresh from the nursery and around 10 years old, are planted in place of the old ones and the cycle starts anew. A small story that speaks of a larger problem. Even though “we are damned to repair” (Hertweck et al., 2022), since we live in a world that is constantly decaying, aging, and falling apart, we seem to have forgotten how to repair. What it means. What it affords us, but also what it denies us.

I am fascinated by repair, by mending broken things.
How it leaves traces, shows how someone engaged with something, made it whole again, without erasing its crack.

As designers too we tend to create these images of glossy new worlds, in which everything is always supposedly better and better than the old one, in which problems are just opportunities. For me it becomes increasingly difficult to indulge in this fantasy. Anthropogenic destruction is not something temporary, it is here to stay -potentially ever worsening. Due to this I believe it is important to learn and live with the broken, the imperfect, the decaying, and the mundane. Not out of defeat, but out of the belief that we need a counter-narrative and practice to that of constant growth and renewal, to that of a perfect world. A narrative that does not resolve to doing nothing, but that acknowledges that the crisis we have brought over ourselves is permanent and our only option is trying not to worsen it.

As such for me repair becomes a practice that does not aim to erase the break, but continuously engages with it. Repair not as a singular act, but rather a process of continued maintenance and care that acknowledges the manifold ways in which we have impacted and destroyed the world around us. Repair as an impetus to live with what there is, rather than to create new things, to fix the ones that are broken.



Traditional Repair, Immaterial Injury by Kader Attia, (Attia, 2014)



Wheatfield - A confrontation by Agnes Denes, (Pau, n.d.)

Part A | Theory and methodology

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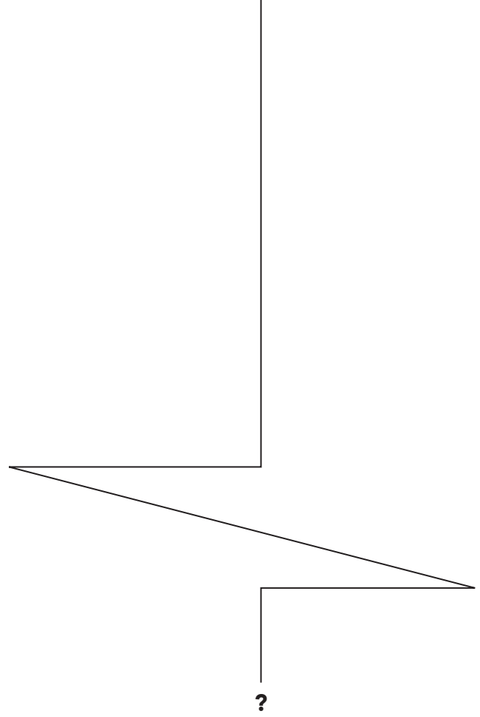
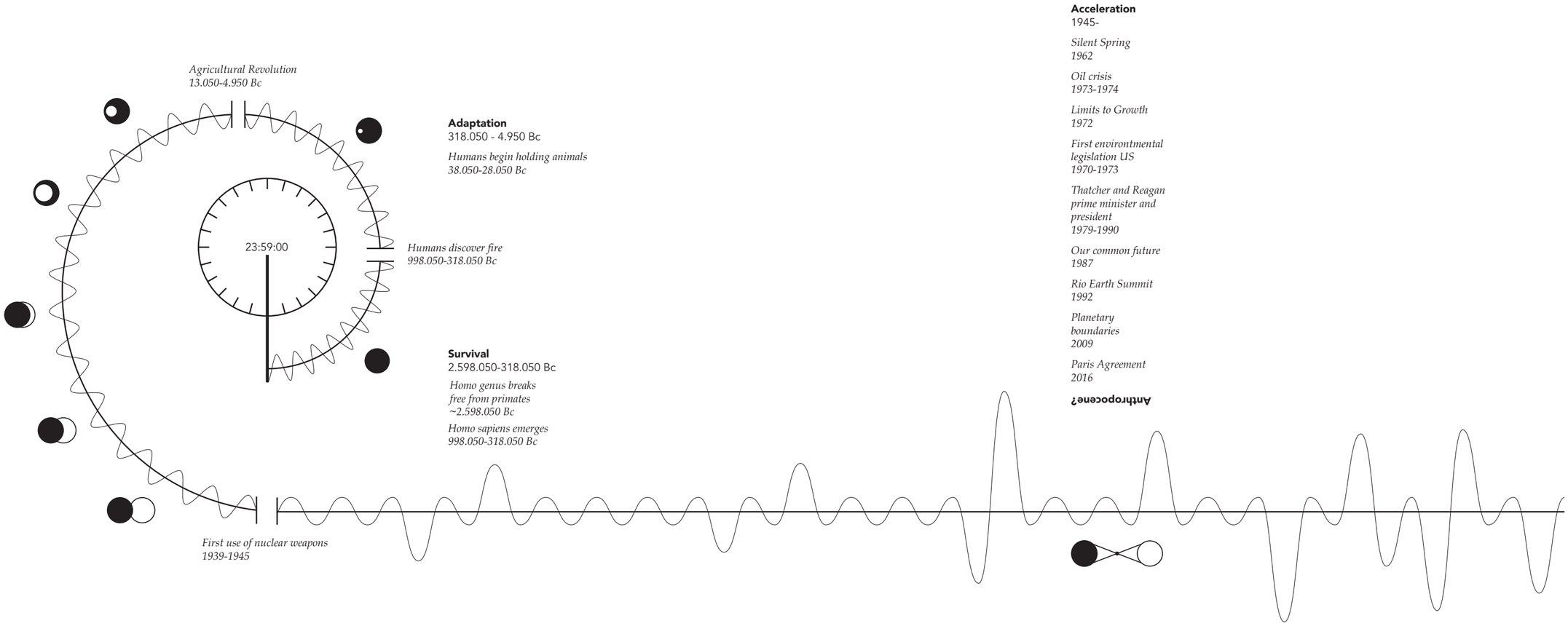




Keystone
4.950BC-1945

The first civilizations emerge and collapse
4.050 Bc -350

Start of Colonialism
1506-1610

Start of Industrial revolution
1763-1860

Man and nature
1864

Model T assembly line
1908-1929

Introduction of industrial agriculture
1926 -1939

Adaptation
318.050 - 4.950 Bc

Humans begin holding animals
38.050-28.050 Bc

Survival
2.598.050-318.050 Bc

Homo genus breaks free from primates
~2.598.050 Bc

Homo sapiens emerges
998.050-318.050 Bc

Acceleration
1945-

Silent Spring
1962

Oil crisis
1973-1974

Limits to Growth
1972

First environtmental legislation US
1970-1973

Thatcher and Reagan prime minister and president
1979-1990

Our common future
1987

Rio Earth Summit
1992

Planetary boundaries
2009

Paris Agreement
2016

Anthropocene?

Visualisation human-environment timeline with most important events and development of human nature relationship symbolized through circles (Created by author based on Larson & Harrington, 2018; Hamilton, 2017)

Part 1.0 | Prologue

Of humans and nature

Since the *Homo genus* developed our relationship with the world around us, the world we inhabit and are dependent on has changed fundamentally and irreversibly.

In their first prototype of a timeline depicting the "human-environment" relationship Larsen and Harrington decern four specific timespans or *durations* to describe the evolution of this relationship: *Survival, Adaptation, Keystone and Acceleration* (2021). During the first *duration* the *Homo genus* develops from our last primate ancestors, eventually leading to the emergence of *Homo sapiens* towards the end of the duration. This time is characterized by hunter-gatherer behaviours, as well as the use of crude tools and the discovery of fire.

The advent of "anatomically modern humans", with their ability to construct more complex tools as well as their increased mobility, marks the beginning of the *Adaptation duration*. During this time *Homo sapiens* leave Africa spreading over the world and furthermore begin to domesticate animals as well begin to develop agricultural skills. The end of this duration is marked by the Agricultural Revolution.

Humans now have a greater impact on their environment and become a so-called keystone species. Describing this *duration* Larson and Harrington focus on Eurocentric societal and environmental development. They subdivide the *keystone duration* into three *scenes*. The first one coined *Civilization* is characterized by various environmental changes such as erosion due to agriculture, as well as anthropogenic changes to ecosystem and atmospheric composition. It is furthermore marked by evolution of nation-states, more advanced agricultural techniques as well as the rise and fall of (the first) civilizations. Towards the end of the scene mobility increases once more, cumulating in the European lead colonization of the world. The increased trading of goods, plants, and animals, but also humans and diseases lead to global changes in the human-environment relationship. The following scene, the *Global map scene*, is defined by European efforts to map the whole globe, a growing importance of distinguishing between private and collective property, as well advances of science. This *scene* ends with the Industrial Revolution. During the following *scene*, *Wealth of Nations*, capitalist ideas of production and consumption, as well as the exploitation of nature for profit, become prevalent. Industrial infrastructures use up increasing amounts of natural resources and alter the landscape. Agriculture becomes furthermore industrialized and a Fordist economic order takes hold in Europe and North America towards the end of the *scene*. At the same time first ideas nature conservation begin to develop. The end of the *Wealth of Nations scene* is marked by the first nuclear detonations permanently altering the geologic makeup of this planet.

During the *Acceleration duration* the anthropogenic influence on the environment drastically increases. Anthropogenic climate change and sea level rise are measured and experienced. Technology and information systems develop at a rapid speed. In the first two *scenes* of this *duration* environmental consciousness increases, first environmental laws are passed in the United States and environmental organizations form. At the same global trade and demand for fossil fuel increase. The OPEC embargo brings environmental governance to a halt and ushers in the *Overshoot scene*. While there is a growing realization that the earth cannot support humanities need for resources and its ecological footprint, fossil fuel dependence leads to economic deregulation and further environmental exploitation. Following the *Overshoot scene* is the *Sustainable Development Scene*. Ideas of global sustainable development and environmental governance gain importance and lead to first international talks. The concept of Ecosystem Services lead to recognition of the economic and non-economic benefits of natural systems and the potential economic risks of anthropogenic environmental destruction, which develops into the concept of Green Capitalism. In a last *scene* the "long crisis" that is evoked through anthropogenic environmental destruction is more commonly recognized and quantified through ideas such as planetary boundaries and the "sixth mass extinction".

While Harrington and Larsen describe the ever-increasing human impact on this planet with words such as "keystone species" and "acceleration", an alternative categorization has gained prevalence since the turn of the 21st century: a proposition to introduce a new geological epoch named after humankind – the Anthropocene (Zalasiewicz et al., 2010, Hamilton, 2017). The power that humans hold over this exceeds that over the environment, it has become geological and humans capable of altering the deep history of this planet (Hamilton, 2017).

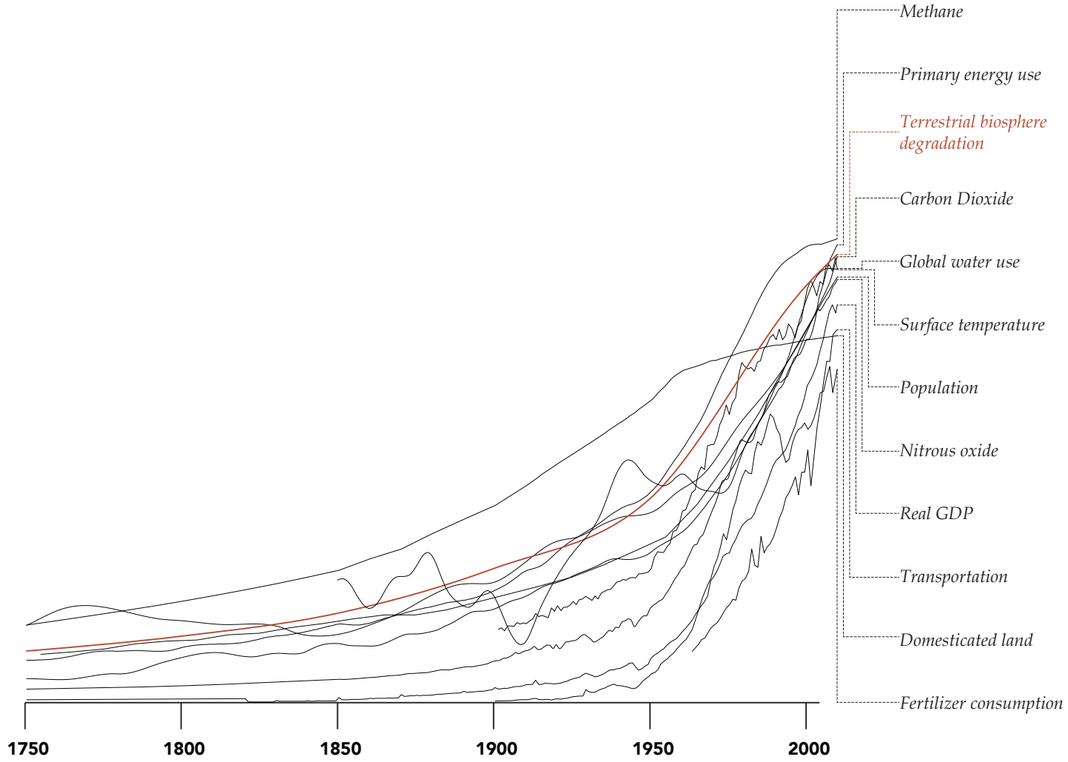


Diagram of selected causes and effets of the Great Acceleration
(adapted by author based on data by Broadgate et al., 2014)

Part 1.1 | Frame

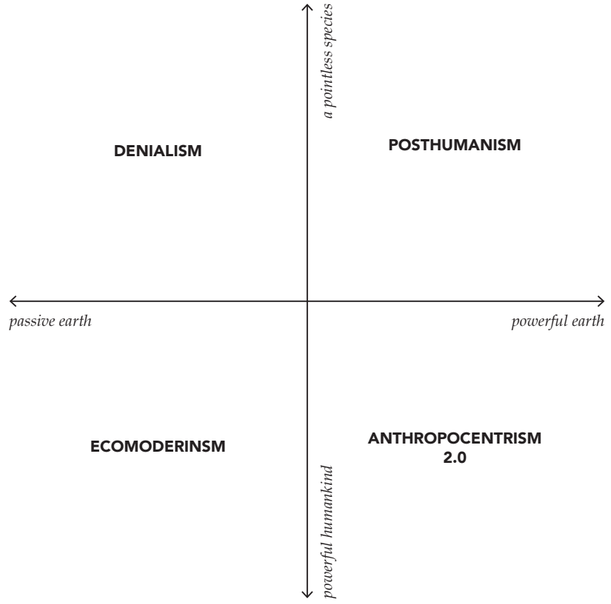
A recent rupture

Over the course of our existence as humans, first *homo*, then *homo sapiens*, our relationship to what surrounds us, our environment has completely shifted (Larson & Harrington, 2018). Since the beginning of the Industrial Revolution, and especially since the end of the end of the Second World War and the start of the Great Acceleration so much so that two scientist, Paul Crutzen and Eugene Stoermer, proposed a new geological epoch named after humankind in the year 2000. They felt it was necessary in order to emphasize human impact "on all scales" and "the central role of mankind in geology and ecology"(Crutzen & Stoermer, 2000). While the great impact of humans on their surroundings had been recognized earlier, observation were generally limited to the scale of landscape or an ecosystem. (Sijmons, 2020) What makes the proposition of Crutzen and Stoermer unique is that speaks of a disruption of the entire *Earth System*. The notion of the Anthropocene thus entails three changes to how we conceive of our relationship with our environment:

Firstly, our impact on this planet has evolved from disturbance to disruption or rupture, due to the fact that we recognize we not only change ecosystems or even the (global) climate, but the entirety of the so-called *Earth System*. A measurable observation that comes forth out of the field of the *Earth system science*, an integrated and transdisciplinary discipline that brings together earth sciences, life sciences and the "industrial metabolism " to conceive of this planet as a "unified, complex, evolving system beyond the sums of its parts" (Hamilton, 2017).

Secondly, these changes humankind is causing to the *Earth System*, to biodiversity, climate, landcover, geochemical cycles among others, are not of a temporary nature. The ongoing large-scale mobilization of carbon dioxide, ocean acidification or the destabilization of the Greenland ice sheet, for example, are processes that could only be potentially reversed over tens of thousands of years (Hamilton, 2017). Humankind has thus become a *geological power* capable of altering *deep time*. Our human history has converged with the history of this planet.

Lastly, this means "the fate of one determines the fate of the other" (Syvitski, 2012). While we may hold unprecedented amounts of power over this planet, we are less and less able to control it. Gaia is enraged and fighting back. As Hamilton puts it: "Humans are more powerful; nature is more powerful." (Hamilton, 2017). We might have more agency than ever, but this agency cannot be separated from "its embeddedness in the processes of nature" (Hamilton, 2017). Humankind is not separate from nature, but deeply embedded and dependent on it.



Four reactions to the Anthropocene based on work of Dirk Sijmons and Clive Hamilton (adapted by author based on Sijmons, 2020)

Contesting narratives

The notion of the Anthropocene as presented here is however not uncontested and does not elicit a unitary response within (scientific) discourse. It has evoked countless discussion both concerned with the proposed start of this epoch, as well as its legitimacy of its name (Zalasiewicz et al., 2010, Hamilton, 2017). Some date it back to the migration out of Africa and with that the beginning of the extinction of large vertebrates and predators (Sijmons, 2020). Others argue the Anthropocene started when humans became sedentary and started practicing agriculture. Crutzen and Stoermer propose the beginning of the Industrial Revolution (2000), others prefer the start of the Great Acceleration and the deployment of nuclear weapons at the end of the Second World War. On the other hand, the name Anthropocene – the age of humankind- has been challenged by post humanist thinkers as it not only homogenizes all humans and negates unequal distributions of power and guilt, but also portrays the human as a singular actor (Tsing et al., 2019; Haraway, 2016; Sijmons, 2022). Haraway, for example, suggests Capitalocene to highlight the stake of first mercantilism and colonialism and later capitalism in transforming the planet, our relation to it, as well as our relation to each other (2016). In addition to this she also proposes the term Chthulucene to highlight the connectedness of humans with all other beings and the planet, as well as the equal agency distribution among all beings and things on this planet. This post humanist notion of the world presents a point of opposition to Hamilton's notion of the Anthropocene, which he calls Anthropocentrism 2.0. In his book *Defiant earth*, he distinguishes in total between four reactions to the Anthropocene divided on a scale of powerful/powerless planet vs powerful/powerless humankind (see figure).

Denialists reject the notion of a climate crisis, let alone the Anthropocene, as alarmist (Sijmons, 2020). They present it as a push from leftists' elites or even a communist conspiracy to end the (Western) way of life and bring civilization to a grinding halt. While this worldview has gained traction trough (alt) right politicians and the media, Sijmons urges us to recognize the denier in all of us that does not want to give up its privileges and thus might help strengthen this movement. Considering the ever-worsening effects of the climate crisis, it becomes harder to justify this stance, which might be born out of angst or oblivion.

Hamilton on the hand describes Ecomodernism as the most articulate representation of the "dominant economic-political system" (Hamilton, 2017). In this worldview the planet is a makeable and shape-able entity that can be engineered back to health without any meaningful change to the (capitalist) system. In this worldview the Anthropocene is not

just a challenge to overcome, but an opportunity to prove our ingenuity and mastery over this planet. However, there is growing understanding or belief that this not sufficient as it does not address the root causes of planetary problems. Sijmons postulates that ecomodernism is an attempt to solve the problems with the same mechanisms that caused the problems in the first places (2022), while Hamilton highlights the "no-analogue state" of the Anthropocene that disputes the idea of a "good Anthropocene" made by ecomodernists based on the earth in the Holocene (2017).

He positions Posthumanism and Anthropocentrism 2.0 as alternative world views to this. Posthumanism, to which Donna Haraway and her idea of the Capitalocene or Chthulucene belong to, hails from the world of social sciences and is a critique of the division between nature and society, to which post-humanists attribute the destruction of nature and the colonial ambitions of countries of the global North (Hamilton, 2017; Hornborg, 2017). It centres around notions of equal distribution of agency among all living things that aim to reformulate the human-nature/other than human relationship. Humans are not unique or different from other beings or things in this worldview. They also do not act alone or independently, as agency or action is always spread in a network of "actants" (Hamilton, 2017; Benett, 2009; Latour, 2007).

While Hamilton acknowledges the dependence and connection of humans with the world around us, he refutes the social and historical explanations of the Anthropocene undertaken by post-humanists, as well as their claim that humankind is "just another species". In his reaction to the Anthropocene – Anthropocentrism 2.0 – humans are the dominant species on this planet, they have caused the Anthropocene rupture. However, in opposition to teleological anthropocentrism, this is not a self-declaration that grants humans a special place and moral dominion over nature. It is an acknowledgement of the actual power humans now hold over this planet, which brings with it the unique responsibility, even obligation to protect the earth. It is also an "anti-humanist anthropocentrism" as it places the power not only in the hand of humans, but equally in the hands of this planet. Within his understanding of the Anthropocene, we must accept the facts of the Earth System Science – there is no going back to the Holocene. We must work in and with this new complex situation to (hopefully) still avoid the worst.

To care

According to Hamilton, what makes humans unique is not so much our power, as it is our responsibility for this planet. For him both freedom and responsibility are woven into nature. Through forming an independent relationship with the planet humankind has gathered unprecedented agency humankind and with that acquired a certain amount of freedom. However, as we now begin to realize, this freedom is always restricted by and tethered to the forces of nature. Our freedom is rooted in the realm of necessity and as such brings responsibility with itself. A responsibility to care for this planet. We might have the freedom to decide if we want to accept this responsibility if we choose to care or to neglect. But we can only continue to exercise freedom, by accepting responsibility. Accordingly, Hamilton postulates that we should not judge our actions on a scale of good to bad, as this is always intersubjective and descriptive of a relationship between humans, but on a scale of care to neglect. As such the notion and doing of care becomes a fundamental factor of our relationship with our environment and our reaction to the Anthropocene.

The "practices and principles" of care have been explored critically within academic, political, and societal discourse since the 1970s (Fitz et al., 2019; Puig de La Bellacasa, 2017). While regarded as feminized work, care became an important political talking point with the dismantling of the welfare state in the last 1970s and the end of state socialism in the Eastern Bloc in the 1980s (Fitz et al., 2019). The newly introduced austerity measures as well as the decrease in welfare provisions lead to an examination of care in the fields of health, education, culture, and housing. Care, including the "rhetoric of self-care", also became an important topic within neoliberalism with the provision of care being directly linked to inequality, debt, and exploitation. Today various social and ecological movements have raised awareness for care concerns, which highlight the connection between social and environmental justice.

An ethics of care furthermore gained traction in the mid 1980's through the work of Carol Gilligan (Burton & Dunn, 2013; Norlock, 2019). Her normative ethical theory of care is a feminist philosophical perspective that provides a counter point to principle based ethical theories, such as Kantian deontology, utilitarianism, and justice theory (Norlock, 2019). Rather than applying absolute and abstract principles to determine moral actions, an ethics of care focusses on a relational and context dependent approach towards morally driven decision making and action. In her landmark work "In a Different Voice" Gilligan details here observation that girls and women tend to subscribe to a "morality of responsibility" that values intimacy, responsibility, relationships and caring

Care is a
"vital affective state,
an ethical obligation
and a practical labour."
María Puig de la Bellacasa (2012)

for others, as opposed to the more masculine coded "morality of rights" that values of autonomy, rights, and independence. These empirical results gathered by Gilligan were then applied differently by various philosophers. Nel Noddings argues for a partiality as morally favourable and justifies prioritizing interpersonal relationships over distant ones. Virginia Held and Joan Tronto on the other hand widen the care perspective to include social and political dimensions and argue that an ethics of care enables the realization of better societies. Held, Sara Ruddrick and Eva Feder Kittay furthermore highlight the vulnerability of children and other dependents and the perspectives of mothers to correct neglect both within politics and ethical decision making. In the 21st century care-work and caring relationships within the workplace have furthermore received more attention within the discussion around ethics of care.

However, as María Puig de la Bellacasa points out "the ethics of care" occupy but a small part of a larger (academic) discussion around care, which has grown in the last century in various fields (2017). Care been discussed in many other domains that span politics, civil society, productive and reproductive economic issues, ecological efforts, knowledge and scientific work, human nature relationships, among others. For Joan Tronto and María Puig de la Bellacasa care supersedes interpersonal and interhuman relationships and comes to signify an engagement and commitment to the larger world around us. As such it can be understood in direct connection to Hamilton's call to care as the central objective in the Anthropocene.

For Tronto and Puig de la Bellacasa care emerges as a necessary, profound, but also specific engagement with the world around us (Puig de la Bellacasa, 2012, 2017; Tronto, 2019; van Dooren, 2014). It is an engagement, because care at its core is about forming relations, about recognising the interdependency that we rely and subsist on, which mirrors the way in which Post-Humanism and Anthropocentrism 2.0 understand the world. Care is thus an "affective state", it always starts with being emotionally and intellectually affected by someone or something else (Puig de la Bellacasa, 2012; van Dooren, 2014).

Through its recognition of interdependence care on the other hand becomes necessary, a "non-normative obligation". Puig de la Bellacasa describes care as "concomitant to life- not something forced upon living beings by a moral order" (2012). Care is however also a profound engagement with our environment as it "obliges in that for life to be liveable it needs being fostered "(2012). While care can somehow not be avoided, Puig de la Bellacasa highlights the importance of promoting "sustainable and flourishing relations, not merely survivalist or instrumental ones" (2012). Joan Tronto asserts that there is always a standard and quality to care (2019). Her and Bernice Fisher define care accordingly: "a species activity that includes everything we do to maintain, continue, and repair our 'world' so that we can live in it as well as possible. That world includes our bodies, ourselves, and our environment, all of which we seek to interweave in a complex, life-sustaining web" (1990). While care might not be a normative obligation, it is certainly an ethical on.

Care lastly is always a specific doing, "a practical labour" (Puig de la Bellacasa, 2012; Tronto, 2019). It might have the general aim to bring together all its pieces in ta "complex, life-sustaining web" (Tronto & Fisher, 1990), it is however never an abstract relationship or a generic doing. It is always a concrete and embodied relationship that requires action. It consists of sets of different activities nestled into one another - practical acts of giving, but also receiving care (Tronto, 2019).

However, this also highlights the troubles of care. This labour needed for care is often linked with exploitation and domination. Care is not straightforward, as Puig de la Bellacasa puts it: "interdependency is not a contract, but a condition." Caring and being cared for does not necessarily create a smooth and peaceful world, to care means to "engage with the inescapable troubles of interdependent existences" (Puig de la Bellacasa, 2012). Lastly, caring is also excluding. As an "affective state" it focuses attention on some, takes it away from others (Puig de la Bellacasa, 2012). As such it also is highly political (Tronto, 2019). What we choose to care about, determines what kind of society we are. others (Puig de la Bellacasa, 2012). As such it also is highly political (Tronto, 2019). What we choose to care about, determines what kind of society we are.

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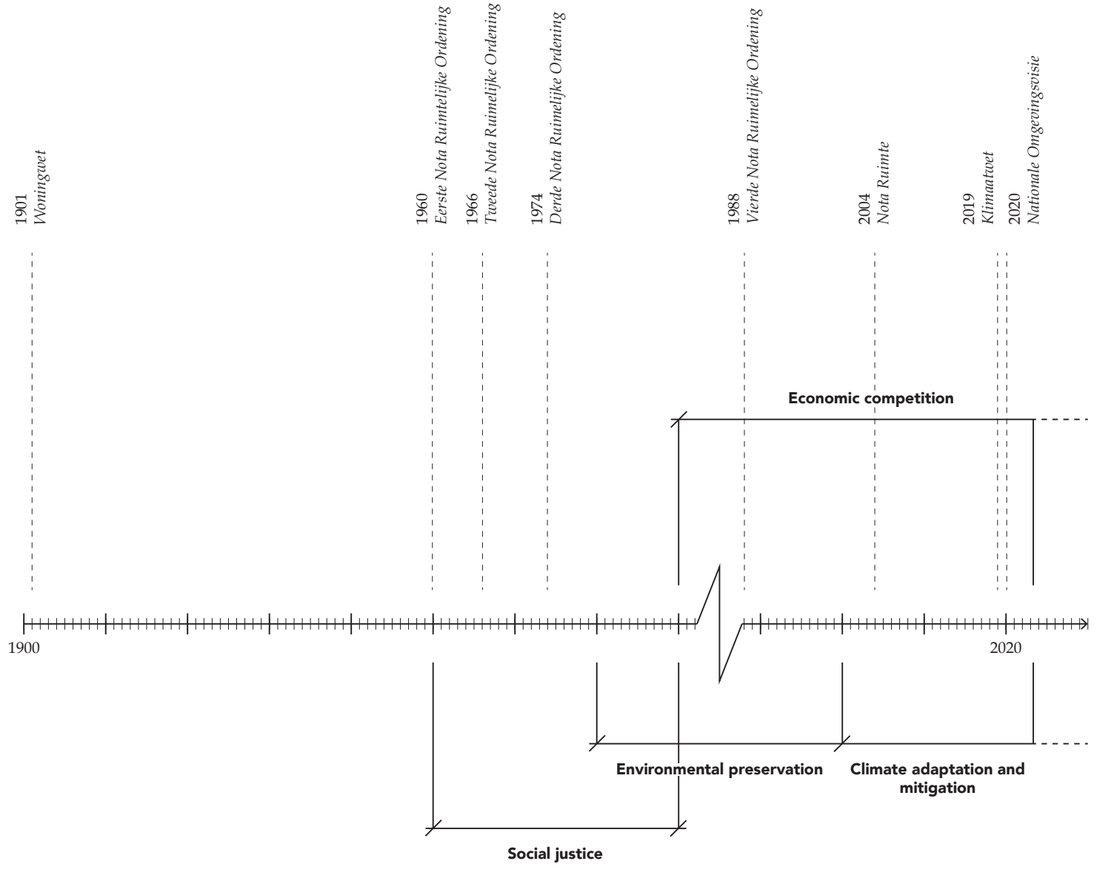


Focal points and caring concerns within Dutch spatial planning throughout the 20th and 21st century (created by author based on de Klerk & van der Wouden, 2021)

Care within Dutch spatial planning

As decisions and practices on all scale levels of spatial planning are always a reflection of social practices and with that cultural norms and values (de Klerk & van der Wouden, 2021), spatial design policies and practices always arise out of someone caring for someone or something. Here however a distinction needs to be made between caring for something and enabling caring worlds. As Joan Tronto formulates it care "requires participating in the ongoing relations of those who are cared for" (2019), as such spatial planning does not directly care for society, but rather facilitates caring worlds through providing a restricting or enabling administrative framework, as well as redirecting labour to areas in need of care.

On this higher scale and abstraction level questions of responsibility and liveability, of care for people and the environment, have been important drivers for policy making that crystallized clearly at various moments in history. In general, spatial planning in the Netherlands, which is very shortly put the planful regulation of land and space use (de Klerk & van der Wouden, 2021), was historically mostly concerned with trying to find consensus and compromise between the demands of private enterprises and individuals and collective values regarding the use of space (de Klerk & van der Wouden, 2021). The first law pertaining to spatial planning for example – the Woningswet in 1901- was meant to protect citizens from precarious housing and living conditions that become common place in the crowded cities of the industrial revolution. Especially in the period between 1950 and 1980 spatial planning hinged around social justice concerns, which manifested in various policies, for example subsidies for social housing and the introduction of "growth centres" (groeikernen). Throughout the whole second half of the 20th century concerns related to limiting urban land use have furthermore been present in spatial planning with concepts such as concentration, growth centres and compact cities.

Since the late 1980s environmental concerns are becoming ever more present and pressing in discourse and law making. The Brundtland-report (1987) instigated a more public discussion about human-induced climate change. Throughout the 1990s it became clear that a long-term transition of the economy was needed. Throughout the 2000s and 2010s various climate policies were ratified that focussed on sustainable development of the energy sector and the overall economy and complimented the environmental laws first instigated in the 1970s and 1980s to regulate pollution. Recently the Climate accord (Klimaatakoord) and the Climate law (Klimaatwet, both 2019) were passed making reduction goals for greenhouse gases legally binding. In 2020 a new planning instrument, the NOVI (National environmental vision, Nationale

Omgevingsvisie) was introduced. Here environmental policy gets the same prioritization as the classical domains of spatial planning with the planning tool centring around the topics of climate and energy adaptation, sustainable economic growth, sustainable urbanization, and healthy rural areas, including sustainable and nature inclusive farming. The reintroduction of the Dutch ministry for spatial planning furthermore is a sign that collective concerns in spatial planning are becoming important again.

However, this caring attitude in policy making often does not translate into practice. A lot of the policies and projects instigated between the 1950s and 1980s to promote liveable neighbourhoods and social justice failed because they hinged on the belief that spatial planning could actively shape the behaviour of citizens. Despite the ever-increasing urgency to combat the climate crisis the Netherlands will fall short of the goals set out in the Climate accord if it remains on its current trajectory (de Klerk & van der Wouden, 2021).

Furthermore, these developments stand opposite of a focal point of spatial planning since the 1980s: facilitating economic growth (de Klerk & van der Wouden, 2021; van der Wal, 2020). With the onset of neoliberalism, it was believed that spatial planning was hindering economic growth and competitiveness (de Klerk & van der Wouden, 2021; Oelsen, 2014). This led to decentralization and deregulation of spatial planning and a project focussed approach, placing more power in the hands of private parties. While the first three notes on spatial planning focussed on equality among regions ("spreidingsbeleid"), the "Vierde Nota Ruimtelijke Ordening" (the fourth note on spatial planning) shifted focus towards enabling competition among regions ("regio's op eigen kracht"). The global economic position of the Netherlands became a central concern of the note. The aim was to strengthen the position of the Netherlands as a distribution centre through appointing two mainports (Schiphol, harbour of Rotterdam). Due to deregulation, this centralized spatial planning approach was halted in the Netherlands after the fourth note on spatial planning. The project focussed approach, as well as the focus on economic growth however remain central concerns within spatial planning. "Green growth" remains a fundamental mission of the NOVI (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2020). While strengthening the economy, also embodies care for something or someone, it is not a caring policy, as the means accumulated through production need to be transformed in caring acts or policies (Tronto, 2019). Care discourse within spatial planning furthermore argues that the processes and products associated with a neoliberal market economy are counterproductive to creating "liveable worlds" (Tronto, 2019; Fritz et al., 2019). As such care thinking within spatial designs centres its efforts on alternative values and strategies.

Caring as a counter practice

Understanding care not only as a necessity for survival, but also an ethically motivated doing at the heart of creating liveable worlds has far reaching consequences for all disciplines concerned with the built environment. Even more so, if care is deployed as a "critical concept" it requires a complete repositioning of the built environment (Tronto, 2019). Designing with care urges us to reconsider the primacy of production and economic development within the built environment. As Joan Tronto writes: "western thought has done a good job of thinking about production as the centre of human life and of pushing the dimensions of care to the side lines" (2019), while Fritz, Krasny and Wien write that working with care means challenging the "developer-driven and capital-centric urbanism of today" (2019). This on one hand means reflecting on current power dynamics and the other hand to promote and imagine new and different modes of working, building, and maintaining.

For Joan Tronto, a caring design practice starts with understanding architecture (and urbanism etc.) as a "reflection of power" (2019). She argues that developments in the built environment often require enormous amounts of material and human resources and with that they not only mostly serve the most powerful, who have access to these resources, but are also employed to exercise control over those affected by the buildings, infrastructures etc. This furthermore means that those designers get rewarded that reproduce the values of capitalism in their work. According to Tronto this has created a culture, in which designers are not "uncaring," but are "caring wrongly". They care about "things" and those that finance and commission those things. However, a caring design practice, does not start from the object, but rather from "responsibilities to care (…) for all who are engaged in contact through this thing." Care thus urges us to re-examine who truly benefits from our plans, proposals, and projects. What they afford, but also what they demand, what they create, but also what they destroy. To Tronto and Fitz et al. a caring design practice accordingly centres around promoting "liveability" on an interdependent planet and "is sensitive to the values of repair, of preservation, of maintaining all forms of life and the planet itself" (2019).

This means a caring spatial planning practice would need to start with a shift in focal point away from a focus on economic development and the growth paradigm (van der Wal, 2020). It would require a recentring towards collective needs and values, which do not only include humans, but also our environment and its flora and fauna. Special attention would be given to those "neglected things" (Puig de la Bellacasa, 2107) and silenced concerns that were excluded from discourses around spatial planning

previously. This would mean to critically question to whose benefit we implement policies, especially social and ecological ones and which blind spots arise through this. It is out of the scope of this thesis, and the field of landscape architecture, to discuss this comprehensively. I however want to raise attention to two exemplary issues.

While the NOVI exemplifies that there is a growing concern for biodiversity issues not only in protected nature areas, but also within agriculture and the city (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2020), thinking with care would require to question the human centeredness of these policies (Jon, 2020; Houston et al., 2018). Are other than humans implemented as an afterthought? Are we meeting their concerns only based on our needs? What happens to the feral and "unruly" entities in spatial planning? How can we implement thriving ecosystems comprehensively into cities and agricultural areas?

While the goal is to transition to a circular economy and within policy today there is already attention given to the prevention of externalising negative effects of spatial development within the Netherlands (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2020), starting from care would means to question how these policies unfold in a globalized world. Who do we continue harm with our economic practices and focal point on growth?

Could we prevent of internalise negative effects that we do not cause directly? What role could local production and the bioregion play as a starting point of these deliberations? How does a transition towards a circular economy affect human stakeholders outside of the Netherlands and non-human stakeholders and resource extraction in general? What if we did not start this deliberation from the basis of needing a certain number of resources, such as "green" energy, but rather from questioning how much resources we need. To think in limits not just in terms of pollution or emissions could reconfigure for whom we can care.

These would require complex political and economic changes and as discussed before, just because policy embraces a certain direction of caring, does not mean it is translated into practice as such. However, as Fitz an Kansy demonstrate a caring design practice is not only dependent on large scale structural changes, but it can also be implemented in the now by operating within the realm of "alternative" or "non capitalist" economies (2019). Designers can make an impactful contribution to a caring world, but showing how thinks could be. Designing with care thus also means promoting and imagining a new cultural narrative that illustrates what liveability within the realm of care means, which shows responsibility not as a burden, but also a benefit. What it affords us, but also what it demands from us. Within Dutch spatial planning the idea of liveability is currently narrowly tied up with economic success (de Klerk & van der Wouden, 2021). Liveability is ensured through the provisioning of services, such as schools, care facilities and shops, which are in turn dependent on the economic development of a region. While of course certain services are indispensable, care can widen the definition of what makes a place liveable and how these necessary services are provided. For this thinking ecological and social issues together becomes a driver of change. In their book Critical Care: Architecture and Urbanism for a broken planet Fitz et al. highlight twenty-four specific case studies that display what redefining liveability could mean and how it always starts with thinking economy, ecology, and labour together (2019). Often rooted in local initiatives and subsisting on situated knowledge, the projects (in the European context) demonstrate how, for example, "eco-civic-hubs" can help close ecological cycles on the level of neighbourhood (R-Urban, France), how small scale, flexible design interventions can create more pedestrian friendly neighbourhoods with space for collective and green infrastructure (Superblock Model, Barcelona) or how reviving traditional water systems can promote food self sufficiency and develop public space (Recovery of the irrigation system at the thermal orchards, Caldes de Montbui). Landscape architectural practices, as well as environmental or ecological challenges become important drivers for change in most of these projects.

Born out of continuous processes of maintenance and intervention attuned to local conditions; mediating between society and ecology, human and other than human; landscape architecture is indeed a practice sensitive to the values of repair, of preservation and maintenance. It is however important to nurture these values, to create "robust, resilient and just spaces and ecologies" (Ivers, 2021). Landscape architects are not exempt from reflecting the structures of power they are part of for whom they design and for whom they could design. Hereafter three overarching starting points or domains are defined that make care more explicit in landscape architecture. They deal with larger societal or spatial planning questions related to care, they can however also be understood as design concepts or starting points for localized initiatives, which of course always must be primarily formulated out of site-specific conditions and situated knowledge (as care thinking is generally (Tronto, 2019; Puig de la Bellacasa, 2017)). These domains address questions of repair and preservation, as well as liveability in the time of the Anthropocene. Through them landscape architecture emerges as a practice that can provide alternatives to classic (urban) development processes and with that impacts every layer of the landscape-natural, cultural, urban.

Repair

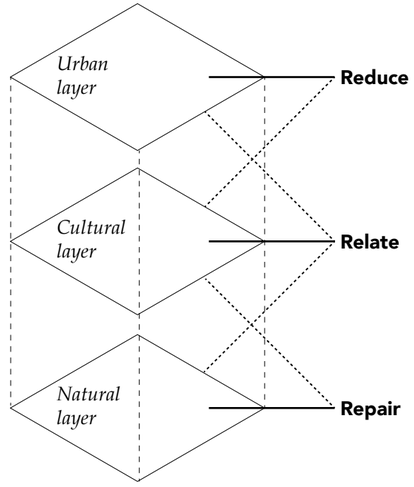
Repair is a central value of caring. Within landscape architecture this mostly relates to reversing environmental and ecological damage and as such to processes in the natural and cultural layer. Thinking with care means, that rather than engineering the planet back to health, humans need to take an active lead in repairing the ecosystem they have damaged (Sijmons, 2020; Sijmons, 2022). By reversing anthropogenic modifications in the landscape and working with natural dynamics, certain anthropogenic pressures on biosphere and atmosphere can be lessened and mitigated: reforestation can lessen floods and promote carbon sequestration for example (Pearlmutter et al., 2018, p. 3-5). Healthy ecosystems with natural succession are furthermore detrimental for biodiversity, even more so biodiversity promotes the working of "ecosystem services" (Pearlmutter et al., 2018, p. 67-78). This is not small task. To fulfil European nature and biodiversity measures the Netherlands needs to find 150.000 hectares of ground to transform protected natural areas or nature inclusive agriculture (de Klerk & van der Wouden, 2021). Other studies even speak of 270.000 to 380.000 hectares till 2050. Landscape architecture can take a leading role in caring for these ecosystems through the design of maintenance and repair strategies that can furthermore be combined with other spatial uses.

Relate

Processes and practices of repair however do not happen in a vacuum. The Anthropocene has shown us not only our dominance, but also entanglement with our environment. Categorizations such as nature and culture cease to exist (Prominski, 2014; Sijmons, 2020). Specifically in relation to landscape architecture Prominski introduces the concept of "Andscapes" (2014) that draws on and gives a more graspable translation of the two Japanese concepts of fudo and seibutsu no sekei. Both emphasize unitary perspectives on the human-nature relationship. Perspectives in which individual distinctions are not eradicated, but their differences are not as important as their connections. Natural and cultural elements are all situated in a "intricate web of elements in dynamic relationships" and landscape architects should strive to work with these complex relationships through synthetic and integrative designs, in which other than humans benefit from human care and vice versa. Relating however is not only an answer to a philosophical categorization of the Anthropocene and care, but also necessary and pragmatic. As anthropogenic land use takes up more and more of the globe, it becomes increasingly important to wholistically include landscape spaces and natural processes into design assignments and everyday practices. The city must become an integral part of the (healthy) landscape and care for landscape an "ordinary" activity.

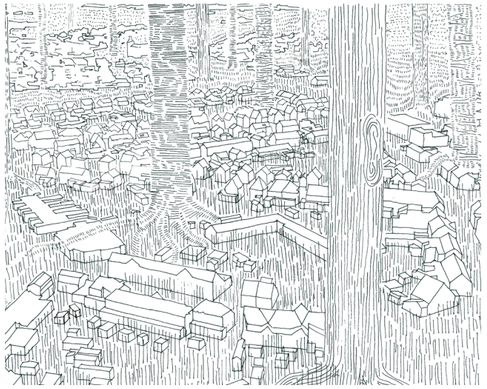
Reduce

While relating already introduces a redefinition of liveability through synthetic and reciprocal designs from which both humans and other than humans' benefit, landscape architecture can also help to reconfigure other questions of (urban) liveability within the Anthropocene. To acknowledge human dominance and responsibility, urges us to limit anthropogenic pressures as much possible (Sijmons, 2022). It is becoming increasingly clear, that sustainability strategies around efficiency are not equipped in addressing the climate crisis (Sijmons, 2022). Degrowth scholars thus reject the ecomodernist narrative of the ability of the (capitalist) system to decouple anthropogenic destruction from market growth (Hickel & Kallis, 2019) and call for far-reaching change towards a system that embraces economic scaling back through narratives of sufficiency and autonomy (Savini, 2021). Landscape architecture cannot stimulate this degrowth it can however help develop and transform degrowing territories by providing alternatives to growth-centric urban development (Waldheim, 2022). Landscapes can absorb and retransform shrinkage and decay (Waldheim, 2016; Desimini, 2014), as often found in regions and municipalities of the Dutch periphery. They can provide spaces for "alternative economies" and decommercialized activities.



Relationship between conceptual starting points -repair, relate, reduce- and landscape layer approach

The Anthropocene challenges us to rethink the way in which care for and take care of the world we are part of. To acknowledge our entanglement with biotic and abiotic beings, but also our dominance over them and with that our responsibility for them. Regarding the landscapes around us this means repairing ecosystems we have damaged, strengthening our relationship and connection with our other than human environment and reducing our impact on it. We need to find new ways (and rediscover old ways) to be in and with the landscape around us.



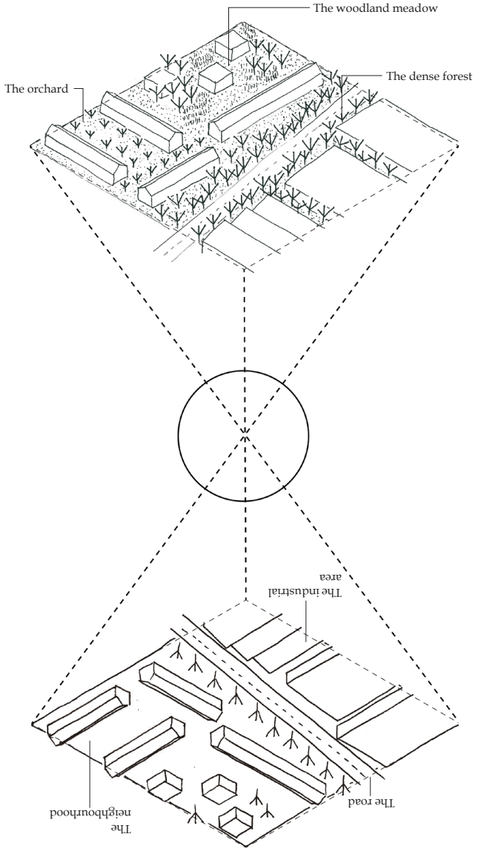
This graduation project is a speculative exploration of how the forest and forestry could be utilized to imagine a more caring relationship between human and landscape within the Zwischenstadt. For this the forest is meant to renegotiate the connection between urbanscape and landscape, human and landscape.

Part 1.2 | Intent

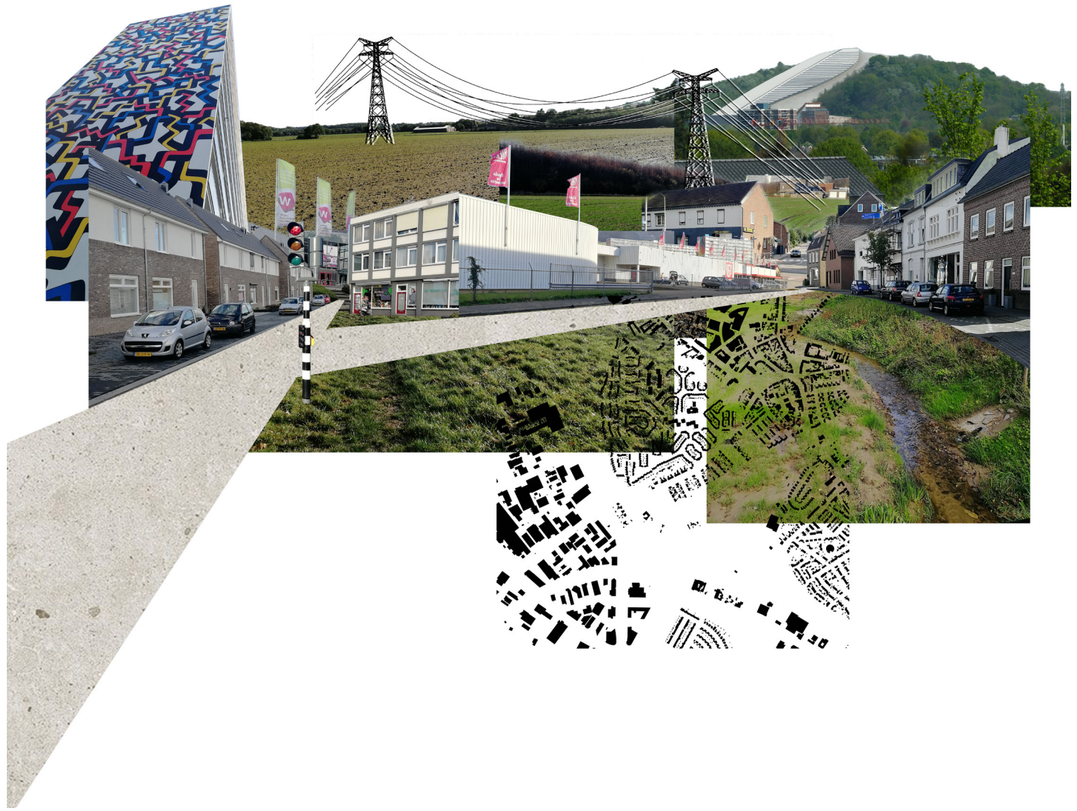
Exploring forestry as a caring practice in the Zwischenstadt

The aim of this graduation thesis is to apply the theoretical framework of care to a specific spatial scenario, that of the Zwischenstadt and to a specific type of landscape scenario, that of the forest. The intent is to explore the spatial, environmental, and ecological, as well as social and cultural consequences of reimagining an urbanized territory as a forest. The underlying impetus and motivation of caring for landscape and environment and caring about the forest, is made the primary spatial development objective and from there other dimensions of caring – caring about people, about the city, about cultural heritage, about ecology- are investigated through the domains of repair, relate, reduce. Rather than focussing on growing or shrinking housing demands, the number of business parks or schools, the road or public transport system, I seek to understand what the forest can afford an urbanized territory, but also demand from it.

For this a specific Zwischenstadt territory is chosen: Parkstad located in Southern Limburg. Hereafter this choice, as well as the choice for forestry are further explained and justified.



Design starting point - viewing the territory through the forest
Design aim- redesigning the territory as a forest



Collage of the urbanization and urbanity of the regiopolis Parkstad

Why Zwischenstadt?

This section will introduce the urban figure of the Zwischenstadt, as well as argue for it suitability in relation to a landscape and care-based approach. Dispersed territories come in many forms and with many names: Tapijtmetropool, Horizontal metropolis, Città Diffusa, Zwischenstadt etc. (Wandl, 2020; Gheysen, 2020; Hermans, 2022). And while they all speak to varying and location specific spatial and cultural processes, they all come to signify a process at the core of urbanization in the 20th century: the interweaving or rural and urban. Cedric Price conceptualizes this development as the third step in the urban development of Europe (Gheysen, 2020). The ancient and medieval city with its fortified walls (boiled egg) gave way in between the 17th and 19th century under the pressure of military technical innovation and the onset of industrialization. What followed was a period of city expansion (fried egg) that made room for growing space demand related to industry and housing. While urban and rural where still partially distinguishable here, this changed in the post war period. Economic growth and with that the start of the Great Acceleration (see page 22) manifested spatially through a stark increase in private cars, supermarkets, business parks and allotment gardens (Gheysen, 2020). At the same time private space demands started to grow (de Klerk & van der Wouden, 2021). This led to the city becoming

Ja, das möchste:
Eine Villa im Grünen mit großer Terrasse,
vorn die Ostsee, hinten die Friedrichstraße;
mit schöner Aussicht, ländlich-mondän,
vom Badezimmer ist die Zugspitze zu sehn –
aber abends zum Kino hast dus nicht weit.

Das Ideal, Tucholsky (1927)

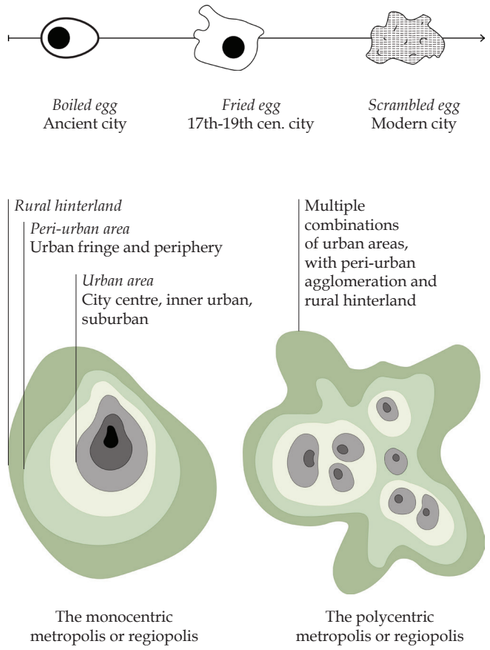
a scrambled egg – the distinction between urban and rural is no longer clear cut and often unidentifiable. The dispersed territory thus emerges as a both cause and product of the Anthropocene.

The formation of the dispersed territory has one hand resulted in monocentric metropolises (London, Paris) and regiopolises (Maastricht, Aachen) which are interwoven with their hinterland on their edges, but continue to have a clearly differentiated urban centre. On the other hand the 20th century also gave rise to polycentric metropolises (Randstad, Ruhrgebied, Vlaamse Ruit) and regiopolises (Parkstad, Hasselt-Genk) that do not always follow the spatial development described by Price

(Gheysen, 2020). They are characterized by a diffuse and seemingly unordered structure with urban fragments throughout, no clear centre and plurality of functionally differentiated networks and nodes (Hermans, 2022).

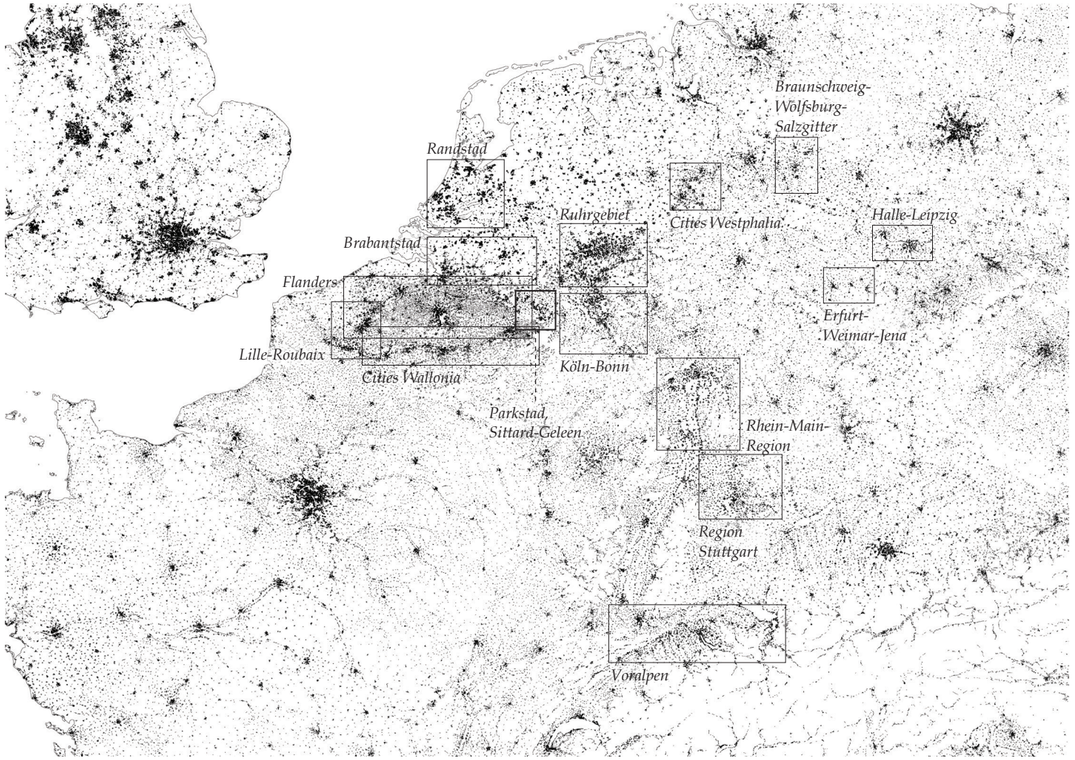
Despite its ubiquity the spatial, social, and ecological potential of the dispersed territory is in general still neglected. While it has been discussed under one name or another since the 20th century and began to really gain traction during the 1990s, Viganò points out that the discourse around the "horizontal metropolis", as he describes it, is still emerging (2018). Sieverts argues that there is still no shared perception, nor vision for what these territories are and what they could be (Cavalieri & Viganò, 2019). They do not exist in the minds of their inhabitants and are unable to stir policy making and collective action. They are thus under continued threat to be completely eaten up by space consumption brought on by individual and economic interests. Gheysen asserts that dispersed territories are still often conceptualized as a problem (2020). For many spatial designers they still connotate either a loss of the pastoral landscape or a lack of urban functions and urbanity. They thus diagnose that a transformation of the settlement pattern is needed to restore it to a pre-dispersal condition, an oversimplified approach to the intricate realities of the dispersed territory as Gheysen points out (2020). He claims that dispersed territories should be understood and addressed in terms of their opportunities and potentials instead. Similarly, Viganò proclaims that the horizontal metropolis, should be investigated as "possible space of emancipation, where spatial and natural capital can be the support for better conditions of life moving through the radical nature of the change underway" (2018). While Sieverts already declared in 1997 that the Zwischenstadt was here to stay (2000), he highlights the importance of the territory finding a soul and evoking a clear and vivid image in its inhabitants (Cavalieri & Viganò, 2019). They should become spaces of experimentation fed by "visions and dreams" (Sieverts, 2018), for which care could become a guiding principle.

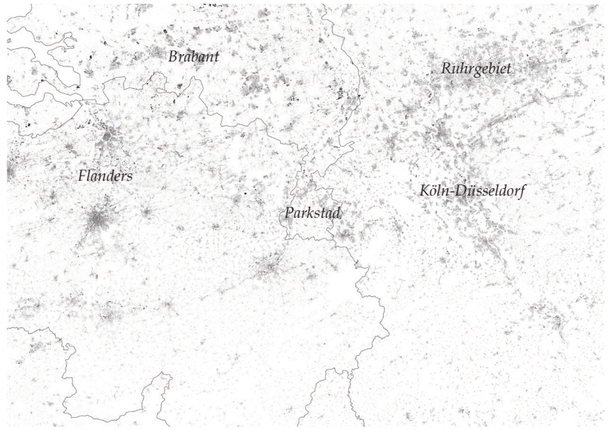
Landscape is an important "capital" within this dispersed territory. It is an essential spatial part of it. Landscape spaces and fragments are interwoven with the urban tissue. It is what Sieverts calls the "verlandschafte Stadt, verstäderte Landschaft" (2000). Secondly metabolically landscape and urban fabric are interconnected. Landscape is in general is a cultural and artificial concept and place (Prominski, 2014), that serves the urban tissue (Newman et al., 2017; Wakefield, 2021). Cities on the other hand are not wholly artificial but made up of landscape elements and processes (Spirn, 1985). Acknowledging and working with this manifestation of landscape, cap help address both local and global environmental and ecological concerns (*repair*). Girot calls for new landscape design principles to combat issues specific to the dispersed territory such as landscape fragmentation, urban heat islands and soil sealing, but also challenges arising from climate crisis on a larger scale (2018). He highlights the importance of a "greater natural patchwork," a designed landscape network of varying sizes which will "offer greater potential for balanced diversity and a better integration of nature at the heart of the horizontal metropolis" (2018). Secondly, landscape can function as a source of inspiration and identity in dispersed territories (*relate*). I have chosen to specifically use the term Zwischenstadt here, not only because of the similar spatial context between Germany and the Southwestern periphery of the Netherlands, but also becomes of Sievert's vision of the Zwischenstadt. He urges designers to develop this territory through the lens of the landscape as connector and carrier of identity for the territory (Sieverts, 1997). Landscape can help to find and articulate the soul of the Zwischenstadt. Here the search for a new kind of collective or public space, which is of yet absent in the dispersed territory, could also become an integral part of this identity (Gheysen, 2020; Girot, 2018). Lastly, especially dispersed territories that used to be industrial hubs (Ruhrgebiet, Parkstad) are currently experiencing stagnating growth or shrinkage, they thus become an interesting test care for an alternative landscape-based development trajectory (*reduce*) (Waldheim, 2016; Desimini, 2014).

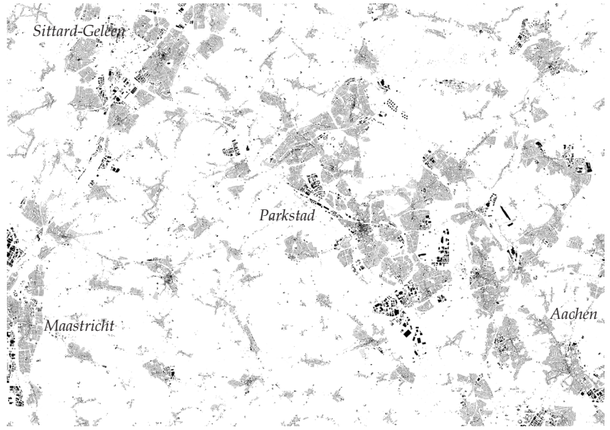


^ Urban development throughout time in Europe (adapted by author based on egg diagram by Cedric Price (Gheysen, 2020))

^^ Spatial configurations of the dispersed territory (adapted by author based on PLUREL project (Wandl, 2020))







Dispersed territories in the Netherlands
Due to high population density, post-war Dutch spatial planning throughout the middle of the 20th century was still concerned with upholding the differentiation between urban and rural as present in the conceptualization of the city as a fried egg (de Klerk & van der Wouden, 2021, van der Wal, 2020). However, as the neoliberal turn began to manifest in spatial planning in the late 1980s this policy direction was abandoned, which on one hand tolerated the interweaving between urban and rural and on the other hand no longer controlled it with more power put in the hands of municipalities and private parties. Urban and industrial expansion, especially large-scale distribution centres, began to spread in the landscape. This gave rise to the Randstad as a polycentric metropolis, with however a fairly clear hierarchy in each of the cities and several polycentric regiopolises in the Dutch periphery, such as Parkstad, which is currently often neglected in the national spatial planning discourse (Hermans, 2022).

<< Sel. polycentric regions in Western Europe
< Urbanization patterns in wider Euregio
^ Urbanization patterns around Parkstad

Why forest?

While the previous section highlighted the environmental, ecological, spatial, and cultural importance of the Zwischenstadt the following section will argue for the relevance of the forest as a landscape typology and element for transforming the Zwischenstadt. The forest is a multi-dimensional and multi-scalar entity that can address a variety of concerns, from environmental and ecological, to social-cultural, spatial, and economic ones (Research Fellowship Urban Forestry TU Delft, 2019). As such the forest or forested elements can answer to multiple challenges and questions arising in the Zwischenstadt and within the Anthropocene. The Netherlands is for example planning to plan an extra 37.000 hectares of forest till 2030, to address environmental, ecological, but also recreational and economic concerns (Interprovenicaal Overleg & Ministerie van Landbouw, Natuur en Voedselkwaliteit, 2020).

Forests and forested elements can help repair and maintain landscapes and ecosystems (*repair*). While trees are increasingly affected by the climate crisis due to extended periods of droughts, extreme weather events, as well as rising numbers of pests and diseases (Senf et al., 2020; Freer-Smith & Webber, 2017), they are also widely recognized for their climate adaptation and mitigation benefits (Pearlmutter et al., 2017). Trees cool down their surroundings through shading and evapotranspiration which is especially relevant where urban heat islands occur (Hiemstra et al., 2017). They can store sequester carbon dioxide and remove other pollutants from the air (Fares et al., 2017; Samson et al., 2017). An ability that however can be hampered and even reversed by excessive pollution, as well as extended drought (Fares et al., 2017). On the other hand, trees can function as sponges, as well as prevent erosion, which is especially relevant during storm water surges (Vilhar, 2017). Through this tree can also help improve water quality and replenish ground water reservoirs, in turn important during extended periods of drought and areas with significant amounts of sealed soil. Trees furthermore provide various ecological benefits. Healthy forests and woodlands can help maintain soil health (Zhiyanski et al., 2018; Pinho et al., 2017) and provide unique and rich ecosystems for a variety of flora and fauna, which are in turn needed for the provision of environmental benefits (Pinho et al, 2017; Freer-Smith & Webber, 2017). What furthermore makes trees or forested elements interesting is their relatively small size. Single trees or small tree configuration can be implemented in the denser urban tissue of the Zwischenstadt and connect it to larger landscape structures and patchworks (Girot, 2018). For biodiversity, especially in urban areas these smaller steppingstones and links, next to larger patches are crucial (Pinho et al., 2017).

Next to these regulating ecosystem services, trees and forests also have provisioning services (*relate*) (Tiwary et al., 2018). They can supply food, fodder, fuel, wood, and timber for construction. Forests furthermore have impact on other provisioning services, such as the quantity of available water for consumption, cooling, and irrigation. Trees and forests also provide a variety of cultural ecosystem services. They can improve "quality of life" and "quality of place" by enabling social interactions, creating recreational and educational spaces, providing pleasant sensory experiences, and strengthening a sense of place or identity (O'Brien et al., 2017). Forest infrastructure and green infrastructure in general can stimulate an active lifestyle and through that improve physical wellbeing (Carrus et al., 2017). There is furthermore a growing body of evidence that green and forested spaces have "restorative" qualities (Carrus et al., 2017). They can relief stress and fatigue in humans and rejuvenate them and with that improve mental wellbeing.

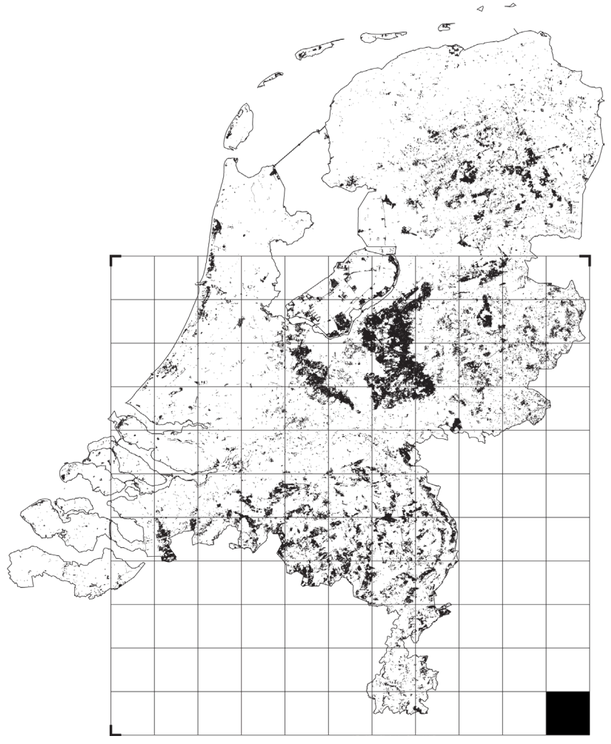
Forests furthermore have a strong cultural image and narrative (*relate*). The forest is an archetypical landscape, strongly connected to the human conception of "nature" (Konijnendijk, 2019). Within Western cultures forest occupy a sometimes-dualistic position (Harrison, 1992). They invite longing, but also fear and are considered sacred as well as lawless. They are both spaces and places (Konijnedijk, 2019). While spaces, characterized by the unknown and an idea of freedom, are open, invite action and suggest the future, places are humanised and enclosed, they reflect established values and a sense of security and home. Mirroring the theory of environmental preference (Kaplan, 1979), Konijnendijk suggests we need both – "venture and shelter", "attachment and freedom" (2019).

		Scales of the Urban Forest | *Individual trees, streets, parks & woodlands, urban ensembles, urban patterns, green systems*			
		Element	**Feature**	**Area**	**Territory**
Dimension of the Urban Forest	**Environmental**	*Microclimate regulation, carbon sequestration, water regulation, air pollution reduction*			
	Ecological	*Individual, community, ecosystem, bioregion*			
	Social-cultural	*Identity, health & recreation, aesthetics, place making*			
	Spatial	*Structure, experience, tree architecture*			
	Economic	*Employment, wood production, food, leisure*			

Dimensions and scales of the urban forest (adapted by author based on Research Fellowship Urban Forestry TU Delft, 2019)

While forest have disappeared from European landscapes ever since antiquity (Konijnendijk, 2019), they remain an important landscape typology found in most European landscapes (as remnants). Trees and forest structures are furthermore one of the most present landscape elements in and around urbanized areas (Konijnendijk, 2019). Both spatially and metabolically forest and city have been interlinked throughout history (Wambecq, 2019; Konijnendijk). While cities have destroyed forests, they did and do dependent on them and have propagated them at various moments in time (Wambecq, 2019). The interdependence of forest and urban territory, as well as the forest as an essential building block of the urban is beginning to gain traction now within academic discourse (Konijnendijk, 2019; Wambecq, 2019; KU Leuven International Center of Urbanism, 2022). Introduced under the term forest urbanism the underlying concept is to bring together ecological and social urban challenges by transforming "ways of living and stewardship of the environment" through the integrated development of forest and urban (*repair, relate*) (KU Leuven International Center of Urbanism, 2022). This idea compliments the practice of urban forestry, which is centred around the provision and management of forest resources in urban contexts (Miller, 1997).

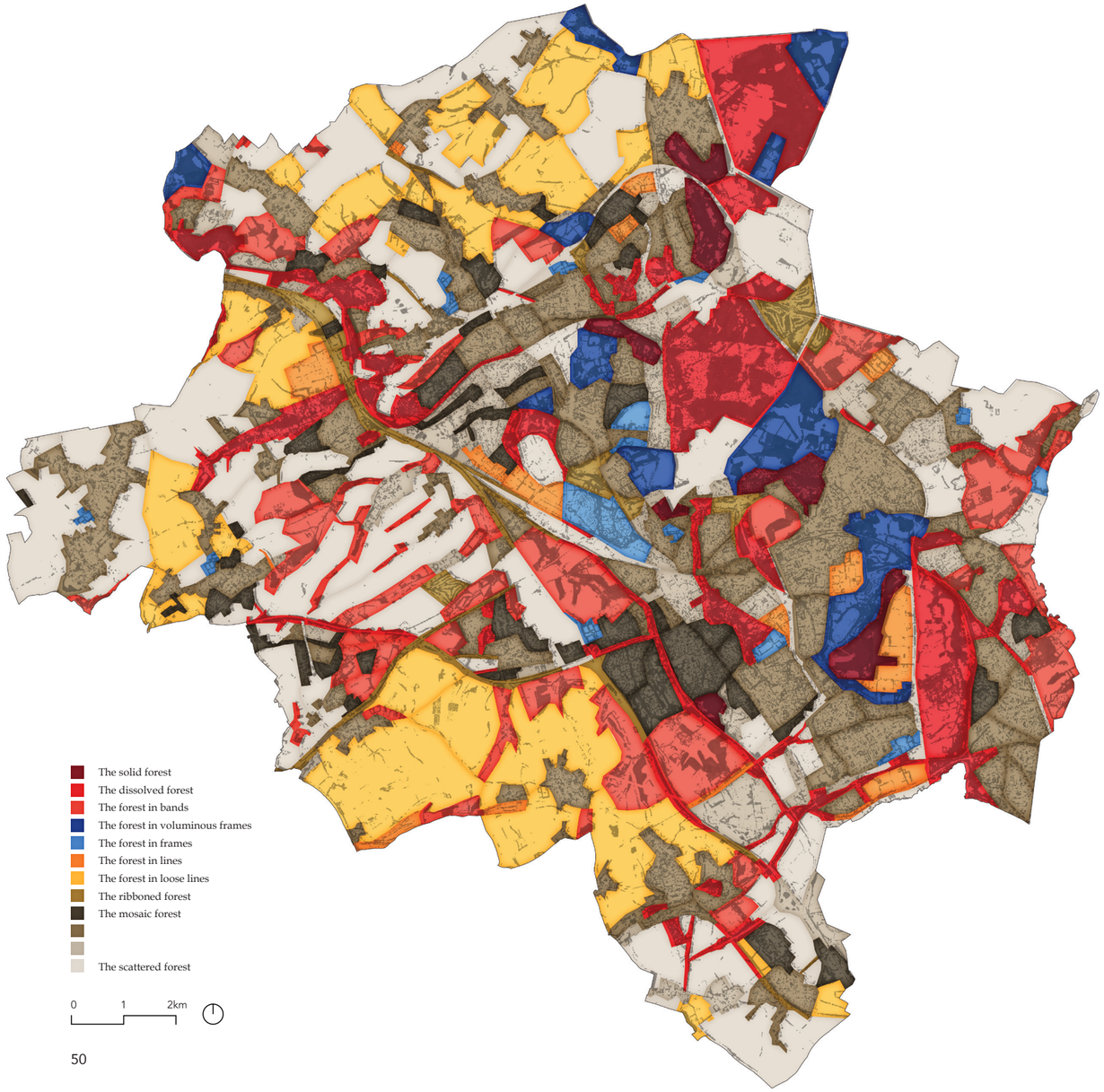
This strong spatial and mental presence of the forest in both city and landscape can aid in framing and reconnecting the fragmented Zwischenstadt (*relate*). The wide variety of grain sizes and scales in which trees and forests can occur makes them valuable structural and structuring agents. The multi-dimensionality and multi-uses of the forest can fill a spatial forested framework with life and provide multiple environmental, ecological, and social benefits. It can help in creating in lived experiences and mental images of the Zwischenstadt and with that help territory to "find a soul" (*relate*). Through the forest can promote and alternative definition of liveability and urbanity in dispersed territories. Forest could come places of collective dwelling and working, for example, or public spaces that are decommercialized. These forms could help to build up alternative economies (*reduce*). In scenarios of stagnation or shrinkage of population and economic development vacated lots and neighbourhoods could furthermore be repopulated with forest frameworks (*reduce*). Such a deeply interconnected idea of the urban and the forest, however, also incites a question of responsibility. While the forest can take care of or address various anthropogenic challenges, it needs to be taken care of so that biodiversity and a healthy ecosystem are ensured within it. This however can enrich the connection of humans to the environment and their everyday surroundings (*relate*) (Prominski, 2014).

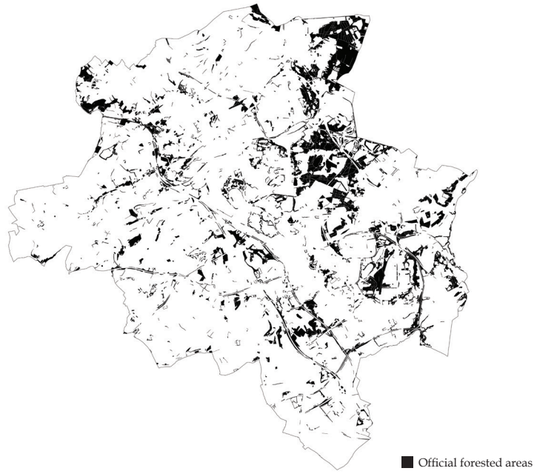


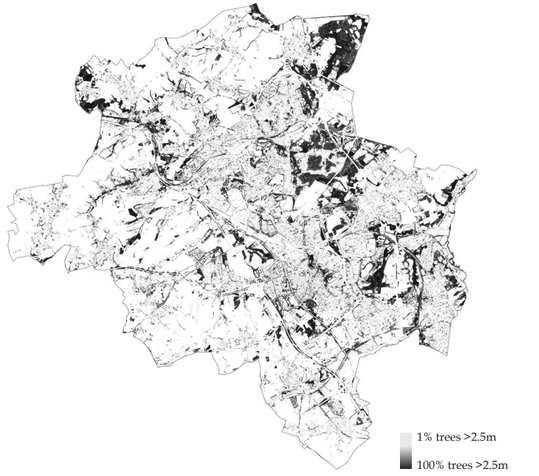
Visulization of 37.000ha of extra forest that is supposed to be grown in the Netherlands till 2030 (created by author based on Interprovenicaal Overleg & Ministerie van Landbouw, Natuur en Voedselkwaliteit, 2020)

Forest development in the Netherlands

In the past the Netherlands was covered by deciduous forests (Natuurvolgendbosbeheer, 2021). As humans began to settle in the Neolithic age the first forests started to disappear to make room for agricultural terrain (Staatsbosbeheer, 2021). When population declined in the early Middle Ages the forest started to take over the landscape again. However, as population began to rise again around 1000 CE large parts of the Netherlands were cultivated and the forest disappeared. Around 1850 only 5% of the Netherlands was forested (Boosten, 2016). However, from there on out forest cover began to grow again. Administrative and agricultural changes made the establishment of production forests on formerly uncultivated sandy soils attractive. Forest cover continued to grow throughout the 20th century, however due to the redistribution of agricultural land a lot of small, forested elements got destroyed. From the 1970s and 1980s on sustainable forest management, with an eye on biodiversity, resilience, and landscape value, began to gain traction. Today around 10% of the Netherlands are forested (Staatsbosbeheer, 2021).



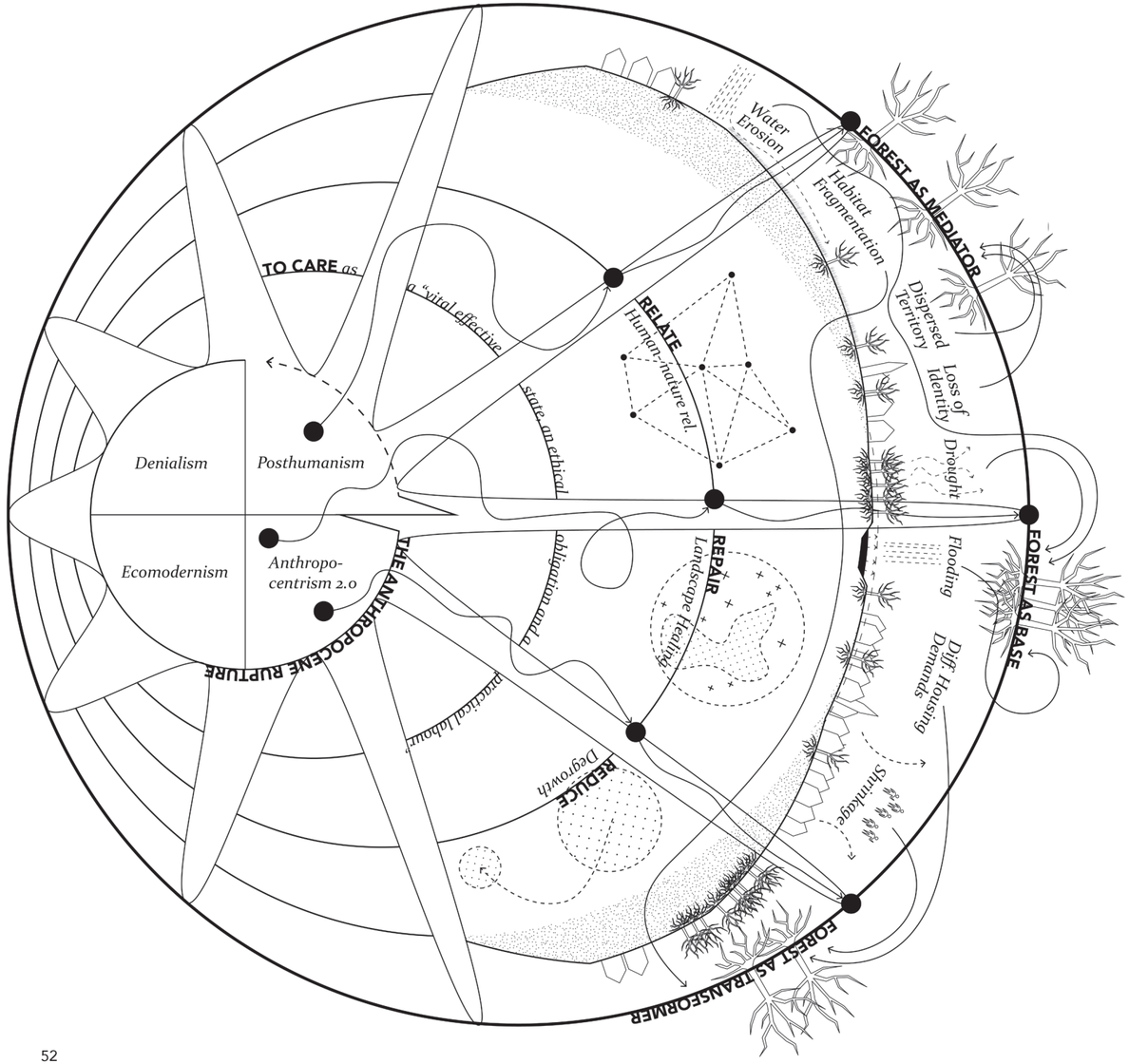




The forest of Parkstad

11% percent of Parkstad is covered by forest, however accounting for forested elements and the urban forest around 35% of the territory is covered by trees. The largest forested areas can be found on the Brunsummerheide, around the Kaffeberg and the three biggest streams, Worm, Geleenbeek and Rodebeek. The Brunsummerheide, currently a Natura 2000 area, is one of the uncultivated heathlands that was reforested for production purposes in the 19th century. The forest takes on a variety of shapes and compositions. It is dense and solid and forms larger open rooms during it in the previously mentioned areas. In the urban tissue it is finer grained and mosaic like, with quite significant variations in density. In the agricultural it takes the shape of single trees and small arrangements; larger forest structures can mostly be found along dry valleys. Some larger forest band structures can also be observed along slopes.

Forest typologies Parkstad
Forest structure Parkstad
Tree structure, percentage of trees >2.5m



Part 1.3| Define

Problem statement and research question

Site specific problem statement

The three perspectives outlined above- a need for care and (re)forestation, as well as the condition of the dispersed territory (Hermans, 2022; Sieverts & Reverda, 2014)- all converge in the territory of Parkstad. The territory today grapples with fragmentation and a loss of spatial identity due to the rapid urban expansion associated with the rise, fall and subsequent erasure of its 20th century mining industry. By strengthening the relationship between landscape and urbanized territory, forest infrastructure can act as a connector and carrier of identity between people and their surrounding (*relate*). Due to its turbulent 20th century history, Parkstad is furthermore a shrinking territory with an ageing population, which also makes it a relevant case study in exploring how forest infrastructure can help provide alternative modes of urban development in the name of degrowth (*reduce*). Lastly, Parkstad is need of environmental and ecological restoration measures. While reforestation is generally encouraged in the Netherlands (Interprovenicaal Overleg & Ministerie van Landbouw, Natuur en Voedselkwaliteit, 2020), Parkstad can particularly benefit from it due to its problems with water erosion, drought, and flooding, as well ecosystem degradation of large-scale farming areas and protected natural areas (*repair*).

Research question

This graduation thesis thus examines forestry and forest infrastructure within the Zwischenstadt through its capacity for care, exemplified by the domains of repairing, relating, and reducing. The aim is to uncover and explore the potential for change or revitalization of the territory when applying the framework of care and the strategy of (re)forestation. The main question is thus as follows:

_How can forest infrastructure revitalize the Zwischenstadt through becoming an agent of care?

The sub questions address the individual dimensions of care, as well as add a fourth objective – to reflect:

_How can forest infrastructure aid in repairing damaged ecosystems in the Zwischenstadt? (*repair*)
_How can forest infrastructure strengthen spatial integrity and relationships within the Zwischenstadt? (*relate*)
_How can forest infrastructure aid in making degrowth operational in the Zwischenstadt? (*reduce*)
_How can forest infrastructure be maintained and designed in a way that honours the needs and agency of the forest? (*relate, reduce, repair*)
_What does forest infrastructure mean in the context of this project? (*reflect*)

Conceptual representation of theoretical framework and intent

Methodology

Scoping
The first part of this graduation thesis is aimed at exploring my own fascination, as well the site. An initial site analysis through mapping, literature research and design projection reveal a complex network of challenges and stakeholders. In an iterative process this preliminary analysis is combined with a reflective literature research about the condition of the Anthropocene as a call to care through which three challenges were chosen as particularly relevant and promising: *relate*, *repair*, and *reduce*.

Exploring
In a subsequent step these three challenges are then explored separately both conceptually/theoretically and in relation to the site and to forestry. For this each challenge will be explored through four components:
_Literature research aimed at understanding relevant design concepts in relation to the challenge, as well as forestry.
_Reference study aimed at exploring relevant forestry projects that tackled similar challenges.
_Site analysis through descriptive (GIS, photography) and interpretive mapping (combining descriptive maps, using mapping techniques such as a landscape layer analysis), mostly done through plan and section, as well as diagram, sketch, and collage.
_Design projection to understand spatial implications and manifestation of each challenge in relation to forestry, done in plan and section, as well diagram and sketch.

The design projections for each challenge are then overlayed and compared to understand in which ways they can support one and other and in which ways they contradict each other. This then triggers an iterative and synthetic process in which each challenge or perspective is sharpened individually and in relation to each other.

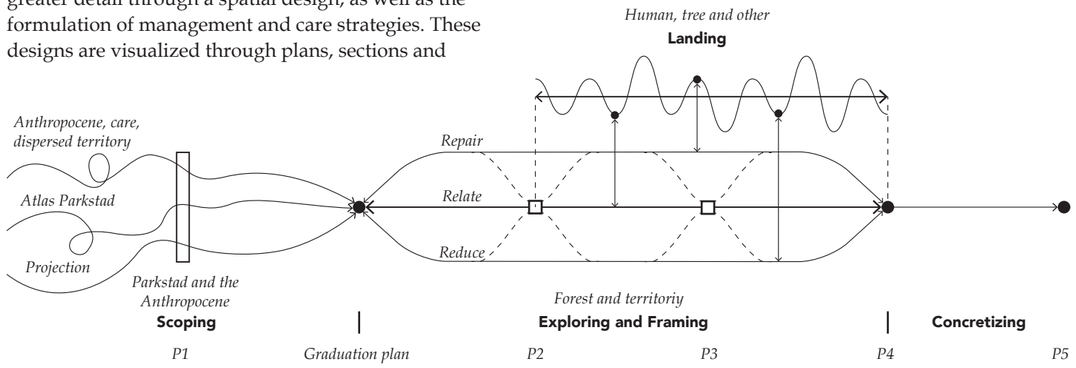
Aim of this phase is to understand the following facets of these challenges:
_*Repair*: mapping and description of environmental and ecological challenges in relation to landscape typologies of Parkstad (especially drought, flood, water erosion), design strategies in which forestry can help alleviate those challenges (Natuurkennis.nl, n.d.)
_*Relate*: mapping of spatial and historical composition of landscape and urbanized territory of Parkstad, design strategies to enhance spatial quality and readability of the Zwischenstadt, design strategy to formalize/legitimize/interweave landscape typologies and space for other than humans in dispersed territories (internal images of territory, coherence, complexity, contour, own vs special places (Schröder & Bund Deutscher LandschaftsArchitekten, 2001; Vicenzotti, 2019)
_*Reduce*: mapping of current and supposed future patterns of vacancy, design strategies to transform vacant land through forestry (working with context, time, and scale, creating gradience of maintenance (Desimini, 2014))

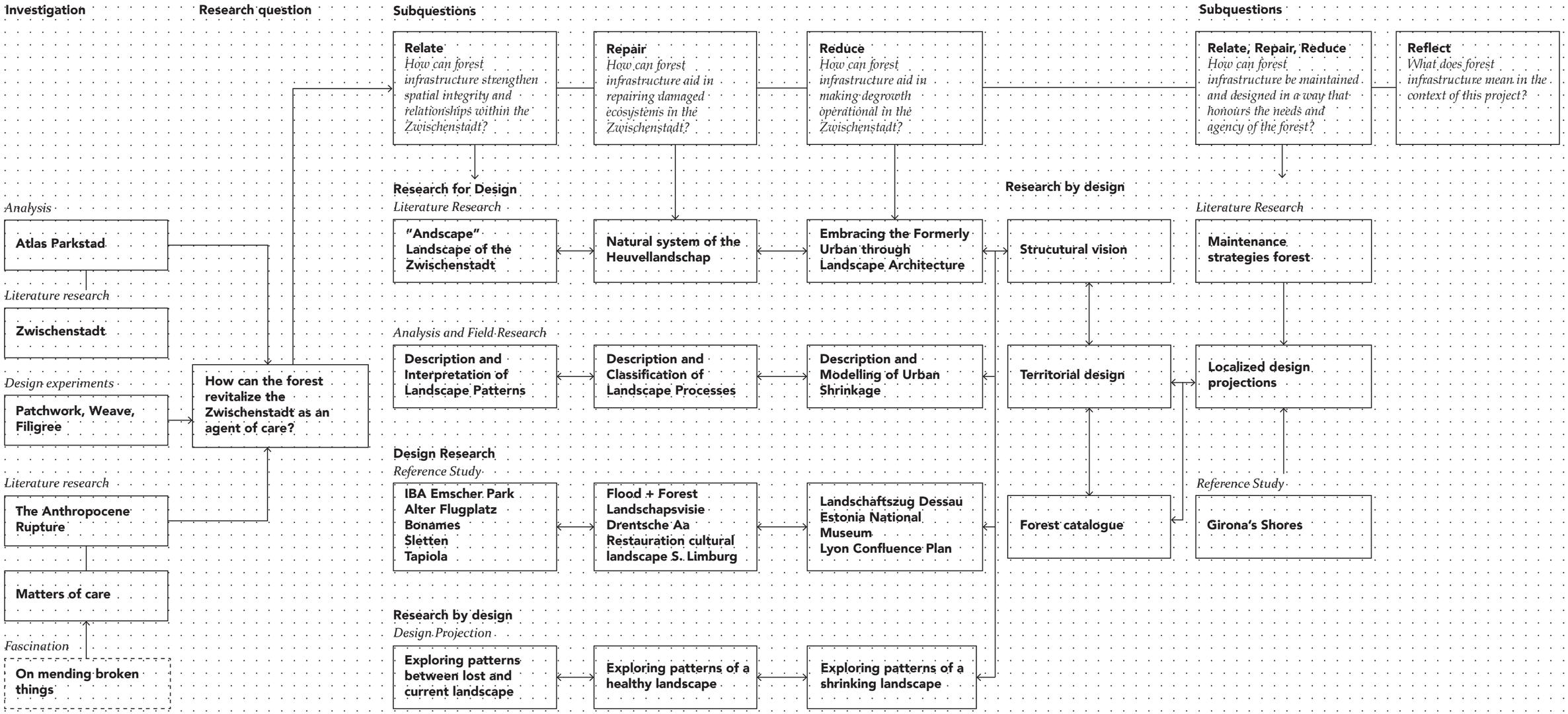
Framing
The result of this exploration and synthesis is a strategic vision, as well as masterplan on the scale of the territory, which is supplemented with a forest typology catalogue that concretizes spatial ecological characteristics of the forest such as habitat and system/arrangement.

Landing
At the same time design locations are worked out in greater detail through a spatial design, as well as the formulation of management and care strategies. These designs are visualized through plans, sections and drawings on eye height, but also circle and progress diagrams that bring together maintenance and time. The aim is to elaborate how this new forest territory could look like, but also how it could function; how humans can take care of the forest and use and interact with it in a way that honours the needs of the forest as well as its agency. For these findings of the Exploring step will be used, if needed additional research on forest maintenance will be conducted.

Concretizing
The last weeks of the graduation are used to reflect on this process, align findings and improve visualizations.

Scheme working process during graduation




Investigation
Research question
Subquestions
Relate
How can forest infrastructure strengthen spatial integrity and relationships within the Zwischenstadt?
Repair
How can forest infrastructure aid in repairing damaged ecosystems in the Zwischenstadt?
Reduce
How can forest infrastructure aid in making degrowth operational in the Zwischenstadt?
Subquestions
Relate, Repair, Reduce
How can forest infrastructure be maintained and designed in a way that honours the needs and agency of the forest?
Reflect
What does forest infrastructure mean in the context of this project?
Research for Design
Literature Research
Research by design
Literature Research
Analysis
Atlas Parkstad
Literature research
Zwischenstadt
Design experiments
Patchwork, Weave, Filigree
Literature research
The Anthropocene Rupture
Matters of care
Fascination
On mending broken things
How can the forest revitalize the Zwischenstadt as an agent of care?
"Andscape" Landscape of the Zwischenstadt
Natural system of the Heuvellandschap
Embracing the Formerly Urban through Landscape Architecture
Strucutural vision
Maintenance strategies forest
Analysis and Field Research
Description and Interpretation of Landscape Patterns
Description and Classification of Landscape Processes
Description and Modelling of Urban Shrinkage
Territorial design
Localized design projections
Design Research
Reference Study
IBA Emscher Park
Alter Flugplatz
Bonames
Sletten
Tapiola
Flood + Forest
Landschapsvisie
Drentsche Aa
Restauration cultural landscape S. Limburg
Landschaftszug Dessau
Estonia National Museum
Lyon Confluence Plan
Forest catalogue
Reference Study
Girona's Shores
Research by design
Design Projection
Exploring patterns between lost and current landscape
Exploring patterns of a healthy landscape
Exploring patterns of a shrinking landscape





^ Flat complex near Heerlen station
> Heathland and pine forest in Brunsummerheide





Silver sand mine, Heerlen
Building Caumermolen with flat complex in background, Heerlen





^ Shared neighbourhood garden in Heerlen
> Ringroad Parkstad





Farm on the plateau of Ubachsberg, municipality Voerendaal
Glaspaleis Schunck with food truck in foreground, city centre Heerlen

Part B | Analysis Zwischenstadt

Relate, Repair, Reduce

2. Site Introduction
A layered landscape 68

3. Repair
In the Dutch hills 82

4. Relate
Approaching the Zwischenstadt 102

5. Reduce
Reviewing shrinkage 124

6. Conclusion
Repair, Relate, Reduce as
careful and caring interventions 134











Overview map Parkstad

Territoral model Parkstad depicting relationship between natural (water and valleys) and anthropogenic processes (urbanization and forest)



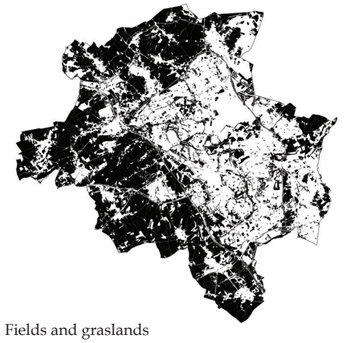
Municipal borders



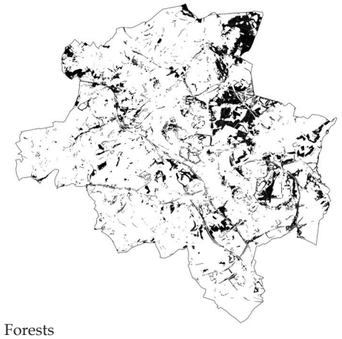
Relief



Streams



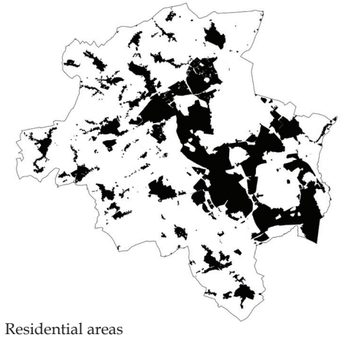
Fields and graslands



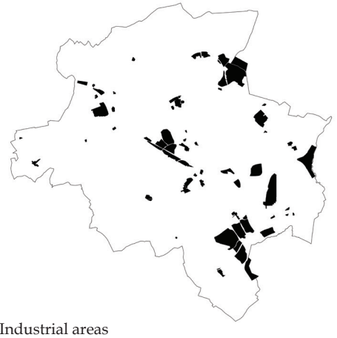
Forests



Heathlands



Residential areas



Industrial areas



Roads and railway

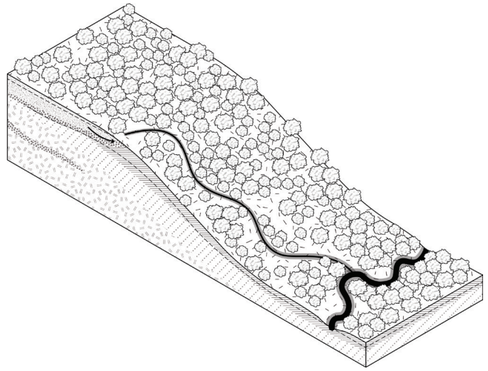
Part 2 | Site introduction

A layered landscape

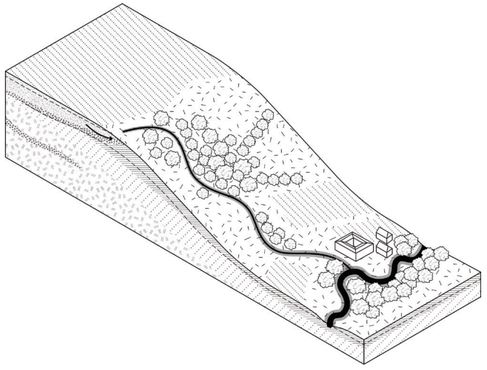
Parkstad is primarily a political and administrative entity. It refers to both an administrative collaborative entity as well as one of the regions of Limburg (Ministerie van Binnenlandse Zaken en Koninkrijksrelaties, 2022). It is comprised of seven municipalities all located within Southern Limburg in the Netherlands. However, both the name as well as the special organizational structure of Parkstad allude to the tightly interwoven history, characteristics, but also issues of the seven municipalities that form Parkstad. Throughout its history it was a rather isolated inward-looking region centred around agricultural production, this however drastically changed with the onset of the 20th century (Hermans, 2022). For around 70 years Parkstad transformed into a mining region known as the “Oostelijke Mijnstreek”. Both the onset and demise of this economic activity completely transformed the spatial and social structure of the region. This led to the spatial transformation of Parkstad into a dispersed territory, a Zwischenstadt, in which widespread residential areas and industrial terrains converge with streams, forest structures and agricultural land typical for the landscape of the Dutch hills.

Geological development

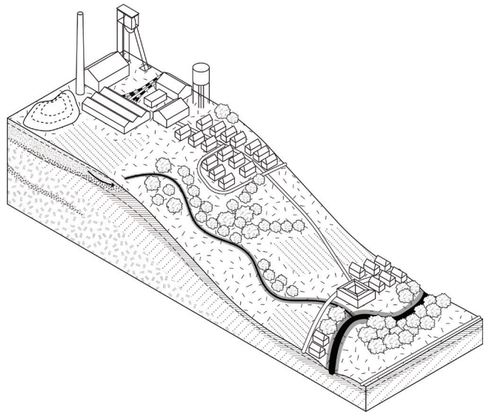
The Dutch hills are a unique landscape for the Netherlands that can be found in Southern Limburg. It is characterized by its relatively steep relief and fertile soil. Earliest soil deposits that still outcrop today date from the Carboniferous period and are made up of limestone, shales and coal. In the Cretaceous period various layers of sand, clay, glauconite and limestone amassed on top of this. In the Northern part of Southern Limburg, a thick layer of sand and clay accumulated on the limestone in the Tertiary period. The maas deposited rivers sands and gravel on top of that in the Early-Pleistocene period. After this the relief of the hilled landscape was formed. Located at the foot of the Ardennes the landscape got lifted, while streams in the peneplain of the Maas cut out large and small stream valleys (Natuurkennis, n.d.; Geologie van Nederland, n.d.). The hill landscape is thus not actually made up of hills, but rather eroded plateaus. On top of these plateaus a thick layer of loess was deposited by wind during the last Ice Age in the Late Pleistocene. Earlier soil deposits outcrop especially in the steep stream valleys due to anthropogenic land reclamation in the Late Holocene period. This erosion material was then deposited as colluvium and alluvium on slopes and in stream valleys. Various geological breaks and the decrease of the thickness of the deposit layers from southeast to northwest, as well as the anthropogenic reclamation processes make for a varied soil composition.



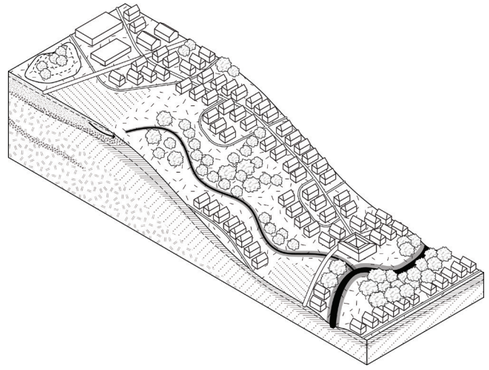
Forest landscape
Before humans started to settle in Southern Limburg the landscape was completely covered by forests (Rijskdienst voor het Cultureel Erfgoed, 2022). This changed around 7000 years ago, when Southern Limburg was first cultivated. Cultivation steadily increased till the end of the 3rd century. After the Romans left the Southern Netherlands, the population decreased, while the forest took over large parts of Parkstad once more before the land was fully cultivated in the Middle Ages (Rijskdienst voor het Cultureel Erfgoed, 2022).



Hill landscape
From around 1300 on the landscape of Southern Limburg was fully cultivated. The flat and wide plateaus were used for agriculture. The steepest parts of the slopes remained forested while the rest were partly in use as grassland, partly as agricultural land. In the middle of agricultural parcels tree shrub lanes were planted to limit erosion. Here earth accumulated and small terraces known as graften appeared. Soil erosion along often used paths furthermore lead to the development of hollow ways on slopes. The stream valleys were mostly used as grasslands with some agriculture and forest remnants.



Mining landscape
The coal found deep in the ground under Parkstad irreversibly changed the landscape of the region. From around 1900 on a highly industrialized hub developed in place of the small agricultural villages spread out in and around the hills. Not only did eleven mines with their large chimneys, conveyor towers and mining mounts change the view over and on Parkstad, the region also quickly urbanized. Mining colonies, spread out over the whole territory, were built, while train tracks emerged to transport the coals to the country at large.



Patchwork landscape
From the end of the 1960s on the landscape of Parkstad once again transformed. All the mines were slowly dismantled, and the mining colonies partly demolished. They were replaced by residential neighbourhoods and industrial terrains, which started to slowly spread over the landscape. Highways and even more recently the ring road were built further cutting the landscape into pieces. While the mining time initiated the development of a Zwischenstadt, it is now formalized in between an abundance of single-family houses, multi lane roads and boxy sheds and warehouse.

Pre-roman and Roman history
After the last ice age, the climate got wetter and warmer, which meant a dense forest developed in the region (Rijskdienst voor het Cultureel Erfgoed, 2022). This forest landscape was first cultivated around 7.000 years ago, which makes Southern Limburg the oldest cultural landscape in the Netherlands. The first farmers settled along the Maas, on plateaus and on the edge of streams. They used slopes and terraces as agricultural land, which meant the forest slowly and continuously disappeared. This process continued during the Iron Age and the Roman times. The Romans also first started cultivating the plateaus. The built large villas from which large-scale production for the whole region as well as the military was organized. They furthermore founded larger settlements in Maastricht (Trajectum ad Mosa) and Heerlen (Coriovallum), located on crossings of important Roman roads. The Romans used Heerlen as a resting point on their tours to Tongeren or Nijmegen and built a bath house there (Hermans, 2022). In the third century the population reached its peak and declined thereafter. As a result, forests started to cover Southern Limburg once more.

Middle Ages
Between 650 and 750 AD the population started to slowly grow again, however only the valleys of the Maas and the smaller streams were inhabited. Settlements often started at places where one could naturally cross the streams. Due to their position, they often had a linear and elongated shape. Between 1000 and 1300 the plateaus were once again cultivated. The villages in the valleys started secondary settlements here. From the edge of the plateaus the forests on the plateaus were felled and the land cultivated. Only the steeper slopes remained uncultivated, the forests that grew here still exist today. Parkstad however has relatively flat slopes in many places, so that these forests can only be found on a few slopes, for example at the edge of Kerkrade or close to Thull. The sandy grounds of the Brunsummerheide and Heerlerheide remained uncultivated and were owned collectively. They transformed into heathland during the Middle Ages due to overgrazing. At the end of the Middle Ages the population once again grew, existing villages were extended and densified and agricultural production intensified. During the 16th century the characteristic closed farmsteads started to evolve. Till the French occupation various kingdoms and aristocratic families owned different parts of Southern Limburg leading to manifold castles built in the region. The hilly furthermore knows a lot of water mills used to grind grain and produce clean water.

Age of coal
Parkstad was only industrialized relatively late (Hermans, 2022). While the first train line was built in the area in 1853, economic industrialisation started in 1893 (Rijskdienst voor het Cultureel Erfgoed, 2022; Hermans, 2022). A private mining company -Oranje-Nassau- got a concession to delve for coals found deep in the soil underneath Parkstad. Quickly eleven mines, partly private, partly public developed. An influx of workers began to settle in the mining region from there on called Oostelijke mijnstreek. This necessitated the urban expansion of the former agricultural hub. The Roman-Catholic chaplain of the region named Poels started to organize this urban expansion. Inspired by the papal encyclical “Rerum Novarum,” which positioned the Catholic church as an alternative to the advancement of socialism, he formulated a plan for new living quarters for the miners and their families, which were meant to avert social and spatial problems found in industrializing cities elsewhere. The Garden City idea by Ebenezer Howard formed the conceptual basis for this. Spread out, green and healthy settlements with decentralized facilities are supposed to prevent that the workers live to close together and become tumultuous. These individual neighbourhoods are in turn organized in a decentral manner around the individual mines to keep a village mentality and ensure social control over the workers. An urban expansion without the development of urbanity, a “Inländische Rohstoffkolonie” – a domestic resource



Initial streetplan for the centre of Heerlen by Jan van Stuyt 1913 (Open Monumentendag Heerlen, 2020)

colony. To put this idea into practice he founded the housing corporation “Ons Limburg” in 1911 and hired the architect Stuyt to design these mining colonies. Of which none however was completely finished. Equally the masterplan that Stuyt drew up for the Oostelijke Mijnstreek remained incomplete. Despite these efforts of “social engineering” (Hermans, 2022) an urbanized and urban society started to develop slowly. Workers from all over the Netherlands, and later Europe, began to settle in Parkstad initiating cultural exchange, which however was often characterised by xenophobic stereotypes. Industrialisation furthermore transformed the character of Parkstad, as it required the modernisation of habitats and traditions brough on by new working methods, mentalities, societal relations, as well as an altered spatial organization of the territory.

Pre-mining | **Mining** | **Post-mining**

Agricultural landscape | Mines, train tracks and mining villages | Modernist urban neighbourhoods and facilities | Industrial areas and motorways | Small urban interventions and the ringroad

Spatial development

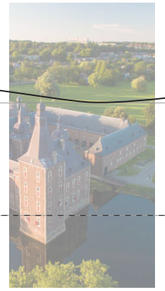
Landscape cultivation

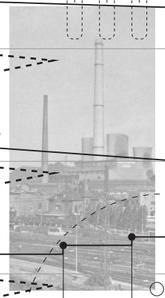
Forest development

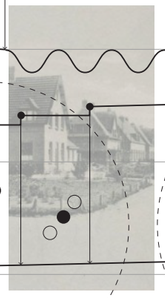
Urbanization

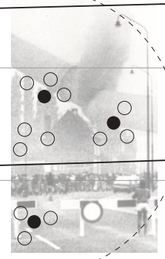
Urbanity



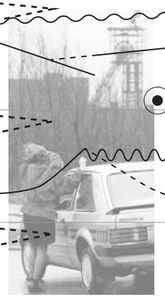


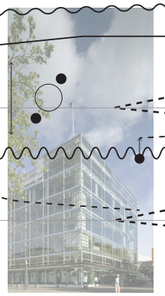


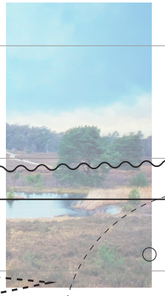














~5000 BC
First agricultural cultivation of Geleenbeekdal

~0-100
Romans found Coriovallum (Heerlen)and build a bathhouse there

1160
Abdij Rolduc founded

1225
First version Kasteel Hoensbroek built

1282
s Hertogenrode (Kerkrade) gets city rights

1815
s Hertogenrode gets split in Herzogenrath and Kerkrade

1839-1867
Limburg part of the German federation

1853
Trainline between Aachen and Maastricht opens

1893
First concesssion for Oranje Nassau mining company

1896
Trainline between Sittard and Herzogenrath opens

1899
First coals dug in Oranje Nassau I

1906
First state mine opened in Kerkrade

1911
"Ons Limburg" starts desiging and building mining villages

1959
Land consolidation starts in Southern Limburg

1965
De Uyl announces closing of all Dutch coal mines, economic and spatial restructuring starts

1967
American military base AFCENT opens

1973
Start widespread heroin problems

1974
Oranje Nassau I closes as last mine

1974
New structural plan for mining region

1977
First mining terrain gets rebuild

1995-
Renaissance of various cultural institutions

1997
Heerlen starts shrinking

2001
"Operatie hartslag" to counteract drug problems

2005
Heuvellandschap as national landscape

Houses demolished to counteract shrinkage

2013
New administrative way of working together for Parkstad

Brunssummerheide becomes Natura 2000 area

2014-2022
IBA Parkstad

2015-2019
Ringway gets build around Parkstad

2015
Year of the mines

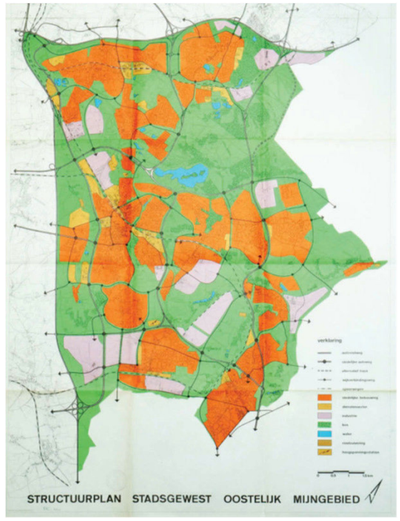
2016
Future tourism award

1890 | 1900 | 1910 | 1920 | 1930 | 1940 | 1950 | 1960 | 1970 | 1980 | 1990 | 2000 | 2010 | 2020

Post-coal age

If the start of industrialized mining formed the first break line in the development of Parkstad, a second maybe even more drastic one was initiated in 1965 by former economic minister den Uyl. He proclaimed that all Dutch mines would be shut down over the following years. At the same time society grew more secular, which meant that both the hold of the church and the mines over the region disappeared over a short time span leading to social disorientation. Although den Uyl introduced a plan for restructuring the region through "new work, new life and a new society" (Hermans, 2022), this failed. New, mostly white-collar jobs were created in the region, however there is no clear directive and direction needed for a comprehensive restructuring. In the wake of this social instability urbanity and an urban culture start to really evolve, however this development is mostly tied up with urban problems. While a literature and music scene take flight in Parkstad, the region and especially Heerlen become famous for heroin use and prostitution, with alcoholism as another big problem.

While the social structure of the mining region collapses, the spatial structure is also completely dismantled. Hardly any traces of the mining landscape are left behind preventing the development of cultural heritage or points of remembrance. In place of the mines poorly designed industrial terrains and residential areas are built by speculating real estate developers. New infrastructure, most notably the highways A76 and A79, is built between 1963 and 1975 (Rijskdienst voor het Cultureel Erfgoed), spatially separating Parkstad from the hill landscape to its West. Inner-city functions such as education, care and certain retail businesses are relocated weakening the urban cores. Urbanization and urban activity are increasingly spatially separated, and the

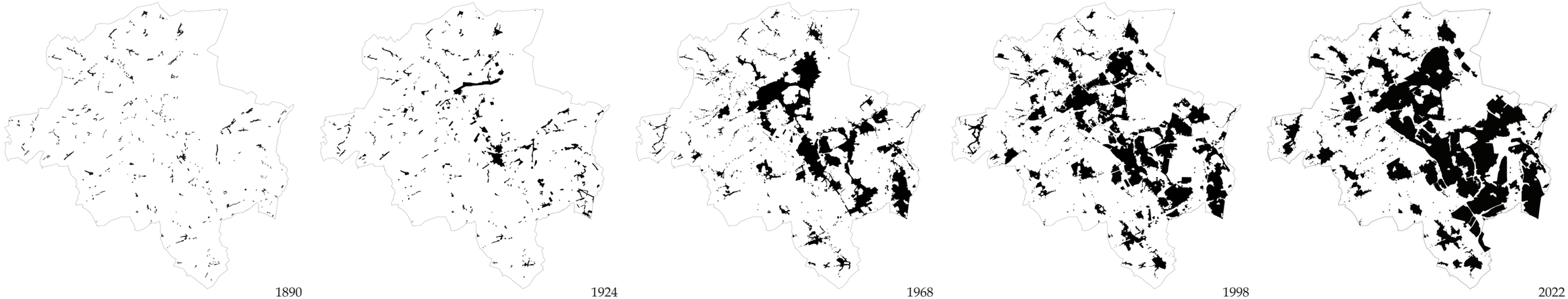


1974 Strucutural plan for the post-mining land- and urbanscape of Parkstad (Sociaal Historisch Centrum voor Limburg, 2017)

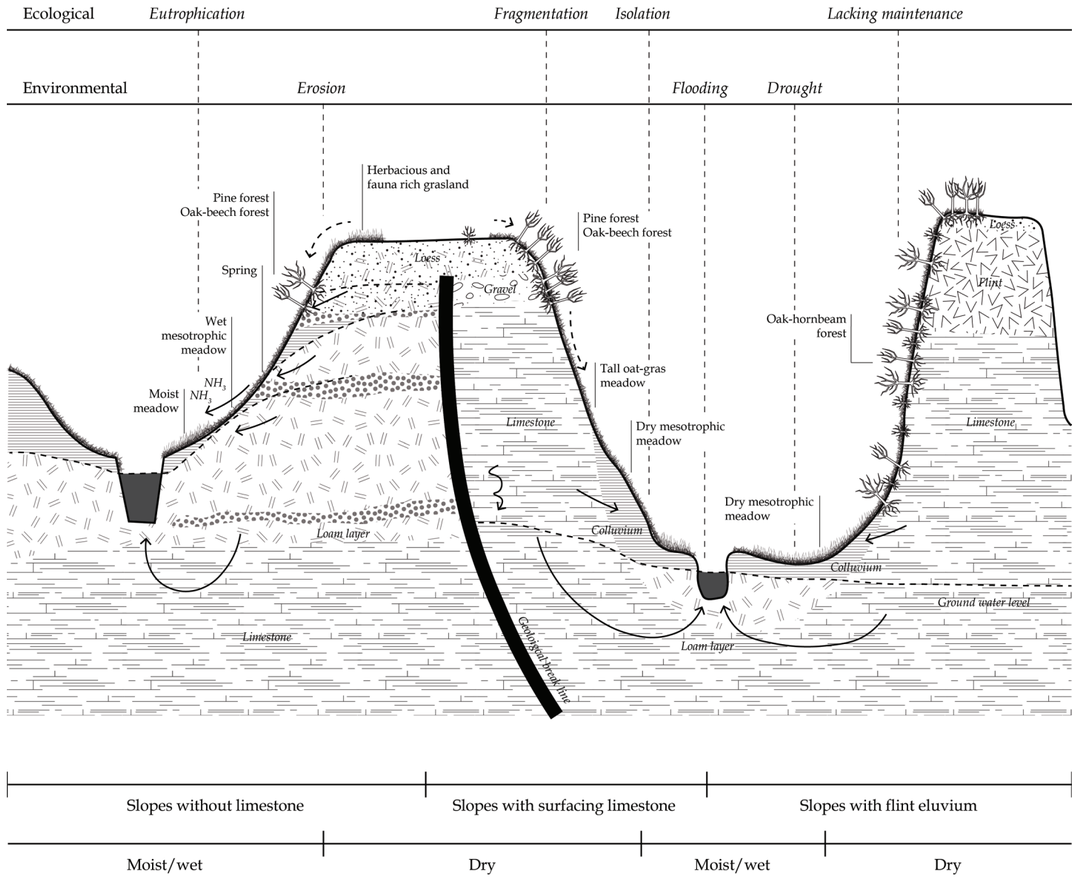
region now definitely becomes a Zwischenstadt. Both the social and the spatial problems lead to young people leaving the region in large numbers. As Hermans puts it: the region loses its thinkers, makers, entrepreneurs, and future double earners. This brain drain and selective migration lead to a third break line, in which the balance between urbanization and urbanity is increasingly distorted. Population numbers start to decline, while vacant buildings become abundant. As a reaction to alarmist reports and new articles published about this, politicians in Parkstad plan the demolition of thousands of houses, mostly located in socially and economically disadvantaged neighbourhoods, in the 2000's. At the same time a programme, "Operatie Hartslag," is set up to help those struggling with addiction, while various important cultural institutions in Heerlen experience a resurgence such as the independent cinema "Stadsschouwburg", the cultural podium "De Nor" and the "Schunk Glaspaleis". This is also the time when former mayor of Kerkrade Thijs Wöltgens rebrands the region into Parkstad acknowledging its Zwischenstadt characteristic as an asset. In the 2010's this focus on cultural development is continued. 2015 is declared the year of the mines, while the region wins the Tourism for Tomorrow Award a year later.

IBA Parkstad

Most notably the first international edition of the IBA took place in Parkstad between 2014 and 2022 (Hermans, 2022). Originating in Germany, IBA stands for "Internationale Bauaustellung"- International building exhibition. The IBA is an open format exhibition which allows for a city or a region to experiment with innovative projects and solutions regarding the built environment in "real time." An IBA usually takes places over several years – an "Ausnahmezustand auf Zeit" (a temporary state of exception), ending in an exposition year. Important for a successful IBA are the choice for a topic (1), that leads to a number of actually executed processes (2) in a high-standing process (3). Already in 2007, the idea arose to host an IBA in Parkstad to combat the social and spatial issues here. Only after the financial crisis, which worsened the situation of Parkstad, this idea was put into practice. From 2014 on the seven municipalities and a group of experts started to prepare the exhibition. For these five focal topics were developed: Collateral landscape (structural innovations), Re-use and remodelling (urban innovations), clever heritage (heritage innovations), crafts and manufacturing (technical innovations) and activating the mental space (social and societal innovations). While other IBA editions, especially IBA Emscher Park, chose a regional approach and plan to tackle similar issues, IBA Parkstad chose for a more piecemeal approach with fifty small projects, which were partly built till 2022 and are partly still to come.



Development of the Zwischenstadt landscape throughout the 20th Century



Visulisation landscape ecology loam and brook landscape with a summary of most important challenges (adapted by author from Natuurkennis.nl, n.d.)

Part 3 | Repair

In the Dutch hills

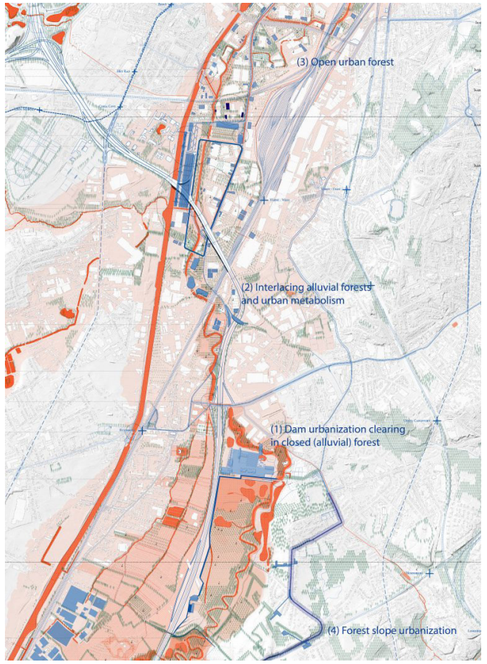
To repair landscapes means to retransform them into healthy ecosystems that can support diverse species of flora and fauna, which are resilient to future climatic change and that can even mitigate some of it. In short to (re)establish landscapes that are environmentally resilient and ecologically rich. In Parkstad landscape degradation can be linked to the ongoing industrialization of agriculture (Van Noordwijk et al., n.d.), as well as urbanization. While the landscape used to be covered by extensive deciduous forests (Rijskdienst voor het Cultureel Erfgoed, 2022), it has been cultivated to some extent over the last 7.000 years (Hermans, 2022). As such ecosystem evolved in close relation to not only abiotic and biotic conditions, but also to humans use and maintenance. The result of which was an extremely heterogenous landscape with great variation of conditions linked to soil, relief and land use leading to a variety of different habitat types (forest, meadow, brook), which are themselves heterogenous due to a variety of factors (soil condition, steepness of ground, maintenance, light). These landscape conditions are crucial for several animals from insects and butterflies to small mammals, as well as rare plants such as orchids (Van Noordwijk et al., n.d.) Over the course of the 20th century these conditions were drastically altered. While the forest cover grew over this time, agricultural use intensified. Formerly extensively used mesotrophic habitats became increasingly polluted, while traditional maintenance strategies were stopped and small landscape elements disappeared (Van Noordwijk et al., n.d.). This led to a demise of biodiversity, as well as various environmental challenges.

This heterogeneous landscape can be subdivided into four types. Parkstad is dominated by the loess landscape intercepted with the brook landscape (Klimaateffectatlas, n.d.; Van Noordwijk et al., n.d.). At the North-eastern edge a small part of the territory belongs to the sandy and clay river terrace landscape. The territory is furthermore widely urbanized. The following section will analyse the specific challenges associated with the loam and brook landscape, as well as the larger territorial green infrastructure. The river terrace landscape only occupies a small and furthermore protected part of the territory. While, due to the fragmented and dispersed nature of the urbanized area, challenges arising in the cultural landscape also carry over to the urbanized territory. As such the focus here is formulating design principles around water and ecology for challenges arising within the hill landscape (combined brook and loess landscape, see graphic to the left). It is however important to note that the most effective strategy to help combat those challenges is to make agriculture more diverse, nature inclusive and less reliant on fertilizers, which falls out of the scope of this thesis.

Reference and inspiration for the repair section is mostly found in the elements and maintenance techniques of the cultural landscape of Southern Limburg. Here maintenance centred around coppicing, as well as extensive grazing used to create a biodiverse and heterogeneous landscape (Van Noordwijk et al., n.d). As such the landscape elements that make use of these techniques (graft, holle weg, middenbos) are seen as starting points for environmental and ecological restoration.

The proposed plan of Flood and Forest by Wim Wambecq and Bruno De Meulder is a further inspiration as it brings environmental and ecological restoration together with urban development and proposes large scale transformations of neighbourhoods and industrial terrains into forests.





^ Proposed plan Flood + Foorest for Brussels by Wim Wambecq and Bruno De Meulder (Wambecq & De Meulder, 2017)

< Visualization landscape gradients Flood + Foorest for Brussels by Wim Wambecq and Bruno De Meulder (Wambecq & De Meulder, 2017)

> Coppiced ash trees (Ecopedia, n.d.)

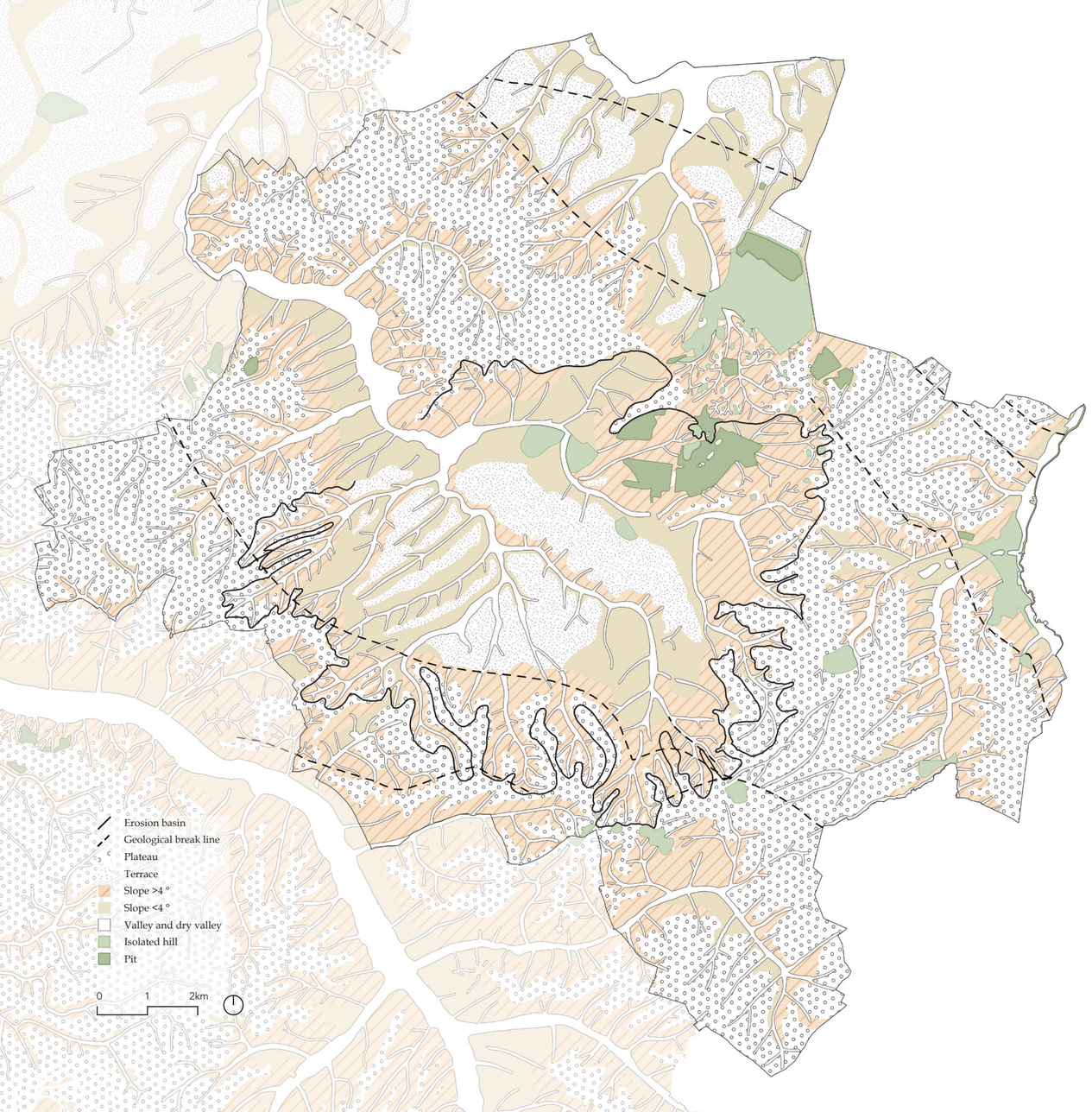
v Graft above Wahlwiller Southern Limburg (Visit Zuid Limburg, n.d.)

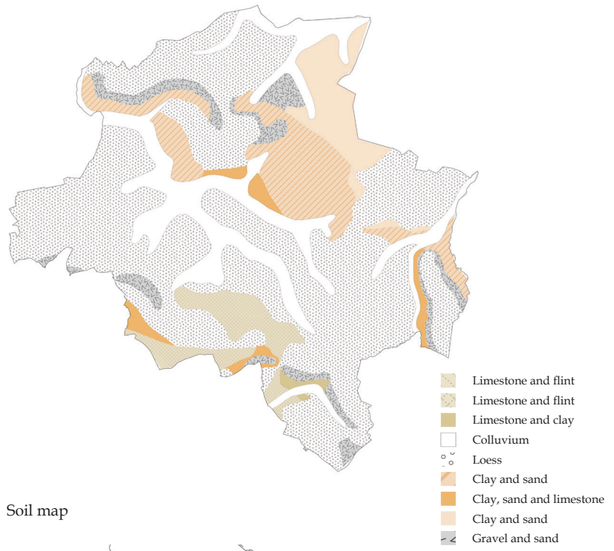
vv Coppiced Oak-hornbeam forest in Flanders (Verboven, 2016)



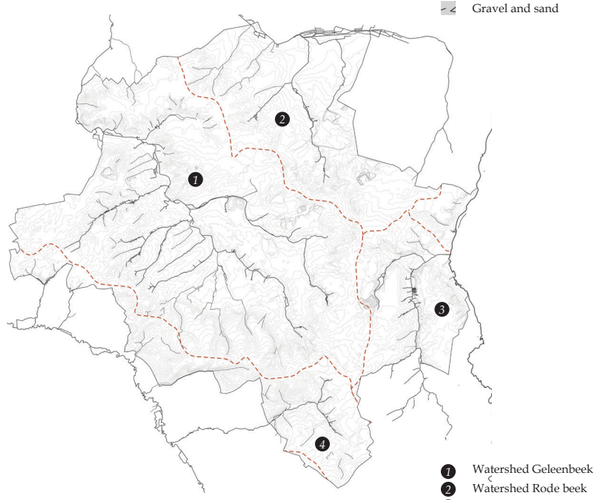






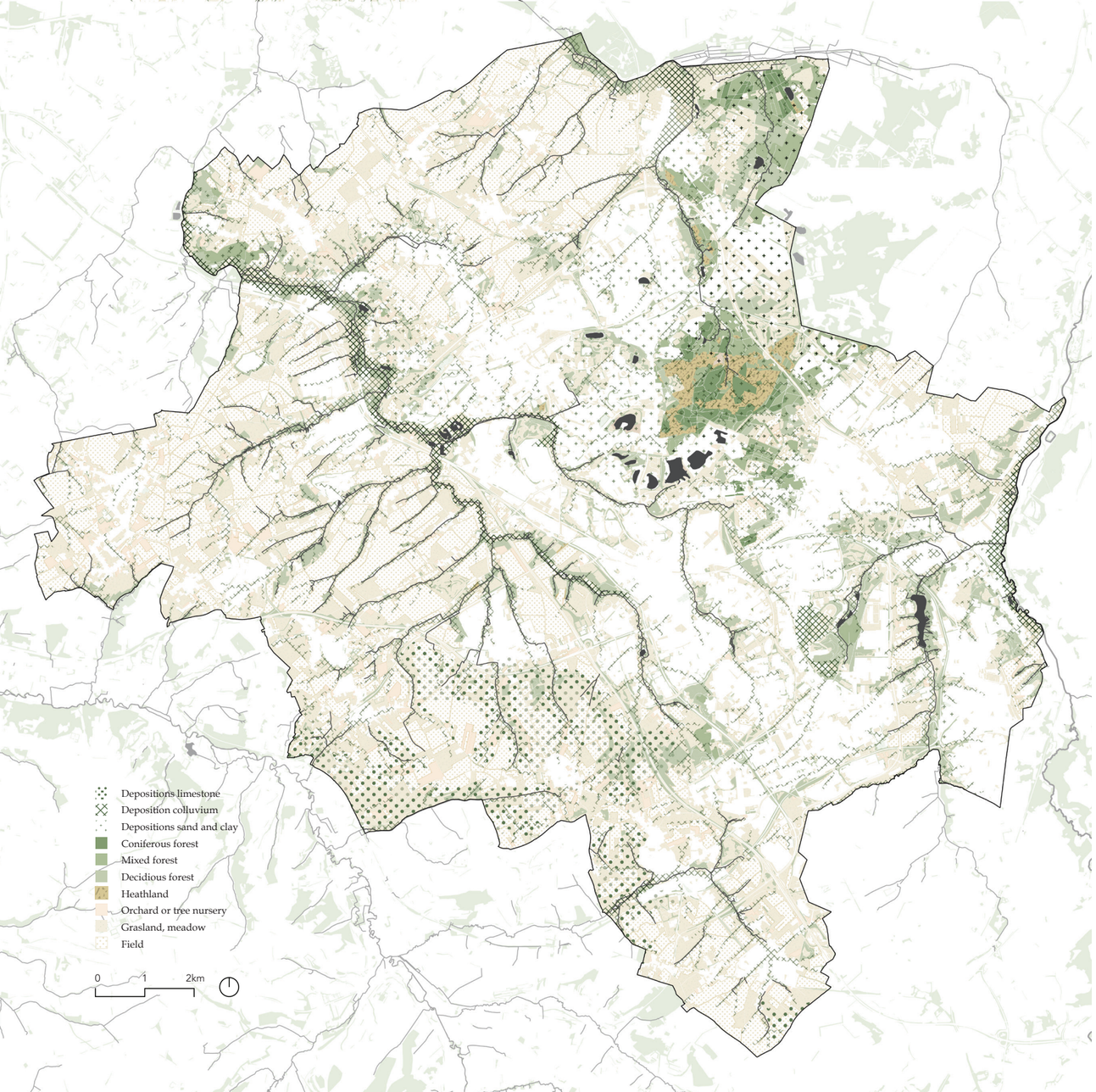


Soil map



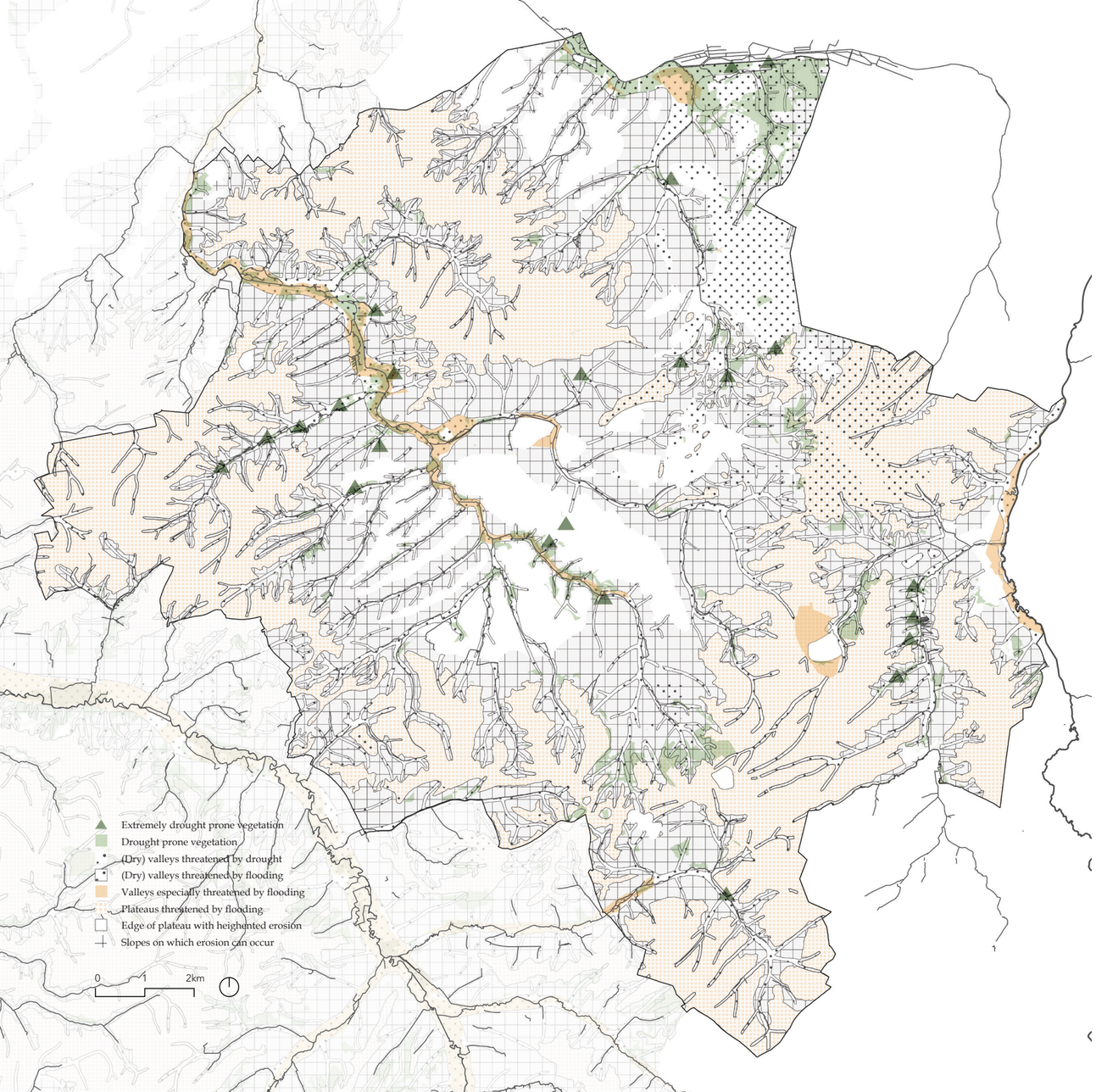
Watersystem

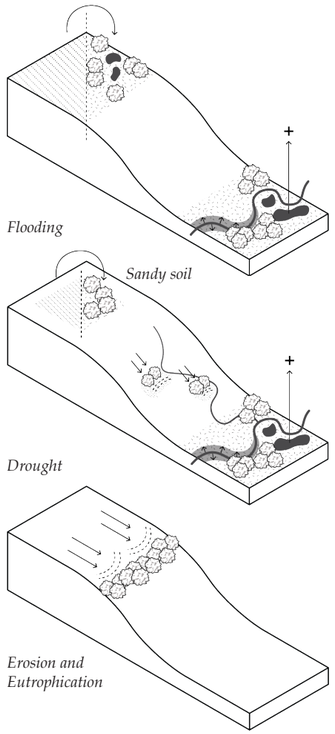
A long and complex history of both alluvial and fluvial soil depositions has led to an extremely varied soil composition in the Dutch hill landscape - both vertically and horizontally. Three soil typologies are especially relevant in the context of this landscape: loess, limestone, and flint eluvium. Albeit not unique in Europe, they are unique to the Netherlands. Equally the geomorphology dominated by plateaus, slopes and valleys is only found here. The interplay of the two has led to a landscape with wide and flat loess plateaus, slopes of varying steepness with different soils in their uppermost layer (either limestone, flint or loess mixed with sand and clay), while the valleys are dominated by a colluvium with particles from all the above. Situated between the Northern and the Southern part of the hill landscape, Parkstad knows varying degrees of steepness and openness around the slopes and valleys of its its three main streams – the Worm, Geleenbeek and Rode beek. Parkstad furthermore knows a wide sand deposit that lead to the development of heathland next to Brunssum.



		Wet		*Dry*
		Brook and spring landscape *Loam, limestone, flint stone, clay, sand* *Damp to wet*	**Loam landscape** *Loam, limestone, flint stone, clay, sand* *Dry to damp*	**Sandy landscape** *Sand and clay* *Dry to damp*
Closed	Forest and forested elements	Wet alder forest, Bird cherry forest Oak-hornbeam forest Oak-beech forest, Oak forest, Woodrush-beech forest Pine forest Thicket	Oak-hornbeam forest Oak-beech forest, Oak forest, Woodrush-beech forest Pine forest Thicket	Thicket Oak-beech forest, Oak forest, Woodrush-beech forest Pine forest **across all soil types a variety of cultural forested elements can also be found such as orchards, wooded banks and hedges*
	Heath	Wet heath		Sand drift Dry heath Wet heath
	Bog	Acidic or raised bog Dynamic marshland Raised bog		Weakly bufferd bog Raised bog
	Grasland	Wet mesotrophic meadow Moist meadow Tall oat gras meadow	Dry mesotrophic meadow Wet or dry herbacious and fauna rich grasland Tall oat grass meadow	Dry mesotrophic meadow Herbacious and fauna rich grasland Wet mesotrophic meadow
	Field	Herbacious and fauna rich field	Herbacious and fauna rich field	Herbacious and fauna rich field
Open	Open water	Small lake Spring Brook		Small lake

The loam, brook and river terrace landscape present all contain a wide array of wet to dry, open to closed biotopes (see table to the left). Characteristic are a variety of forest and meadow biotopes, as well as smaller wet biotopes such as springs and bogs that can occur on slopes and at the edge of plateaus, where ground water surfaces due to the impermeable underground. Because of the heterogenous conditions of hill landscape, these habitats are closely interlinked in a vegetation mosaic. The differences in site conditions furthermore lead to subtypes of habitats occurring in close proximity to one another. The Oak-Hornbeam forest for examples knows five different subtypes of which two or three can appear on the same slope. Some of these biotopes are especially relevant to the repair challenge as they only occur in this landscape typology or are vulnerable to extinction. These landscape typologies include mesotrophic meadows on slopes, Oak-Hornbeam forests on limestone, Bird-cherry forests, spring forests, as well as springs oversaturated with bicarbonate (Van Noordwijk et al., n.d; Natuurkennis, n.d.; Ouden et al., 2016).



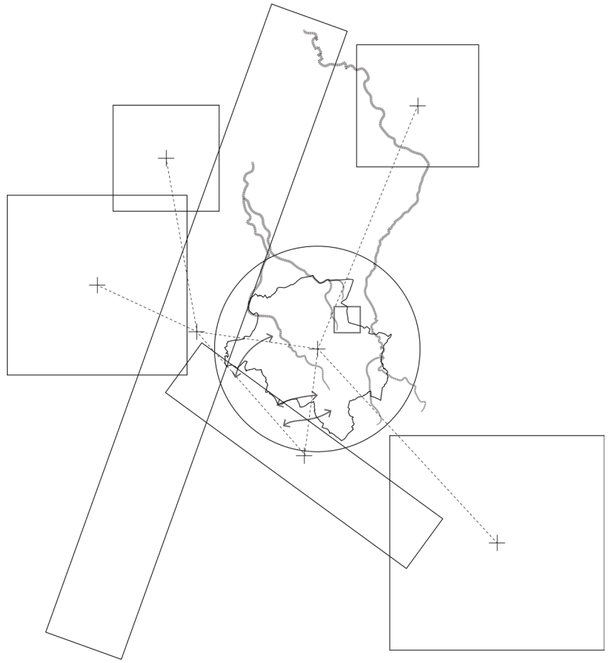


Design principles to lessen environmental challenges

Flooding, erosion, drought

Due to its topography the landscape around Parkstad is sensitive to a variety of water related challenges. Like in the summer of 2021 the narrow stream valleys can flood. This is also a problem for plateaus as the loess soil here can only take up water slowly. Especially slopes that are not forested, are sensitive to erosion, which in turn worsens eutrophication on slopes and in stream valleys (Natuurkennis, n.d.). Drought is especially prevalent on the sandy soil in the area, as well as in the stream and dry valleys, in which vegetation is dependent on high ground water levels (Grootjans, n.d.). To both combat flooding and drought, it is important to increase the sponge capacity of the landscape. Transforming parts of the agricultural area on plateaus into meadows or forest can help improve absorption capacity of the soil. In the valleys it is important to create water storage for extreme rain fall on the other hand more extensive maintenance, creating shallower streams, as well as stopping drainage of ground water can help to alleviate drought. Adding a forested buffer stroke to the edge of plateaus and the edge of stream valleys can help to limit erosion as well as eutrophication.





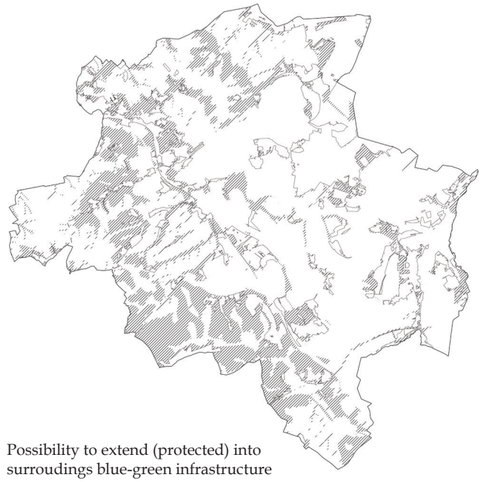
Potential connections to natural areas in surrouding territory

A larger network

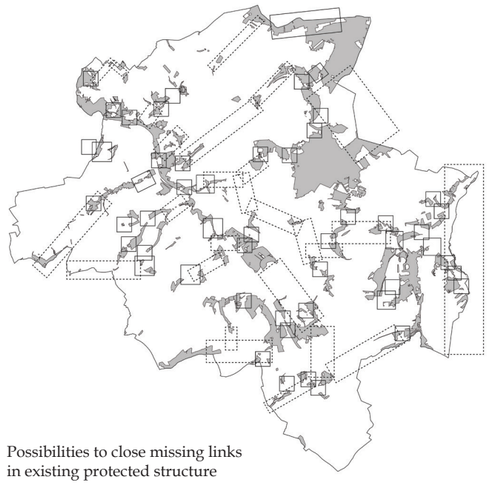
Especially along its streams, with accompanying forest vegetation Parkstad is connected to a larger natural network that encompasses important areas for nature development such as the Geul valley (South-West of Parkstad), Maas valley (West of Parkstad) and the Ardenne/ Eifel mountains (South-East of Parkstad). Strengthening the landscape connectivity within Parkstad, but also towards those areas, can help to create a stronger natural network within the whole Euregio and enable exchange of species. For this it is important to create a robust habitat network around the larger streams present in Parkstad namely the Worm, Geleenbeek and Rode Beek. As small parts of Parkstad also belong to the watershed of the Geul strengthening the natural network along those dry valleys and small streams that flow into the Geul can also enable a better landscape connectivity. On a smaller territorial scale, the heathland around Brunssum (Brunsummerheide) can furthermore be better connected to heathlands in Germany (Tevener Heide).

Large road infrastructure
Railroad
Natura 2000 network
NNN network
Urbanized patches
Coniferous forest
Mixed forest
Decidious forest
Heathland
Orchard or tree nursery
Grasland, meadow

0 1 2km



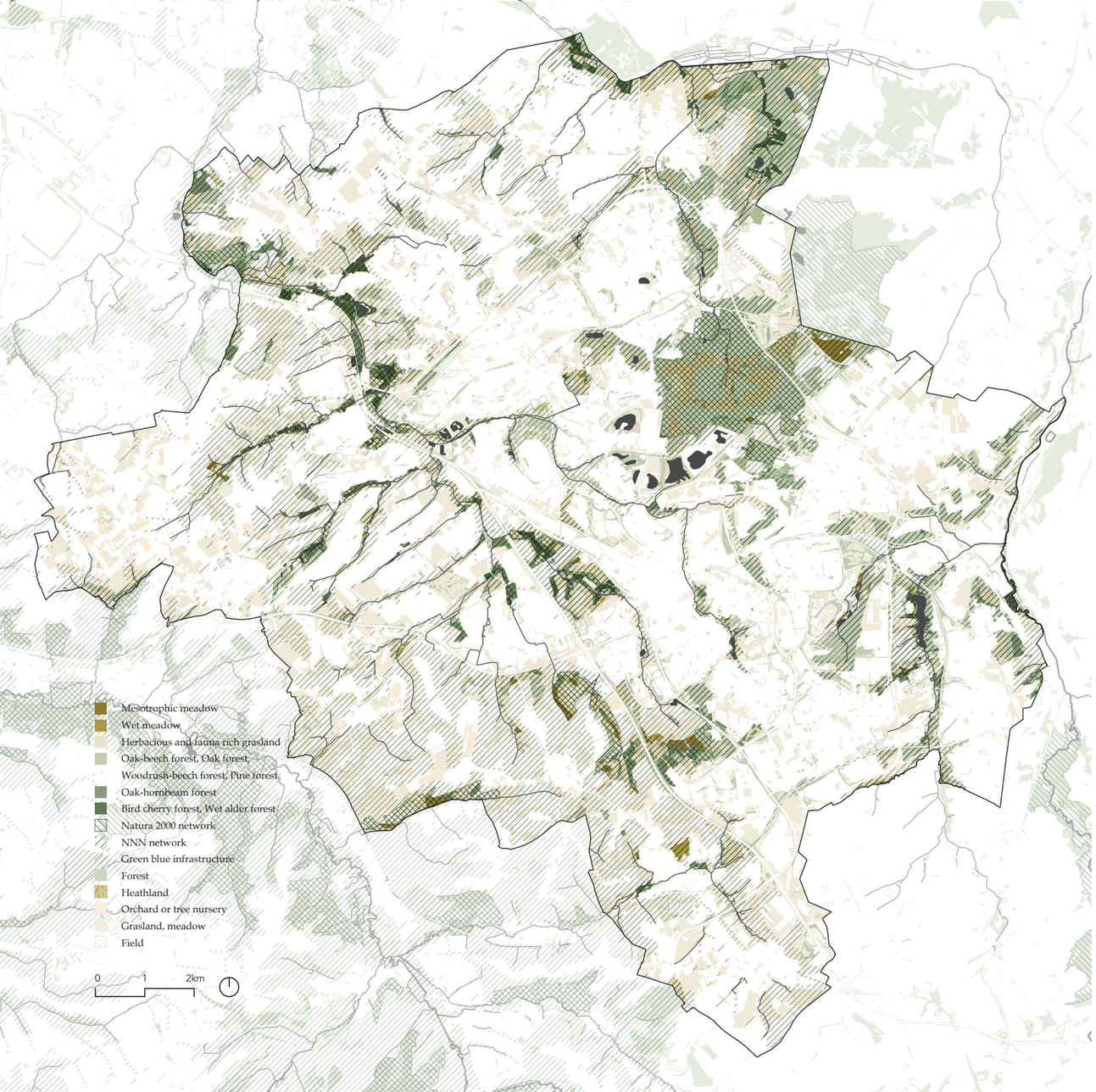
Possibility to extend (protected) into surroudings blue-green infrastructure

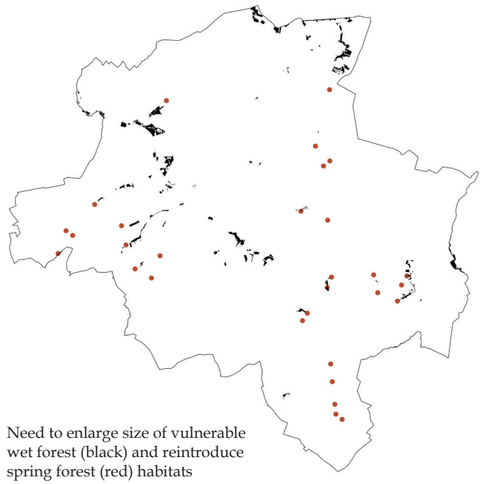


Possibilities to close missing links in existing protected structure

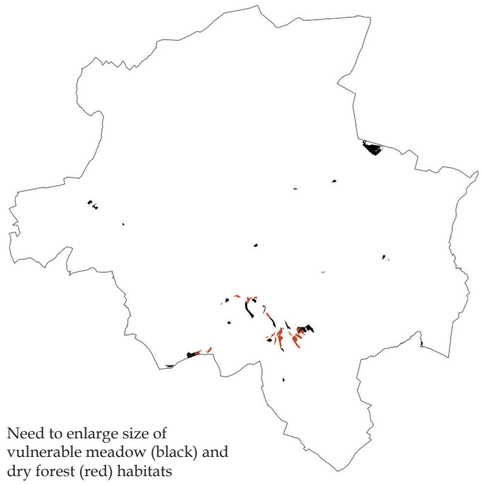
Missing links

Connections to the larger landscape network in turn require improvements in the natural network on the scale of Parkstad. The hill landscape is characterized by its habitat heterogeneity on multiple scale levels; however, this heterogeneity is also dependent on interconnection and gradients between habitats (Van Noordwijk et al., n.d.). Especially due to intensification and expansion of agriculture as well as the growth of the Zwischenstadt, the diverse habitats of the hill landscape became and are becoming increasingly fragmented and isolated. Protected areas are currently mostly located within stream valleys, as well as around the Brunsummerheide. While the areas form a network there are number of breaks and fragments in the network. Establishing ecologically valuable landscape typologies or extensively used agricultural areas in these places can help to improve the overall connectivity of the landscape and help migrating animals to enlarge their habitats. Furthermore, habitats with a focus on nature development can be extended up the slopes and occupy a wider area generally. Here they can also be interwoven with agricultural areas (page 98-99).





Need to enlarge size of vulnerable wet forest (black) and reintroduce spring forest (red) habitats

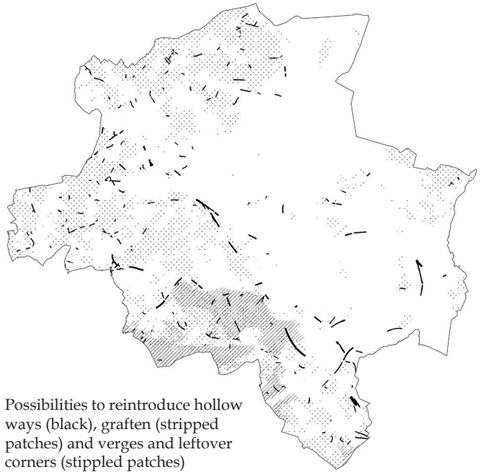


Need to enlarge size of vulnerable meadow (black) and dry forest (red) habitats

<u>Isolated patches</u>

When extending and interconnecting the natural network it is important to pay attention to those habitats that are critically endangered (Van Noordwijk et al., n.d.). These are most notable mesotrophic meadows on slopes, which have become so small that they cannot support the animal populations that inhabit them (carnivorous ground beetles for example need at least 5ha). There is furthermore a rare forest typology, the Oak-Hornbeam Forest with orchids, which only grows on limestone slope, that has nearly disappeared from the Netherlands (Ouden et al., 2016). The limestone slopes of Parkstad provide an opportunity to reintroduce this forest typology. It is furthermore important to pay attention to the development of wet forest typologies such as Bird cherry forests and forests around springs (Natuurkennis, n.d.; Ouden et al., 2016). As the Bird Cherry Forest does not migrate easily here it is also crucial to extend existing patches. Forests around springs only occur in small patches as they are dependent on the specific conditions of the spring, so here it is important to allow once again for forest development around springs.



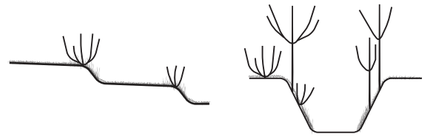


Possibilities to reintroduce hollow ways (black), graften (stripped patches) and verges and leftover corners (stippled patches)





Possibilities to introduce bufferzone around plateau (black line) and redevelop forest edges (outline stippled patches)



Graft
Graft

Holle weg
Hollow way

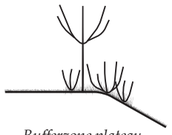


Berm
Verge

Overhoek
Leftover space



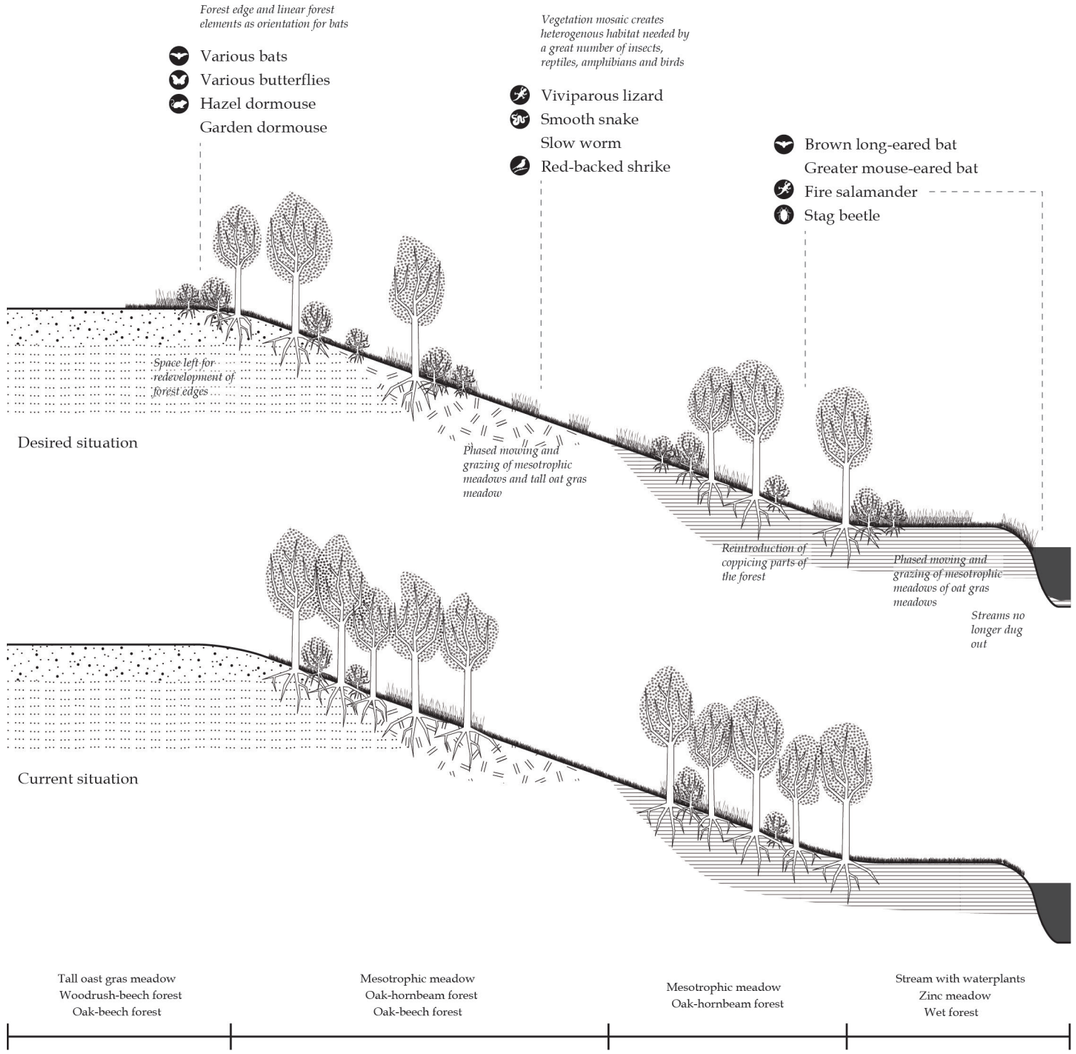
Mantel en zoom
Forest edge

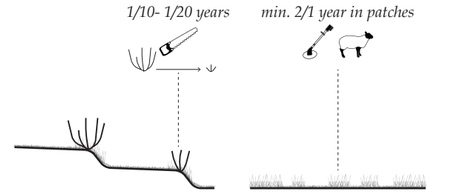


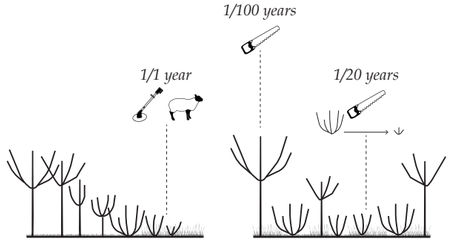
Bufferzone plateau

Catalogue of linear landscape elements to be (re)introduced in Parkstad

<u>Lost connections</u>
On the scale level of a patch landscape heterogeneity and connectivity can furthermore be fostered through connecting habitats by small scale (forested) landscape structures. This is especially crucial for agricultural habitats or more intensively used meadows. These elements were much more present in the past, however got lost throughout the 20th century and can be reintroduced as such . Two elements specific to the hill landscape- the “Graften” and “Holle Wegen” (short description on page 72) used to provide forested connections, while road verges and leftover agricultural space provided mesotrophic meadow strips as connections (Van Noordwijk et al.; Natuurkennis, n.d.) Another important landscape elements that used to foster connectivity between habitats, as well as landscape heterogeneity were well developed forest edge, which also disappeared over time. It is thus also to enlarge the threshold around forested patches to allow for their redevelopment. Lastly, the buffer zones especially around the wide-open plateau edges that are to be introduced to combat erosion and eutrophication also can become connectors of habitats.



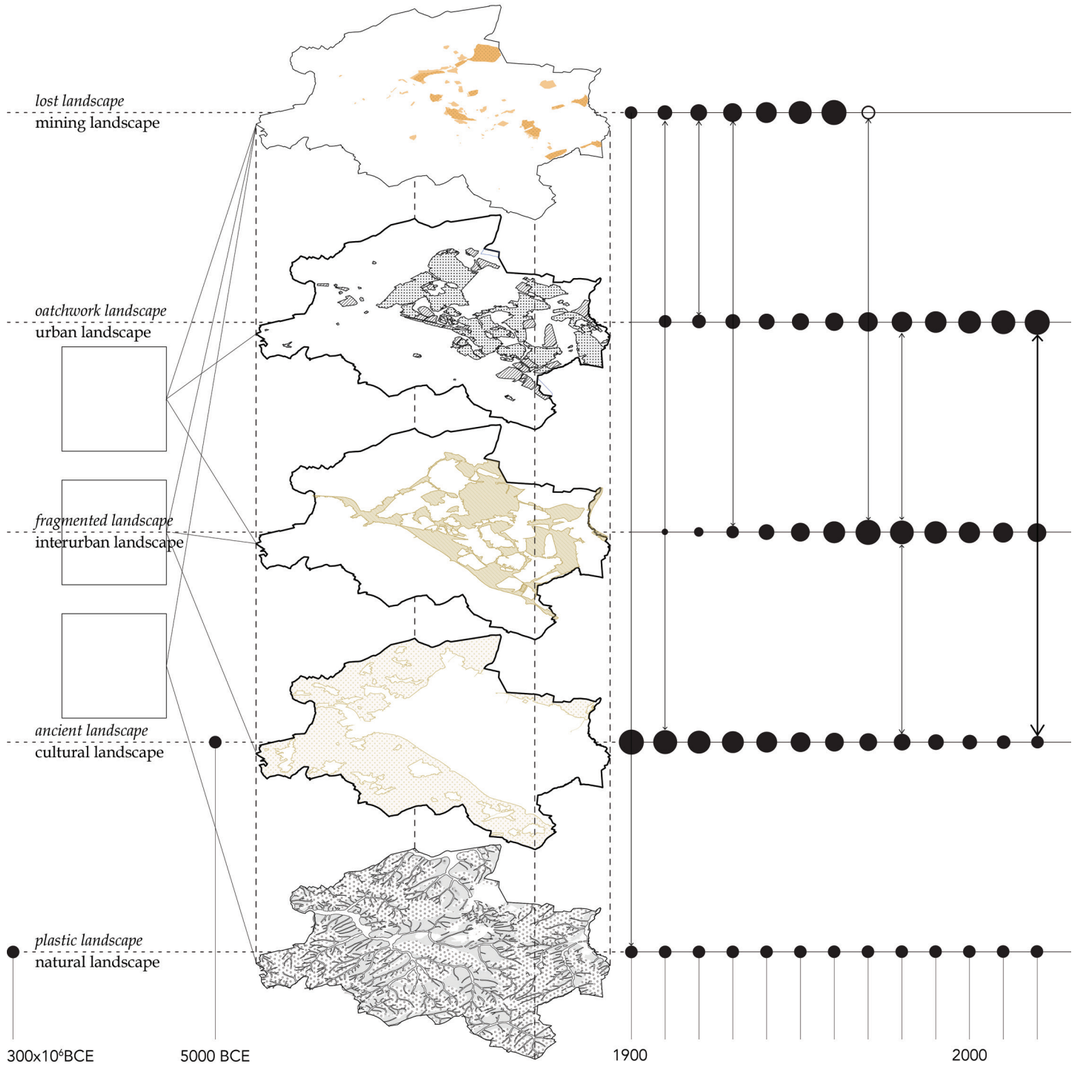




Maintenance techniques for most prominent landscape typologies

Lacking landscape managment

However not only the quantity of habitats and landscape elements are important, also their quality. Loss of biodiversity in the hill landscape is directly tied to a decline in traditional landscape management techniques (Van Noordwijk et al., n.d.). The disappearance of coppiced forests ("Hakhout") or coppiced forests with standards ("Middenbos") after the Second World War, meant that the forest started to become denser and darker leading to the disappearance of species dependent on a light forest. Eutrophication destroyed or threatened a lot of the mesotrophic meadows, in order to restore their characteristic habitat a more intensive management is needed. It is important to mow the meadows more frequently or let sheep graze there more frequently, while removing the mown gras. On the other hand, it is also to do this maintenance in phased steps, as to not destroy the habitat of the animals that live in these meadows completely and allow them to migrate during maintenance. In order to restore habitats around it is furthermore crucial to stop digging them out, as well as mow less frequently.



Part 4 | Relate

Approaching the Zwischenstadt

To *relate* means to create synthetic design that honour nature and culture, the needs of humans and non-humans (Prominski, 2014). For urbanized territories this means merging landscape and city wholistically. This integration on one hand is led by environmental and ecologically parameters, as analysed in the previous section *repair*, it is however also dependent on a careful spatial integration that takes anthropogenic uses and urban patterns into account. An integration that is sensitive to human perception of the territory and is aimed at creating qualitative and liveable that embody reciprocal care. While dispersed territories and the Zwischenstadt showcase the interweaving of landscape and urban structures, these structures often lack an overarching vision and are driven by economic values (Cavalieri & Viganò, 2019). They lack legibility and fail to create an internal image in the minds of their inhabitants. A spatial framework and narrative for the Zwischenstadt thus not only become the starting point for designing with care through *relating*, but they can also justify such measures as they answer to larger spatial and societal questions. Schröder et al. define three spatial parameters as especially important in rendering the Zwischenstadt readable: contour, complexity, and coherence (Schröder et al., 2001). These in part mirror the work of Kaplan and Kaplan on environmental

In the opinion of the general public, this kind of urban cultural landscape is regarded as ugly and as something that requires escape.
It is 'anaesthetic', it is seen without emotions.
If seen at all, it is seen instrumentally only.

Good architecture, good urban design and good urban landscaping is much-needed, but it is not enough, it must be supplemented and supported by cultural activities.

Thomas Sieverts (2018)

preference. They postulate that humans prefer and aesthetically appreciate environments that are coherent, complex, mysterious, and legible (Kaplan, 1979). Schröder et al. further underline the importance of creating both own and special places (2001) and with that call for the creation of diverse third places (Oldenburg, 1999).

I order to assess the capacity of Parkstad to cater to these notions and evoke an internal image the spatial composition of the territory is analysed. Seemingly unordered and diffuse, Parkstad processes an internal spatial logic, that is a result of both global and local processes and preconditions. The aim of this section is to look at this processes and preconditions in distinct layers and reveal their spatial qualities and relationships with one another. The image on the left contains a summary of the five layers explored hereafter: the natural topography, the cultural landscape, the landscape fragment, the urban patchwork and the lost mining landscape.

View of industrial heritage, Landschaftspark Duisburg Nord by Latz + Partner (Latz + Partner, n.d.-b)

Overview area IBA Emscher Park and Emscher Landschaftspark (dark grey) (Kimic, 2012)

View onto Cowperplatz ,Landschaftspark Duisburg Nord by Latz + Partner (Latz + Partner, n.d.-b)







Both the plan for the Emscher Landschaftspark, as well as the Grüngürtel of Frankfurt lay interesting connections between large scale landscape planning and small scale projects that integrate human and other than human worlds. Both plans are made up of an overarching landscape vision (where however landcape and city are still viewed as separate entities) and multitude of smaller landscape projects. Landschaftspark Duisburg Nord and Alter Flugplatz Bonames combine public space and cultural institutions with environmental and ecological restoration. The project of Alter Flugplatz Bonames is even a research project meant to better understand ecological restoration of old industrial sites (Prominski, 2014).

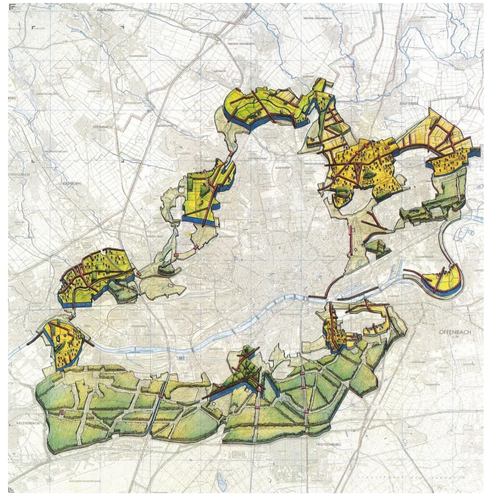
Concrete field turned into forest through cutting up concrete, Alter Flugplatz Bonames by GTL landscape architects

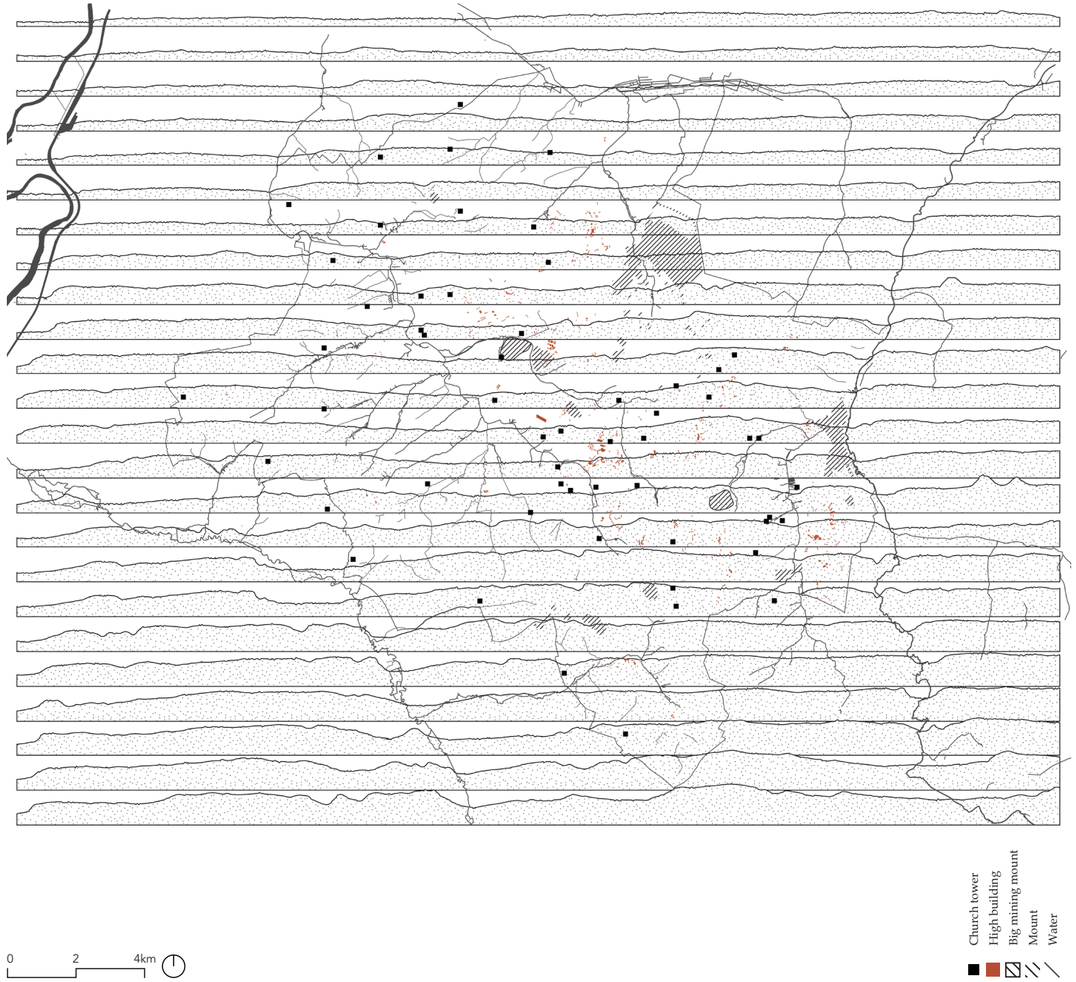
Original plan Grüngürtel Frankfurt by Latz + Partner(Latz + Partner, n.d.-a)

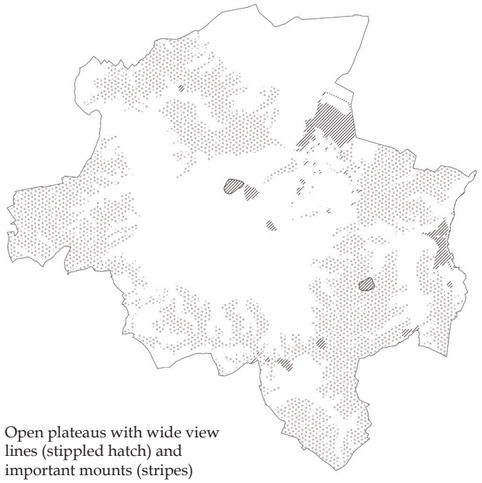
Landing strip as central connection and activity axis, Alter Flugplatz Bonames GTL landscape architects







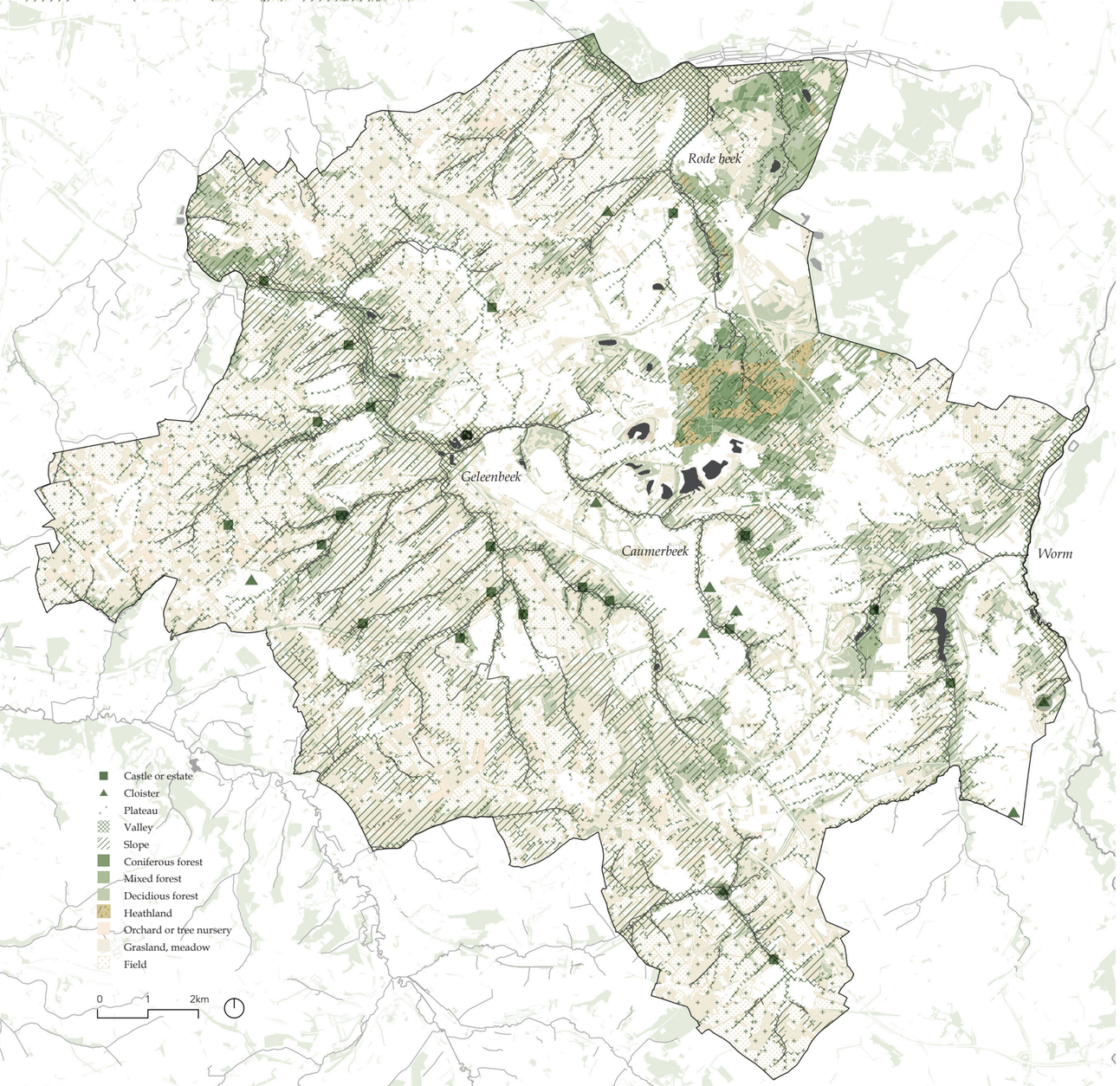


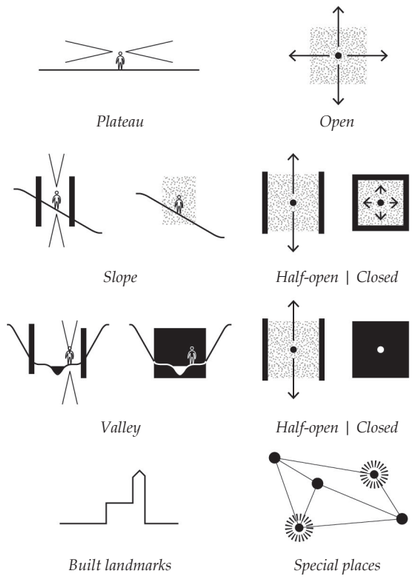


Open plateaus with wide view lines (stippled hatch) and important mounts (stripes)

A plastic landscape

The natural topography of the landscape with its plateaus and valleys naturally allows for wide view of the landscape. Anthropogenic changes to the landscape such as church towers, viewpoints, mining mounts and high-rise buildings intensify this ability as well as provide landmarks, which to view. These points of orientation are important identifying features in the spread out Zwischenstadt landscape. The Wilhelminaberg, for example, with its ski hall and recreational facilities on top of it is one of the most important beacons of Parkstad and a popular destination for locals and tourists alike. The diffuse and heterarchical set up of the Zwischenstadt can be disorientating at times so these landmarks can help in orienting oneself. Safe-guarding and fostering these wide views and specific landmarks is important as they are site-specific landscape elements that are tied up with the character (hill landscape) and history (mining mounts and church towers) of Parkstad.

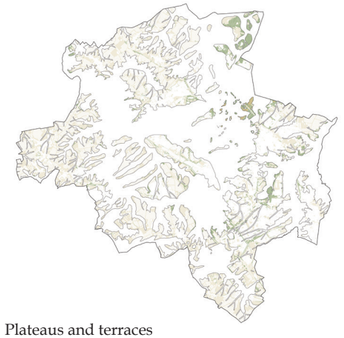




Structuring characteristics of the cultural landscape

<u>An ancient landscape</u>

As discussed in the history of Parkstad, the hill landscape is the oldest cultural landscape of the Netherlands (Hermans, 2022). As large parts of Parkstad have been urbanized throughout the 20th century, widespread cultural landscapes can only be found along the Western flank of Parkstad. There are furthermore various parts of stream valleys in the urbanized territory, which remained forested and retained their landscape character (parts of the Geleenbeek, Worm and Caumerbeek for example). The hill landscape knows a very characteristic landscape profile (page 82)) as well as stereotypical landscape elements (“Graften“ and “Holle Wegen”, page 72 and 98-99). Structured by the sequence of plateau – slope – valley the landscape is defined by varying degrees of openness (Heusschen * Copier Stad+Landschap, 2017). The plateaus are relatively flat and are predominantly in agricultural use. Due to these factors, they are open and allow for wide views. However, the presence of higher plateau tops as well as forest on the adjacent slopes can in certain places delimit and frame these views. The steepest parts of the slopes in Parkstad are traditionally forested as

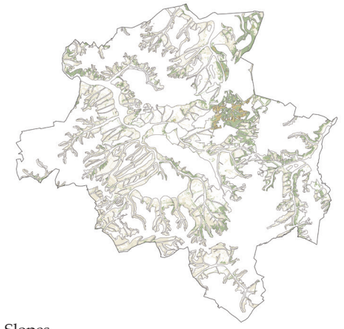








Plateaus and terraces









Slopes







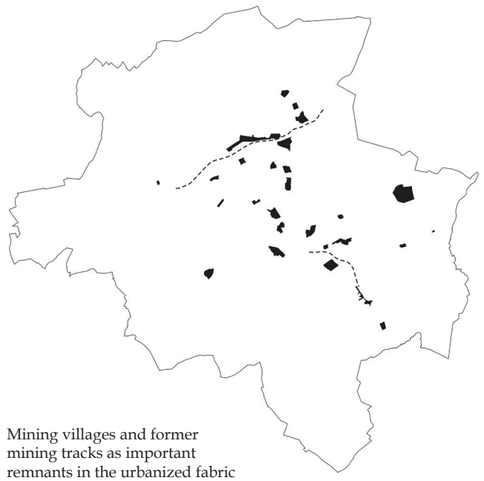


Valleys

they are difficult to cultivate. Here the oldest forest of Parsktad can be found. Especially with the end of coppicing (“middenhout”, “hakhout”), the forests developed a closed and dark character. Where “graften” are intact or at least commonplace the slopes also retain a closed character. Gentler slopes predominantly in agricultural use have a half open character as forested elements along roads and between plots of land are more common. Both dry and stream valleys often have a half open character as well. The edges of the valleys create linear viewlines. This experience is strengthened by building structures as well as planting structure along the stream or former stream. However along certain places of the streams the valleys have a closed character. Here forest structures are so predominant that large parts of the stream valley develop a closed quality amplified by the steep edges surrounding it. The cultural landscape lastly also knows built elements such as castles, cloisters, windmills, and traditional farm structures characteristic for the Dutch hills. Especially the larger built structures such as castles and cloisters functioning as landmarks both in the cultural and the urbanized territory.

Mining monuments
Former mining railway tracks
Railway tracks
Protected townscapes
Mining colonies that still exist today
Destroyed mining colonies
Mount of rocks
Quarries
Former mines

0 1 2km

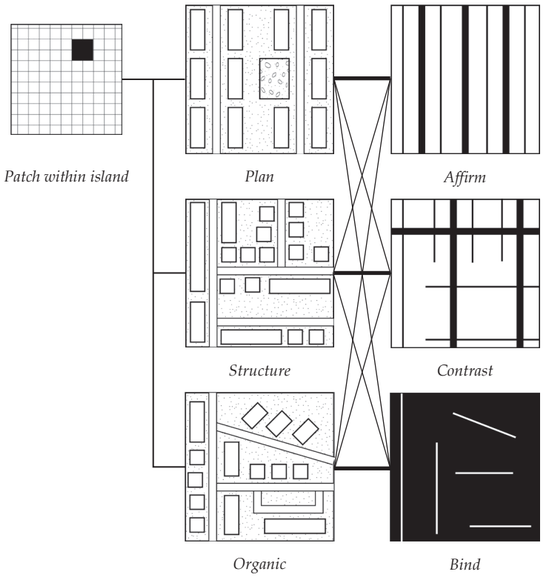


Mining villages and former mining tracks as important remnants in the urbanized fabric

A lost landscape

The mining heritage within the "Oostelijke Mijnstreek" has all but nearly been destroyed. Unlike in the German counterpart "Rheinisches Revier" transformed mining terrains cannot serve as new landmarks and public spaces for a post-industrial landscape and Zwischenstadt. With this an important opportunity to construct a new landscape identity and shared understanding of the territory have been lost. Most of the former mines are furthermore built over with residential developments and industrial areas. What remains of the mining areas, aside from a few memorials, are the often-unfinished mining villages. In part small neighbourhoods in part clusters of houses these residential spaces bear witness not only to the past of Parkstad as a mining district, but also to the ideal of the Garden city prevalent in urban design and architecture at the beginning of the 20th century. As such their urban and green structures as well as individual houses should be retained. Where they form ensembles with an own language, their spatial integrity should not be disturbed.





Three overarching patch typologies that can steer the forest neighbourhood development

A patchwork landscape

While the plan to build the mining villages in Parkstad in a spread-out structure already gave rise to the territory as a patchwork, this development course cemented after the mining period with further urban expansion and urban restructuring. In the IBA Handboek five different urban development strategies are distinguished for Parkstad (Coenen et al., 2015):

_*Insertion* of infrastructure creating borders and breaks between urban areas and within them

_*Replacement* of old mines, industrial terrains and infrastructures with new urban structures both industrial and residential

_*Restructuring* of historic city centres

_*Expansion* of new residential an industrial developments unconnected to the existing urban fabric

_*Infill* and densification of existing built structures, mostly existing ribbon settlements

This led to the development of a twofold patchwork, on a macro scale a fourth (or fifth) layer of landscape developed that compromised





1 The plan



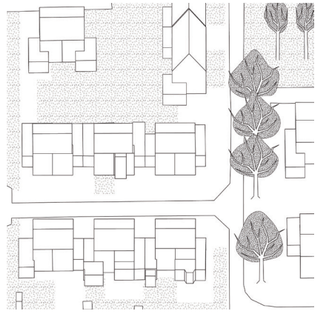
2 The structure



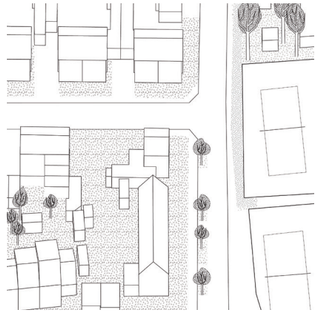
3 Organic development

the edges and borders of these developments, as well as the unbuilt spaces within them (page 120-123). On the other hand, the overall spatial evolution of the Parkstad led to the formation of residential and industrial islands, which due to their heterogenic development structure themselves form patchworks. While these patchwork islands often grew around established centres, the primarily residential development around them constitute autonomous fragments, disconnected from the centre patches which are turned inwards (Coenen et al., 2015). Rather than developing organic borders and edges, not only the outside, but also the inside of the islands is fragmented by infrastructural *insertions*. While some of these fragments, for example the *replacement* of old mines and bigger *infills* were planned and built as larger structures, mostly today *infills* and even *expansions* are built and planned in piecemeal structures. The resulting patches are varied in size, grain structure and complexity. Without taking blends and overlaps into account they can be subdivided into three categories – plan, structure, organic:





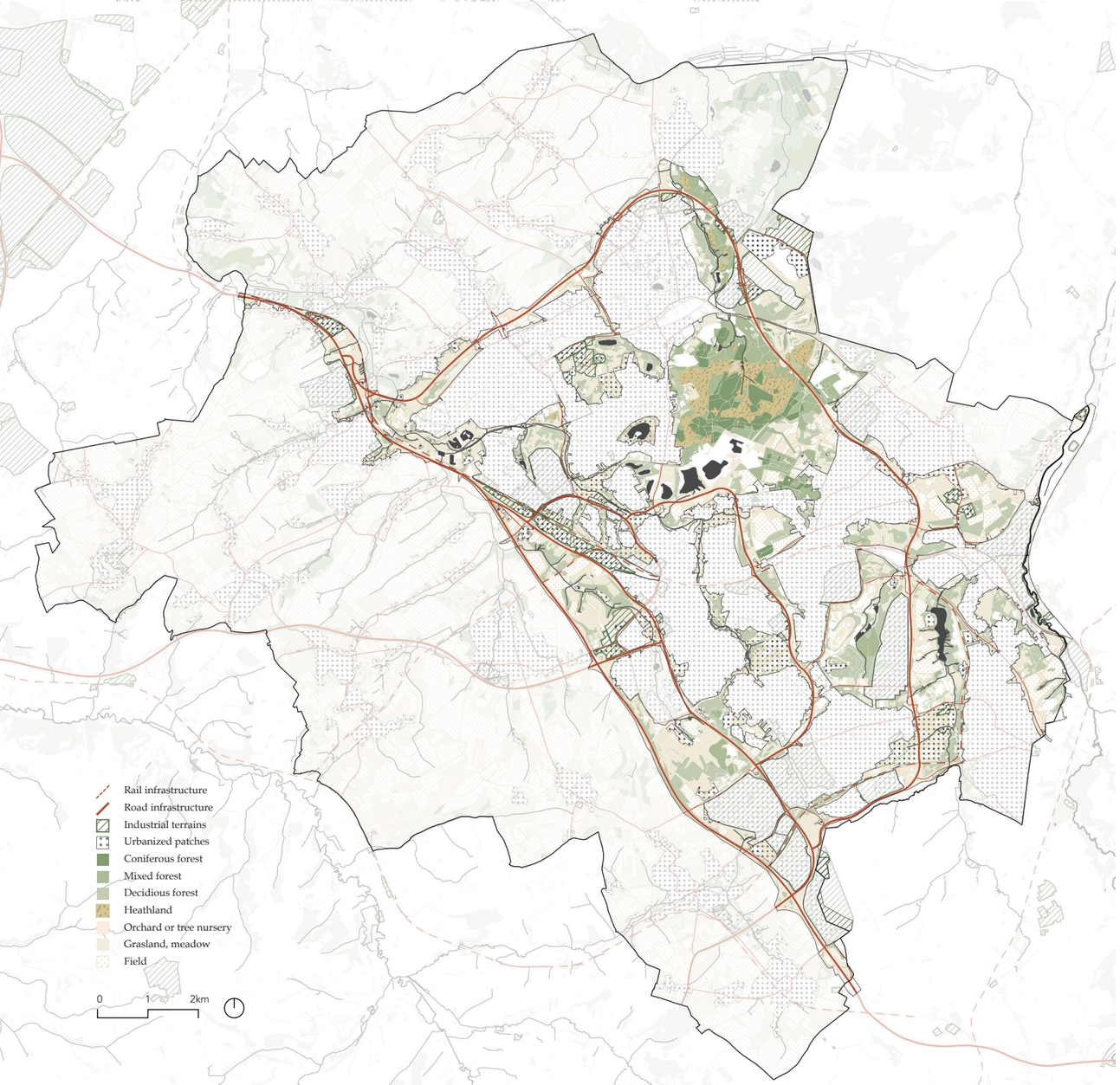


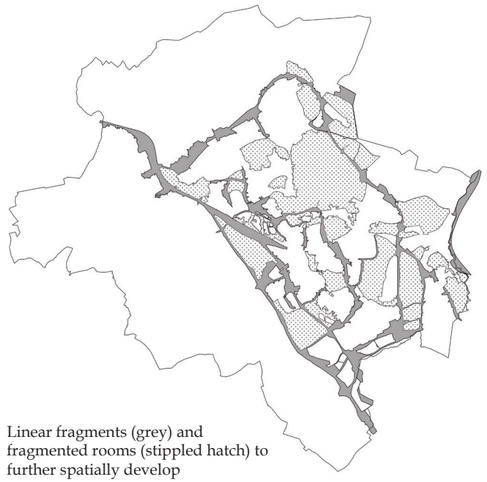







_Coherently planned pieces of city with their own internal logic and accompanying public spaces *(replacement, expansion, infill)*
_Gradual *expansions* and *infills* that follow a simple urban grid, however often lacking qualitative public spaces and spatial expression as they are planned piece by piece
_Piecemeal *expansions* and *infills* that form complex and difficult to read urban structures often with green structures as internal leftovers and without qualitative urban space
An urban landscape evolves that is on one hand extremely heterogeneous and at the other also vey homogeneous, as only a limited number of building typologies – mostly two-story buildings either as single family, duplex or row houses make up the landscape. As it is impossible, nor desirable to create overall coherence within this patchwork, a differentiated landscape approach is needed attuned to each piece of the city. Forestry here can either *affirm* the spatial framework, *contrast* it or *bind* it together, depending on the situation at hand and its development trajectory (page 115).





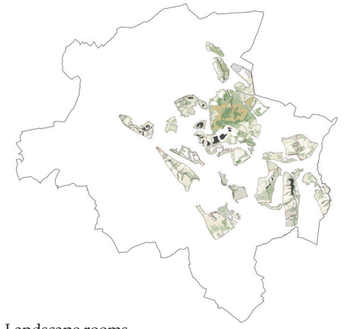
Linear fragments (grey) and fragmented rooms (stippled hatch) to further spatially develop

A fragmented landscape

The fragmented landscape represents a fourth (or fifth, if one includes the lost landscape) landscape layers. It consists of elements of both the cultural and the urban landscape, which not belonging to either. It comprises the border and edges of the patchwork islands, as well as landscape fragments in between large-scale infrastructure most notably the leftover space between the A76 and the N281. This fragmented landscape can be subdivided into two larger categories: This fragmented landscape can be subdivided into two larger categories:

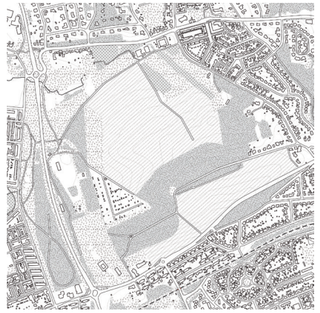
_Linear fragments occurring around road infrastructure and streams. The often-inserted road infrastructure (most notably the ring road) forms a larger spatial barrier than the streams which also function as connector between islands.

_Fragmented rooms which are partly framed by linear fragments and can be natural protected areas, recreational areas, agricultural areas with incidental developments. These fragmented rooms can contain urban and industrial fragments in turn. Like islands within



Landscape rooms







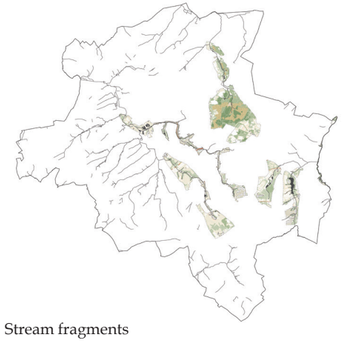


Infrastructural fragments









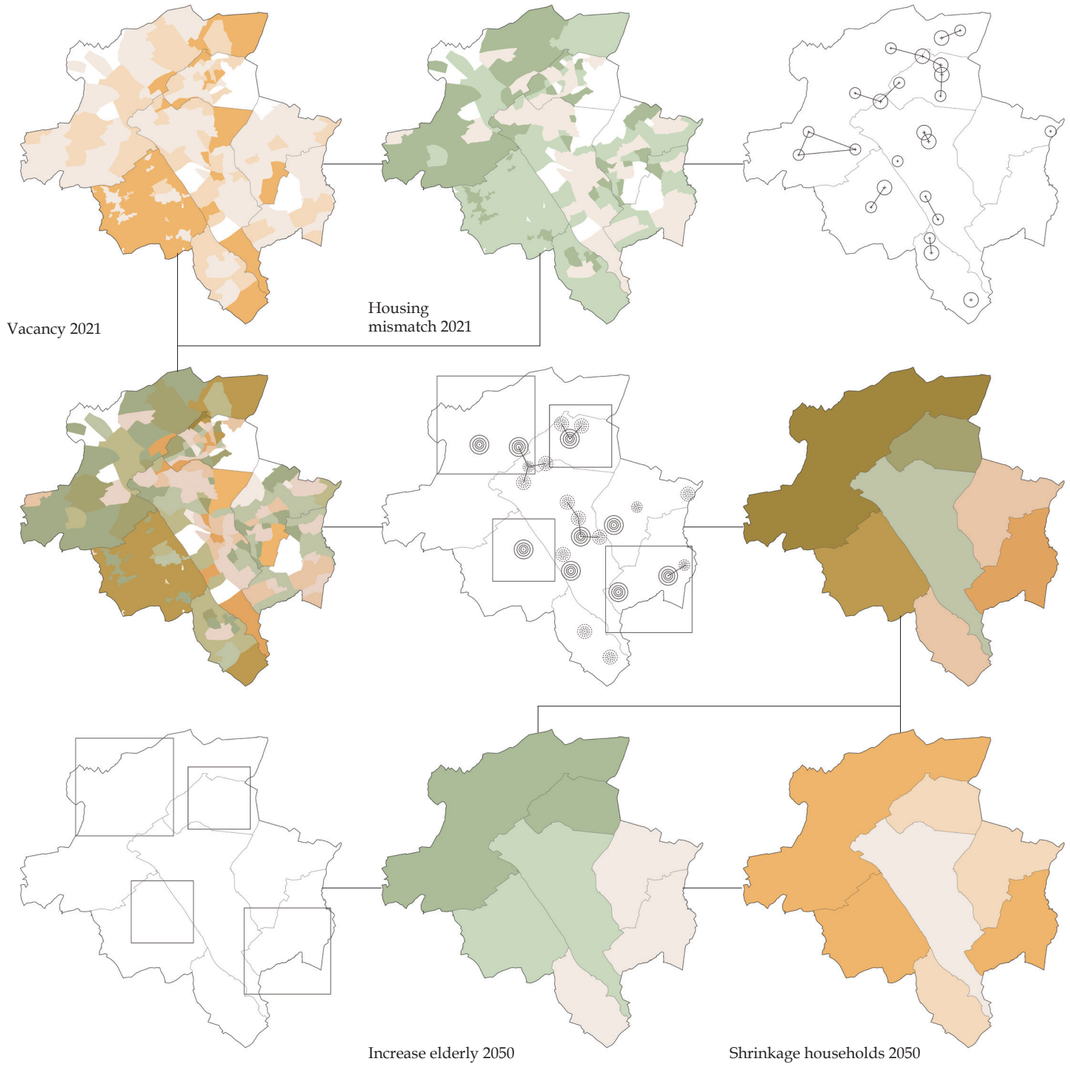
Stream fragments







islands. The fragmented rooms often contain spatial traces and logics of the cultural landscape, while they are disconnected from the larger framework of the cultural landscape itself.
The linear fragments connect the fragmented rooms creating a larger urban-landscape structure that embraces the urban islands both on their outside and inside. On the scale level of Parkstad it forms an overarching structure. Fostering and developing this larger landscape infrastructure could help to improve the overall readability and experiential quality of the Zwischenstadt without attempting to destroy its heterogeneous quality. Such a forestry tactic could furthermore prevent large scale forestation of the open parts of the cultural landscape, as well buffer the natural protected landscapes in the fourth landscape. Especially after the mining time the fourth landscape became increasingly smaller and more fragmented, which lead to natural areas being wedged in between industrial terrains and residential developments.



Part 5 | Reduce

Reviewing shrinkage

To reduce means to limit anthropogenic pressures on the environment as much as possible. While there is a growing understanding that this requires new social and economic logics such as degrowth (Hickel & Kallis, 2019; Sijmons, 2022), the implementation of these lies outside the field of landscape architecture and spatial design generally. However, in already shrinking territories landscape architecture can enable an alternative development trajectory (Desimini, 2014; Waldheim, 2016). Waldheim writes that in opposition to architecture, which is bound up with growth and progress, landscape architecture is uniquely situated to respond to the shrinking city: "As building fabric, street wall, and traditional public space recede as the primary determinants of urban order, landscape emerges as uniquely capable of restoring some form of spatial or social order" (2016). While Desimini rewrites the narrative of shrinkage as an inherent problem that cities face, to one full of opportunity – "an alternative form of urbanism requiring a projective stance" (2014). In reference to Julia Czerniak, she calls this form of urbanization the "formerly urban" and highlights the inherent chance to balance "ecological and civic functions" in the shrinking city with its decreasing density and increasing wildness. For this she formulates four overarching design principles or

Shrinking cities may not need traditional gardens, parks, and civic plazas but they do need landscape architecture's comfort with a process-based design involving slow evolution to shape successfully their socio-ecological future. These qualities are the hallmarks of landscape architecture.

Jill Desimini (2014)

starting points that landscape architects should embrace when working in the "formerly urban" territory: redefining and reinterpreting the existing site conditions (1), embracing "slow time" which is required for transformation (2), working with maintenance gradients, and embracing wildness in a designerly manner (3), as well as working through the scales (4). She envisions a design process, driven by "land stewardship and management" rather than construction, that builds on these fourth tenets to "cultivate a deliberate landscape, one of cultural significance and ecological service" (Desimini, 2014).

Parkstad, where population numbers have been decreasing since the mid-1990s and are predicted to shrink in the future, especially after 2035 (PBL&CBS, 2022), is thus an appropriate test case for these design strategies. The following section maps the spatial distribution of shrinkage, changing housing needs, as well as social problems associated with shrinkage to evaluate the role which shrinkage can play in the formulation of a new territorial forest infrastructure.

Architectonic detail Landschaftszug Dessau by StationC23 (Architektenkammer Sachsen-Anhalt, n.d.)

Blooming meadow Landschaftszug Dessau by StationC23 (Architektenkammer Sachsen-Anhalt, n.d.)

Overview Landschaftszug Dessau by StationC23 (Architektenkammer Sachsen-Anhalt, n.d.)



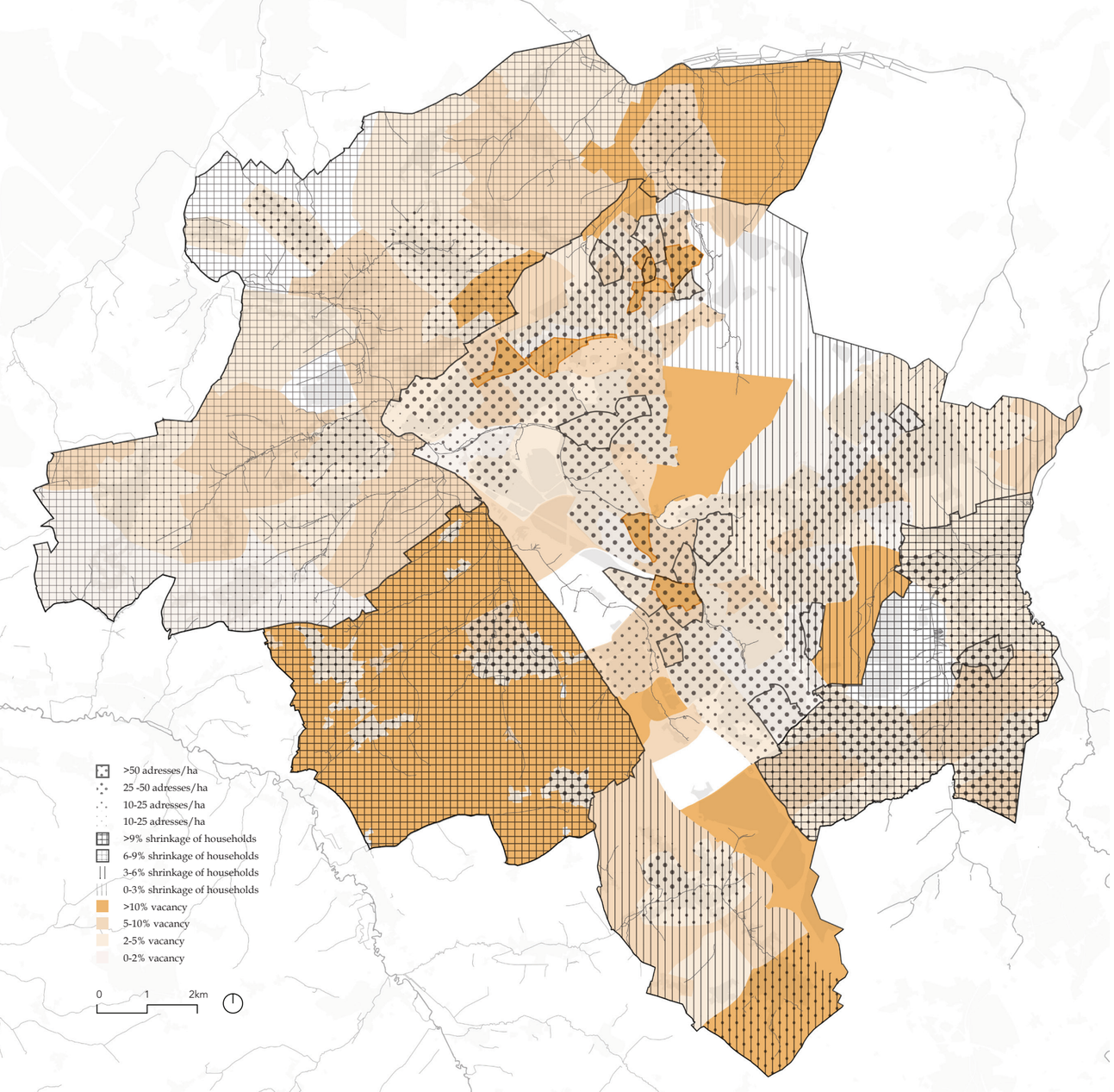


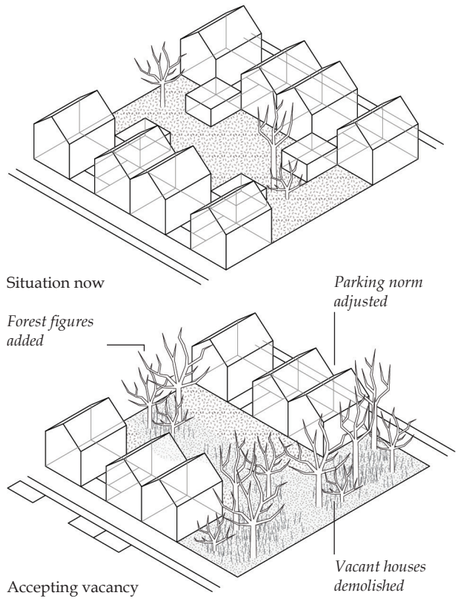


Both plans for the Landschaftszug Dessau and Lyon Confluence Plan take slow time and gradual landscape development as their starting point. The long term vision is to establish extended landscape structures as the backbone of urbanized patches. While the Lyon Confluence Plan anticipates a situation of renewed development (Desimini, 2014), Landschaftszug Dessau deals with low term vacancy. Here houses in the landscape strip will be gradually demolished and taken over by meadow. For this a low maintenance scheme was developed by landscape architects StationC23. This was done as a second plan after initial attempts for landscape development through community participation largely failed.



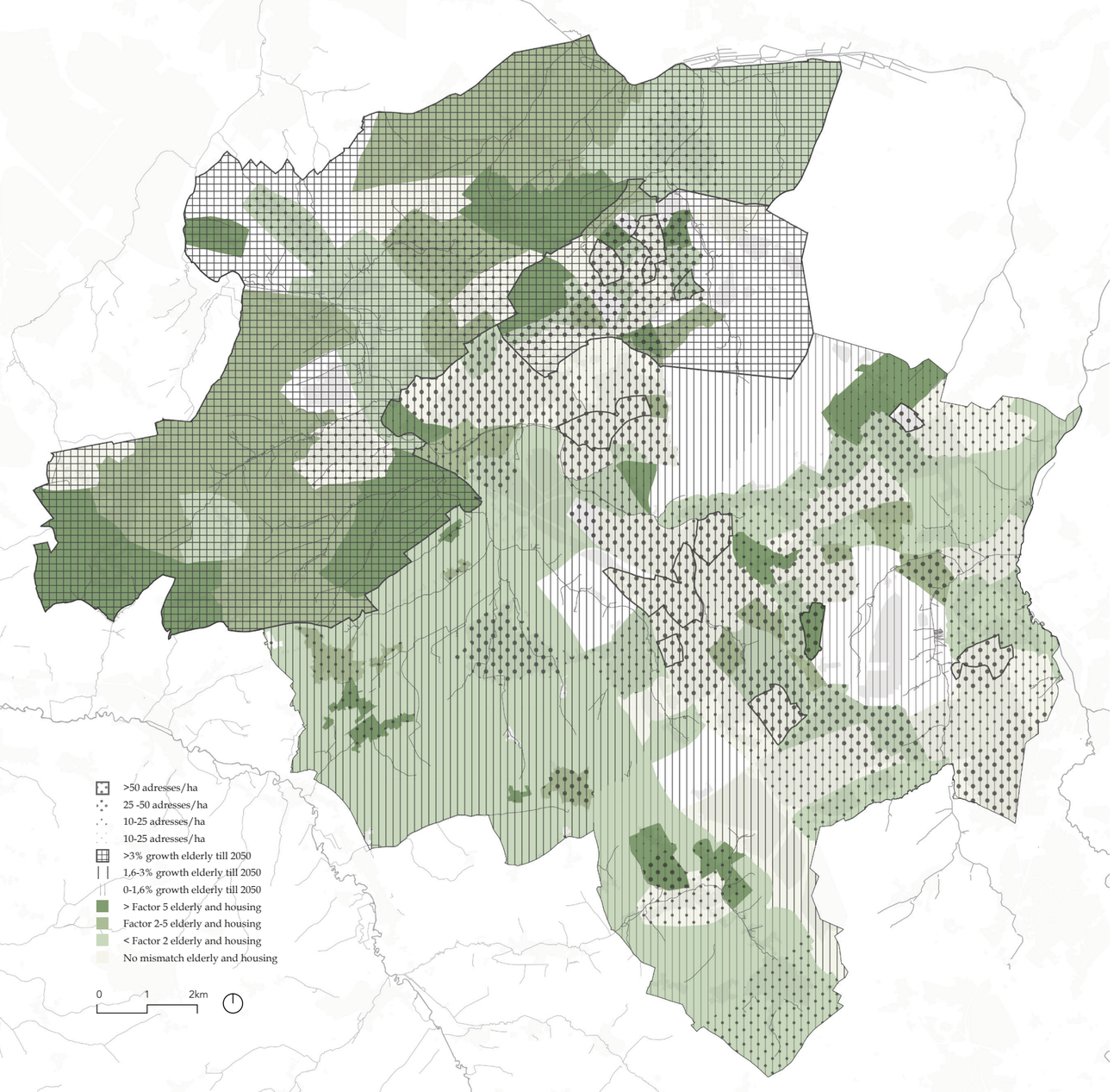
Proposition for Lyon Confluence Plan by Michel Desvigne Paysagiste (Miligan, 2010)

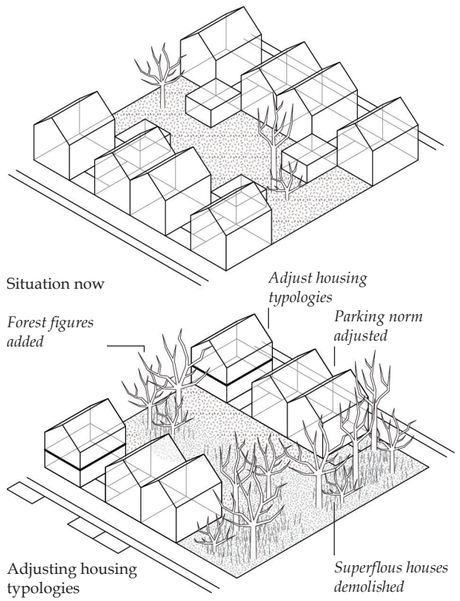




The vacant landscape

While thousands of houses have been demolished in Parkstad since the mid-2000s in many neighbourhoods there are still vacancy levels above those needed for a healthy housing market (around 2%). Especially in the periphery, but also around the centres of Heerlen, Hoensbroek and Brunssum vacancy levels above 10% percent can be found. For the peripheral municipalities of Beekdaelen, Voerendaal and Kerkrade current prognosis furthermore predict the shrinkage of households with more than 10% until 2050 (CBS, n.d.-b). Spatial distribution of current vacancy and the inherent uncertainty concerning shrinkage predictions make interventions to redefine shrinkage most favourable on a local scale. In those neighbourhoods and municipalities that are especially affected taking housing out of the housing stock in a planned manner, while simultaneously replanning parking and introducing forest figures can lead to the development of new communal or collective forest neighbourhoods established with houses that are already built.





<u>The mismatched landscape</u>

Parkstad is not only experiencing above-average vacancy levels, but there is also a mismatch between housing typologies and population (CBS, n.d.-c). Parkstad has a large percentage of elderly people due to general demographic change, but also because of its specific history of shrinkage and social problems after the mining time. However most neighbourhoods are dominated by single family houses, especially unsuitable for elderly above the ages of 80. As not all elderly can be housed in retirement homes it is crucial to retrofit the existing housing stock for them. This could mean transforming single family homes into appartements, while taking out those houses of the housing stock that are no longer needed. Such a strategy would not only help to meet qualitative housing needs, but also help save resources. Again, a local approach is best fitted for this problem, as levels of mismatch vary greatly. However, it must be noted that particularly the neighbourhoods on the border between Heerlen and Landgraaf, as well as Brunssum experience higher levels of mismatch.









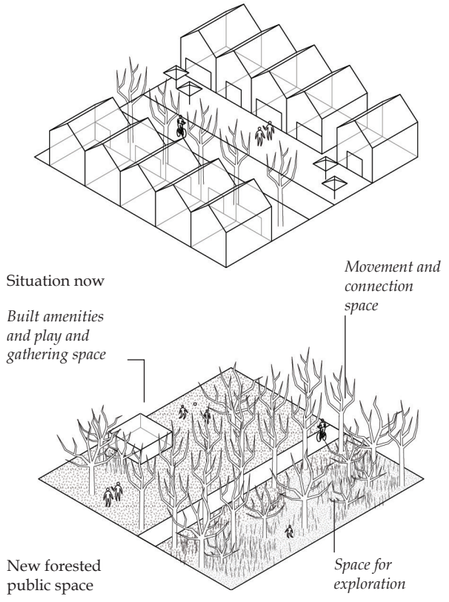












The vulnerable landscape

The problems associated with shrinkage however not only affect the housing stock, but also the whole socio-spatial make up of the region. There are furthermore connected to other challenges such as unemployment and income disparity (Hermans, 2022). Another issue associated with shrinkage, is the disappearance of (speciality) shops in the town centres of Parkstad. This not only connotes a decrease of local entrepreneurship in the region, but also leads to town centres becoming increasingly unattractive and even unsafe as public spaces. As the revitalization of town centres becomes increasingly unrealistic, also in light of societies reliance on e-commerce, alternative public spaces are needed. Here newly created forest spaces could provide this alternative as they are reliant on commercial activity and can also function as gathering spaces.

Empty storefronts in Hoensbroek and Heerlen, advertisement office space industrial terrain de Koumen(situation as of June 2023)

Cares about	Cares for	Careful intervention
Repair		
Water and soil Ecology	- Minimizing erosion and eutrophication, containing flooding and preventing drought damage through forestation and reforestation; - Reconnecting forest and meadow biotopes; - Revitalizing oak-hornbeam forests through maintenance; - Extending network of riparian forests; - Reestablishing valuable meadow biotopes through maintenance; - Reestablishing forest edges as important ecological zones	- Introduction of spatially and ecologically diverse forest catalogue, reintroduction heterogenous landscape typologies; - Formalizing multi-species thinking in site interventions; - Territorial forest framework that is senstive towards ecological enhancement, landscape identity and the spatial capital of the Zwischenstadt; - New forest-housing typologies for shrinking communities - New recreational and public spaces
Relate		
Landscape- city relationship Human-nature relationship Landscape identity and readability	- Preserving spatial identity of cultural landscape; - Highlighting traces and spatial remnants of the old mining landscape; - Making the Zwischenstadt readable and experiencable through introducing a new landscape identity; - Creating spaces and practices in which inhabitants can experience and work on the landscape	**Caring intervention** - Forest maintenance centred around enhancing biodiversity - Forest maintenance centred around urban liveability, public space provision - Provision of decommercialized (cultural) activities - Provision of work opportunities linked to forestry
Reduce		
Shrinkage Aging Society Public space	- Using forestry to provide an alternative spatial devleopment model for shrinking communities; - Creating communal spaces to meet in and spend time together through forestry; - Creating an alternative model of economic production through forestry	

Part 6 | Conclusion

Repair, Relate, Reduce as careful and caring interventions

In her work Joan Tronto makes distinctions between five different types of care: Caring about, caring for, care giving, care receiving and caring with (Tronto, 2019). These actions do not constitute care in and of themselves, but need to occur together to enable networks of care and a caring world. The -first two principles of care -caring about and caring for- are used to structure the research of the analysis. Caring about means recognizing and understanding where there is a need for care, while caring for means turning this need for care into concrete steps for action. The design principles and starting points described in the analysis chapter are also an extension of this idea of caring for. They can be further subdivided into two care interventions:

_Careful interventions, which are centred around creating a spatial framework that enables a more caring world, such as allocating places for forest to grow or for alternative public spaces to develop.

_Caring interventions, which are interventions or actions that actually provide care for someone or something. Such interventions are centred around actual local initiatives and programmes such as sustainable maintenance works or social programmes.





^ View from Valkenburgweg onto APG building, Heerlen
> Roundabout Musschenbroek, Heerlen





^ Park in neighbourhood Vrank, Heerlen
< Industrial terrain De Koumen, Heerlen





^ Spring of the Rode beek, Brunshummerheide
< Neighbhourhood Mariarade in Hoensbroek





^ View from Plateau of Ubachsberg towards Ransdaal, municipality Voerendaal
> Spoorsingel behind the Maankwartier, Heerlen

Part C | Territorial vision and local design

In the forest territory

7. Design brief
A territorial project 146

8.1 Deconstruction
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A forest in three figures 162

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A new legibility 166
A new connectedness 180
A new collectivity 182
A new responsibility 186

9. Projection
Traversing the linear forest 190
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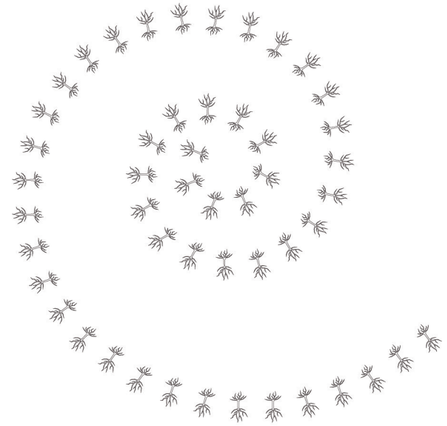
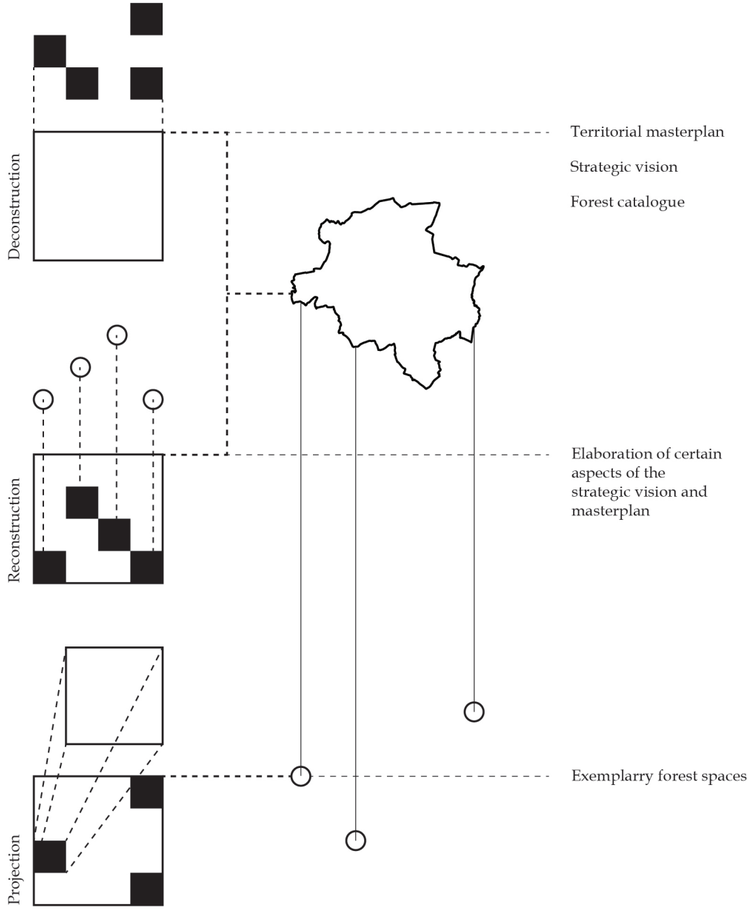
Living in the forest clearing 214





Part 7| Design brief

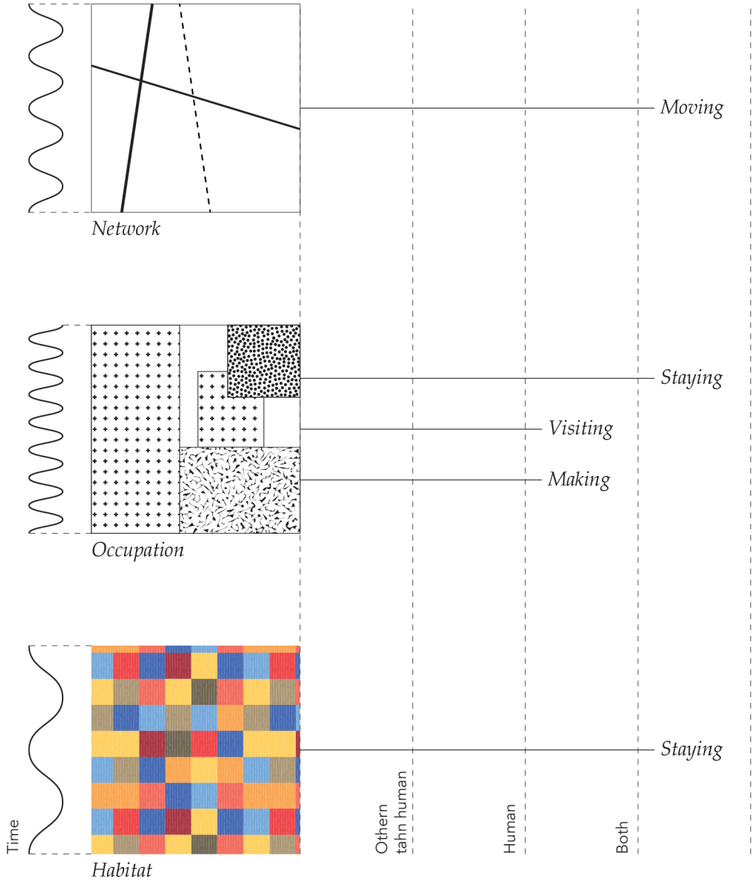
A territorial project

The aim of this project is to design a site-specific reforestation strategy that re-envisions the territory through the forest as an agent of care equipped to tackle the challenges of relating, reducing and repairing within Parkstad.

The project is elaborated on two scales- the territorial and the local scale.

On the territorial scale the relationship between forest, landscape and urbanized territory is explored through the design of a strategic vision. This is aimed at exploring how forestry can alleviate (environmental and ecological issues (*repair*), reconnect landscape and urbanized territory and strengthen the overall spatial quality and readability of the territory (*relate*) through various reforestation strategies, among others through transforming (vacant) land (*reduce*). While the strategic vision sets out a general framework of the use and functions in relation to the challenges at hand, the masterplan illustrates possible spatiality and pattern language of this forest. A supplementary forest catalogue further details the spatial, ecological, and functional characteristics of these forest patterns. This is summarized in the design chapter of deconstruction. The chapter reconstructions zooms in on certain aspects of this strategic vision, such as the spatial design principles behind the masterplan (*relate*) , the natural network that is created (*repair*), new public spaces (*reduce*) and an overview of (maintenance) responsibility (*relate, repair, reduce*).

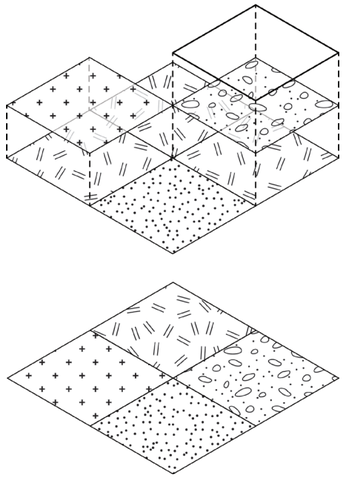
On a local scale relationship between place, forest, humans and other than humans is worked out through design projections three different places. The aim is to detail how a strengthened relationship between landscape and urbanized territory manifests on an interindividual scale (*relate*), as well as how environmental and ecological restoration (*repair*) and degrowth/shrinkage (*reduce*) influence use, maintenance regimes and experiential qualities.



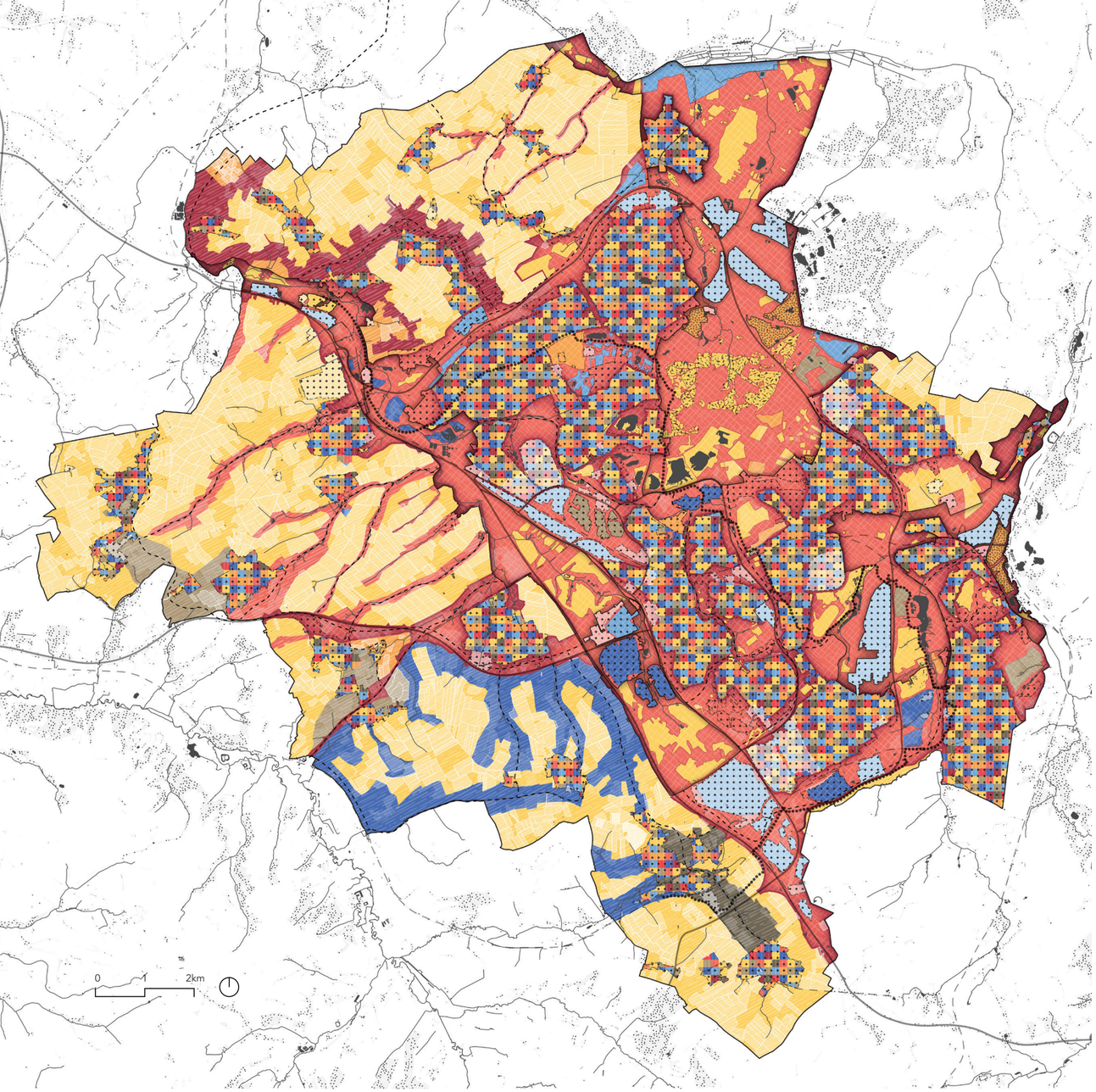
Part 8.1 | Deconstruction

The vertical map

In order to redesign the territory as a forest a reconceptualization of its representation is needed. If the Parsktad is meant to be all forest, a first, albeit of course abstract step, is to reconfigure the legend of its map. Maps especially on a regional or territorial scale represent landscape and city or natural, cultural and urban land uses and processes as horizontal and spread out over the territory. One use occupies one patch of land, overlays only occur occasionally. This effectively separates them and represents them as independent entities, while they are actually interwoven, interdependent and simultaneous. The richness and complexity of the territory, that is built up in landscape architecture through such concepts as the (Dutch) layer approach (Van Schaick & Klaasen, 2011), gets quite literally lost in translation. In order to represent the design ambition of all forest, as well as to better capture the already existing complexity of the territory, the new map for Parkstad makes use of a vertical legend, which utilizes and reinterprets the three layers of the Dutch landscape approach (Van Schaick & Klaasen, 2011). The foundational layer swaps substratum for habitat and represents each patch of land as a forest or landscape. A secondary occupation layer showcases natural or anthropogenic occupation. A third layer showcases networks in the landscape both for humans and other- than humans.



Conceptualisation new map legend
Conceptualisation current map legend



As soon as we entered the woods I realized they were full of people. The almost vertical track rose through towering walnuts, their grey, cracked barks swollen and blistered into burrs. They were heroic, dishevelled trees, and they were laden with walnuts. During late September and October thousands of people in the Ferghana Valley migrate to the forest and set up camp for up to six weeks to harvest the walnuts. (...) The sounds of woodland work where everywhere. People called to each other across the valley or through the leaves. A boy greeted us from high up in a tree and down a hail of nuts.

Wildwood, Deakin
(2008; original work published 2007)

Habitat see page 153

Forest typologies

Occupation, network see page 158

Staying

- Shared habitat human and other than human
- Predominantly other than human habitat
- Core zone other than human habitat
- Heathland habitat
- Water based habitat | Blue corriror (*moving*)

Moving

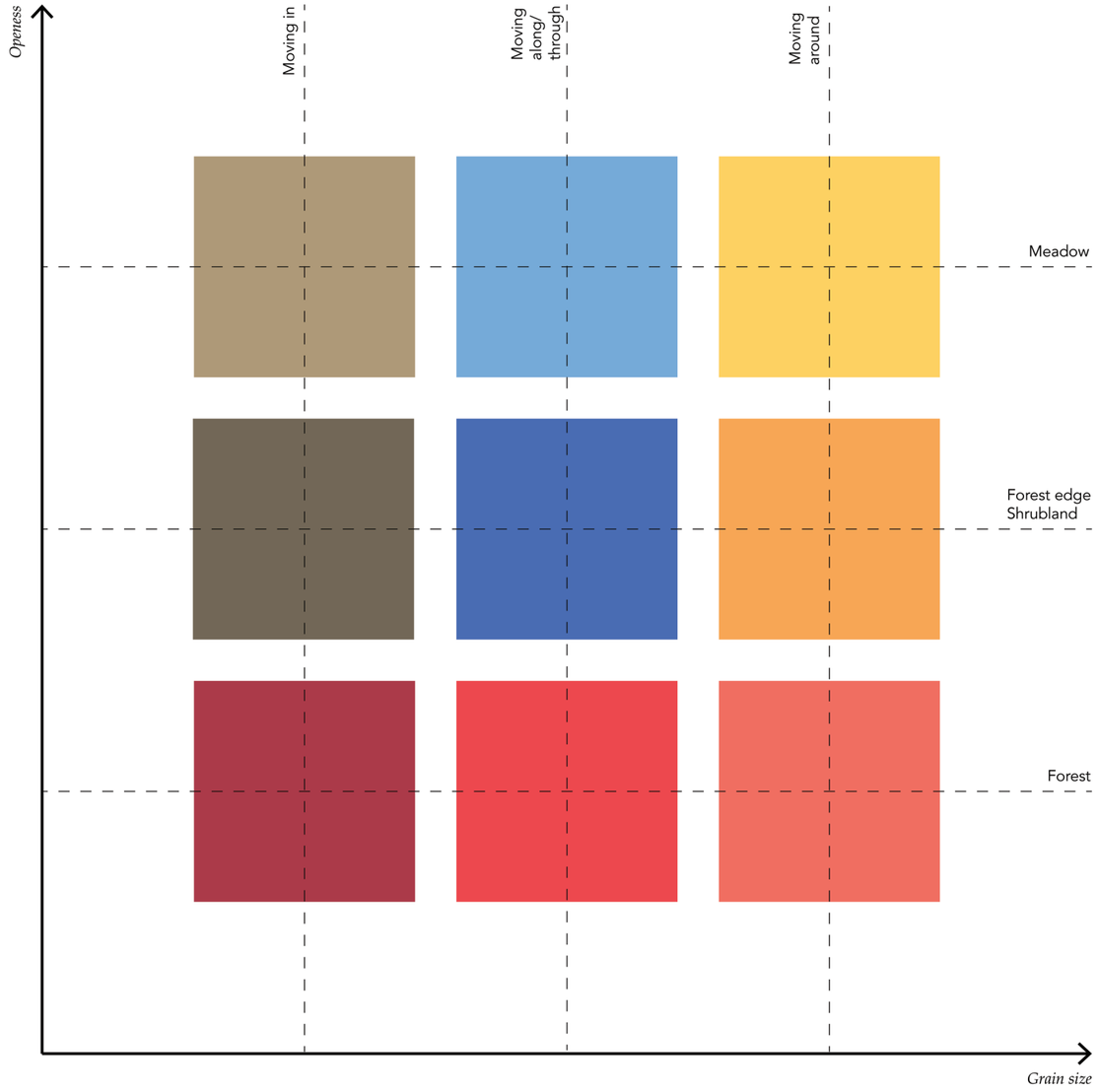
- Green corridor
- Leisure lane
- Railroad
- Highway and ring road

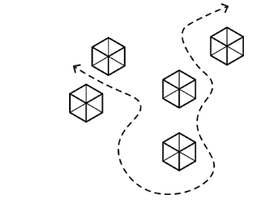
Making

- Industrial terrain
- Nature-inclusive production
- Production (strive towards nature-inclusive)

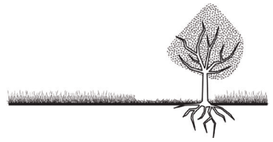
Visiting

- Public forest hubs
- Hidden publicly accessible forest terrains

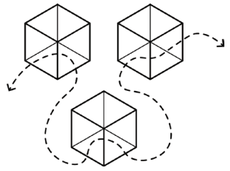




Moving around



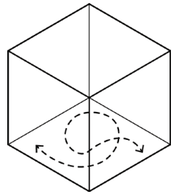
Meadow



Moving along | through



Forest edge, shrubland



Moving in

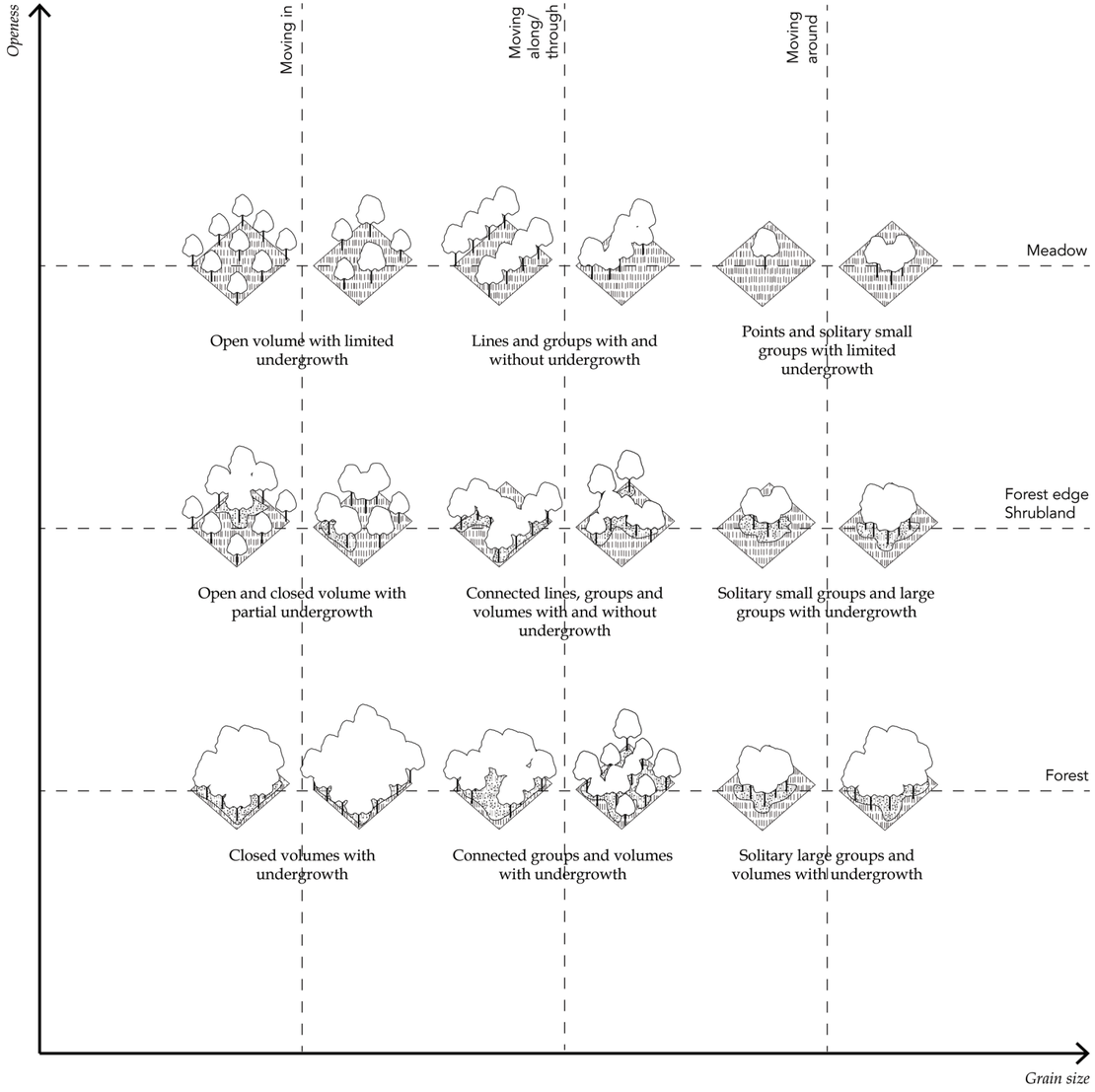
Spatial, Experiential

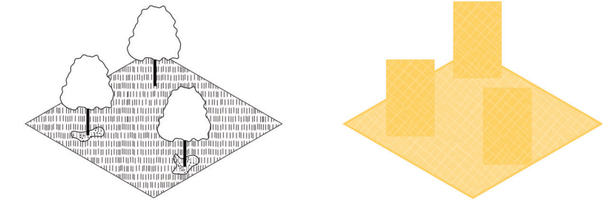


Forest

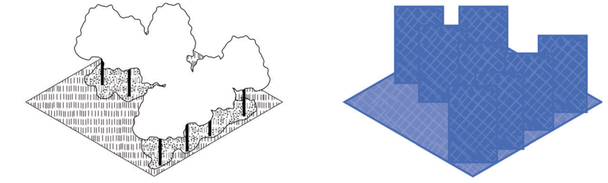
Environmetnal, Ecological

<u>The forest catalogue as habitat</u>
At the centre of building up this new map legend, the forest, as the foundational habitat layer of the territory, needs to be defined further. The forest is far from a monolithic entity. Both the spatial analysis of the forest of Parkstad (page 50-51), as well as the analysis of different forest typologies in the Repair section (page 89 and 99) show that already today the forest in Parkstad is extremely varied both in terms of size, shape, density, light regime, and ecological structure. The forest comes in large patches, in complex mosaics, long lines, small groves and many other structures. It is partly deciduous, partly coniferous, and sometimes mixed consisting of pine forests, oak-hornbeam forests, poplars, wet forests and many more. The presence of trees is furthermore ubiquitous, even on the wide and open plateaus the presence of singular trees provides a certain forested spatial experience and ecological benefits. Building on this current diversity is crucial not only to make the forest territory ecologically viable, but also legible and varied in experience.

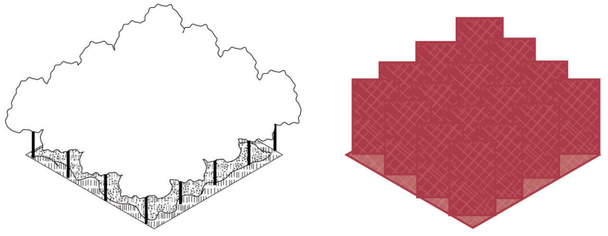




Forest arrangment *meadow x moving around*

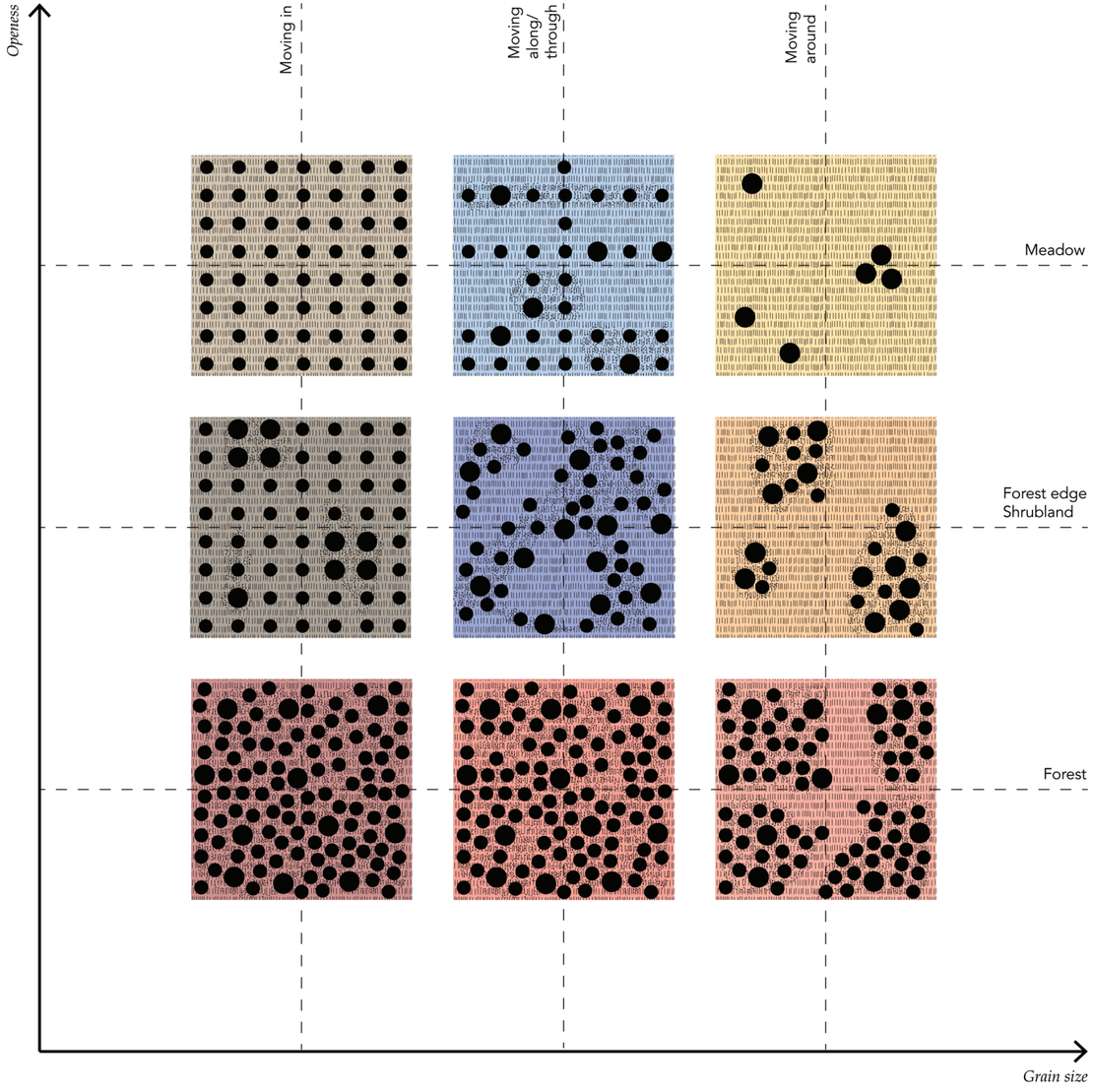


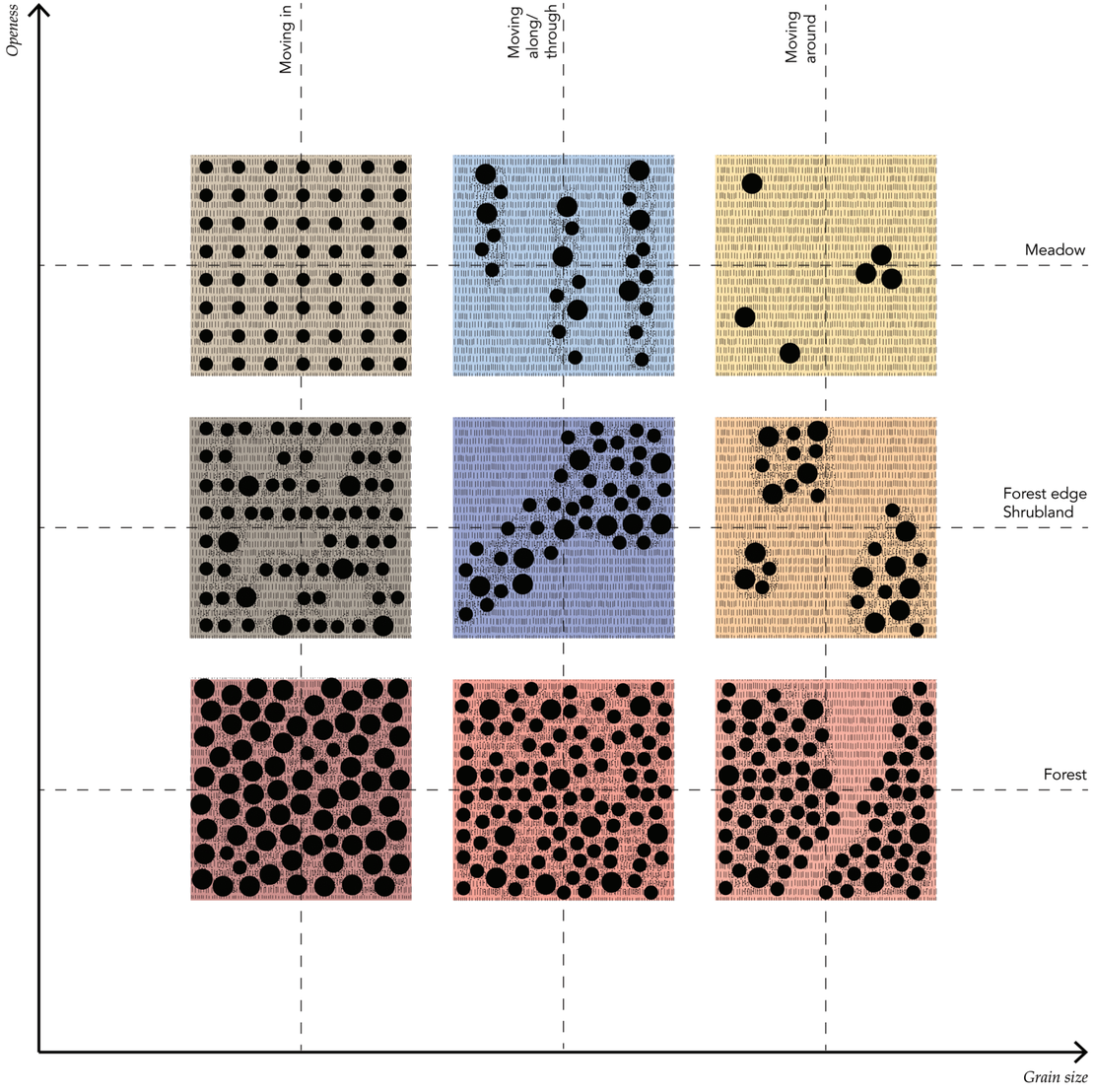
Forest arrangment *forest edge x moving along | through*

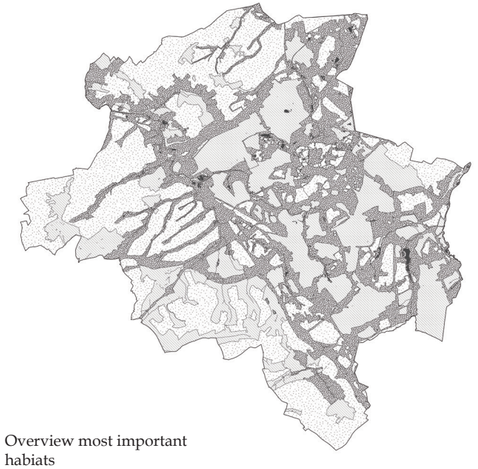


Forest arrangment *forest x moving in*

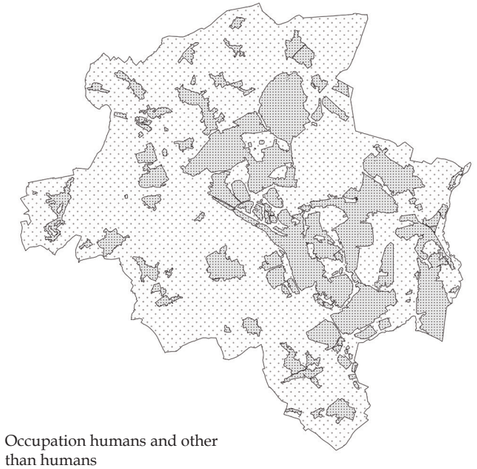
To gather the complexity of the current as well as desired all forest situation a simplified a forest framework of forest catalogue was developed for Parkstad that summarises the most important ecological demands in terms as well as spatial development directions. The resulting forest arrangements and typologies can be understood as design starting points that can be further specified per specific design location and can lead to different spatial configurations and typologies (page 156-157). Out of the repair analysis it can be concluded that the enhancement of meadows, forest edges, coppiced forests, as well as high forests (both wet and dry) should be prioritized in ecologically terms. Out of the spatial analysis of the forest four experiential relationships between forest and human (or other than human) can be summarized: walking around the forest, walking along the forest, walking through the forest, and walking the forest. These four ecological and four spatial parameters are cross referenced to create the forest framework from which the new territory is constructed.


Openess
Moving in
Moving along/ through
Moving around
Meadow
Forest edge Shrubland
Forest
Grain size

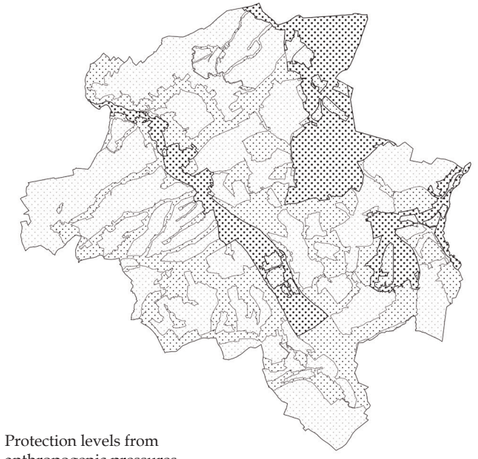

Openess
Moving in
Moving along/ through
Moving around
Meadow
Forest edge Shrubland
Forest
Grain size



Overview most important habiats



Occupation humans and other than humans



Protection levels from anthropogenic pressures

Staying

Overview most important habiats

- Water-based habitats
- Heathland habitats
- Predominantly grasland habitat
- Mixed habiat between forest and grasland
- Predominantly forest habitat

Occupation humans and other than humans

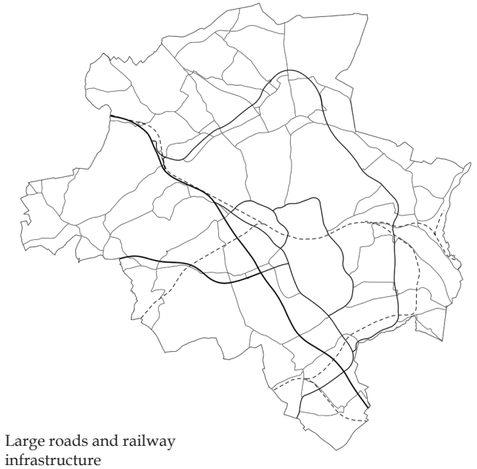
- Predominantly occupied by other than humans
- Occupied by both humans and other than humans

Protection levels from anthropogenic pressures

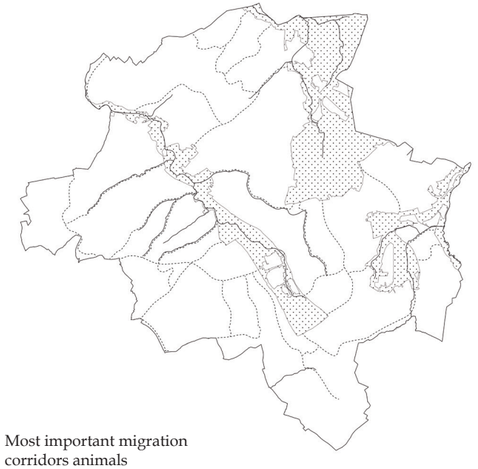
- Shared zone (encouraging) nature-inclusive development
- Connecting zone other than human habitat (Limiting anthroprogenic pressures as much as possible, preventing further development)
- Core zone other than human habitat (excluding human habitation, limiting accessibility to humans)



Most important recreational routes



Large roads and railway infrastructure



Most important migration corridors animals

Moving

Most important recreational routes

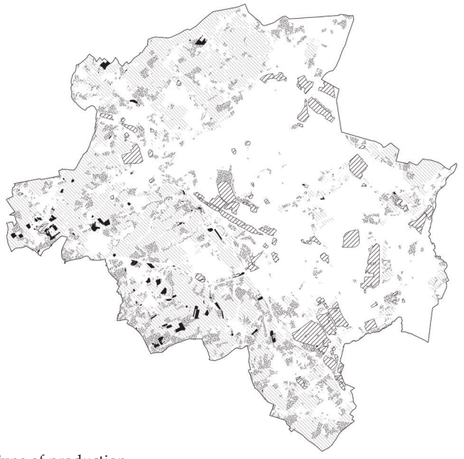
- Leisure lane
- National hiking paths
- Regional biking network

Large roads and railway infrastructure

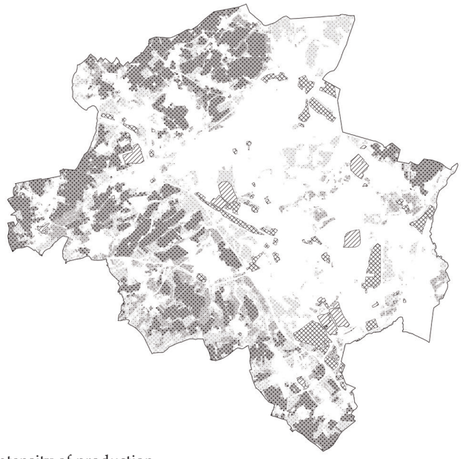
- Railroad
- Highway
- Ring road and most important arteries
- Other important main roads

Most important migration corridors animals

- Core zone
- Important blue corridor
- Important green corridor



Type of production



Intensity of production



Public spaces and recreational facilities

Making

Type of production

- Industrial terrain
- Field
- Meadow or grasland
- Orchard or forest

Intensity of production

- Industrial terrain
- Industrial terrain with limited impact on habitats
- Passive production
- Nature-inclusive production
- Production (strive towards nature-inclusive production

Visiting

Public spaces and recreational facilities

- Public forest hubs
- Hidden publicly accessible terrains
- Other recreational areas

Habitat, occupation Staying *Occupation distribution between humans and other than human* *Special habiats outside of meadow- forest spectrum*	*Network* Moving *Infrastructure for humans such as roads, railways, but also hiking and biking paths* *Special habiats outside of meadow- forest spectrum*
Occupation Making *Agricultural landscapes with different use intensities* *Industrial landscapes with different use intensities*	*Occupation* Visiting *New public spaces* *Recreational terrains*

<u>Occupation and network</u>

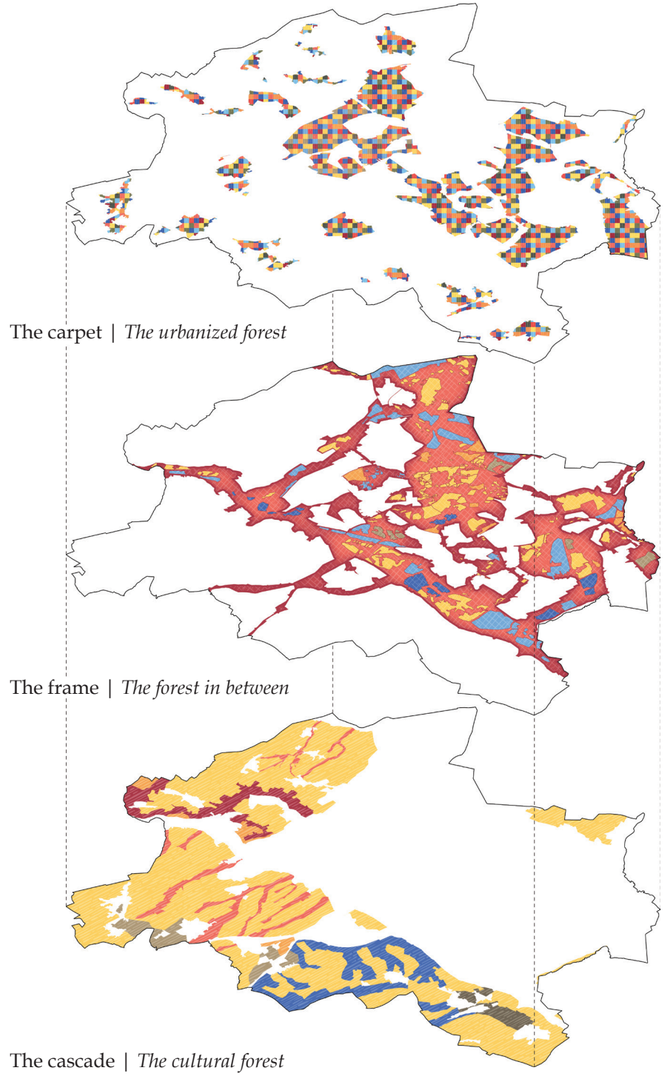
The aim for the second and third layer of the map – occupation and network – is to include not only human land uses, but also other-than human ones. For this four overarching legend categories are established.

_*Staying* maps which part of the habitat other than humans live in and which parts are also occupied by humans. By that it also details where the landscape is (partly) protected from anthropogenic pressures. It furthermore represents important habitats outside of the meadow-forest spectrum depicted in the foundational layer

_*Making* depicts anthropogenic land use in the form of agriculture and industrial use. Here the occupation and protection patterns of staying determine the intensity of agricultural use.

_*Visting* shows the new public space in the forest that are predominantly made for humans, however in a manner that is inclusive to other than humans.

_*Moving* outlines both anthropogenic (movement) infrastructure, as well as important green and blue corridors for other than humans

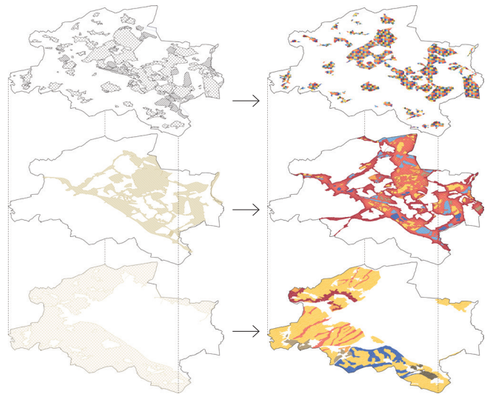


A forest in three figures

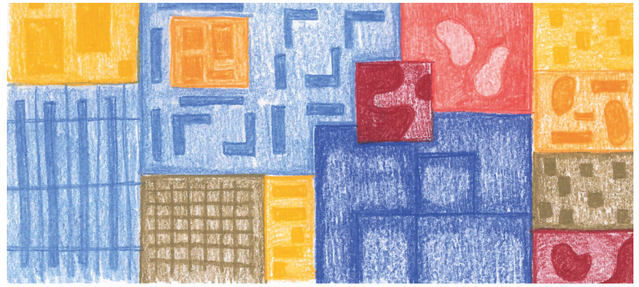
In order to understand how the forest typologies established in the forest catalogue can be implemented in the territory of Parkstad, a rereading and reinterpretation of its spatial set up is done in the analysis part. From this it can be concluded that two morphological interventions on the scale of the territory can help revitalize Parkstad: a better-connected natural network (*repair*) and a spatial framework that renders the Zwischenstadt more readable and identifiable *(relate*). The cultural landscape with its specific spatial set up of open plateaus, half open or closed slopes and half open and closed valleys furthermore emerges as an important quality which should be safeguarded within the new forest territory (*relate*). On the other hand, the vacant lots, as well as future predicted shrinkage does not lend itself to be reconfigured into a larger landscape framework as it is too dispersed (*reduce*). This can be said for the urbanized landscape in general (*relate*). The fourth or fragmented landscape however emerges as a promising spatial framework that can be strengthened through expanding and unifying it through forestry. Out of these needs, qualities, and limitations three territorial forest figures emerge: *The cascade*, the open forest that moves with the rhythm of the cultural landscape. *The frame*, the dense forest which frames the territory. *The carpet*, the diverse forest which revitalizes the urbanized fabric.

We came presently in a large open space, sloping somewhat towards the south, the sunny site of which had been taken advantage of for planting an orchard, mainly, as I could see, of apricot trees (…). A strange sensation came over me; I shut my eyes to keep out the sight of the sun glistening on this fair abode of gardens, and for a moment there passed before them a phantasmagoria of another day. (…) I opened my eyes to the sunlight again and looked round me, and cried out among the whispering trees and odorous blossoms, 'Trafalgar Square!'

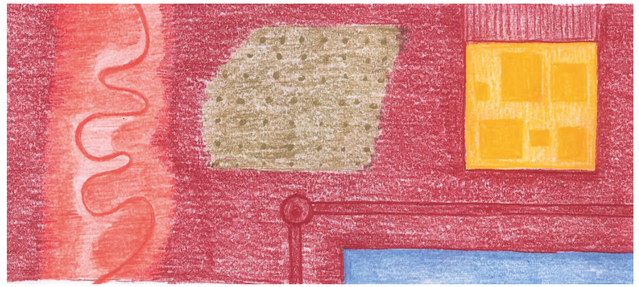
New from Nowhere, Morris
(2004; original work published 1890)



Landscape layers on which the new forest figures are based (from top to bottom - urbanized landscape, fragmented landscape and cultural landscape)



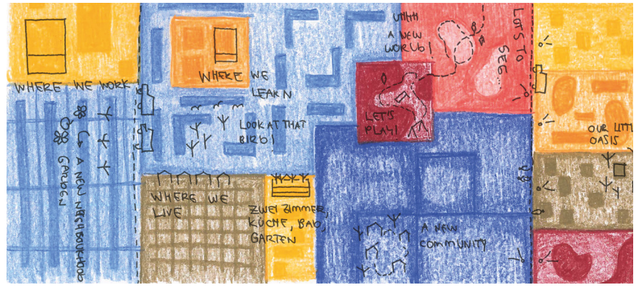
The carpet

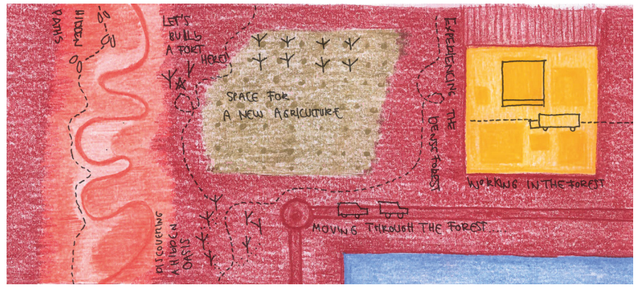


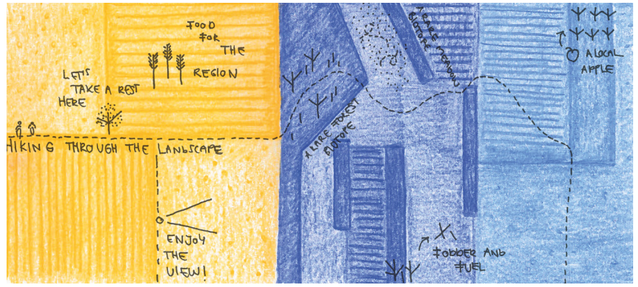
The frame



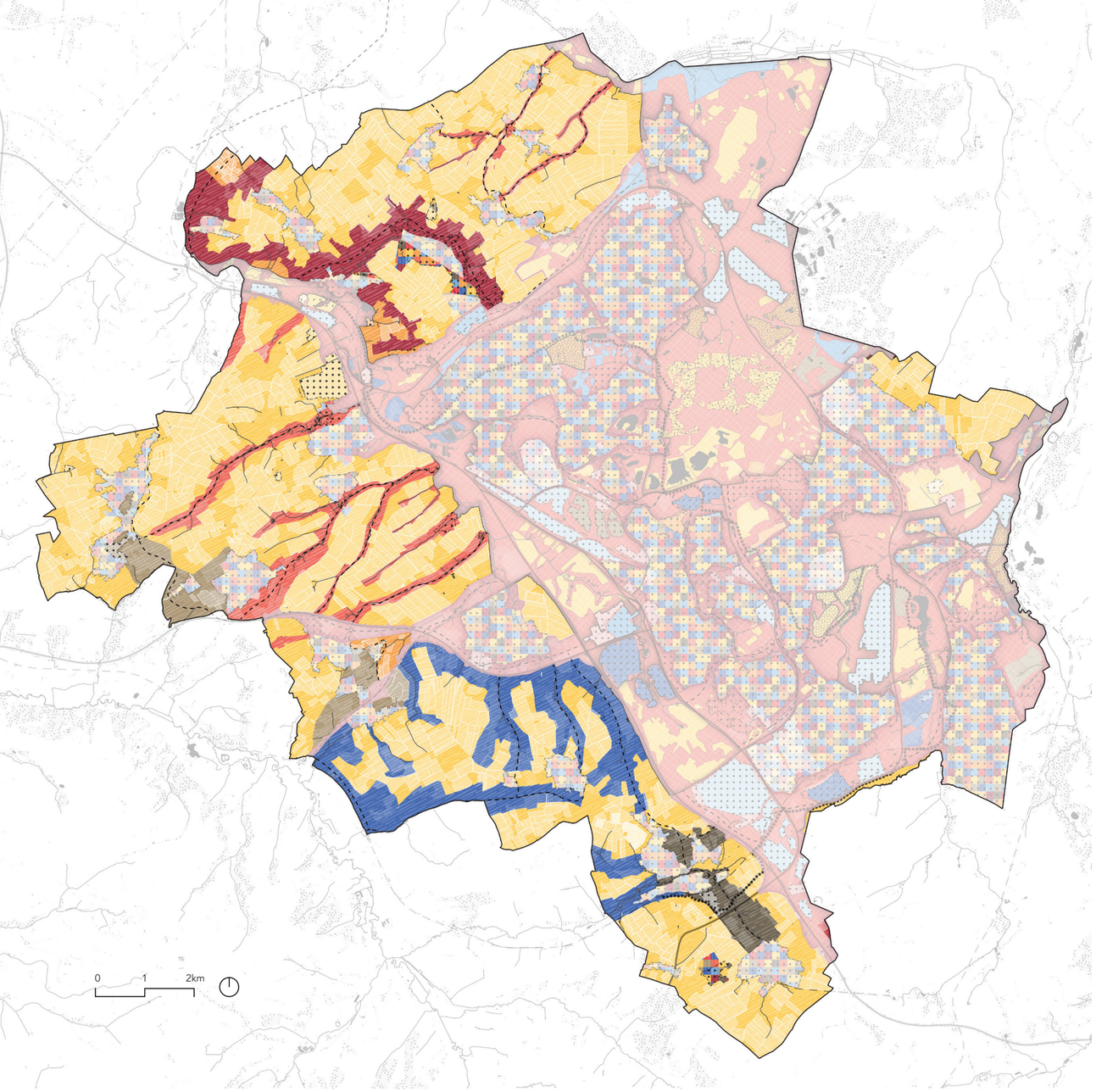
The cascade







Each forest figures has its own patterns, rhythm and density. This spatiality affords different uses, functions and experiences of the forest.

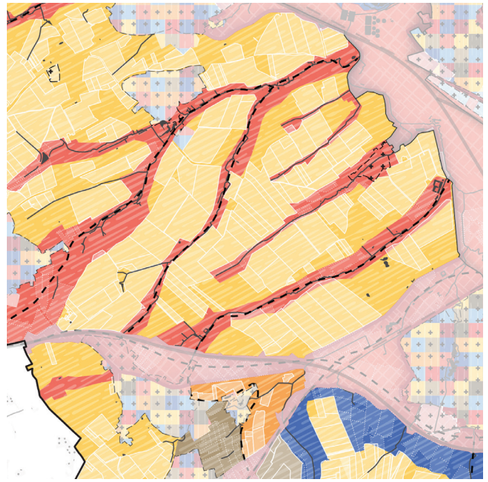


Part 8.2 | Reconstruction

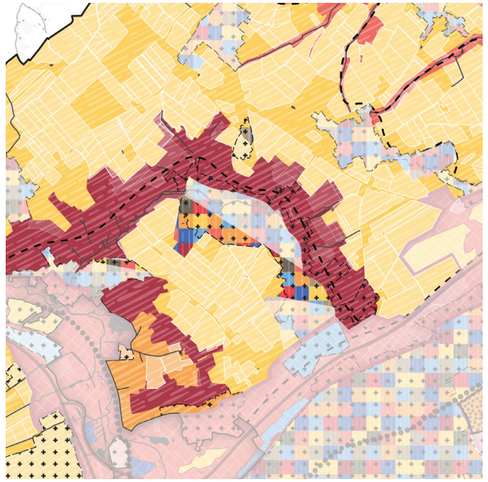
A new legibility

The cascade

The cascade compromises the plateaus and slopes of the cultural landscape (page 108-111). The forest here emerges in a threefold manner. As an extremely open structure with single trees on the plateaus, as a denser linear structure on the slopes, as a framing and interconnecting entity between villages and urbanized patches. The goal on the plateaus is to keep the open and wide views that characterize them today, as well as retain space for agriculture. Trees are added not only as small ecological patches for birds and insects interconnected by strips of meadow, but also as landmarks and guiding poles for hikers. The slopes are planted with varying linear forest structure according specific site conditions such as steepness and current forest patterns. They furthermore have an explicit environmental and ecological function. Following the edge of the plateau, they are meant to help counteract erosion and eutrophication. Their spatial presence furthermore delineates space for the development of rare meadow typologies. The aim is moreover to plant the forests on the slopes as interconnected structures to highlight landscape connectivity. By reintroducing cultural forest elements (graft, hollow way) as well as maintenance techniques (coppicing) the forests on the slopes are also are meant to strengthen the cultural identity of the landscape. Lastly, they help in creating a more varied landscape experience for visitors and inhabitants of the cascade alike. The last forest variety, forest volumes around and in between villages, emerges as a reaction to the specific spatial and experiential quality of the open plateaus and half open slopes. To not disturb the cultural identity of the landscape forest volumes are added to already existing volumes – that of the villages. The specific set up of villages on the slopes furthermore lends itself to the creation of intervillage forests, that keep close to the existing developments, while adding a new ecological and experiential quality to the plateaus and slopes.



1



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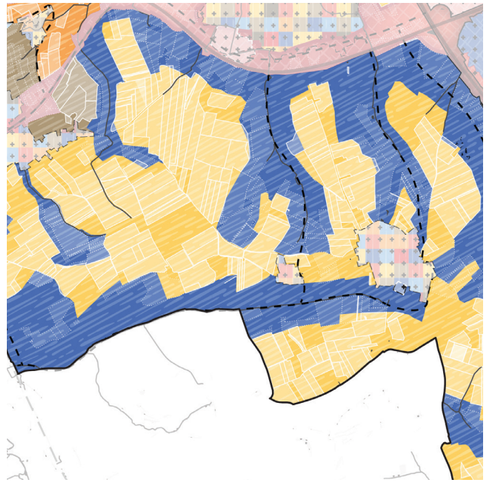


3



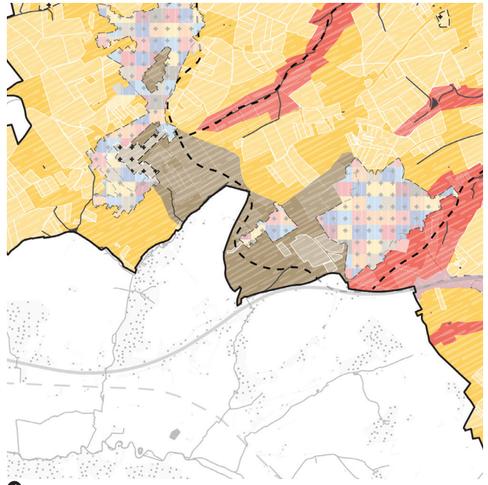
1 Forest groups and volumes in dry valley



2 Forest volume on slope



3 Forest lines on slope



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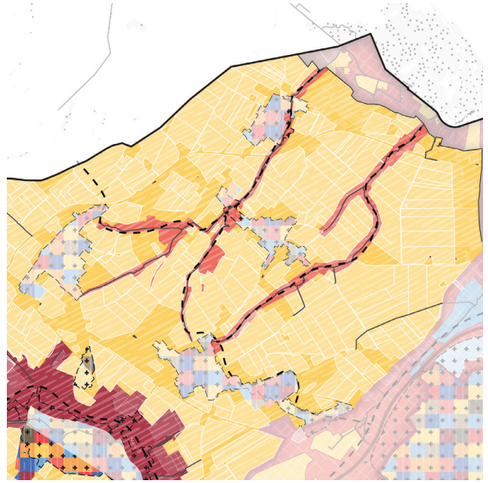


5

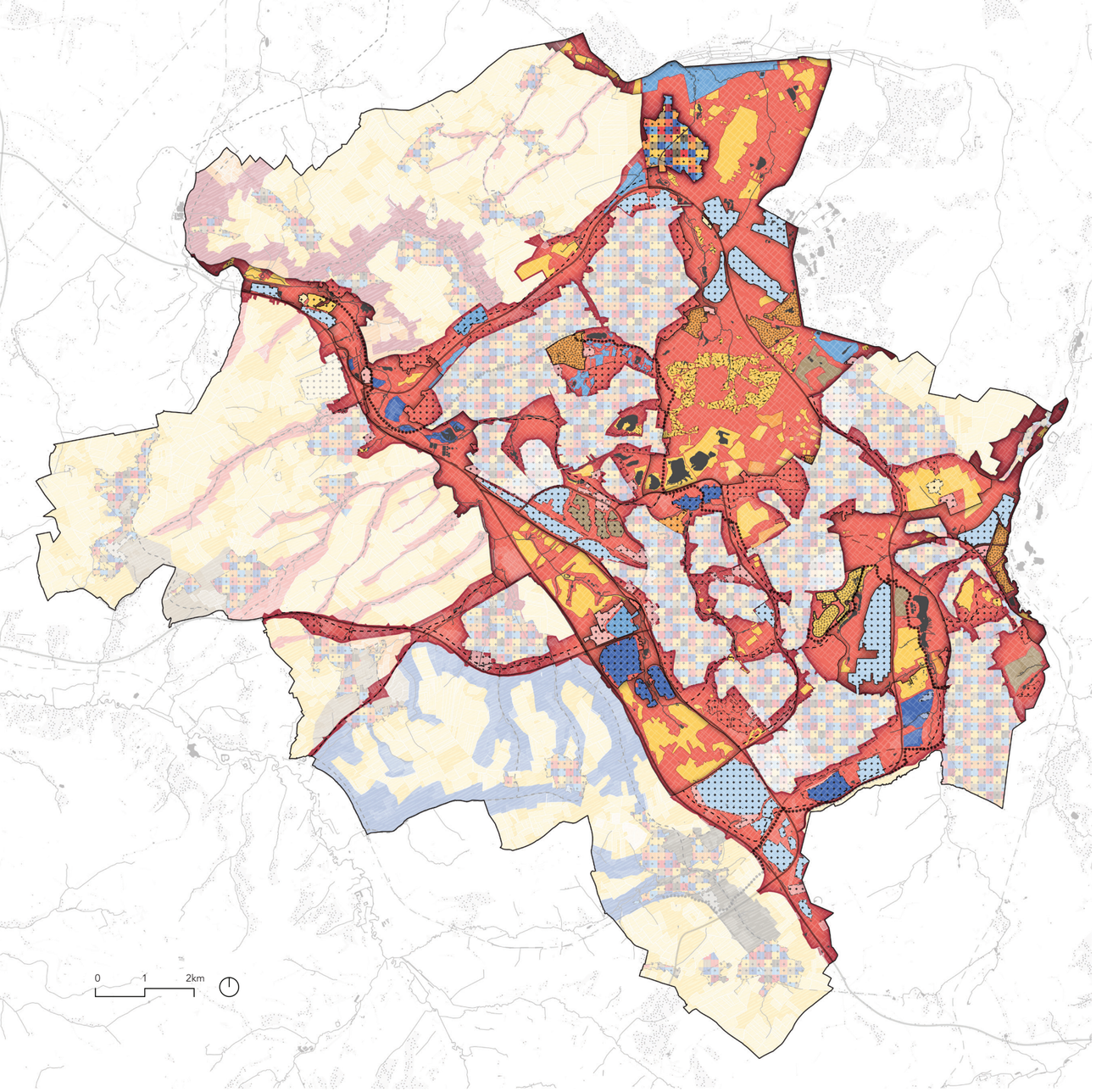


4 Point arrangement of trees on plateau



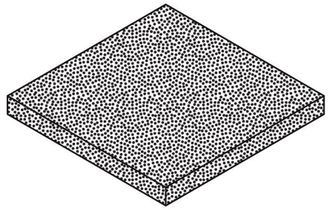
5 Forest volume connecting settlements

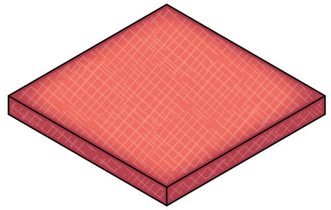
The aim within the cascade is not so much to introduce a new visual language as it is to strengthen the visual language of the cultural landscape. The landscape of Southern Limburg is the oldest cultural landscape in the Netherlands and as such should be treated with care and respect.



The frame

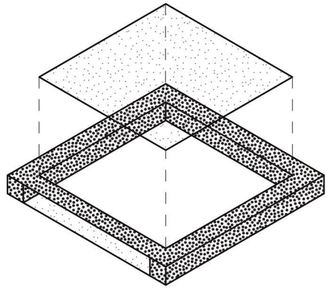
Unlike the cascade, which is mostly meant to strengthen existing forest figures (except for the intervillage forest), the frame introduces a new forest figure to the territory. Out of the fragmented landscape, the stream valleys and the exiting dense forest patches a complex and sometimes contradictory forest figure emerges. The intention here is to create a comprehensive dense forest that on one hand embraces the urbanized patches and gives them a clear and readable border (*relate*) and that inhibits them from further spreading out (*reduce*). On the other hand, the frame is meant to strengthen overall landscape connectivity by providing a thoroughly interconnected network (*repair*). Lastly bringing together landscape fragments, stream valleys as well as existing forests creates a forest figure that transcends usual categorizations of landscape and urban, which gives voice to the interconnectedness and interwovenness of these two phenomena in the Zwischenstadt (*relate*). The frame houses manifold functions: industry, recreational space, agriculture, transportation infrastructure, collective and public functions, as well as in part housing. This is done around the edges of the urbanized territory to delineate a stronger border. Functions that need a larger open forest structure are housed in rooms, while smaller functions as well as those in need of no or minimal open space are housed in the dense forest which is the typifying for the frame. This also goes for linear functions (such as transport or water infrastructure). However as open space around those functions is often limited, they form linear forest structures. As such three different forest elements emerge in the frame: linear forests, enclosing and ecnlosed forests, and dense forests. What ties them together spatially is that all of them are enclosed by a threshold space, needed to not only create a visual border, but also the experiencing of entering a different world that exists outside of the cultural landscape and the urbanized patches (page 120-123). Within the frame transition into an open room are gentler and more gradual, to express moving through the frame as opposed to leaving it. This is furthermore important for biodiversity as expressed in the need for forest edges (*repair*). The rooms in the frame are furthermore always designed with the goal of biodiversity and landscape heterogeneity enhancement in mind (*repair*). Open rooms for example double as meadow biotopes.

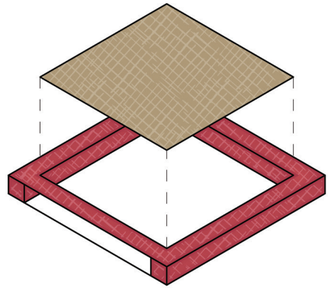




The dense forest

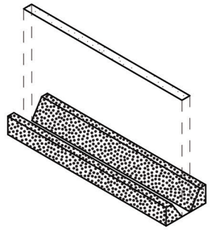
Space for nature development, leisure, collective and public functions

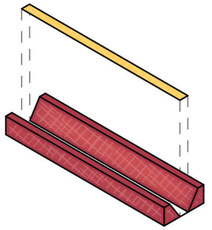




The enclosing forest

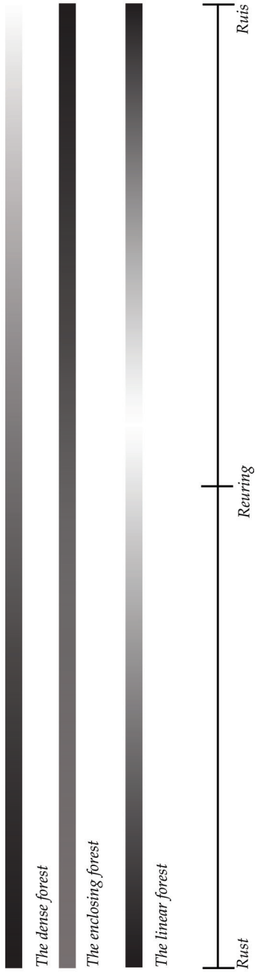
Space for agriculture, leisure, nature development, collective and public functions, industry

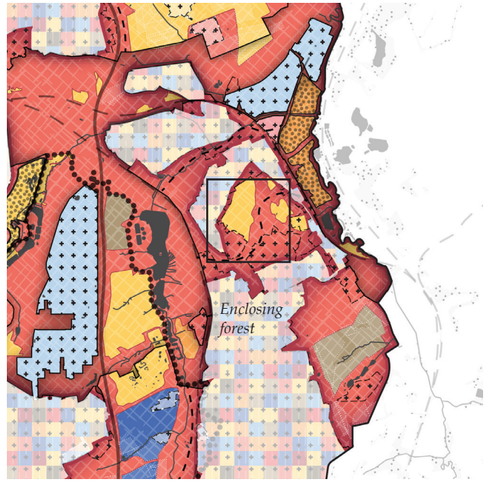


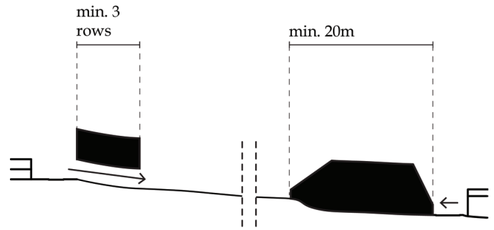


The linear forest

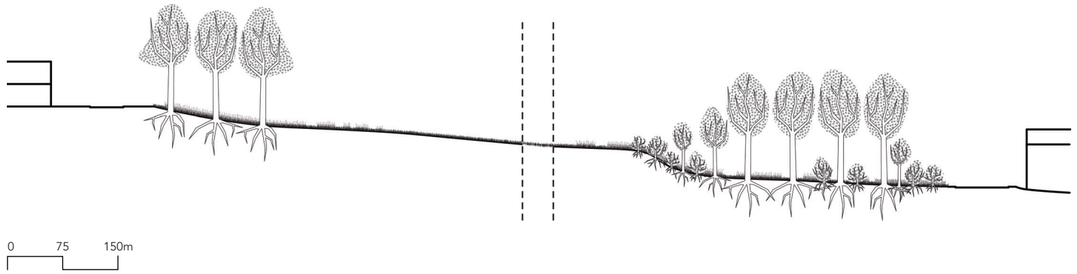
Space for transporttion, leisure, nature development

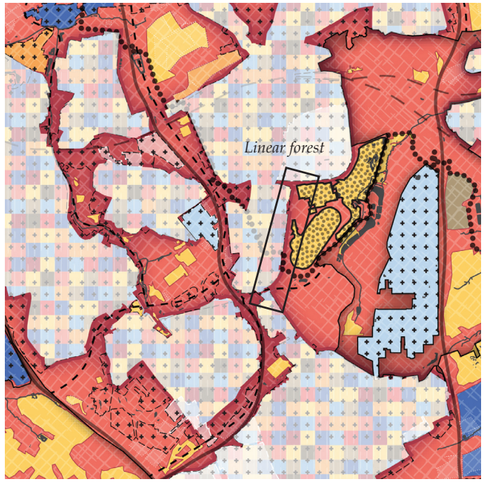


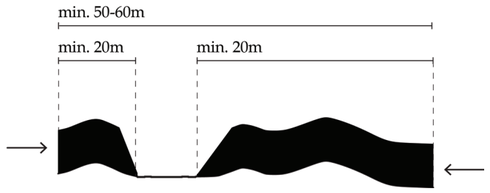




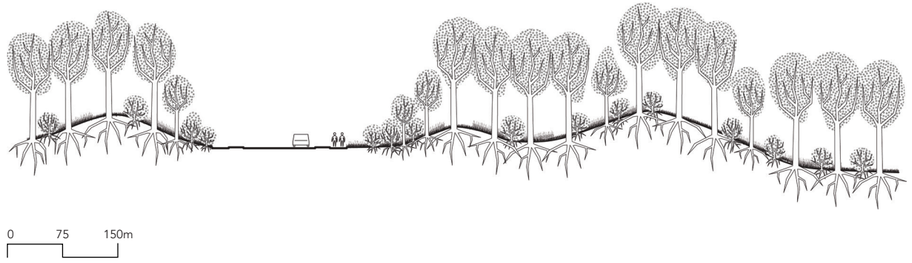
As most of the enclosed fragments are so big that they clearly denote a space of their own, a dense forest threshold around the whole fragment is not needed. However for reforestation purposes, as well as to create a visual boundary in the distance on side of the enclosed fragment should have a forest threshold of at least 20m. On the other sides a more transparent threshold can be created, for example with open rows of trees.

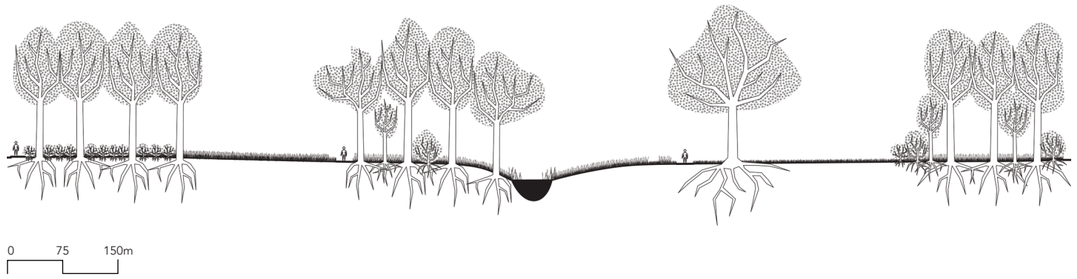


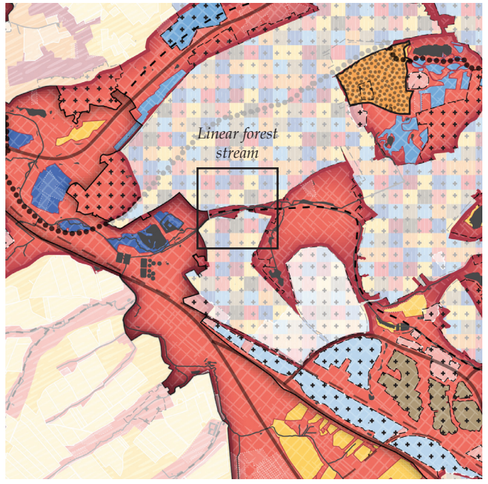


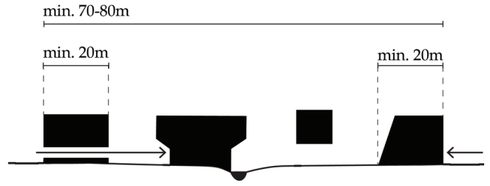


In order for a tree line or stroke to qualify as part of the frame it needs to be at least 40m wide. This is so the trees are sufficiently dense and can create a visual barrier. As 40m is the minimum width it is important here to allow for the development of undergrowth to limit transparency as much as possible.

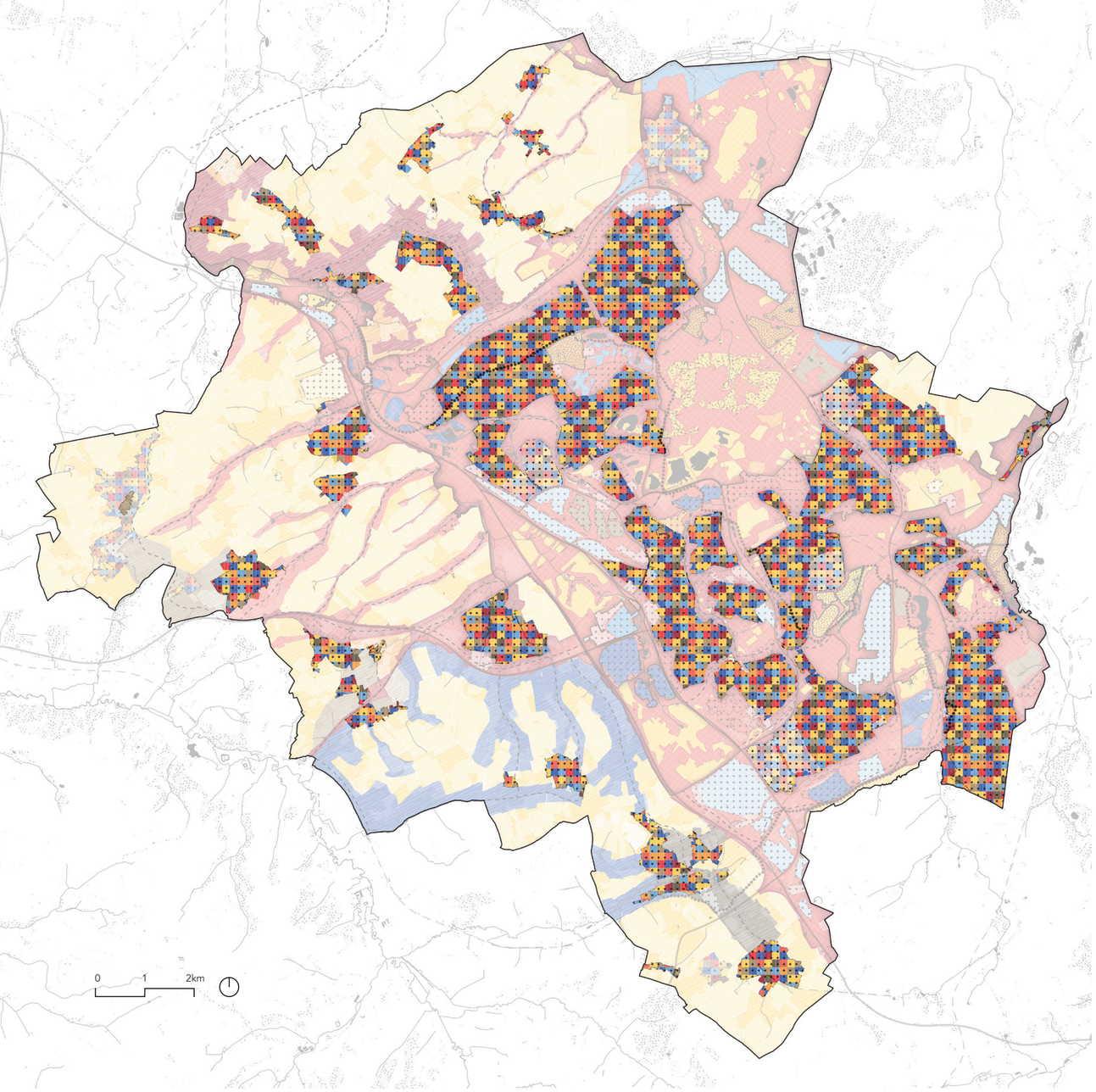








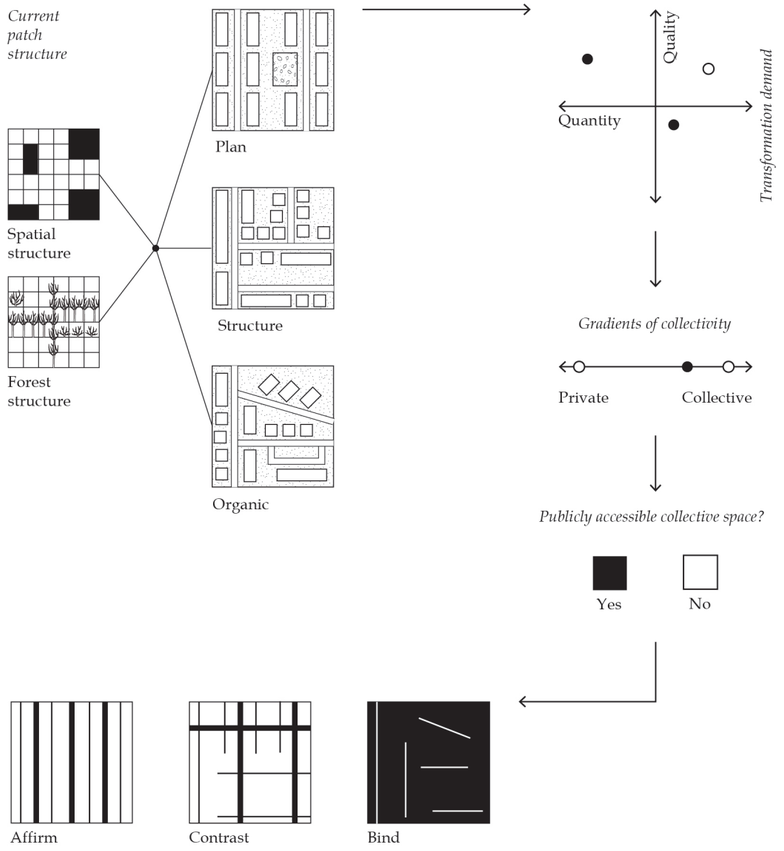
When there is more space for a linear fragment, roughly 70 to 80m it is possible to create a semi-transparent screen on one edge of the fragment. In this case it however becomes important to create second tree stroke as a delayed visual barrier.



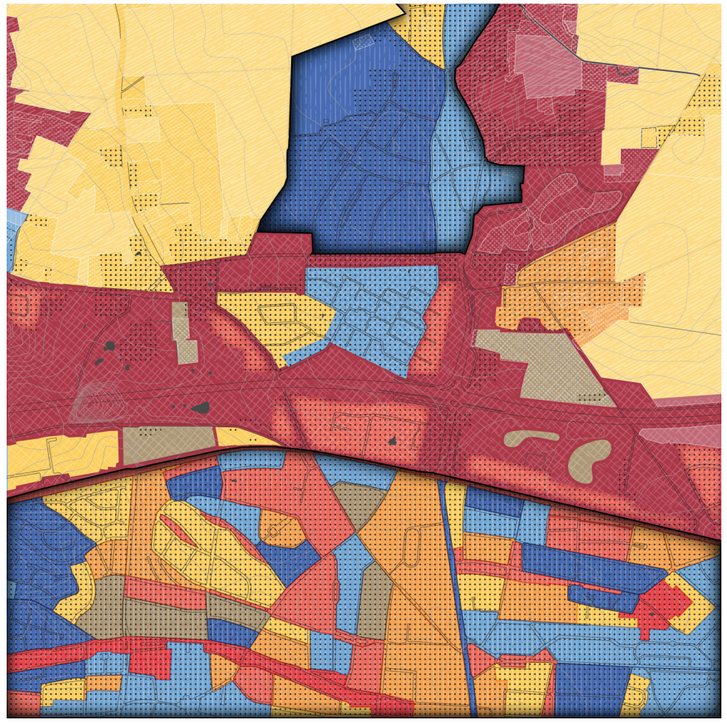
The carpet
The final forest figure is that of the carpet. It consists of the urbanized patches of Parkstad primarily located in the centre East. A key insight of the analysis, as well as the design projections, was the impossibility of finding overarching structures or narratives within the patchwork urbanization. Rather than forcing an order on the territory that does not exist, a more localized approach is chosen. Per patch of urbanization, which can come in different scales - from neighbourhood to housing block, an individual forestry approach can be designed. Here the intent is not an "anything goes" mentality, but rather a careful design projection aimed at strengthening liveability and diversity both for human and other than humans alike (*repair* and *relate*). Shrinkage, as well as decline and change in housing demand are accordingly considered opportunities to restructure patches and help achieve a greater variety of forest typologies and living environments (*reduce*). While design decisions in the carpet are highly individualized four factors emerge as important determinants for the forest future of each patch. According to them development directions can be sketched. The four determining factors are:

_ *The current structure of the patch* (page 112-119 for three principal structures) stirs development direction, as it is for example not desirable to restructure patches which already have a strong spatial identity, or that are part of the cultural heritage of Parkstad (especially mining villages, page 108-109)
_ The *transformation demand* (e.g. the interplay of vacancy, future shrinkage, change in housing demand as well as quality of housuing, see page 128-131) can lead to restructuring of the patch generally and with that open up opportunities for a higher forest volume and density
_ This transformation demand can furthermore be used to create different *gradients of collectivity*. While well-functioning patches could in principal also be transformed into more collective living arrangements. Those patches in need of restructuring generally are the more obvious and resource efficient choice (*reduce*).
_ Lastly the allocation of *publicly accessible collective space* on a higher scale level (island) can also determine the development direction of a patch.

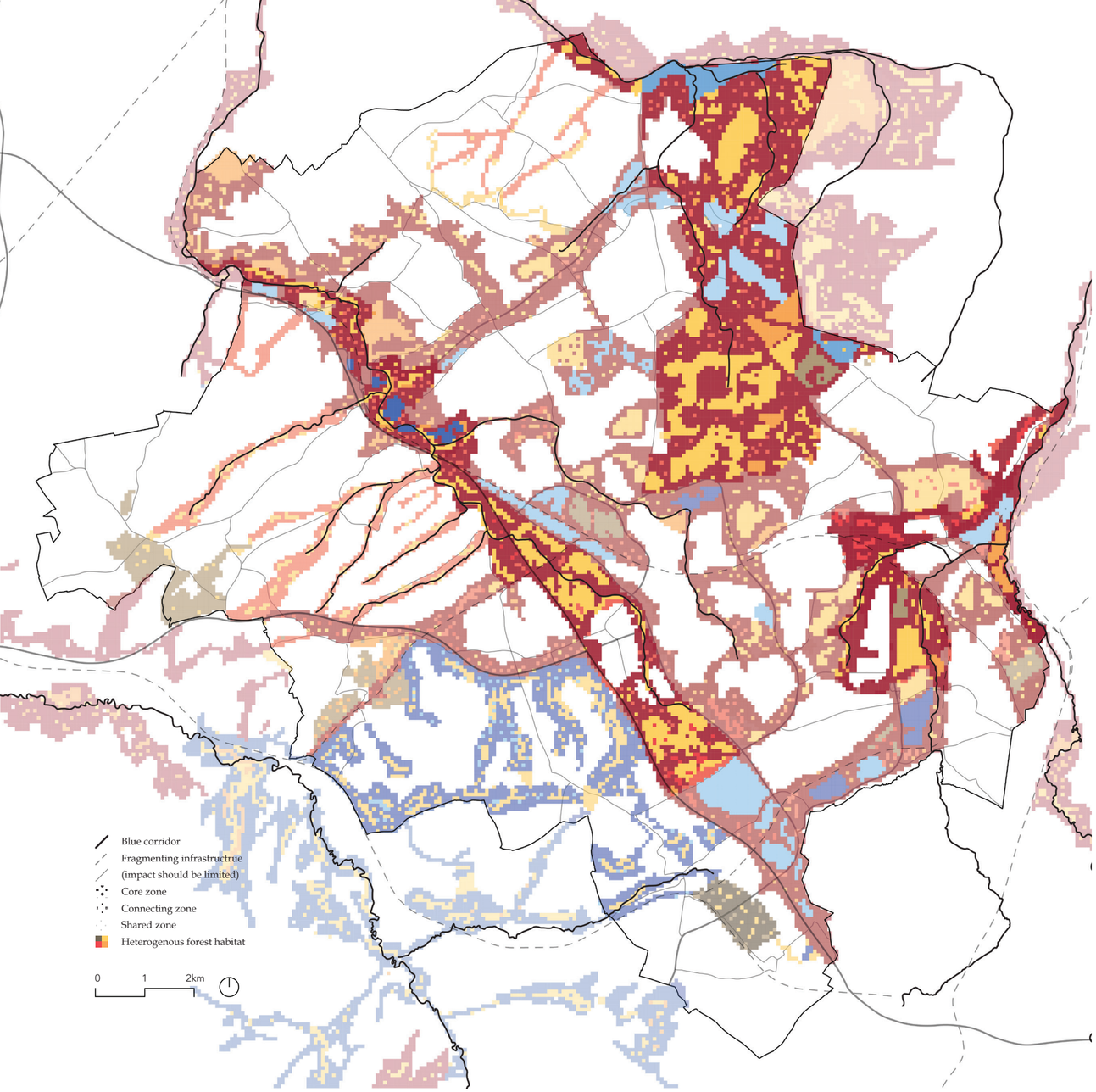
The interplay of these four factors in turn determines if the general urban structure should be affirmed, bound together or contrasted. Generally it can be said that affirm is a less invasive development direction, while bind and especially contrast require greater interventions and are thus appropriate for patches with a greater need for restructuring.



Important factors that can stir the forest development of patches. A careful reading of the existing landscape and forest structure is furthermore important in the transformation process.



Example of a possible spatial structure of the carpet (area within black outline) In this case Amstenrade and Hoensbroek. Here the different patch sizes and spatial structures become clear.

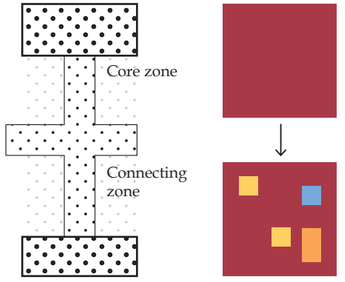


A new connectedness

While redesigning the territory of Parkstad as a forest places a strong emphasis on landscape development and biodiversity enhancement, it is nonetheless important to reserve spaces for flora and fauna that are disturbed by human presence (*repair*). Especially in the Zwischenstadt where landscape and urbanscape are so deeply interwoven this is crucial as humans tend to make use of the landscape fragments in their totality. Recreational pressure is for example one of the reasons why deer are disappearing out of the stream valleys in Parkstad (Hermans, 2022). To combat this challenge an extended natural network with three levels of protection is introduced (page 158):

_The core zone is the most protected area. Within Parkstad three areas constitute this zone. They all contain vulnerable stream biotopes and are furthermore important connection corridors to the landscape at large (page 92-93). Already today these areas are mostly free of human settlements. The aim is however limit anthropogenic pressures as much as possible. Wherever possible access for humans will be denied or limited.
_The second zone is the connection zone. These corridors and spaces enable exchange and connection between the core zone. They are furthermore habitats in and of themselves. While human occupation and use is taking place here, the aim is to limit further development as much as possible, while transforming either dismantling or transforming infrastructure long term. Maintenance strategies here are focussed on ecological and environmental values, they however also allow for anthropogenic use.
_The aim for the rest of the territory is to strike a balance between the anthropogenic and natural uses and needs.

It is lastly important to mention that maintenance and restoration in all zones and habitats should be centred around improving, not only landscape connectivity, but also heterogeneity.



Connection principle different zones of protection
Principle of forestering heterogenity

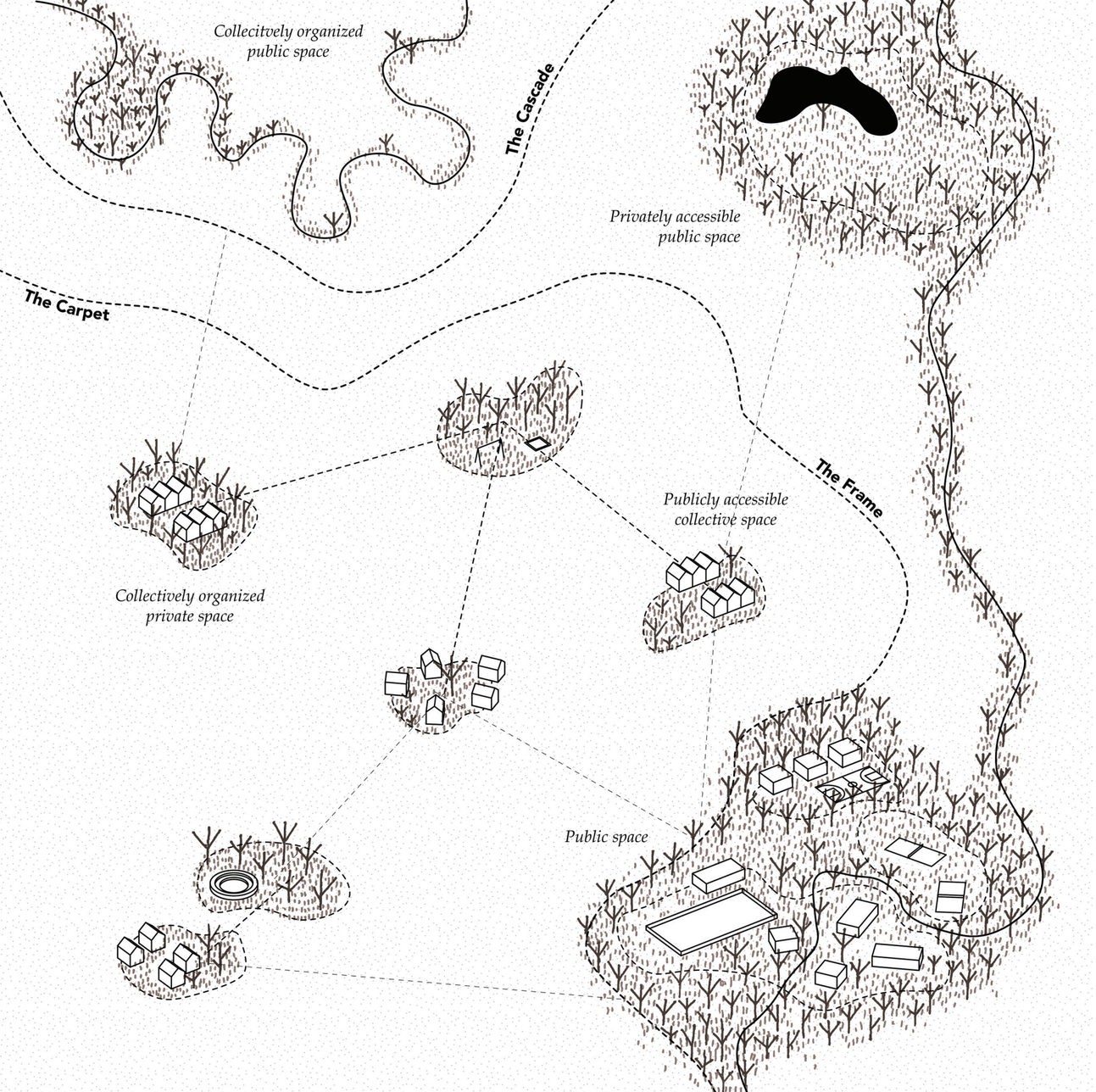


A new collectivity

While fostering landscape connectivity, heterogeneity and biodiversity are important facets of care (*repair*), the new forest structure is also intended to revitalize and transform spaces for humans (*reduce, repair*). While shrinkage has been primarily understood and analysed as a change in residential housing needs, shrinkage also affects the amounts and level of services and commercial enterprises allocated in an area (de Klerk & van der Wouden, 2021) with shrinking territories often experiencing a loss of shops, cultural institutions, schools etc. Parkstad for example is experiencing a heightened level of vacancy of shops within old town centres and partially outside of it (Parkstad Limburg, 2021). Public space dependent on these commercial enterprises themselves or their surroundings with that begin to disappear or lose their attractiveness. Rather than trying to revitalize commercial public and collective spaces, thinking with care – both care for the environment and communities- calls for an alternative development strategy for these spaces. In her work on shrinkage Desimini calls for the formation of public spaces outside of usual categorizations of (green) public spaces, such as plazas, parks, and gardens (2014). She suggests inserting elements of social programming in the emerging wilderness of the "formerly urban". While the relatively high population density in Parkstad and the current and expected shrinkage does not warrant such drastic measures, the underlying idea of anchoring collective and public spaces in landscape elements, rather than urban ones provides a new perspective on cultivating public life. This is certainly not a new idea, old city forests throughout Europe have for example provided the backdrop for spontaneous meeting, large gatherings, and recreational outings for centuries (Konijnendijk, 2019).

More recently within the Zwischenstadt discourse Landschaftspark Duisburg-Nord emerged as a new form of public space located outside of urbanized areas in old industrial heritage (Schröder et al., 2001; page 104). In Parkstad the new forest figures can serve as a spatial setting for a different collective and public life. To acknowledge the diminishing support for services in shrinking communities as well as the movement ranges of different user groups, amenities are differentiated throughout the scales and spread out over Parkstad accordingly.

_*Collectively organized public space*: outside of the urbanized patches recreational facilities the existing hiking network in the cascade is strengthened through the allocation of new paths (page 198-199) as well small amenities such as resting and viewpoints (page 200-201).
_*Public space*: on the scale of Parkstad two large public forest infrastructures are introduced. These clusters provide functions for a large group of users

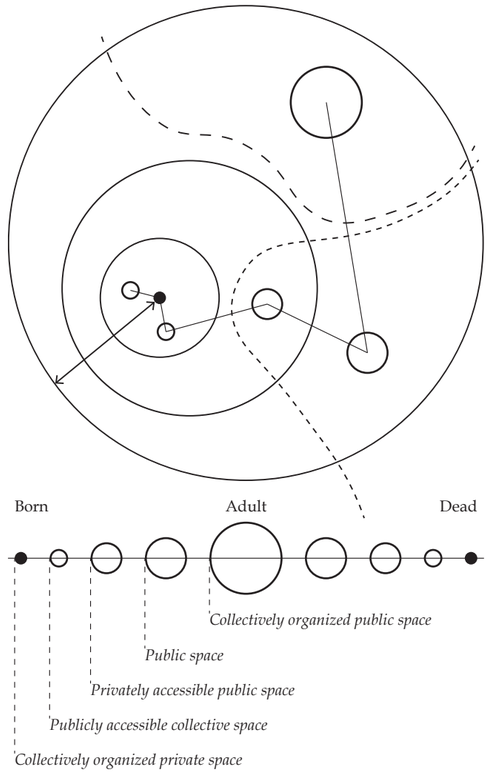


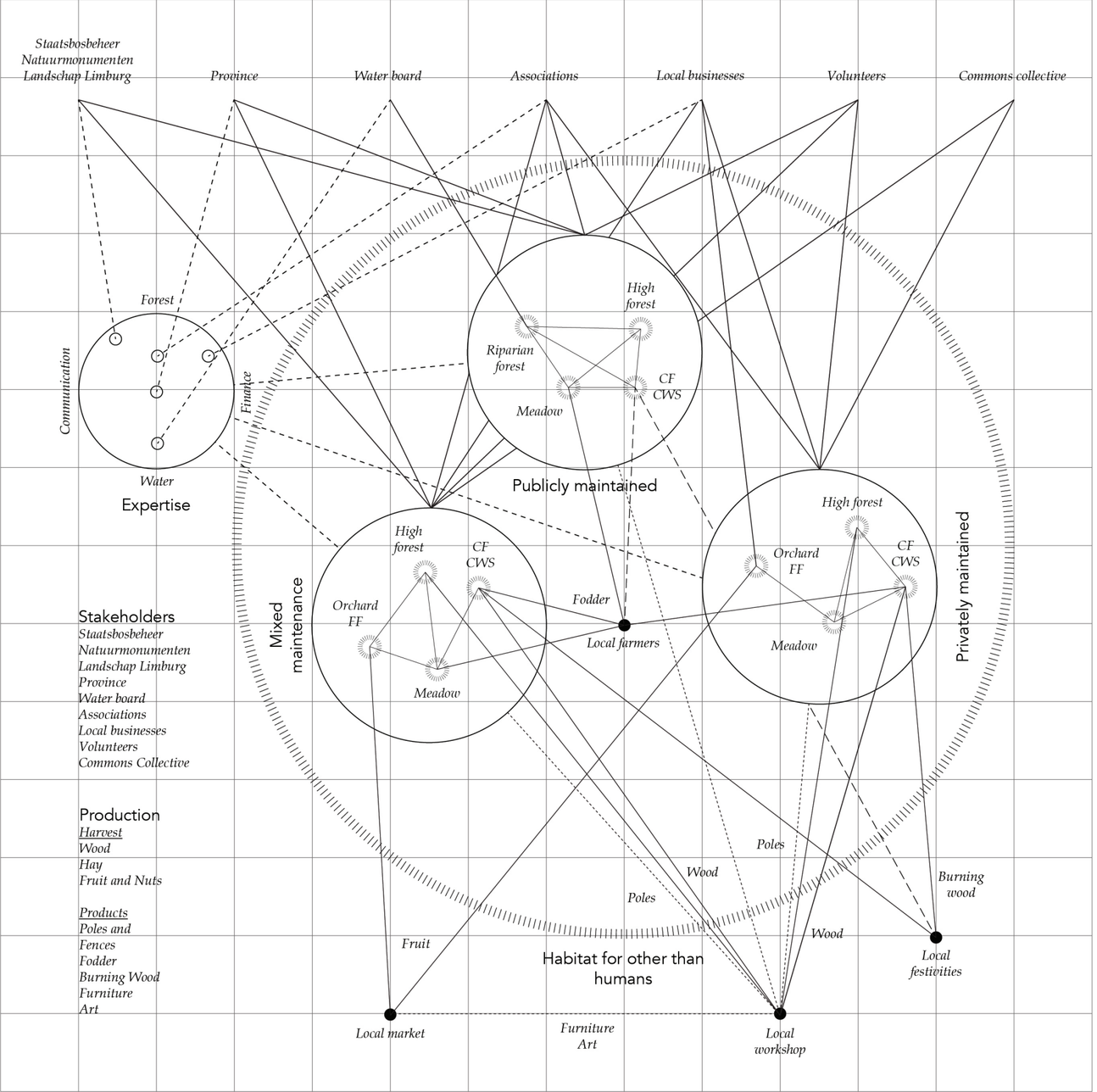
(sports, leisure, events, work), with that they become the primary alternative for the town centres. One of these clusters already exists in Kerkrade (area around Wilhelminaberg) and is centred around events and leisure. In the North of Parkstad a new cluster is introduces which combines work with cultural functions, as well as infrastructure needed to sustain the new forest infrastructure.

_*Privately accessible public space*: thirdly, hidden public spaces are introduced in the frame. These spaces are largely unprogrammed, but publicly accessible. They are adventurous spaces meant to be discovered and explored. They furthermore double as spaces for nature development. Here the aim to help to take away pressure from vulnerable natural areas such as streams, by providing new recreational areas in a forest setting. These spaces can become interesting for user groups with high mobility, such as teenagers or young families.

_*Publicly accessible collective space*: smaller public and collective functions are placed in small forest groves in the individual neighbourhoods making them accessible for less mobile user groups (elderly, children).

_*Collectively organized private space*: new collective housing in the carpet forms the fifth type of collective or public space.





A new responsibility

This new vision of the forest detailed here however not only affords humans and other than humans a new living environment, but it also demands ongoing management and stewardship by humans to ensure that it remains healthy itself. While the previous sections (legibility, connectedness, collectivity) explored how the forest can care for various social, spatial, and ecological needs, the forest must also be cared for to sustain this complex web relationships and functions. This necessitates a commitment from the inhabitants of Parkstad, as well from various institutions and stakeholders to provide for the forest and the landscape at large. According to the three forest figures, the level of protection, as well as the use of the forest, a maintenance scheme for the whole forest territory is worked out.

_Completely publicly maintained (government institutions and volunteer groups) areas with nature development and biodiversity enhancement as the main goal
_Mix of public (government institutions and volunteer groups) and private maintenance (commons collectives, local business, associations). This is done to ensure that the vulnerable biotopes in this zone are taken care of and well developed. While the goal is to limit anthropogenic pressures, human inhabitation and maintenance are allowed.

"The casual glimpses which the ordinary population bestowed upon that wondrous world of sap and leaves called the Hintock woods had been with these two, Giles and Marty, a clear gaze. They had been possessed of its finer mysteries as of commonplace knowledge; had been able to read its hieroglyphs as ordinary writing; to them the sights and sounds of night, winter, wind, storm, amid those dense boughs (...) were simple occurrences whose origin, continuance, and laws they foreknew. They had planted together, and together they had felled; together they had, with the run of the years, mentally collected those remoter signs and symbols which, seen in few, were of runic obscurity, but all together made an alphabet.

The Woodlanders, Hardy
(1998; original work published 1887)

_Privately maintained (associations, local businesses, commons collectives, farmers). As the focal point in this area is striking a balance between human and other than human needs and the maintenance guidelines are less strict maintenance is mostly in private or collective hangs. Governmental organizations and specialized maintenance businesses can provide guidance and help with specific tasks.

For a more detailed maintenance scheme with specific tasks, look at the three projections hereafter (page 196, 208 , 223).

Staatsbosbeheer
Natuurmonumenten
Landschap Limburg

Province

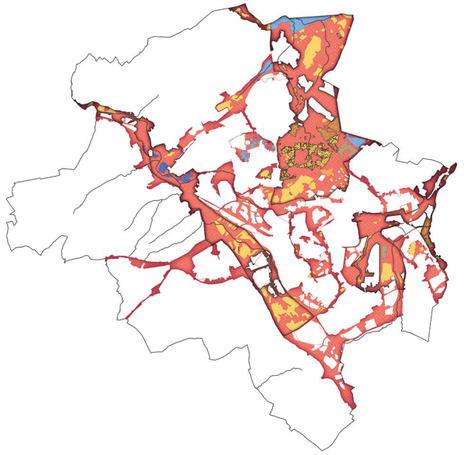
Water board

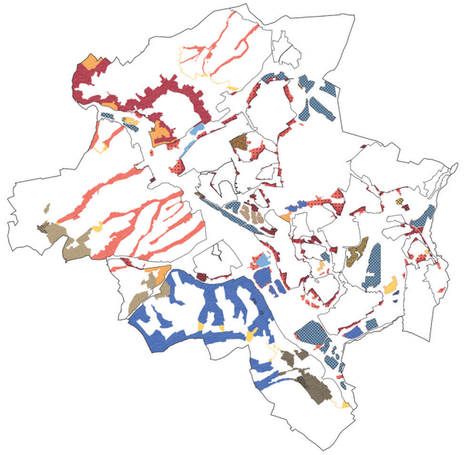
Associations

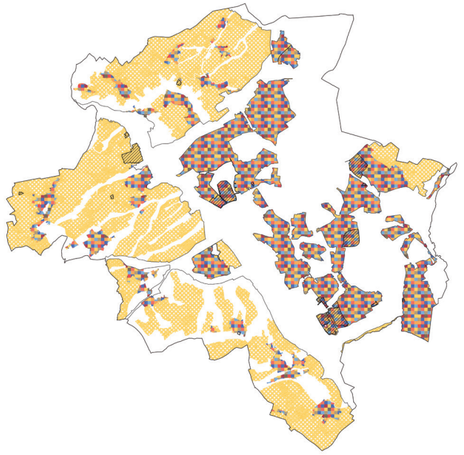
Local businesses

Volunteers

Commons collective









Publicly maintained forest
The publicly maintained forest consist all forests in the core zone and some parts of the connecting zone. Those parts of the frame that are not occupied by humans, farmland, businesses or large scale public spaces. As the focus here is on nature redevelopment, the areas are publicly owned and publicly maintained with the help of volunteer groups. While the water board is responsible for the riparian forests and stream valleys, the province and other national organizations maintain the drier parts of the forest. Production only happens insofar it occurs naturally due to maintenance work.

Mixed maintenance
The forest with mixed maintenance is mostly made up of connecting zone. It consist of the forest rooms in frame that are either occupied by humans, businesses or large scale public spaces. Those parts of the dense frame that are occupied by humans also fall under the domain of mixed maintenance, so do the denser forested parts of the cascade. Due to its special protection status, as well as more intense maintenance needed in correlation with denser forest figures, it is necessary that public institutions help out the private parties. As such provincial and national governmental associations work alongside private parties here sharing responsibility for the territory. .

Privately maintained forest
The privately maintained forest encompasses the carpet, as well as those parts of the cascade that are not under special protection. These parts have the least intensive maintenance requirements and can as such be maintained by those occupying the places themselves. However, where extra help is needed specialized services can be hired, while public institutions can provide guidance and specialized information.

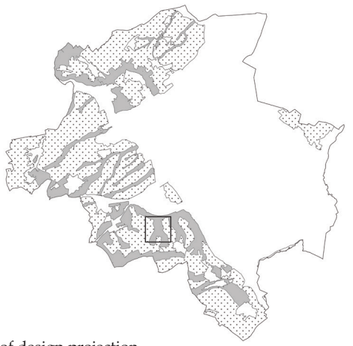
- Blue corridor
- Heathland
- Core zone
- Nature-inclusive industrial terrain
- Industrial terrain
- Occupied by both humans and other than humans
- Public forest
- Hidden public forests
- Passive production
- Nature-inclusive production
- Production

Maintenance work of coppicing

Part 9.1 | Design projection cascade

Traversing the linear forest

On the slopes surrounding Winthagen a linear forest emerges (principle 3, page 168). Lines of shrubs form the basic building block of the landscape, sometimes growing out into a small patch of a light oak-hornbeam forest, sometimes morphing into linear orchard. As the limestone slopes here are rare in Parkstad and generally in the Netherlands, an important aim is to balance space for agricultural development with that for natural development. For this the steeper slopes to the East of the valley are transformed into mesotrophic meadows, while the Western slopes as well as the plateaus are kept for agricultural use. To protect the newly created habitats, as well as to lessen erosion and eutrophication forested strips and forested islands are introduced to the edge of the plateaus. On the steepest slopes to the East these forested strips are partly substituted for "graften", which are recultivated in spots where they were previously grown. These graften are primarily made up of hazel, hawthorn, elder bushes, common dogwood, field maple and different blackberry and rose bushed. The forested strips are consists of the same species. Both are coppiced every 10 to 20 years, while the small forested islands are cultivated as coppiced forest with standards. Similarly to the "graften", this type of forest called "middenbos" used to be common place in the hill landscape, but has disappeared since the Second World War. Bringing it back is not only important for biodiversity, but also help to revive the image and experience of the cultural landscape. This coppiced forest is of the Oak-Hornbeam variety and typically consist of summer oaks, hornbeams, winter lime, sweet cherry and ash. Forested lines in the form of apple and quince orchards are furthermore added around the parcels that directly surround the village of Winthagen. Trees are here added to an already existing volume (the houses), as not to disturb the rhythm and openness of the cultural landscape. The orchard lines create collective space and opportunities for strolling and hiking, while not taking away from the privately owned land and gardens.



Location of design projection

Newly added trees as landmarks
Single trees
Forest
Flower strips
Orchard
Grassland
Fields
Water

0 100 200m



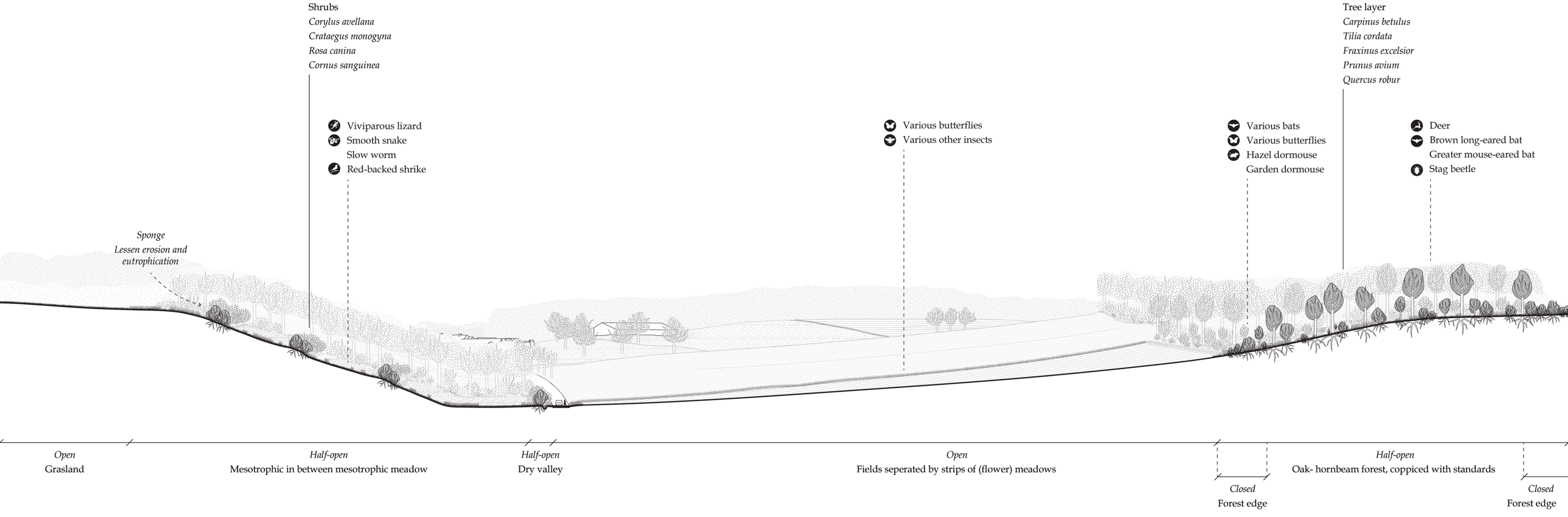
Current situation Valley of Winthagen
Proposed plan Winhtagen after 50 years

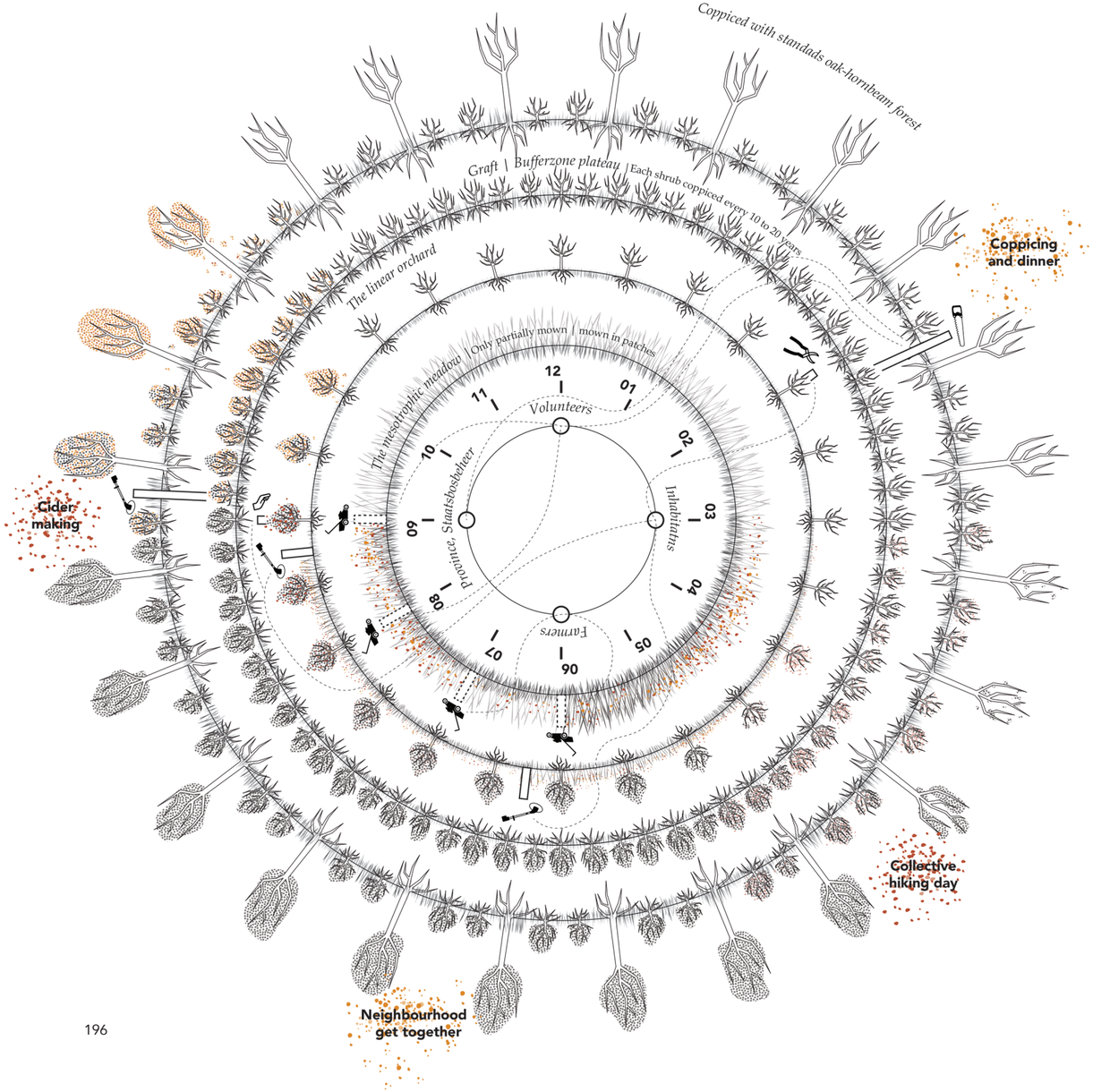


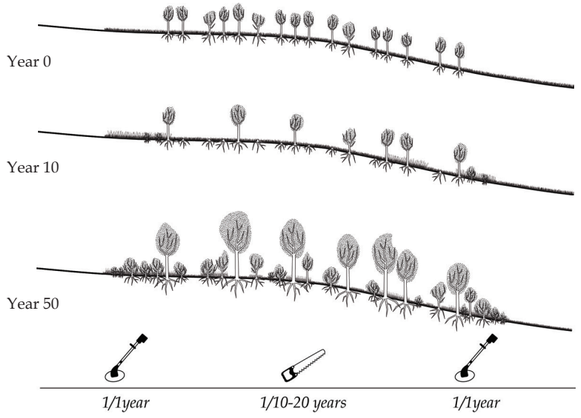
Proposed situation +50 years



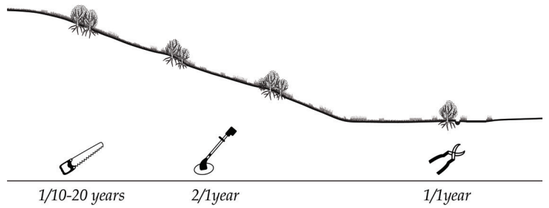
Current situation


Shrubs
Corylus avellana
Crataegus monogyna
Rosa canina
Cornus sanguinea
Viviparous lizard
Smooth snake
Slow worm
Red-backed shrike
Various butterflies
Various other insects
Various bats
Various butterflies
Hazel dormouse
Garden dormouse
Tree layer
Carpinus betulus
Tilia cordata
Fraxinus excelsior
Prunus avium
Quercus robur
Deer
Brown long-eared bat
Greater mouse-eared bat
Stag beetle
Sponge
Lessen erosion and eutrophication
Open
Grasland
Half-open
Mesotrophic in between mesotrophic meadow
Half-open
Dry valley
Open
Fields seperated by strips of (flower) meadows
Closed
Forest edge
Half-open
Oak- hornbeam forest, coppiced with standards
Closed
Forest edge
0
100
200m

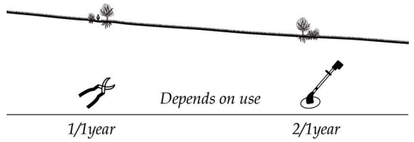




Maintenance of a coppiced with standards forest

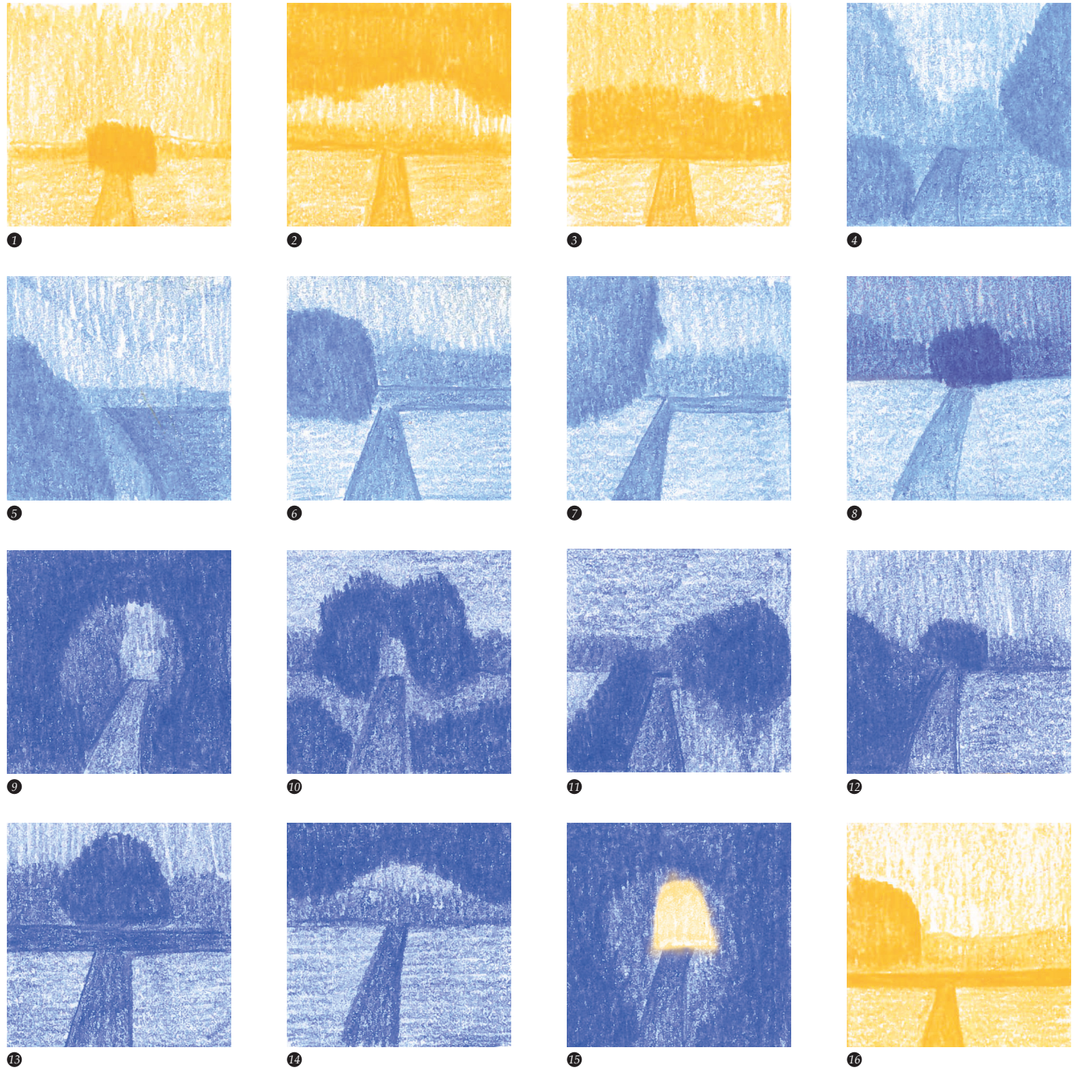


Maintenance of "graften" and mesotrophic meadows



Maintenance of linear orchard

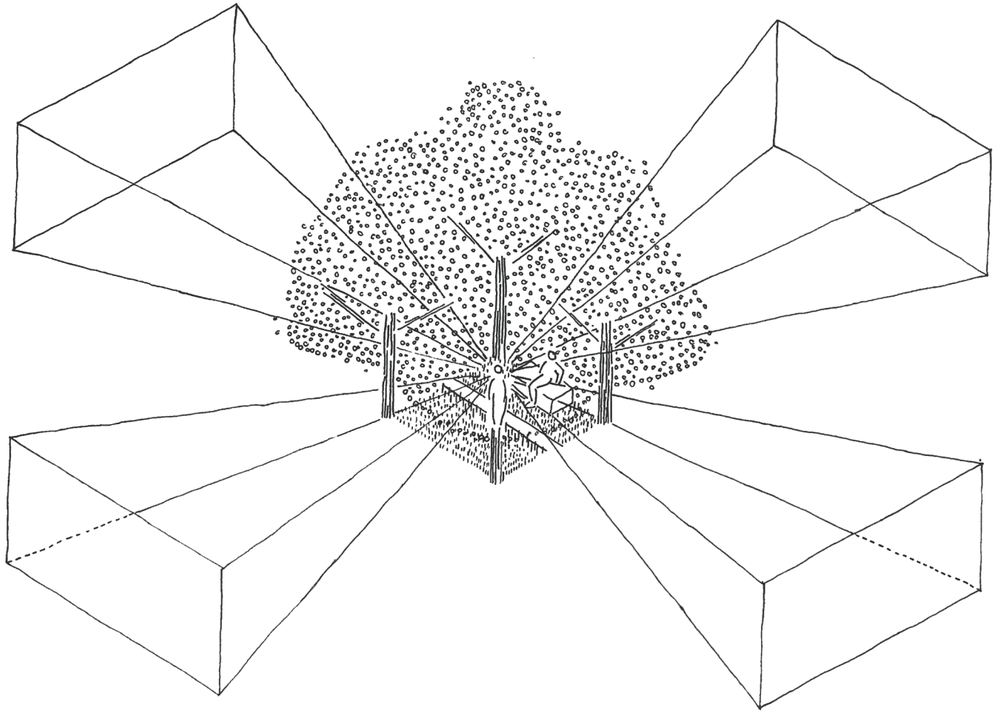
<u>Reviving a cultural landscape</u>
The focus of maintenance and care work in the cultural landscape lies on two different aspects. Restoring cultural forest elements and recreating mesotrophic meadows. The reintroduced "graften" need to be coppiced every 10 to 20 years. A part of the forest patches also need to coppiced in the same intervals. This creates a coppiced with standards forest, a light and open habitat needed by many species at home in the hill landscape. The standards can be cut every 100 year or be spared to die naturally. To recreate mesotrophic meadows without removing soil, the meadows need to be mown completely at least two times a year. This however needs to be done in patches to not destroy the living habitat of the insects depending on it, for this a tighter, more differentiated mowing schedule is needed. Furthermore the fruit trees in the linear orchard need to be pruned yearly. This maintenance cycle with its focus on coppicing and pruning creates a relatively static landscape, in with time moves cyclically.



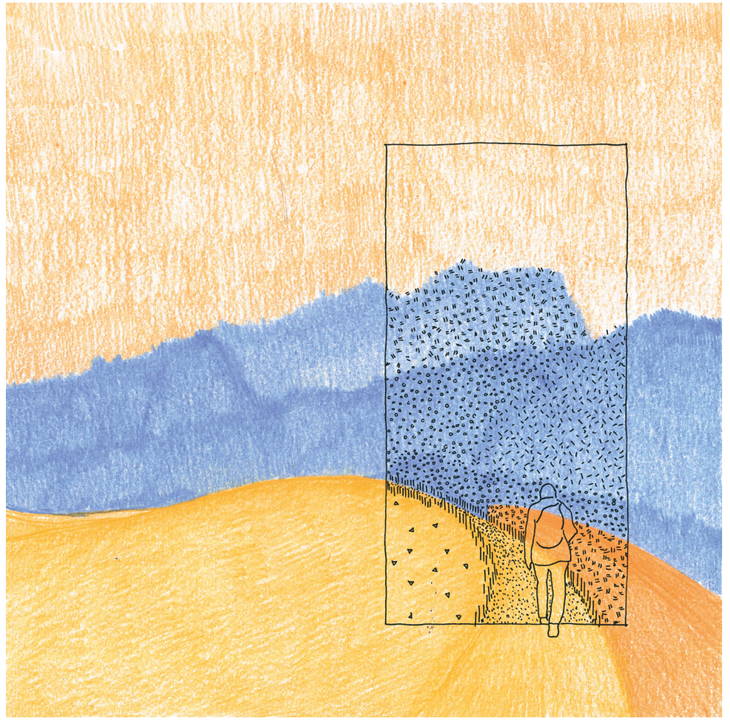


Open, closed, open – walking the landscape

Experiencing the cultural landscape by hiking or walking through it is tied into everyday life and culture of Limburg. For this a new hiking trail is created that is meant to strike a balance between experiencing the rhythm and sequence of the landscape, while not disturbing the vulnerable forest and meadow habitats. For this trails goes over a plateau, in and out of the new forested strips along the Western edge of the valley and through the liner orchard close the village, while keeping distance to the vulnerable mesotrophic meadows when ascending the slope to the East, before once again running over an open plateau. This sequence creates the spatial experience of moving from open to closed to open, making the hiker experience the diversity of the hill landscape and come in contact with the different tree arrangements and landscape typologies of the hill landscape. Along this hike trees either as landmarks on the open plateaus or as linear strips (page 200 and 2001) guide the hikers.



Arrangement of four lime trees. Situated on the plateau this tree groups provides is not only a beacon and point of orientation in the landscape, but also a resting spot from which the wide views over the plateau can be enjoyed.



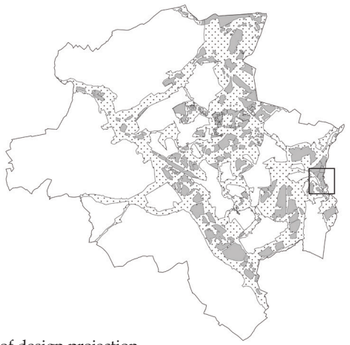
The linear forest at the edge of the plateau guides the hiker, while framing views over the valley. A small trimmed hedge introduces new paths and forms a recurring landscape element.



Part 9.2 | Design projection frame

Wandering among groves

Along the Worm a series of forest rooms open up in the dense forest threshold of the frame (page 170-175). A terrain partly wet, partly dry; with forest, meadow and thickets intertwined in a fine grained mosaic. Currently these spaces are occupied by industrial terrains, which lie directly to the vulnerable ecosystem of the Worm. Here for example the rare bird cherry forest (Prunus Fraxinetum) grows. In order to stabilize these ecosystems and let them expand, the most polluting of these industrial terrains are removed from this stretch. After the industrial buildings are dismantled a gradual process is initiated in which the soil is restored and the terrain is reforested. As the recycling centre that was previously on site buried rubble, healthy soil from the site is moved to these rubble spots. Here it forms mounds, which are reforested with an oak-hornbeam forest. The removal of the soil from other parts of the terrain creates a wetter condition there, which can be forested with the rare bird cherry forest. This is done in steps in order to observe the success of the transplantation and replanting and adjust where necessary. The remaining terrain will either be mown or left untouched so that natural succession can occur. This will lead to a long phase of thicket dominated by nettles and blackberries before the forest will take over here as well. This new forest room is however is not only a space dedicated to natural development, it also affords a new recreational and spatial experience. Here a hidden yet publicly space is created, that invites the visitor to wonder, as well as sit and relax. After traversing the dense and enveloping forest threshold of the frame, enters two forest spaces. Both in inspired by the picturesque tradition of creating delayed arrivals and framed views, spaces are created here that are not easily oversee-able and invite exploration. In the forest gardens leftover walls of the former industrial sheds create a series of landscape rooms either planted with wet forest, singular trees or left to develop naturally. The larger area of the former recycling grounds is reforested in the form or groves, which serve as spots to gather and relax in, while the meadow and thicket invite to wonder and explore.



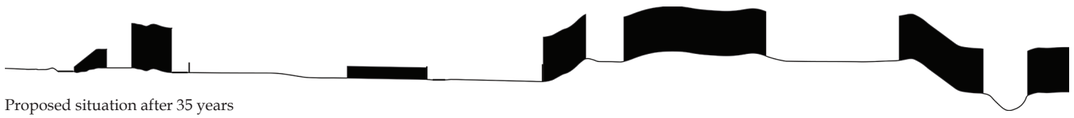
Location of design projection

Newly added trees as landmarks
Existing single trees
Forest
Shrubland
Grasland
Mining ground
Water

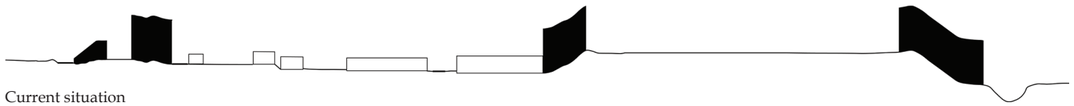
0 50 100m



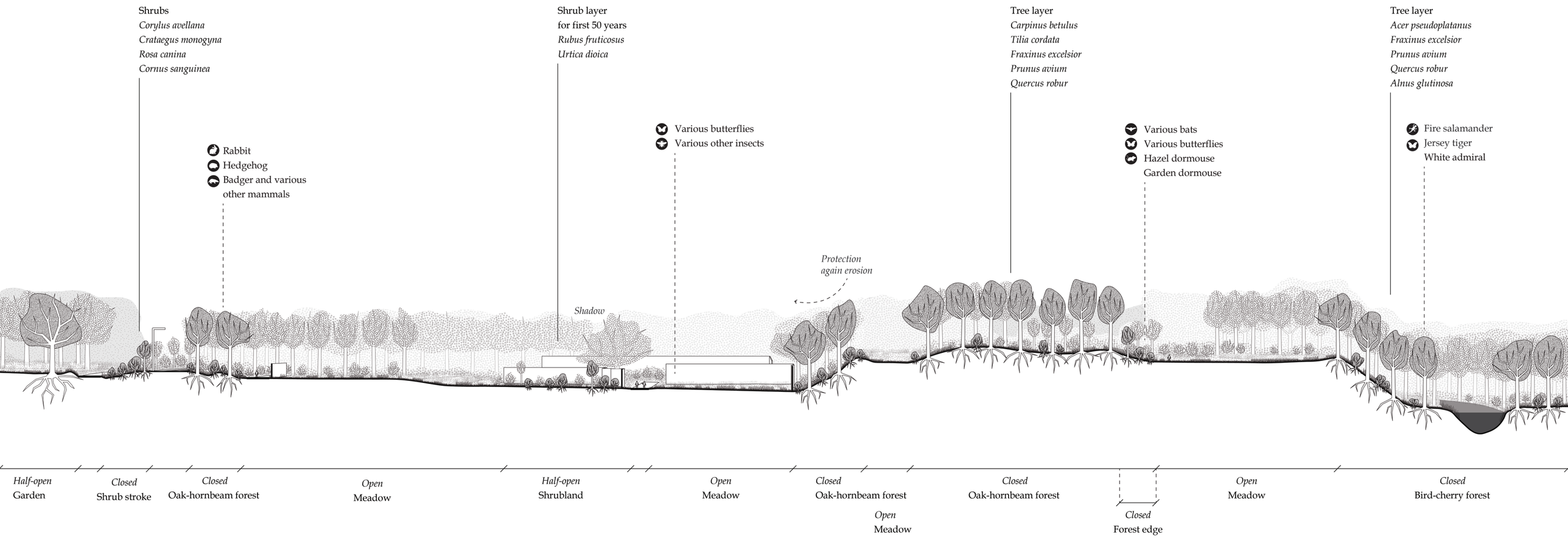
Current situation as industrial terrain
Proposed plan as forest in gradients after 35 years

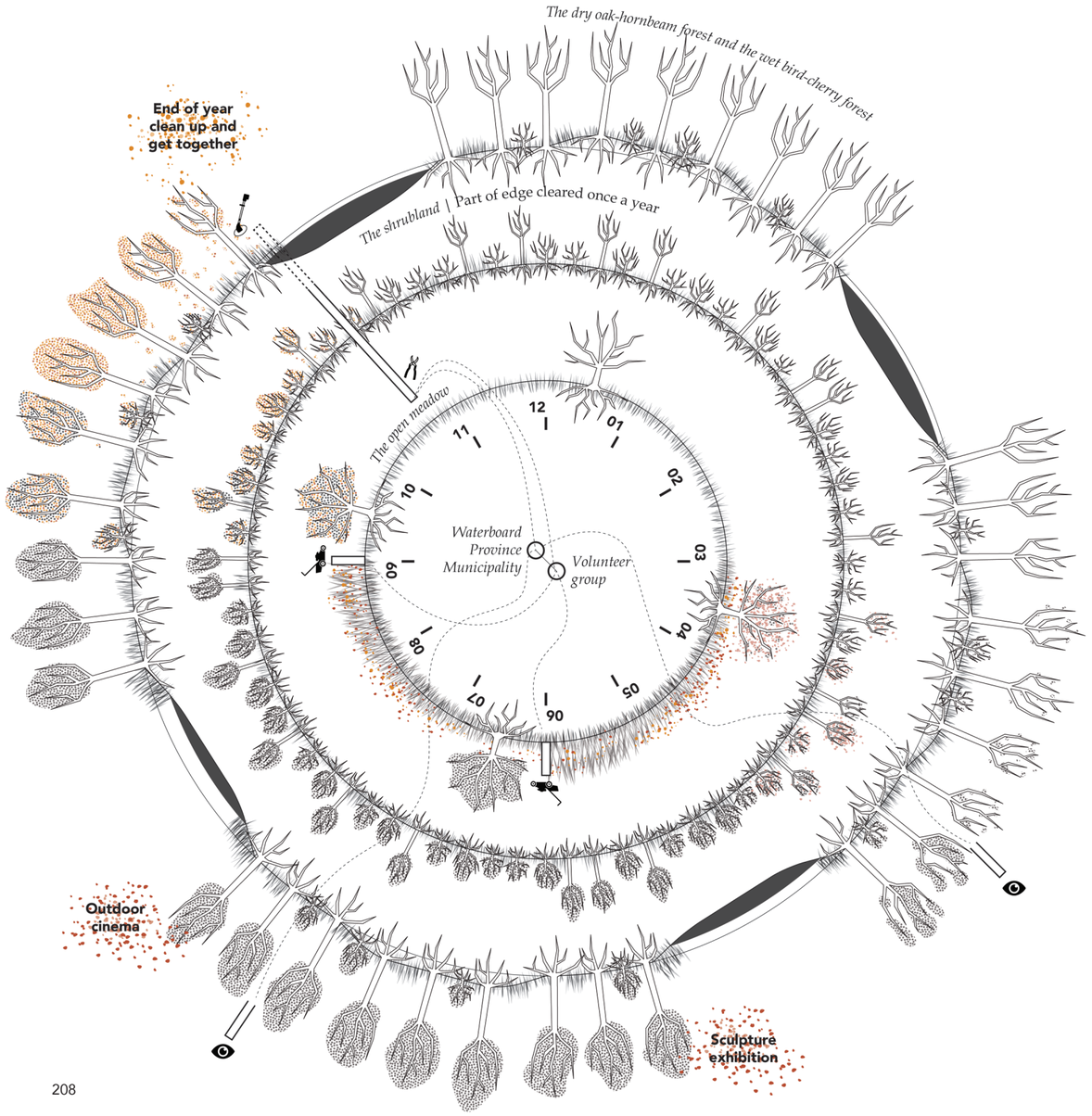


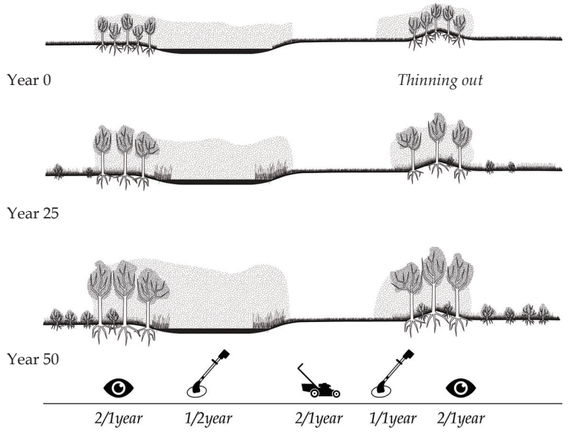
Proposed situation after 35 years



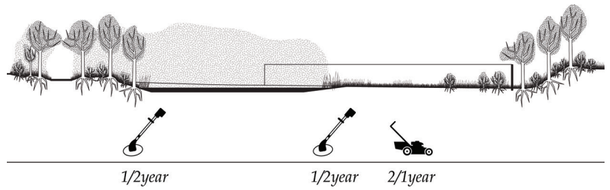
Current situation


Shrubs
Corylus avellana
Crataegus monogyna
Rosa canina
Cornus sanguinea
Rabbit
Hedgehog
Badger and various other mammals
Shrub layer for first 50 years
Rubus fruticosus
Urtica dioica
Various butterflies
Various other insects
Protection again erosion
Shadow
Tree layer
Carpinus betulus
Tilia cordata
Fraxinus excelsior
Prunus avium
Quercus robur
Various bats
Various butterflies
Hazel dormouse
Garden dormouse
Tree layer
Acer pseudoplatanus
Fraxinus excelsior
Prunus avium
Quercus robur
Alnus glutinosa
Fire salamander
Jersey tiger
White admiral
Half-open Garden
Closed Shrub stroke
Closed Oak-hornbeam forest
Open Meadow
Half-open Shrubland
Open Meadow
Closed Oak-hornbeam forest
Open Meadow
Closed Oak-hornbeam forest
Closed Forest edge
Open Meadow
Closed Bird-cherry forest
0 75 150m

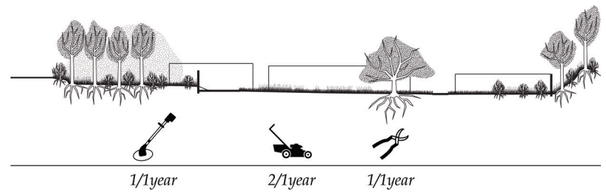




Planting strategies forest mounds and wet forest

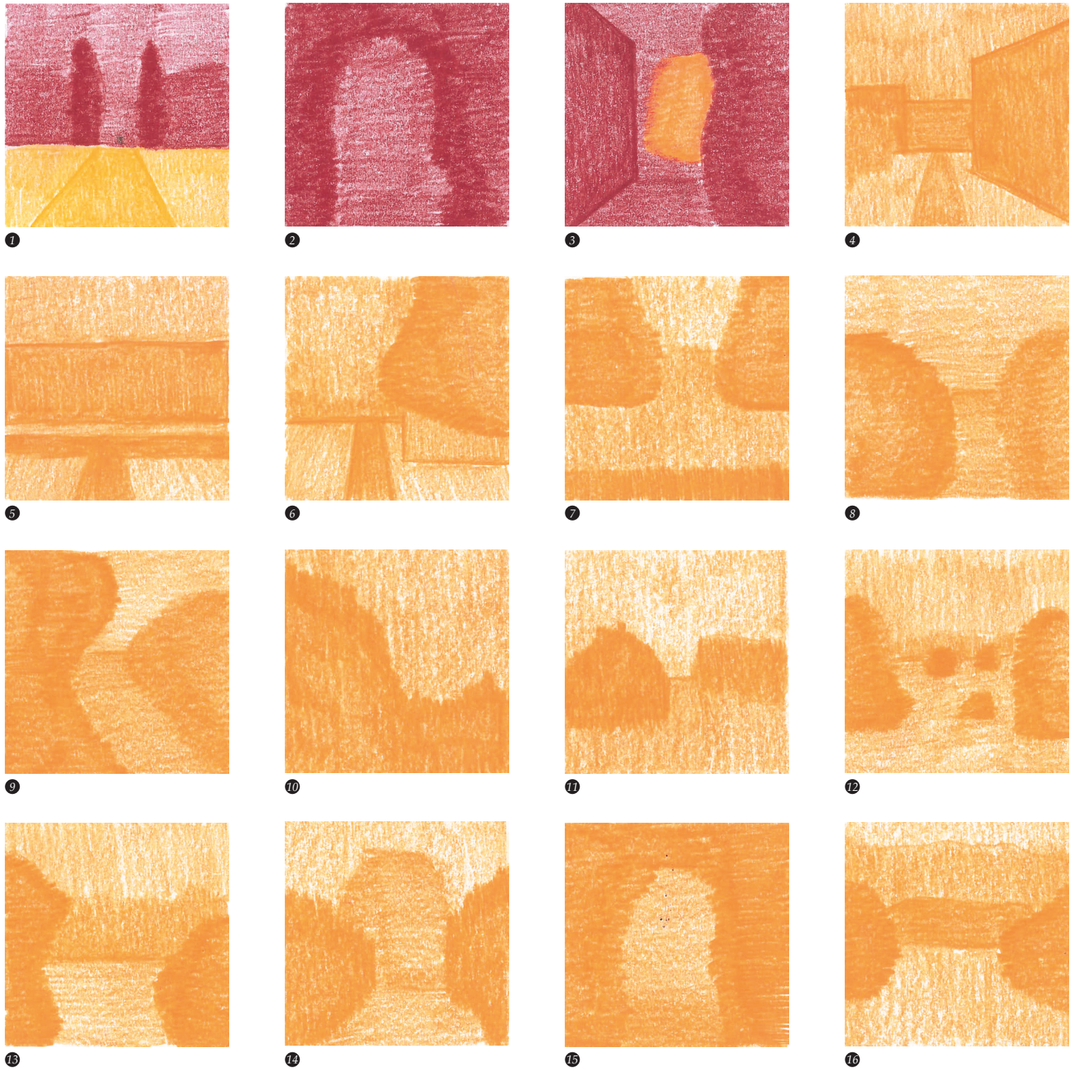


Maintenance forest garden



Maintenance forest park

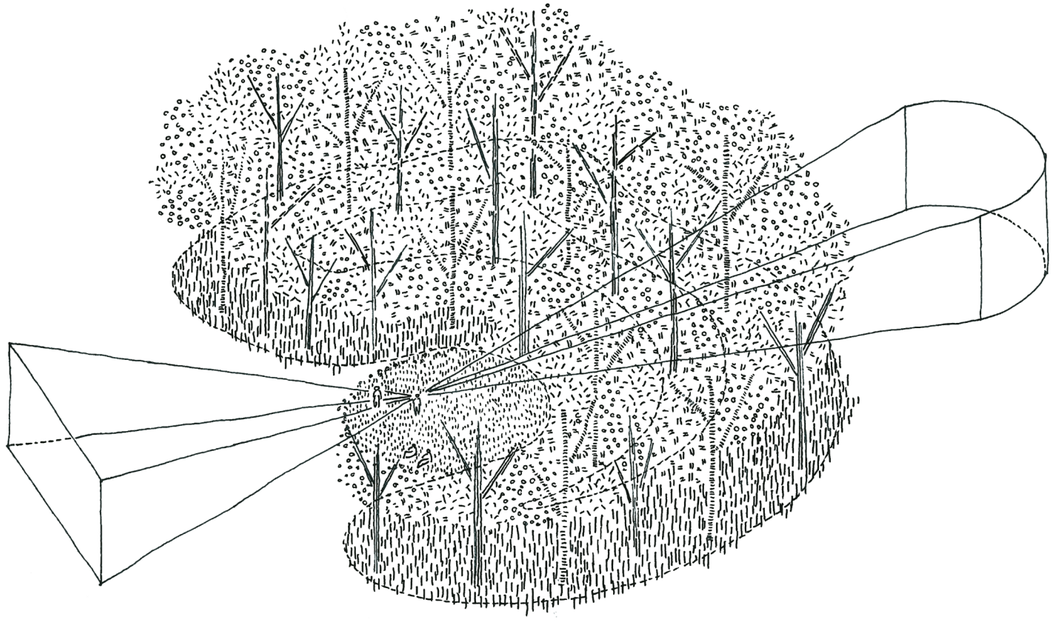
<u>Between letting go and taking care</u>
The maintenance regime of the forest room relies on techniques of rewilding as well as structured planting, maintenance and observation. The newly introduced forest mounts are planted and carefully monitored. Where reforestation is not successful, it is retried or a new strategy is chosen. Part of the open grounds are mown periodically to allow for the movement of visitors. They are however not planted to allow for spontaneous colonization of grasses. Equally the shrubland is left to develop naturally. With the wind carrying seeds to the site it is assumed that the rooms in the forest garden will first be populated by blackberry shrubs and nettle, while the open grounds follow later. As the ground is rather unfavourable, it is assumed that the forest on the mounds will not spread easily to the rest of the site and will take several decades to take over the shrublands. As such the site has no fixed end result, but is rather in a constant state of becoming. The forest will spread and retract, mowing patterns change and plant species appear and disappear.



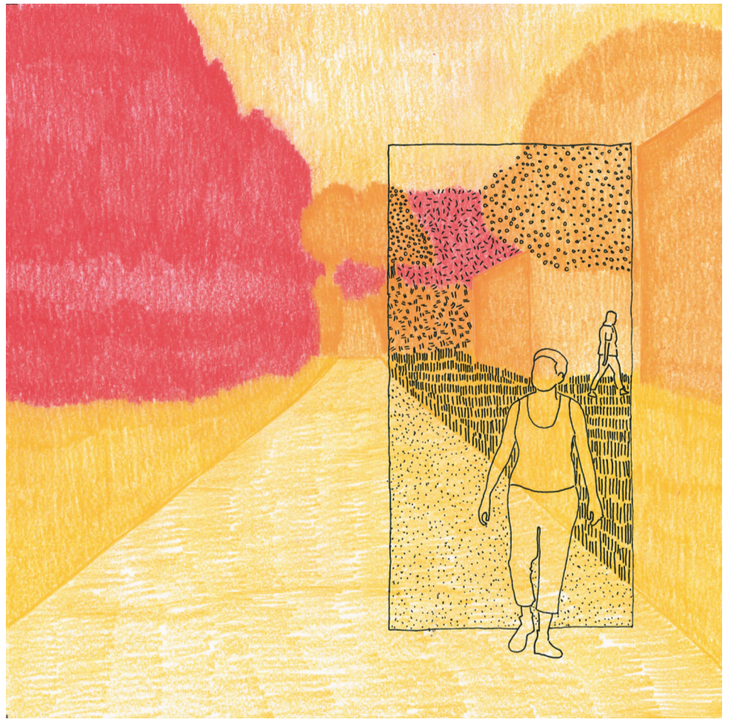


Exploring a new public space

The new forest mounds, as well as the leftover walls of the industrial sheds are shaped in such a way that they create a movement experience in line with the picturesque idea of the delayed arrival. When exploring the forest room the visitor is guided towards a fixed object like a forest grove or a wall, there they have to turn to be let to the next object and so forth. This is meant to invite the visitor to wander and explore. The interplay of different sized and shaped meadows, shrublands, forests and water bodies is further meant to create a varied landscape experience. The surrounding forest frame forms the backdrop of the site, highlighting the limits of the site and creating a tension between legibility and mystery . The new forest mounds are bean shaped to provide a sheltered space in which to sit and relax. Each of the openings in the forest mounds is aligned with a wider view possessing both a middle and background to make for a richer viewing experience. Single trees and porticos with expressive shapes guide the visitor in and out of the forest garden, as well as the site at large.



A forest grove made up of trees present in the Oak-hornbeam forest. The grove provides a sheltered sitting space, while framing a wider view into the forest park.

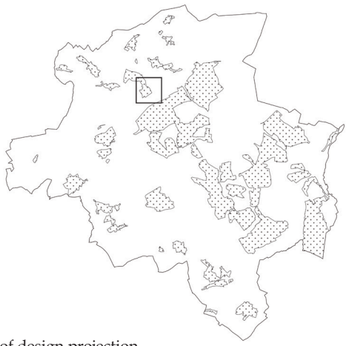


Walking along the long axis of the forest gardens. Single trees and portico arrangements draw you in and compel you to move further.

Part 9.3 | Design projection carpet

Living in a forest clearing

In Amstenrade the forest is your neighbour. As vacancy levels rise, the forest takes hold of the neighbourhood forming wide strips and intimate clearings, in which those who remain gather, wander, play, garden and most importantly live. Already today Amstenrade has vacancy levels of around 15% percent (CBS, n.d.-b), which are supposed to increase by 8% till 2050 (PBL & CBS, 2022). To prevent the negative socio-spatial effects of shrinkage, as well as provide space for landscape development, forestry is utilized here to restructure the neighbourhood. On the scale level of the neighbourhood an interconnected forest network is created that sits orthogonally on the underlying neighbourhood structure thus forming a *contrast* with the existing *structure* (page 114-119, page 176-179). This strategy of *contrast* is applied here, as going against the grain of the neighbourhood enables the creation of an ongoing, unfragmented forest. This is inspired by forest neighbourhoods such as Sletten, but also Tapiola (page 250-257). It however also flows forth from an interpretation and reading of the surrounding landscape, specifically the forest rooms and frames that adjoin Amstenrade to the West and which form the transition from cultural landscape to urbanized territory. In continuation of these forest typologies Amstenrade becomes a forest made up of intimate forest clearings lined with houses, as well as open meadows scattered with houses and bordered by dense strips of forest. This interplay of forest, house and meadow furthermore allows for the diversification of the current building and living typology of free-standing or duplex family homes. In the case of the forest clearing, the forest as a enclosing frame creates small communes of around 12 houses. While the houses and their terraces remain private property, the forest, which surrounds them and the meadow, which they surround, are shared by all inhabitants collectively. The contrast between open and closed create manifold opportunities for spatial appropriation and experimentation and can form the backdrop for shared gardens, secret tree houses or a sunny spot to lie in.

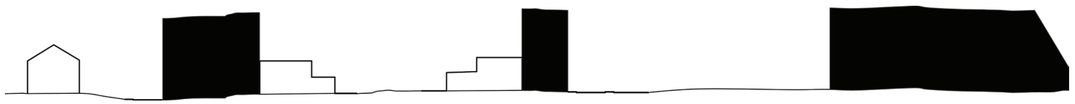


Location of design projection





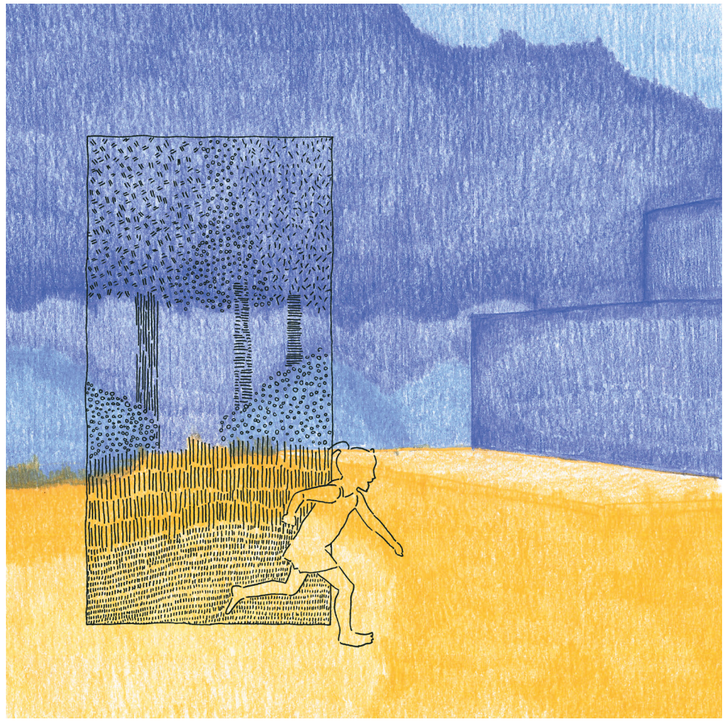
Current situation as neighbourhood
Proposed plan as forest neighbourhood after 50 years



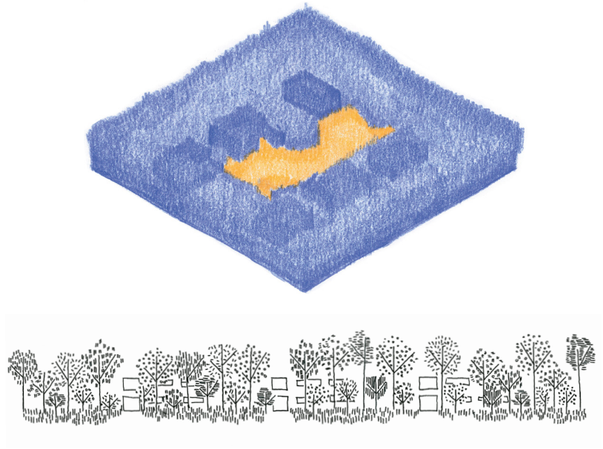
Proposed situation after 50 years



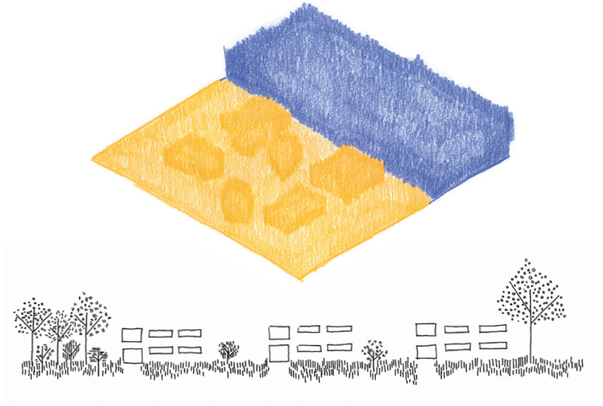
Current situation



The forest clearing creates an enclosed and safe space, that encourages collective use by those living at the edge of the clearing. Here the inhabitants can play, relax and gather.



Housing typology of the forest clearing



Housing typology of the meadow at the edge of the forest

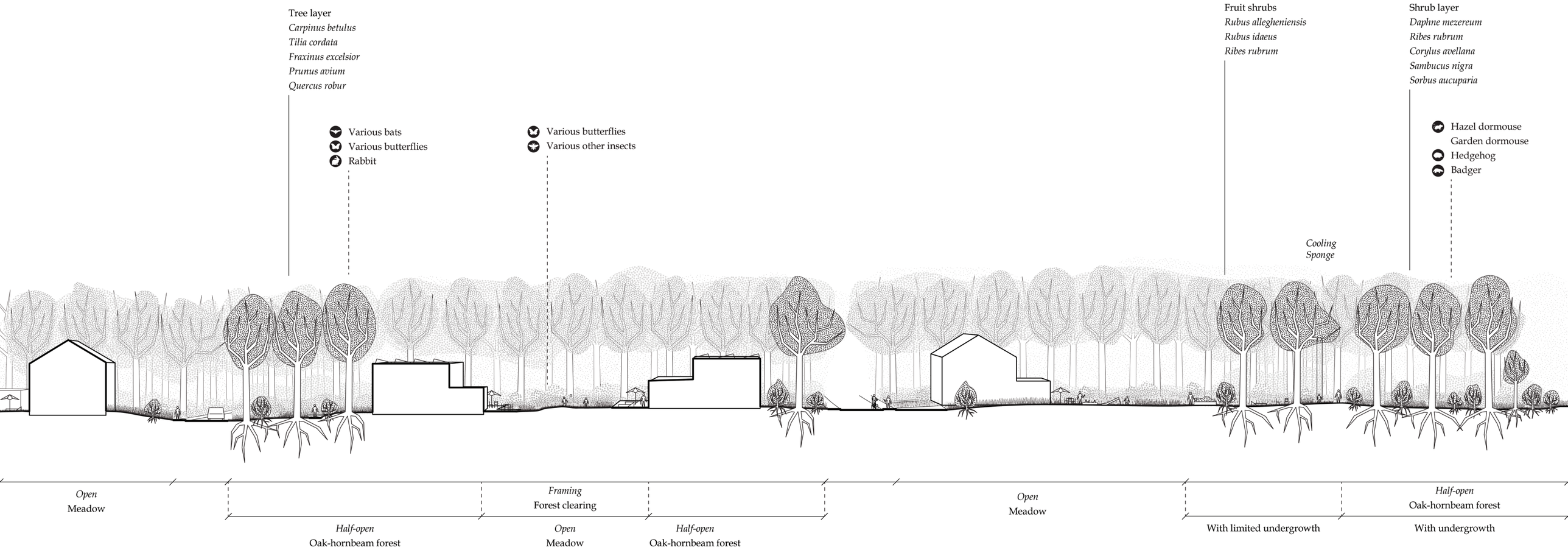
From forest housing to housing-forest

Both the condition of shrinkage, as well as the establishment of collective housing typologies open up opportunities to create new forest-housing typologies that combine and integrate the spatiality of both forest and housing in one. In the case of Amstenrade two different forest-housing typologies are implemented.

_The forest clearing combines forest and housing into a half-open to closed forest framework that sits around an open meadow in its middle. Here trees are planted close to each other to create density. Towards the middle they become smaller or turn into bushed creating a gradual transition to the meadow.

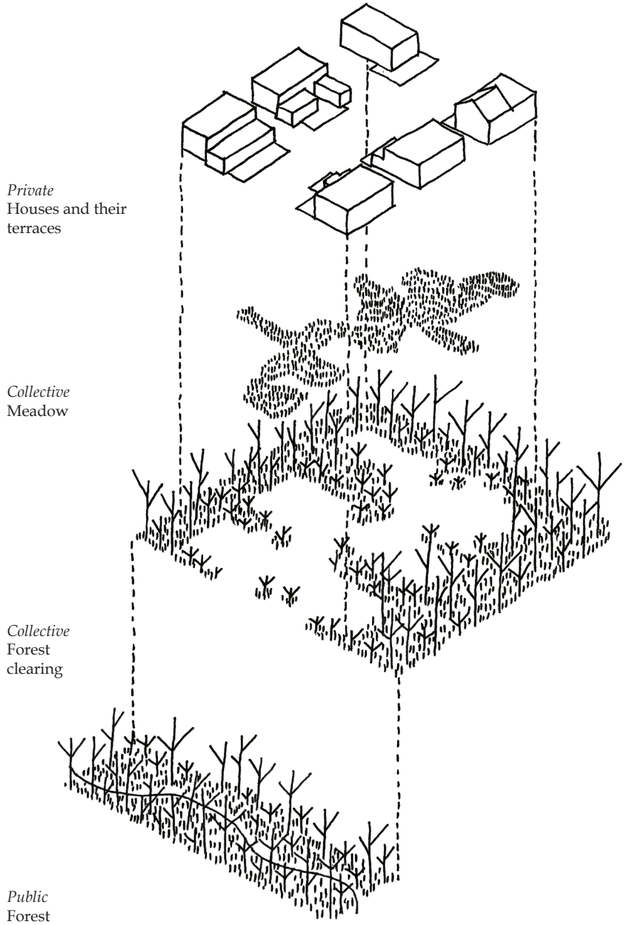
_The meadow on the other hand is an open forest typology where houses and trees are scattered on a plot, that is usually bordered by a dense forest strip to one site. On the meadow mostly single trees are planted that have more of a sculptural appearance.

These spatial difference do not only afford a varied landscape experiences, but also different uses for humans and other than humans alike.


Tree layer
Carpinus betulus
Tilia cordata
Fraxinus excelsior
Prunus avium
Quercus robur
Various bats
Various butterflies
Rabbit
Various butterflies
Various other insects
Fruit shrubs
Rubus allegheniensis
Rubus idaeus
Ribes rubrum
Shrub layer
Daphne mezereum
Ribes rubrum
Corylus avellana
Sambucus nigra
Sorbus aucuparia
Hazel dormouse
Garden dormouse
Hedgehog
Badger
Cooling Sponge
Open
Meadow
Framing
Forest clearing
Open
Meadow
Half-open
Oak-hornbeam forest
Half-open
Oak-hornbeam forest
Open
Meadow
Half-open
Oak-hornbeam forest
With limited undergrowth
With undergrowth
0 40 80m

Tree or shrub
Terrace
Forest garden
Meadow
High meadow
Undergrowth

0 2.5 5m



Private
Houses and their terraces

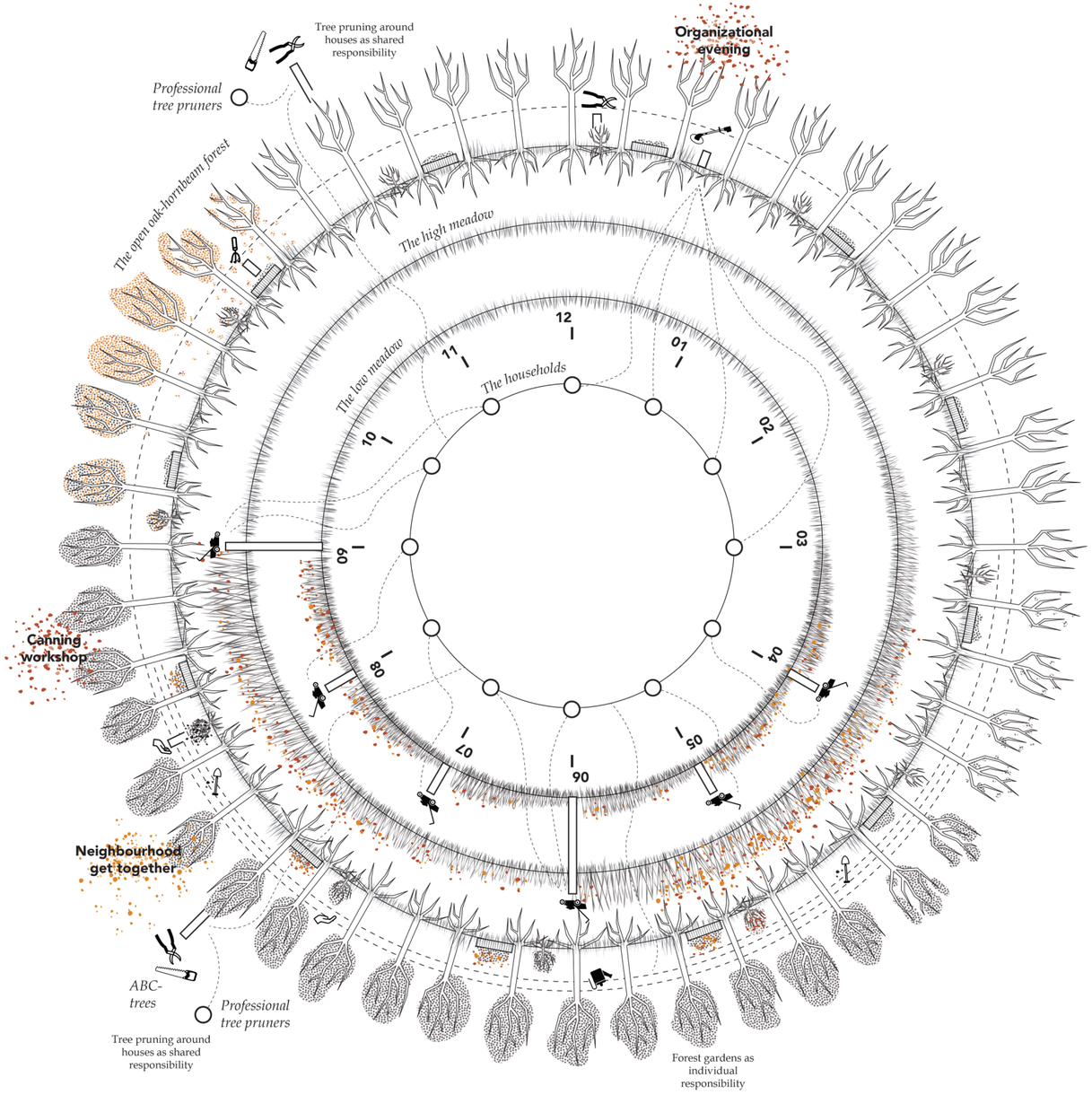
Collective
Meadow

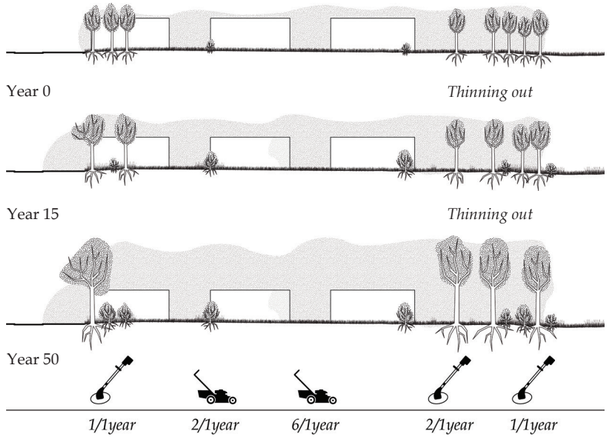
Collective
Forest clearing

Public
Forest

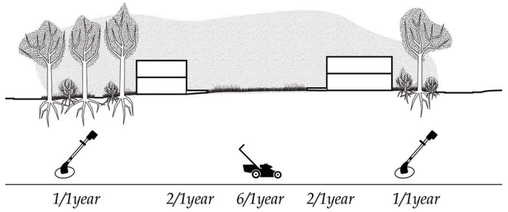
A forest to live in

The forest clearing is a collective housing block in which outdoor space (aside from the terraces), but also maintenance responsibilities, as well as certain amenities (car, larger appliances, (gardening) tools etc.) are shared. The spatial set up of dense to half-open forest frame, the gradual transition to meadow and the meadow itself (page 226) provide manifold opportunities for collective, as well as private appropriation. Along the edge of the forest frame forest gardens can be placed, while the Northern part of the forest frame is also a slow traffic connection and can be used for play (page 227), also for example trees houses etc can be placed here. The gradual transition between forest and meadow itself can be part of the forest garden (for example by planting berry shrubs here). Small coves in the planting structure can furthermore shadowy spots to relax in. The meadow can be used for play and relaxation, as well as to organize collective events. The landscape gradients also provide a habitat for insects, birds, reptiles and small mammals as well.

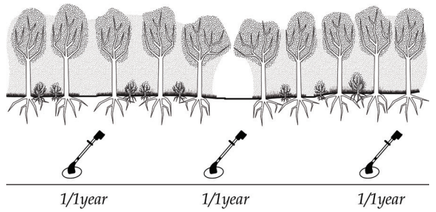




Maintenance forest clearing, forest frame and meadow

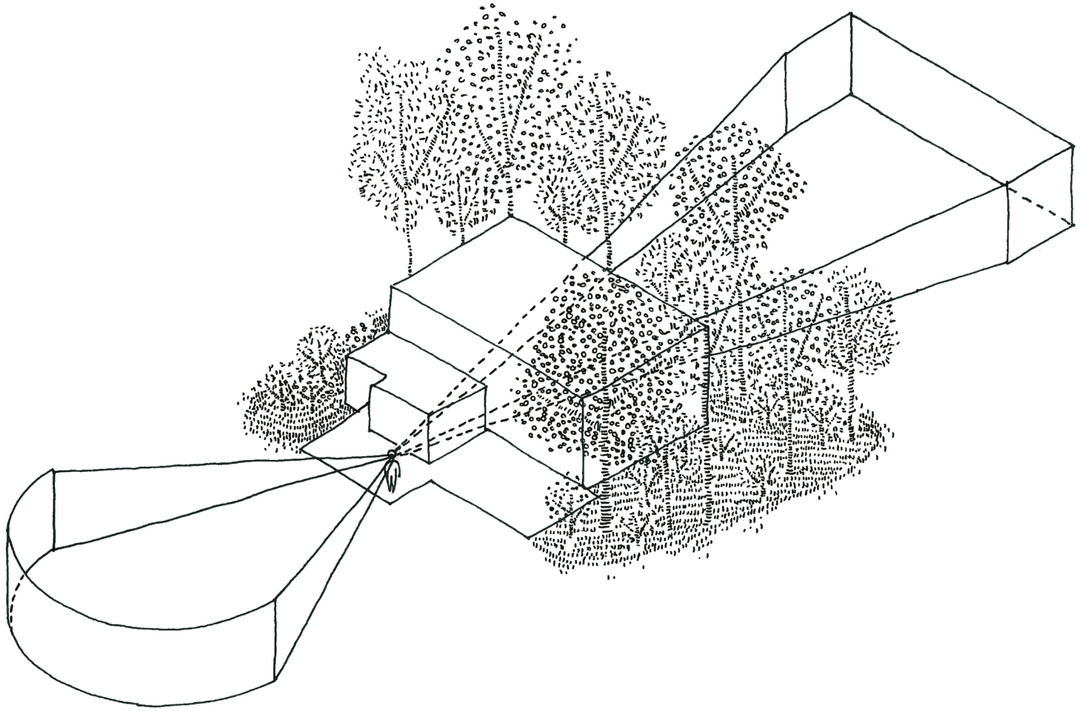


Maintenance forest clearing, forest frame and meadow



Maintenance forest and forest paths

<u>Becoming a woodlander</u>
Living in such close proximity to the forest does not only afford the use of the forest, but also requires active maintenance. In the case of the forest clearing maintenance is split between the households that form the forest clearing. This means that aside of taking care of their own forest gardens and plants (on their terraces), each household needs to do one extra task per year, as well as help with the general organization of maintenance work. Small neighbourhood events can be organized around the maintenance schedule.
The aim of the maintenance is to create a dense forest framework as quickly as possible. For this trees are progressively thinned out over the first 50 years, before maintenance work shifts to taking care of the existing forest and keeping a balance between creating space for humans and other than humans (see page 220-221). In order to make use of the forest edge for gardens etc. the trees here are spaced out more than towards the middle of the forest. The rest of the maintenance work remains constant over time.



The house becomes on with the forest being surrounded by trees on its front. Towards its back the forest decreased in height creating a gradual transition to the meadow.



On one edge of the forest the undergrowth is partly cleared. The space becomes an extension of the garden providing space for play, exploration, relaxation and gardening.

Part D | Conclusion

Between forest, Zwischenstadt and care

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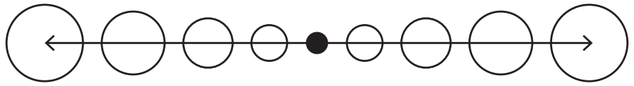
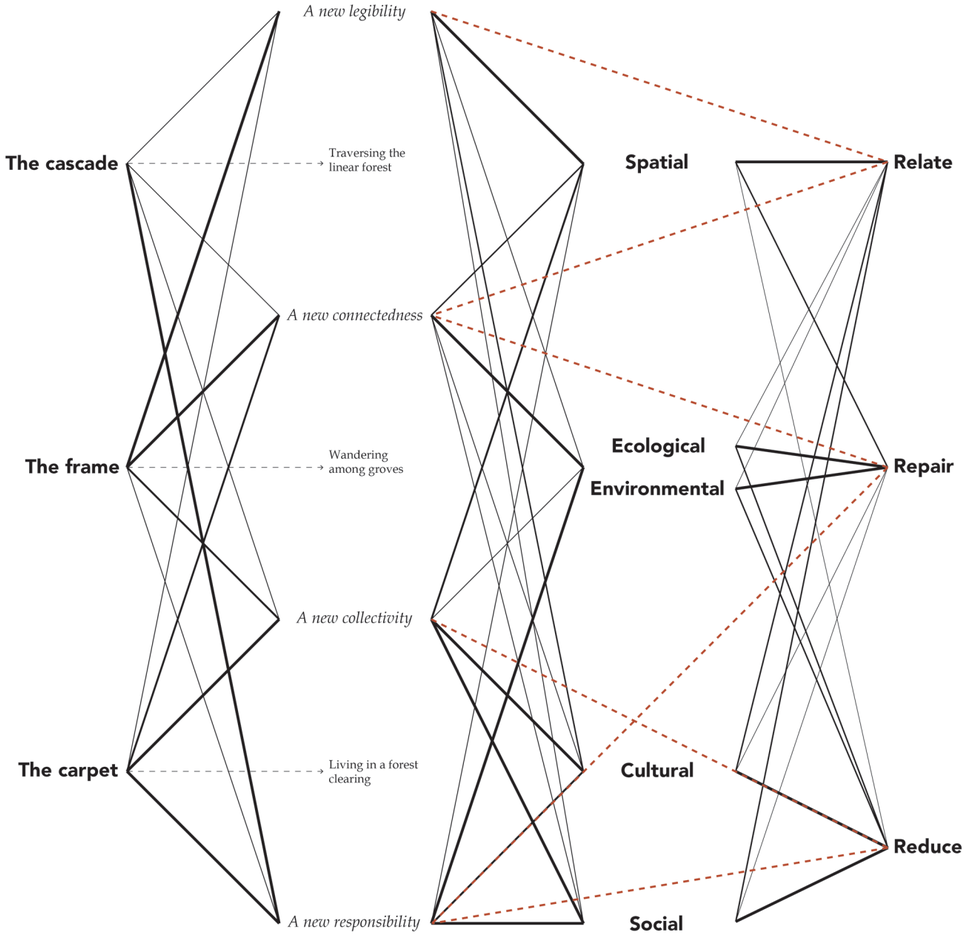




Part 10.1 | Conclusion

Looking back at the forest territory

Forestry can redefine and reimagine the Zwischentstadt by strengthening its underlying base condition of being both city and landscape. The extended forest structure introduced here does this not by articulating the interwovenness of these two phenomena, but rather their simultaneity. The territory is always forest and [residential area, industrial terrain, public space, street, field etc.], rather than forest next to [residential area, industrial terrain, public space, street, field etc.]. These hybrid forest structures revitalize the Zwischenstadt in various ways in line with caring design thinking and practice.

How can forest infrastructure aid in repairing damaged ecosystems in the Zwischenstadt? (repair)
In and of itself a varied biotope the forest provides a habitat for other than humans. This is facilitated by the planting of the forest in an extended network, as well as introduction of diverse forest typology that enhance landscape heterogeneity. Introducing forest figures in the whole territory also formalizes space demands of other than humans in areas formerly dominated by anthropogenic activities. The new forest network furthermore helps to increase environmental resilience by helping to alleviate flooding, drought, erosion, and eutrophication. As such the ecosystems of the hill landscape revitalized and revitalized. These design interventions mirror a core value of care – repair and maintenance. The forest itself embodies care as it is a habitat in and of itself, it however also cares for other entities such as soil and water.

How can forest infrastructure strengthen spatial integrity and relationships within the Zwischenstadt? (relate)
The tree forest figures introduced in Parkstad translate and formalize a reading of the territory as inherently rich in natural and spatial capital. By designing these figures as internally coherent but varied in comparison to one another readability and identity of the Zwischenstadt are strengthened. In their totality they express the continuity and simultaneity of both landscape and city at the core of the Zwischenstadt. This mirrors the condition of the Anthropocene as realm in which the distinctions between nature and culture cease to exist. The primarily anthropogenic goal of strengthening spatial expression also displays care for the landscape as it helps to holistically integrate the processes and dynamics of the landscape into the urbanscape. Due to the ubiquity of the forest structure, as well as a commitment to maintenance, the relationship between humans and “nature” is also strengthened on an interpersonal level.

How can forest infrastructure aid in making degrowth operational in the Zwischenstadt? (reduce)
Forest infrastructure can furthermore help to provide an alternative development strategy for the Zwischenstadt. By integrating forest structures into shrinking neighbourhoods vacancy can be absorbed by landscape development. Through this some of the negative spatial and social consequences of shrinkage can be mitigated. Forest structures can furthermore provide a decommercialized setting for collective and public spaces. With that an alternative liveability can be fostered that is in line with degrowth and care thinking.

How can forest infrastructure be maintained and designed in a way that honours the needs and agency of the forest? (relate, reduce, repair)
For the forest to provide the caring services detailed before, the forest itself needs to be maintained and its vitality fostered. Within the hill landscape the reintroduction of traditional maintenance techniques such as coppicing emerges as an important aspect of this care. Providing adequate space and soil conditions is furthermore crucial. While spontaneous forest development in the frame is also encourages, especially in the frame, planting the forest becomes maybe somewhat paradoxically an important aspect of honouring the agency of the forest. It ensures that rare forest biotopes, that would take decades to develop in new places, are strengthened and do not become extinct. Lastly, space is also reserved for forests, in which humans are excluded in order to give more vulnerable species development space.

What does forest infrastructure mean in the context of this project? (reflect)
The concept of landscape as a type of infrastructure that provides a plethora of services, while simultaneously moving beyond the utilitarian definition of it, is important aspect of landscape architecture (Section of Landscape Architecture, 2022). Within this project the forest mirrors this understanding of landscape infrastructure as it provides various services in line with care (social, ecological, functional), while highlighting the inherent worth of forest and the landscape at large. Inherent to this concept of landscape infrastructure is also the underlying idea of moving beyond a spatial presence of infrastructure, towards a spatial quality of infrastructure, which the landscape or the forest can provide. Within this project this spatial quality is understood as one of the most important assets of forest infrastructure. The forest as a spatial agent makes the city, just as much as humans or buildings make the city. Through the lens of care, the spatial condition of the Zwischenstadt and the specific situation of Parkstad, the forest becomes fundamental and foundational. The functions this infrastructure provide hinge not so much on its presence, as it is ubiquitous, but rather on its characteristics and qualities, as such the forest is also a multifaceted infrastructure.

Part 10.2 | Reflection

Academic Relevance

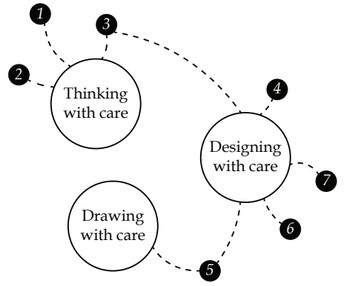
Care as a critical concept
In her essay on care and architecture Joan Tronto postulates that we need an "architecture of care": "we now need an architecture that fulfills the basic tasks of sharing responsibilities for caring for our world, an architecture that is sensitive to the values of repair, of preservation, of maintaining all forms of life and the planet itself" (2019). Not a design professional herself, her elaboration of this question remains somewhat abstract and rooted in her general definition of care (page 27-29). As care is furthermore always situational and relational, any description of care is necessarily always abstract (Tronto, 2019). While the attempt to further define care here for the discipline of landscape architecture, might seem paradoxical in light of the nature of care, it is nevertheless important to do so. It creates a base for further elaboration, discussion and reflection. However such a definition should always mirror the context in which it was undertaken. In my project the three domains of care – repairing, relating, reducing- are a reading of challenges occurring within dispersed territories of North-Western Europe.

As such designing with these three domains in mind was useful and appropriate for exploring and reimagining the Parkstad as a more caring place. They helped further sharpen my understanding of care and the Zwischenstadt. Through applying them and working with them I however also discovered new questions and challenges for caring design practice in the Zwischenstadt. Both old and new findings can be summarized in seven statements:

1. The Anthropocene challenges us to rethink the way in which care for and take care of the world we are part of. It challenges us to redefine and reflect on what a "good territory", "good city" or a "good landscape" is and how it operates.
2. Landscape (architecture) can play a leading role in establishing a caring spatial design practice, as it is uniquely equipped in thinking different domains of care (environmental, ecological, spatial, social etc) together. Accordingly, we need to reflect on how we design and for whom, which means and methods we employ.
3. For this we need to incorporate landscape holistically into our projects, cities, territories. Such an incorporation should challenge preconceived notion of landscape and city, nature and culture.
4. To translate these concepts of care into caring designs we need to broaden our landscape architectonic language.
5. On the territorial scale this becomes a question of drawing. We should develop new representation techniques that honour the flows, spaces and intricacies of a multi-species landscape, that understands landscape as horizontal yet layered.

6. On the local scale this new design language should strive to overcome fixed urban (landscape) typologies (such as building block, courtyard, garden, park etc.), as well as the divide between public and private, to create integrative and synthetic places that challenge the role of landscape in the city.
7. The concept of care, lastly, compels us to work this into a landscape architecture of maintenance not material.

In the further reflection two of these aspects – the question of the city (urbanization, urbanity and the landscape), as well as the question of representation techniques are further elaborated on. And to add a last thought, these ideas or hypothesis are thought from a landscape perspective, would be interesting what demands a caring urban design practice would formulate for landscape.



Seven statements connected to the domains of thinking, designing and drawing with care

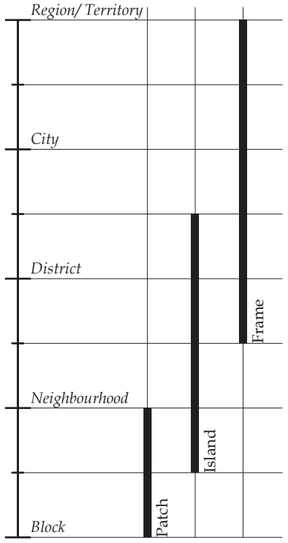
On urbanization and urbanity
A central question of this research is that of urbanization and urbanity. This question unfolds along two axis: urbanity and the Zwischenstadt, and urbanity and care or forestry.

While Parkstad is clearly an urbanized territory, is it also an urban one? And if so, what is the nature of its urbanity? In light of shrinking cities Julia Czerniak introduced the term formerly urban (Desimini, 2014) and while Parkstad and other dispersed territories are shrinking, the situation at hand does not warrant a complete rejection of the urban label. At the same time, the territory is also not suburban, nor classically urban. On one hand it does not depend on another territory for basic and even special functions, which would make it suburban. On the other hand of the spectrum it is also clearly not metropolitan and defies definitions of urbanity that hinge on high levels of density and diversity. An important finding of the project was the inability to create a coherent within the urbanized patches of Parkstad, which would have also defied the key claim of radical acceptance of the Zwischenstadt as brought forth by Sieverts (2000). This project rather concluded that the heterogeneity of the urbanized patches should be intensified to create a more diverse and liveable city. This suggests a diffuse or horizontal urbanity in line with the concept of the horizontal metropolis by Viganò (2018). The character of its urbanity is thus tied up with the character of its landscape.

This is something that the project tried to foster and utilize in the name of care. While made explicit to varying degrees in the project a form of forest urbanity emerged that hinged on the forest to create a more diverse territory (diversity through landscape, not density). The forest was used to create a greater diversity of public space and housing typology for example, integrating the forest into the (economic) metabolism, as well as the cultural agenda of the city was furthermore hinted at, would however need more elaboration. The same goes for exploring other aspects of forest urbanity, that lay outside the scope of this project. It lastly has to be noted that this cannot be used to create a different type of metropolitan urbanity, but will always be more moderate or horizontal in nature.

On scale, focal point and map

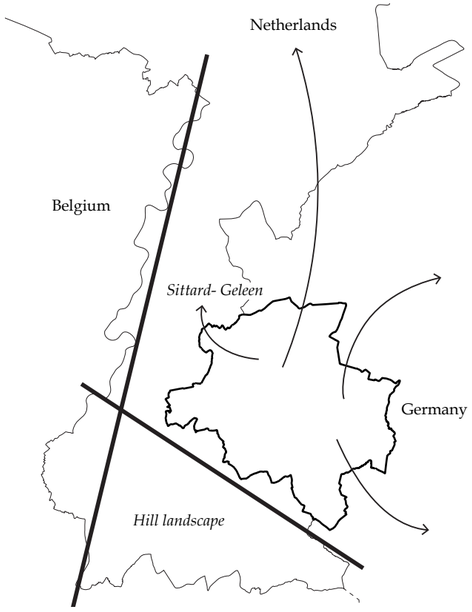
Working in the Zwischenstadt Parkstad not only requires a different way of thinking about the territory, but also another scale, focal points and tools. The Zwischenstadt operates on a different scale than the traditional monocentric city. The conventional scales of neighbourhood and district loose importance, while the scale and move towards intercity scales and landscape spaces. At the same time similar spatial phenomena occur on differing scale levels. In Parkstad the size of urbanized patches and the landscape fragments that surround them vary considerably. This importance of the intercity scale also marks a new focal point of the Zwischenstadt. The traditional towns no longer are the centre of gravity of the city, spatial capital is rather found in areas formerly considered peripheral. The city turns inside out.Through thinking with care the forest becomes a structural and foundational entity both in these landscape spaces, as well as the urbanized patches. While other than humans call for a holistic inclusion in designing. This requires new tools to present both landscape and urbanscape. In this project an attempt was made to draw a vertical map that layers habitat, occupation and network (in the tradition of the Dutch layer approach), while rewriting the map legend by introducing four overarching legend categories (staying, moving, making, visiting), which are meant to give other than humans a place next to human occupation. In order however to create a truly integrative and synthetic more experiments on drawing or better representation are needed. It became increasingly clear throughout the process that the boundaries of a "traditional", yet readable landscape architectonic map are reached and new ways of representation are needed. It is however unclear to me what these could look like, this topic is thus in need of further thought and elaboration.



Scales of the Zwischenstadt Parkstad

Beyond borders

The dispersed territory is a ubiquitous phenomenon, as such the replicability of this approach becomes an important question. While spatial ambiguity and readability are question that are generally important in this type of urbanization, their context varies considerably. In light of the Anthropocene however a landscape or forest-based approach to these urbanized territories is in general vital for their environmental and ecological future, the specific implementation however would need to be researched further. Drawing a first conclusion on the neighbouring dispersed territories of Parkstad there is considerable difference between Germany, Belgium and the Netherlands. The specific spatial history of Belgium and the Nevelstad would warrant a different approach compared to Parkstad, while the spatial set up in German dispersed territories, especially those in the Ruhr area, is more akin to Parkstad. After all the term Zwischenstadt emerged in the context of IBA Emscher Park in the 1990s (Sieverts, 2000). With the Randstad, termed Tapijtmetropool by Jan Neutelings, the Netherlands has a dispersed territory that is metropolitan in nature (de Klerk & van der Wouden, 2021). Here the interconnected green infrastructure quite literally at the heart of the territory ("groene hart") is an important asset and point of contention in the planning discourse. But due to the metropolitan character of the surrounding cities use and meaning of this infrastructure is very different from that proposed in Parkstad. In the Dutch periphery, and especially were cities are shrinking or stagnating, a similar approach could be interesting.



Scales of the Zwischenstadt Parkstad

About growth and decay
This project welcomes the idea of a shrinkage as an environmental, ecological, but also possible spatial value that can open up development possibilities within the current boundaries of the urbanized patches. This marks a turning point in the understanding of the shrinking city (Desimini, 2014), it is however also a stark simplification, that does not consider many facets of this issue. While the design and spread of collective and public infrastructure is meant to withstand the shrinking condition, it is unclear if these new structures can be financed. Looking beyond money it is also unclear if such a comprehensive maintenance programme, especially in line with cultural landscape elements, is realistic, or if it is not better to design a landscape space more reliant on spontaneous development of vegetation and the concept of rewilding.
Furthermore, this project does not consider the possibility of Parkstad growing substantially over the next decades. An increase in immigration in the last years, has already meant that predicted population development in Parkstad now veers more on the side of stagnation or light growth especially in the central municipalities (PBL&CBS, 2022). A few years these predictions were still more negative. While increased shrinkage is expected after 2035, considering an increase in (climate) refugees (Sieverts, 2018) it is questionable if this will actually happen. A growing population would create a support structure for the collective and public spaces, as well as the maintenance scheme envisioned here, it would however also need a revision of planning concerned with residential development. Fostering the forest character in in light of a growing population would necessitate an emphasis on sharing commodities and private space. In line with an ethics of care, that puts emphasis on reduction of anthropogenic pressures, European standards for private space as they still persist today, especially in peripheral regions, would need to change. However if the region were to shrink further, the forest could take up more and more of the territory, continuing to provide an alternative for growth centric development of Zwischenstadt. In that case the territory would lose its urban character and grow to become "formerly urban" (Desimini, 2014).

Alle Häuser sind schon schön, hört auf zu bauen.

Student protest at TU Berlin in 1967
(Diehl, 2006)

Societal and moral relevance

So, how should we live together?
In this project the implementation of the extended forest or landscape structure hinges on an explicit view on community, collectivity and responsibility influenced by the Anthropocene and the concept of care. A revitalized relationship between landscape and urbanscape affords the human communities a number of benefits in light of societal challenges (shrinkage, public space etc.), but also demands a number of concession from them that reconfigure private and public space and functions. The intent of redesigning the forest furthermore implicitly places the needs of the planet above the needs of people. Although the project highlights how this is also to their benefit, it is very uncertain, even unlikely, that the local community right now would accept such changes, especially within their private realm (giving up space on their property for forest development, loss of parking infrastructure, need to share commodities etc.). The modernist movement in architecture and spatial design generally (de Klerk & van der Wouden, 2021), but also for example the specific history of the mining villages in Parkstad (Hermans, 2022), have furthermore shown the limitations, but also moral issues associated with attempts at social engineering. The Anthropocene however will have far-reaching implementations for our planetary inhabitation if we want to or not. The strong conviction that we need to substantially and sustainably change "our ways" to create the possibility of continued inhabitation of this planet is after all at the core of this project. To address both sides of this issue, strategies exist that place emphasis on providing alternatives rather than forbidding behaviour. In line of this the project suggests a careful design of gradients of collectivity, which is however not worked out completely.

The ambiguous forest
In favour of a more speculative and conceptual approach to the whole territory, various important societal design questions were furthermore left out of this project. The forest, as already mentioned in the introduction, is an ambiguous space, that also elicits images of fear or lawlessness in our cultural imagination. It is thus important to consider questions of safety when designing dense forest spaces in urban environments. Other critical points, that could invite further research, are concerns such as reachability or walkability, as well as the question of equity and green gentrification. The contrast between advantaged and disadvantaged neighbourhoods is after all especially stark in Parkstad and forest infrastructure could potentially worsen this problem.

Reflection on methodology and design

Care and the Zwischenstadt as a forestry project
The theme of my graduation lab "urban forestry – forest urbanism", as well as the overall goal of graduation studio "flowscapes" are incorporated into my project. Trees are considered the principle building blocks of the human-nature and city-landscape relationship and as agents of change in the life of humans and non-humans alike. Through them I attempt to build an integrative and multifunctional *landscape infrastructure*, which on one hand mirrors the central design brief for the landscape architecture graduation, but also tries to critically reflect on implicit notions of said infrastructure (economic viability, human utility etc.)

I further incorporate and reflect on my previous and current education by incorporating central themes of landscape architecture into the design projections. The aspect of *process* becomes important in the call to care for the forest and with that the proposed maintenance strategies. *Perception* is a central concern of the new forest territory. Designing a varied forest experience is important both on the territorial and local scale. The understanding of the landscape as a *palimpsest* guided the spatial analysis of the Relate section, leading to the instigation of the three forest figures. Lastly *scale continuum* is elaborated both in the design and research phase.

The difficulty of choosing and the design of a territorial project
The central challenge of this project was the large breadth of research and analysis, but also design implementation. This was on one hand brought to the forefront by my own varied interest and desire "to do everything". It was however also unavoidable to a certain extent. On recommendation of my first mentor this project was set up as a territorial vision meant to connect and mediate between landscape and urbanscape. With such a project set up a very limited research focus would have been insufficient. However, looking back at the project the research focussed could have been narrowed down. While my discussion of care in the theoretical framework, helped me to clarify me to position myself as a designer also beyond this graduation, a theoretical approach focused around literature related to the Zwischenstadt or a caring approach centred around the notion of relating would have been sufficient and most likely led to a very similar design. Generally I believe my approach worked, it would have however also worked, if it was less complicated. Accordingly, an important aspect of this project was developing a clear storyline to break down the complexity I built up. The introduction of the three forest figures emerges as the most important aspect of this ordering of my design and research. It gives the project a concise structure, while opening up manifold possibilities for further development and elaboration.
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My workspace with drawings and books in background

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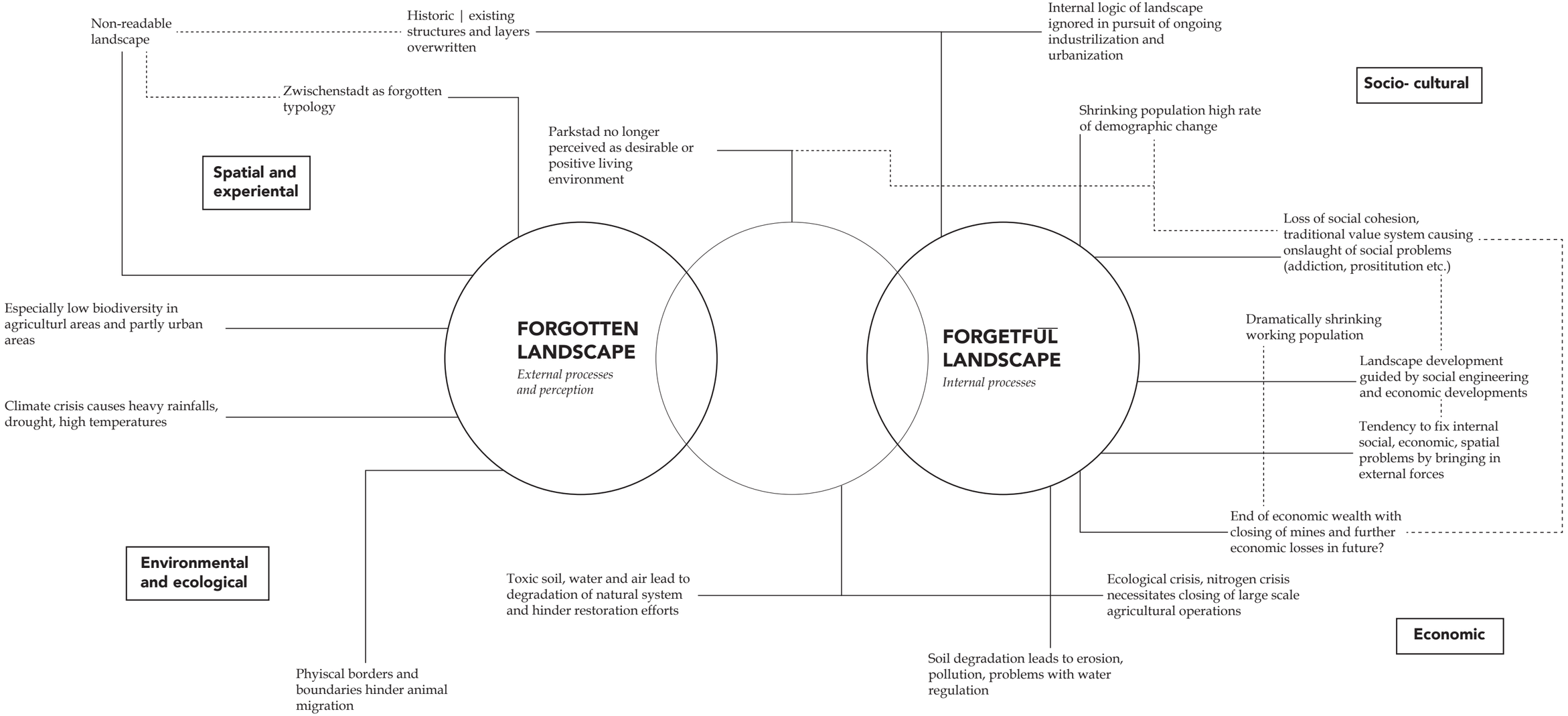

Non-readable landscape
Historic | existing structures and layers overwritten
Internal logic of landscape ignored in pursuit of ongoing industrilization and urbanization
Socio- cultural
Zwischenstadt as forgotten typology
Shrinking population high rate of demographic change
Spatial and experiental
Parkstad no longer perceived as desirable or positive living environment
Loss of social cohesion, traditional value system causing onslaught of social problems (addiction, prosititution etc.)
Especially low biodiversity in agriculturl areas and partly urban areas
FORGOTTEN LANDSCAPE
External processes and perception
FORGETFUL LANDSCAPE
Internal processes
Dramatically shrinking working population
Landscape development guided by social engineering and economic developments
Climate crisis causes heavy rainfalls, drought, high temperatures
Tendency to fix internal social, economic, spatial problems by bringing in external forces
End of economic wealth with closing of mines and further economic losses in future?
Environmental and ecological
Toxic soil, water and air lead to degradation of natural system and hinder restoration efforts
Ecological crisis, nitrogen crisis necessitates closing of large scale agricultural operations
Economic
Phyiscal borders and boundaries hinder animal migration
Soil degradation leads to erosion, pollution, problems with water regulation



Landscape typologies

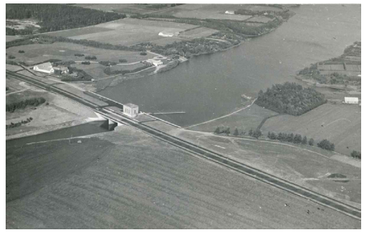
1. Forest
2. Pasture
3. Lake



Function buildings

1. Industry
2. Forest villages
3. Fort villages
4. Retirement home
5. Allotment garden

Location:	Holstebro, Denmark
Year:	1996 onwards
Designer:	Roland Gustavsson and Carl Aage Rasmussen
Size:	160 hectares
Function:	Residential, Scientific Recreational, Ecological





Historical Aerial view Holsterbro (Lokalhistorisk arkiv, n.d.)



Holsterbro in its surroudings (Google Earth edited by author)



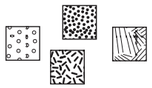
Indication boundary forest neighbourhood Sletten (Google Earth edited by author)

<u>Forest neighbourhood Sletten</u>

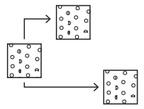
The urban forest of Sletten with its accompanying housing development was established in 1996 as part of a landscape laboratory initiated by the Swedish University of Agricultural Sciences, which started the project in 1990 (Boris, 2012). The aim was to create a 1:1 testing ground for new urban forestry concepts. For this the forest was established in three phases, each with their own forest structure and management. Sletten consists of eight forest villages placed in a dense forest structure and so called fort villages and a retirement home placed in the open pasture landscape. Around the forest villages there is collective zone, in which the inhabitants take care of the forest themselves, while using it as an extension of their garden. Prior to the conception of the urban forest the site was most likely dominated by agricultural fields and small forested elements.



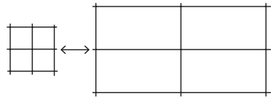
First phase: Habitat model
Subdivision in 36 smaller plots each with its own forest composition selected from sixty total species.



Second phase: Seed-spreading model
Three types of basic woodland: oak, birch and pine. Arrangement of different seed-spreading bases (nine tree and nine bush species) will over time spread into the surrounding woodland creating new self-organized forest stands in the process.



Third phase: Gradient model
Selected species are planted in varying grid formations from 1,25x12,5m to 2,5x5m creating a large spatial variety

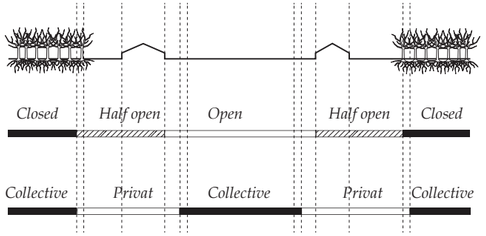






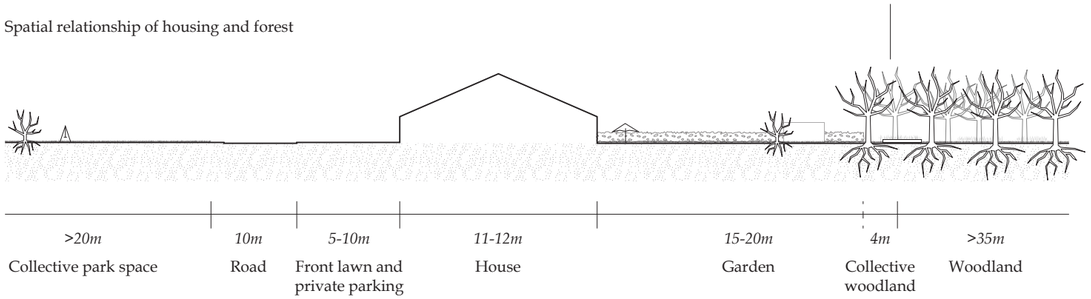
Self-organized forest gardens in Sletten (Boris, 2012)

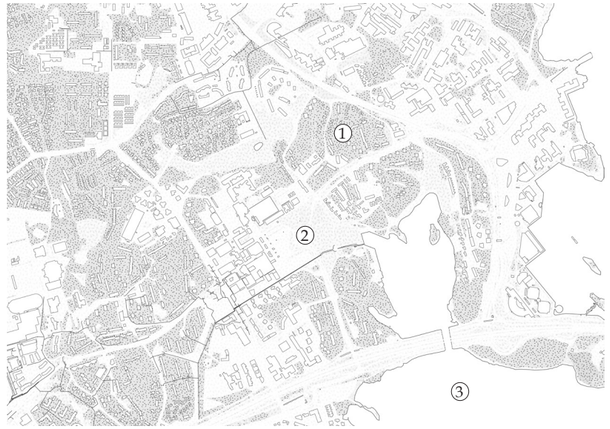
Sletten is an interesting case study for three different reasons. Firstly, the different planting phases techniques (left page) of the forest provide new perspectives on the management and the establishment of the urban forest. Secondly, it is an example of a successful integration of housing and forestry and demonstrates how a spatial layout of such an integration could look like (bottom of page). Lastly, Sletten is exemplary for its collective use of the woodland. On the boundary between garden and woodland, in the so called collective zone, inhabitants can use the woodland as they see fit (with certain rules in place). Out of this a variety of self-organized woodland gardens emerged and are still emerging over time. The forest on one hand is "plastic" enough to afford these activities, while also "robust" enough to create a common identity (Boris, 2012).



Spatial relationship of housing and forest

Official zone in which appropriation of woodland is allowed, gardens however often extend beyond these limitations and the forest is furthermore used for other activities (play, garthering etc.)





Landscape typologies

1. Forest and forested areas
2. Leimuniitty park
3. Baltic Sea



Function neighbourhoods

1. Centre Tapiola
2. Commercial
3. Residential

Location:	Tapiola, Finland
Year:	1945 onwards
Designer:	Otto-Iivari Meurman and Asuntosäätiö foundation (among others)
Size:	210 hectares
Function:	Residential area for 30.000 inhabitants



Pihlajamäki forest town, a successor of Tapiola Garden City (Hautamäki, 2021)



Pihlajamäki in its surroudings in the suburbs of Helsinki (Google Earth edited by author)



Tapiola in the suburbs of Helsinki (Google Earth edited by author)

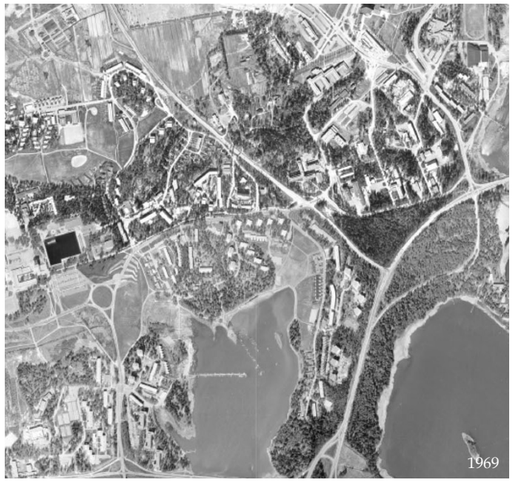


Indication boundary Garden City Tapiola (Google Earth edited by author)

Garden City Tapiola

The late functionalist neighbourhood Tapiola located in the suburbs of Finland's capital Helsinki is an important example of Finish post-war urban planning (Hautamäki, 2021). With its first plants drawn up in 1945 it forms the starting point for the forest suburb era in Finland (Hautamäki & Donner, 2021). While the forest towns reproduce landscape in a more natural state, the planting incorporated in Tapiola is structured and formal. It is based on two Garden city principles: an open, modernist block structure and close proximity to nature. The urban planning strategy however has also particular Finish roots. According to Hautamäki and Donner Tapiola "encapsulated the self-image of post-war Finland. (…) Out of the forest grows a modern society that recognizes its roots in the realm of the king of the forest [Tapio]" (2021). The belief was that the spacious forested surroundings were detrimental for individual and societal well-being and morality.





Historical Aerial view Tapiola before (1950) and after first constructions (1969) (Hautamäki & Donner, 2021)

Garden and landscape architects played an important role in the planning of Tapiola. For the first time they were alongside urban planners and engineers. The design starting point for the landscape design of Tapiola was to preserve the currently existing landscape – forested hills and steep slopes for example were left in their original condition, while meadows were transformed into open parks. The most famous was Leimuniitty, which created a strong contrast with the surrounding landscape due to its distinct shape and colourful modernist planting arrangements.



Leimuniitty park landscape (Hautamäki, 2021)

The forest formerly known as