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Urban Nature: Green Spaces for Human- & Non-Human Benefits

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& Non-Human Benefits

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0.1 Preface

Ever since I was a kid, I have been incredibly connected to nature. Growing up at the edge of the forest, I spent many days and hours wandering amid bushes, trees, and streams, playing, fishing, and tasting the wonders of nature. I wanted to stay in nature as much as possible, understanding nothing more than the good feelings it gave me.

As I got older, the city started to fascinate me more and more. The different building types, smells, noises, and many different spaces can be found within a few quarters of the city; Good areas that intrigue me to walk and explore, and areas that are less compelling, places where people rarely go. For me, few things are better than a day of urban safari.

Now that I am finishing the last semester of my landscape architecture studies, I have learned a lot about nature and cities. How important both are to humans, how humans depend on nature, and how nature and the livability of urban housing areas are threatened in our rapidly changing society. So, when I chose my thesis topic, it was natural to write about a topic that encompassed both nature and the urban.

My primary motivation for becoming a landscape architect is to bring nature to people. To give people access to explore nature in their everyday lives, to give them motivation and the possibility to walk or bike in their neighborhoods and on their commutes. To have the opportunity to experience a few of nature's wonders every day. In essence, to feel the same curiosity I did as a kid. So, in that sense, the experience of writing this thesis has been meaningful, (a bit) overwhelming, and rewarding.

I want to thank my parents for giving me the preconditions to growing up in contact with nature and my friends and study partners who give me both support and their perspectives. Moreover, my teachers that in various ways, have allowed me to learn about the world curiously. A special thanks to my supervisors, Kerstin and Agustin, for giving me good advice and direction and for letting me work in my way. I appreciate all of you.

0.2 Abstract

Even before the rise of environmental concerns, people have been fascinated by nature. The wilderness has wildly been romanticized as a place of inherent value. In the meantime, our urban centers have kept growing and sprawling into surrounding landscapes at the expense of natural areas and resources, depleting the earth's systems. With the current (frightening) trends in climate change, affecting biodiversity, and rising extreme weather events, there is now time for urgent change in the way we view and use nature.

Urban Nature is a term that encompasses both ends of the nature-culture duality. The urban and nature. It is nature that we surround ourselves with in our everyday lives. Urban Nature, at its best, is abundant, close to our homes, and offers recreational values and resilience to extreme weather. With urbanization and its rapid growth, urban landscapes get fragmented, effectively threatening local biodiversity and making urban nature areas less accessible and scarcer.

The Objective of the thesis is to explore the topic of urban nature and how urban nature quality can be promoted through landscape design, also in the context of urbanization in Oslo's most extensive transformation area, Hovinbyen.

The thesis investigates a neighborhood at the edge of Hovinbyen, Etterstadsletta, as an area to rethink with the framework of creating a more vital link between urban neighborhood and nature, promoting urban nature focusing on the species hedgehog (*Erinaceus europaeus*) and red squirrels (*Sciurus vulgaris*) as well as us humans, *Homo sapiens*.

By acknowledging that landscapes are heavily affected by culture, we also admit that humans have the means to change landscapes for the better. What is allowed to thrive and what is not is a decision often deliberately or accidentally made by humans.

The proposed design is not natural, but it is designed with lessons learned from nature, inspired by nature, to give people a feeling of nature and its valuable benefits. The design opens for instances of non-design, with areas that allow for spontaneous vegetation to settle and that will not necessarily get managed other than by interactions with human and non-human movement and activities. This can hopefully partake in creating an ecosystem unique to the place, allowing for humans and other local species to cohabit in the neighborhood.

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*“It’s time to
rethink
wilderness.”*

Cronon, 1996

1. Introduction

“The time has come to rethink wilderness.”

With this urgent phrase, environmental historian William Cronon introduced his essay, *The Trouble with Wilderness: Or, Getting Back to the Wrong Nature*, in 1996. The essay discusses and critiques humans’ dualistic views on nature and wilderness. Critiquing humanity’s history of romanticizing the “serene” and seemingly untouched nature far from human settlements, meanwhile “overlooking” the value of the surroundings of our everyday lives.

“For many..., wilderness stands as the last remaining place where civilization, that all too human disease, has not fully infected the earth. It is an island in the polluted sea in urban-industrial modernity, the one place we can turn for escape from our too-muchness. Seen in this way, wilderness presents itself as the best antidote to our human selves, a refuge we must somehow recover if we hope to save the planet. As Henry David Thoreau once famously declared, “In Wilderness is the preservation of the World.”

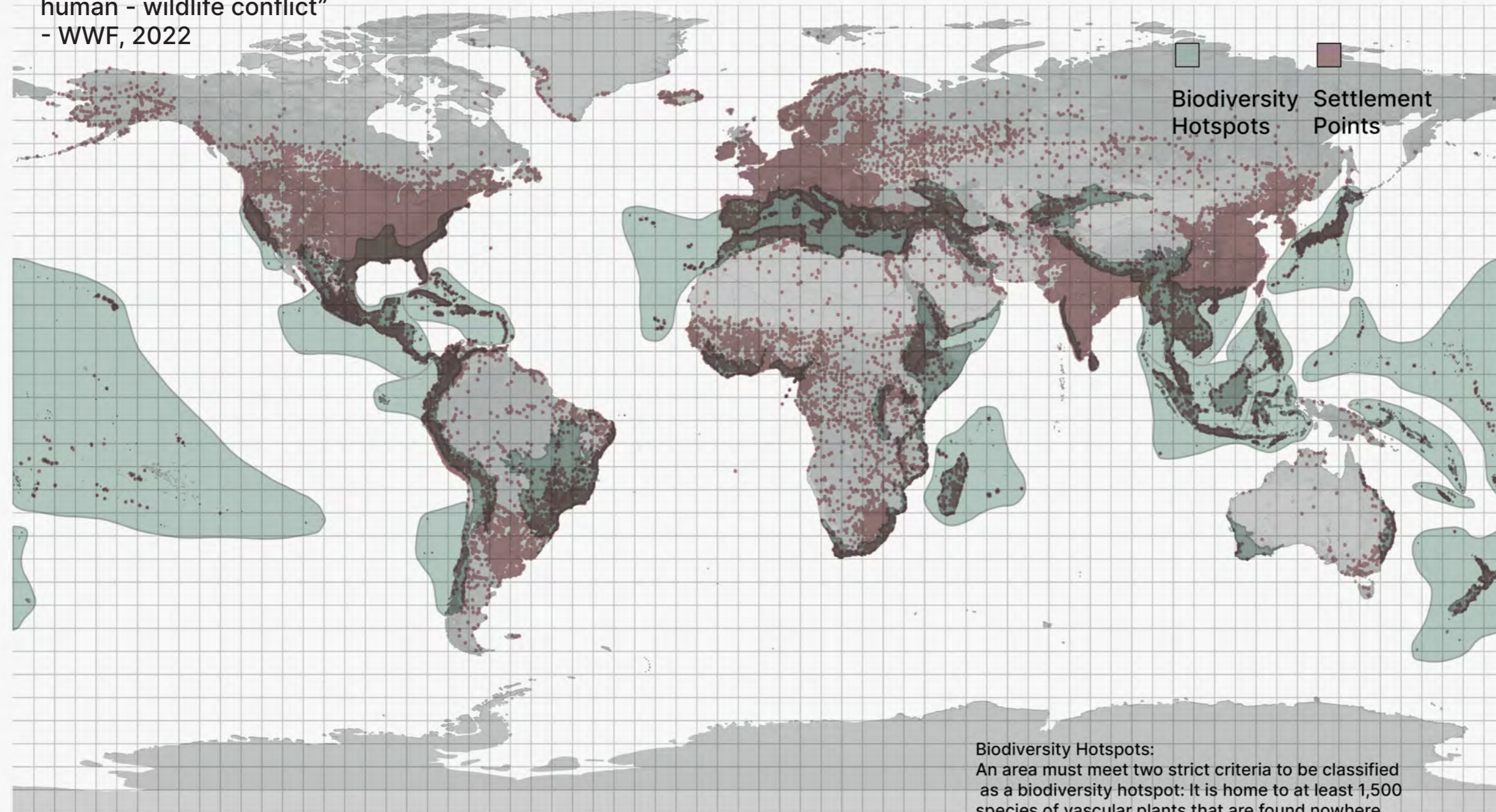
– Cronon, 1996.

1.1 Human Habitats & Its Challenges

Humans prefer to live comfortably. We settle close to water, sheltered from the heaviest weather, and close to fertile grounds. These are habitat preferences we share with many species, which inevitably leads to direct areal-use conflicts. Thus, urbanization, and the land-use changes it requires, are some of the biggest threats to nature and biodiversity (IPBES, 2019). According to published UN DESA statistics, cities will house 66 percent of the world’s population in 2050 (2019). This growth requires the development of new homes and infrastructure and puts multiple pressures on our cities.

Urban sprawl is one of these. A group of academics working for the UN International Resource Panel (IRP) assessed the resource requirements for this future urbanization in a recent report called *The Weight of Cities*. The prevalent trend is one of de-densification (IRP, 2018). The expansion of cities by 2 % every year results in greater reliance on cars and highways, subjecting cities to high consumption of fossil fuels and other natural resources (IRP, 2018; Hajer et al., 2020). This exploitation of land and resources results in land degradation, defined as deterioration or loss of soil productive capacity for present and future use (GEF, 2021). It is a global challenge that affects humans through food insecurity, rising food costs, climate change, environmental dangers, and the loss of biodiversity and ecosystem services (GEF, 2021).

"As human populations and demand for space continue to grow, people and wildlife are increasingly interacting and competing for resources, which can lead to increased human - wildlife conflict"
- WWF, 2022



Biodiversity Hotspots:
An area must meet two strict criteria to be classified as a biodiversity hotspot: It is home to at least 1,500 species of vascular plants that are found nowhere else on the planet (known as "endemic" species). Have lost at least 70% of their primary native vegetation.

Fig. 1 The map of Urban Biodiversity Hotspots and Urban Settlements across the Globe shows the conflicts between Non-human Habitat and Human Settlement.

Urban (Biodiversity) Hotspots

1.2 Climate Anxiety & Our Anthropocentric Selves

Since the last decades of the 20th century, researchers worldwide have exponentially started to recognize humans' impacts on the planet. The Anthropocene, meaning The Epoch of (Hu)man, is the name suggested for the geological epoch we find ourselves in at the time (Jordheim, 2021). A period affected by phenomena, such as an order of magnitude increase in erosion and sediment transport caused by urbanization and agriculture; noticeable and sudden human-caused fluctuations of primal cycles such as carbon, nitrogen, phosphorus, and various metals, as well as new chemical compounds; and environmental changes caused by these instabilities, such as global warming, sea-level rise, ocean acidification, and the spread of oceanic "dead zones." (Jordheim, 2021). These consequences signify that our actions come at a price.

"Growth is very important in our society, but we are depending on our planet. And that is something often forgotten. Earth's systems are not ever-growing."
– Jana Sillman, 2021

The pandemic lockdown reminded us of what cities could look like with fewer human disturbances (fig. 2). With human inhabitants staying inside, photos of animal life re-emerging into our cities were posted in media worldwide. David Attenborough - documentary "The Year the Earth Changed" (2021) is among the popular media productions expressing environmental concern published in the last years. The documentary visualizes how even minor changes in human behavior – such as reducing cruise ship traffic, closing beaches a few days a year, and identifying more harmonious ways for humans and wildlife to coexist – can significantly impact nature (Beard, 2021).

Lastly, the 2021 Netflix release of "Don't Look Up" pictures the feeling many climate scientists share, knowing which urgent situation humanity is in, while challenges is met with minor government reactions and eventually proposals of technological "salvations."

Fig. 2. Goats reclaiming the streets of Sheffield during the covid-19 lockdown, March 2020. (Photo: Andrew Stuart)

This sentiment mirrors the overwhelming and scary feeling of the problems we face (fig.3), generally referred to as climate anxiety. A recent study done by researchers from the University of Bath, Hickman, et al., on 10 000 young people (16 – 25 years), in twelve countries, shows that climate change was a source of concern for the respondents (2021). 59 % of the respondents were apprehensive, and 84

% were moderately worried. More than half of those polled felt unhappy, anxious, furious, powerless, helpless, and guilty. Over 45 % stated their feelings about climate change hurt their everyday lives and functioning, and many reported having many negative thoughts about it. Lastly, respondents viewed the government's approach to climate change poorly and felt more betrayed than reassured (Hickman



et al., 2021). The researchers interpreted from the results that climate change and insufficient government responses - are linked to climate anxiety and suffering of many children and young people worldwide. Moreover, these psychological pressures endanger health and well-being in a way that may be considered morally reprehensible and unjust. The results are furthermore, increasing the need for both research and government response (Hickman et al., 2021).

When facing overwhelming pressure, technology development often represents the solutions we turn to for hope. Actively changing the atmosphere's chemistry, Geo-Engineering has by some been called a solution to our climate problem. Such solutions are embedded in the idea that humans can control the environment. This way, industrial capitalism continues to stop "natural threats" to satisfy our need for growth (Sillman, 2021).

Critique from distinguished professor Donna Haraway points out that these natural relationships are too irregular and unpredictable for us to control (Nightingale,

2021). We have a history of viewing nature as a threat to our built environment. Many of the challenges which have been and are known as "natural disasters" or "extreme natural events" are, however, getting increasingly known as "urban problems" since we now begin to recognize how human activity disturbs natural systems. The effects of these events are a challenge to nature, and built environments, not because of nature itself, but mainly because of land use-change and other human interventions (ADB, 2016, p. 8).

Considering this knowledge of how human society depends on our earth systems, nature is worthy and essential to preserve. Nevertheless, how do we keep nature when society suggests that urbanity and nature are separate poles? When simultaneously our need for steadily more space and recourses pressures our cities denser and bigger. How can we create sustainable and well-functioning urban environments that the future requires?

Fig. 3. Collage of News Articles about the Climate Crisis. The urgency and hopelessness presented in such articles can feel overwhelming for many.



1.3 ...Getting Back to the Wrong Nature

Cronon argues for a shift in our perspective on nature. He points out that the wilderness dualism tends to portray any use of nature as abuse and thereby dismiss us a middle ground where responsible use and non-use could achieve some balanced, sustainable relationship. He believed that only by exploring the middle ground will we imagine a better world for all of us: humans and non-humans, rich and poor, all genders; first World inhabitants as Third World inhabitants, white people and people of color, "consumers and producers – a world better for humanity in all of its diversity," as well as for the rest of Nature (Cronon, 1996).

"The middle ground is where we live. It is where we – all of us, in our different places and ways – make our homes."

- Cronon, 1996

1.4 Urban Nature

Urban Nature is a term that encompasses both ends of the nature-culture duality. It describes urban surroundings that are home to plants and non-human creatures. Urban Nature includes official recreational spaces, like public parks, and informal green areas such as green streetscapes, forest patches, nature zones, roof gardens, and community gardens (World Urban Parks, 2021). It describes the everyday nature urban inhabitants are surrounded with.

The way we traditionally view cities, they frequently feel like "urban islands"; that operate independently of natural ecosystems and landscapes. However, essential links between the health and resilience of our urban landscapes and the health and resilience of the greater surrounding environment are found (McDonald et al, 2020; Grimm et al., 2008.). In this sense, nature may not only redefine and shape our cities today, but it can also help to define our cities and the planet's future (World Urban Parks, 2021).

Biophilic Cities, a book from 2011 written by Timothy Beatley, elaborates on the potential of human cohabitation with nature.

In this book, wildness in cities is not the same as wilderness as traditionally defined in environmental circles. Wildness, instead, refers to urban nature inherently impacted or influenced by humans. It is not remote and pristine, determined by how little humans have used or impacted it, but relatively close and nuanced; it is instead defined mainly by its resilience and perseverance in the face of urban pressures (Beatley, 2011, pp. 14-15).

In this context, the conception that nature exists only in the wilderness comes into question. There is nature to be found almost everywhere if you look around you. It is in the cracks in the road's surface; it exists on the rails of the stairs and behind the derelict building on the edge of the neighborhood.

Many scholars have stated that we now live through the sixth mass extinction (Ceballos et al, 2015). The number of red-listed species has skyrocketed (OECD, 2020). What was once considered common species is now redundant in our immediate surroundings, raising the need for nature conservation efforts in our urban settings (IPBES, 2019).

“We cannot continue to believe that the landscape is sacred and the city profane. They must both be considered sacred.”
– Paul Murrain.

As landscape architects and planners deal with the design of urban spaces, it is part of our responsibility and possibility to aim to reduce loss and long for species inclusion and socially inclusive neighborhoods in our quest to contribute to create a sustainable future.

1.5 Objectives

The Objective of the thesis is to explore the topic of urban nature or nature where people live in the context of urbanization in Oslo’s most significant transformation area, Hovinbyen.

Part 2 of the thesis will begin on a broader scale, looking at the contextual framework on topics entangled with the shaping of urban nature, before delving into the case of Oslo and Hovinbyen in Part 3. Part 3 also includes mapping and observing the green space through the lens of landscape ecology, which leads to the choice of the neighborhood Etterstadsletta as a focus area. Part 4 investigates Etterstadsletta as an area to rethink with the framework of creating a more vital link between neighborhood and nature.

The thesis’s research question is as follows:
How can landscape design be used to promote urban nature quality in the neighborhood Etterstadsletta?

Limitations

This thesis is written as part of the master’s program in landscape architecture for global sustainability. Accordingly, the thematic attention is on a wider regional level both in the introduction, background chapter and most of the discussion. The design and analysis are primarily focused on promotion of urban nature quality through landscape design strategies, and doesn’t detail elements such as material choices, dimensions and structural components.

2

Shaping of

Urban Nature

- 2.1 Defining Urban Nature
- 2.2 Cultural Landscapes
- 2.3 Non-Human Movement & Habitats
- 2.4 The Problem with Lawn
- 2.5 Urban Wildscapes & Rewilding Cities
- 2.6 Biophilic Design
- 2.7 Landscape Ecological Principles

This chapter contextualizes the concept of urban nature, how it's shaped and can be altered through idealistic design.

2.1 Defining Urban Nature

Urban nature is a broad term that might sound contradictory. However, it is understood in this thesis as nature existing in cities, which encompasses the variety of nature areas in cities and the species living there (Beatley, 2011, p. 165). Urban nature, seen in this perspective, includes all green spaces such as allotment gardens, urban forests, school gardens, flower beds, meadows, lawns, rooftop gardens, and green walls, which all contribute to the mosaic of different habitats that comprise the urban ecosystem.

Helen Hoyle differentiates urban nature into two categories, managed areas and remnants (2020). The managed areas consist of planned Green Infrastructure such as parks, street trees, and cemeteries, that often appear as manicured sites. Meanwhile, the remnant areas often appear sporadic, accidental, or less managed. These remnants can be areas such as brownfield sites and buffer zones along railway lines.

As urban nature exists in a range of variations, Ingo Kowarik, an urban ecologist, proposes a four-tiered typology for urban nature. In his typology, “first nature” refers to remnants of existing ecosystems, and “second nature” includes managed agricultural and forestry landscapes. Meanwhile, “third nature” includes designed elements of metropolitan nature such as parks, gardens, and tree-lined streets. Meanwhile, “fourth nature” refers to non-designed elements such as urban wilderness associated with abandoned or marginal sites. (Gandy, pp. 13-14, 2022).

Defining quality is important in order to distinguish between what’s “good” and “less good” urban nature. Quality in urban nature is understood by its functionality, as both biodiversity promoting and for human benefit (Hoyle, 2020; Remme et al, 2021). This implies that an area is of less quality if it provides little to no services for biodiversity and human benefit, and opposite, of high-quality if it’s both beneficial for human functionality and for promoting biodiversity. Such functionality as biodiversity promoting can be determined by where the area is situated, and how well it is connected to other green spaces. At its best, urban nature is abundant, close to our homes, and offers recreational values and resilience to extreme weather (WHO, 2017).

This thesis focuses on urban nature areas on ground level.

2.1 Cultural Landscapes

Since *Homo sapiens* settled this planet 300 000 years ago, the human species have evolved the surface of the planet (fig. 4). With growing awareness of prehistoric and modern global anthropocentric influence, geographers and ecologists are looking for a new classification system to reflect how the world is colored by humanity. Geographer Erle Ellis has divided the earth's surface into a series of "anthropogenic anthromes." These anthromes focus on a range of modified landscapes containing non-human elements instead of emphasizing "natural ecosystems" or "wildlands" as a model for ecological imagination. According to Ellis and his colleagues, 40 percent of the human population lives in zones classified as "urban" or "dense settlements" (Ellis, 2011). Rapid urbanization makes the design of environmentally and socially sustainable cities critical as the share of people living in urban areas is projected to increase from 54 percent in 2015 to 78 percent in 2050 (UN, 2018).

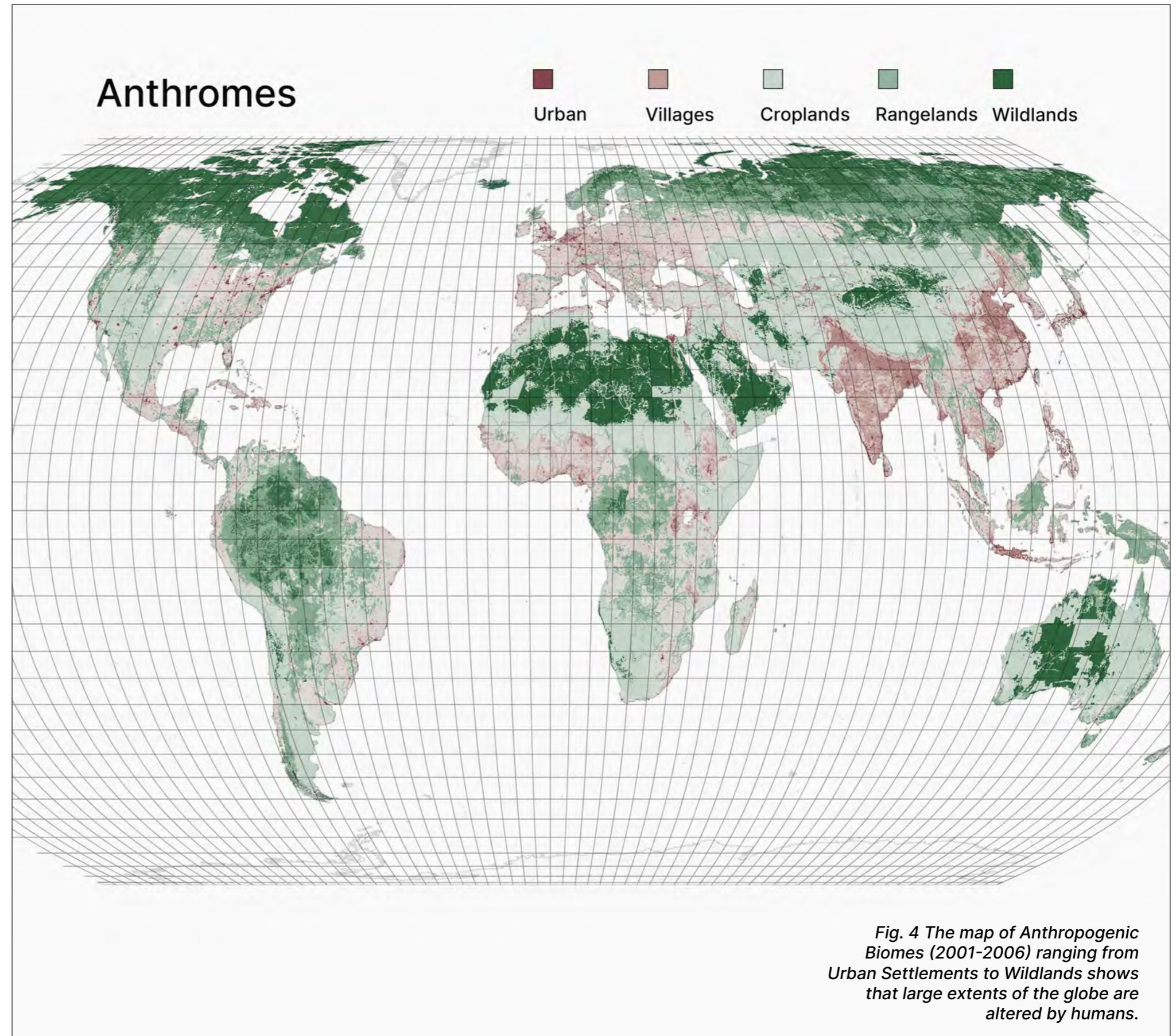
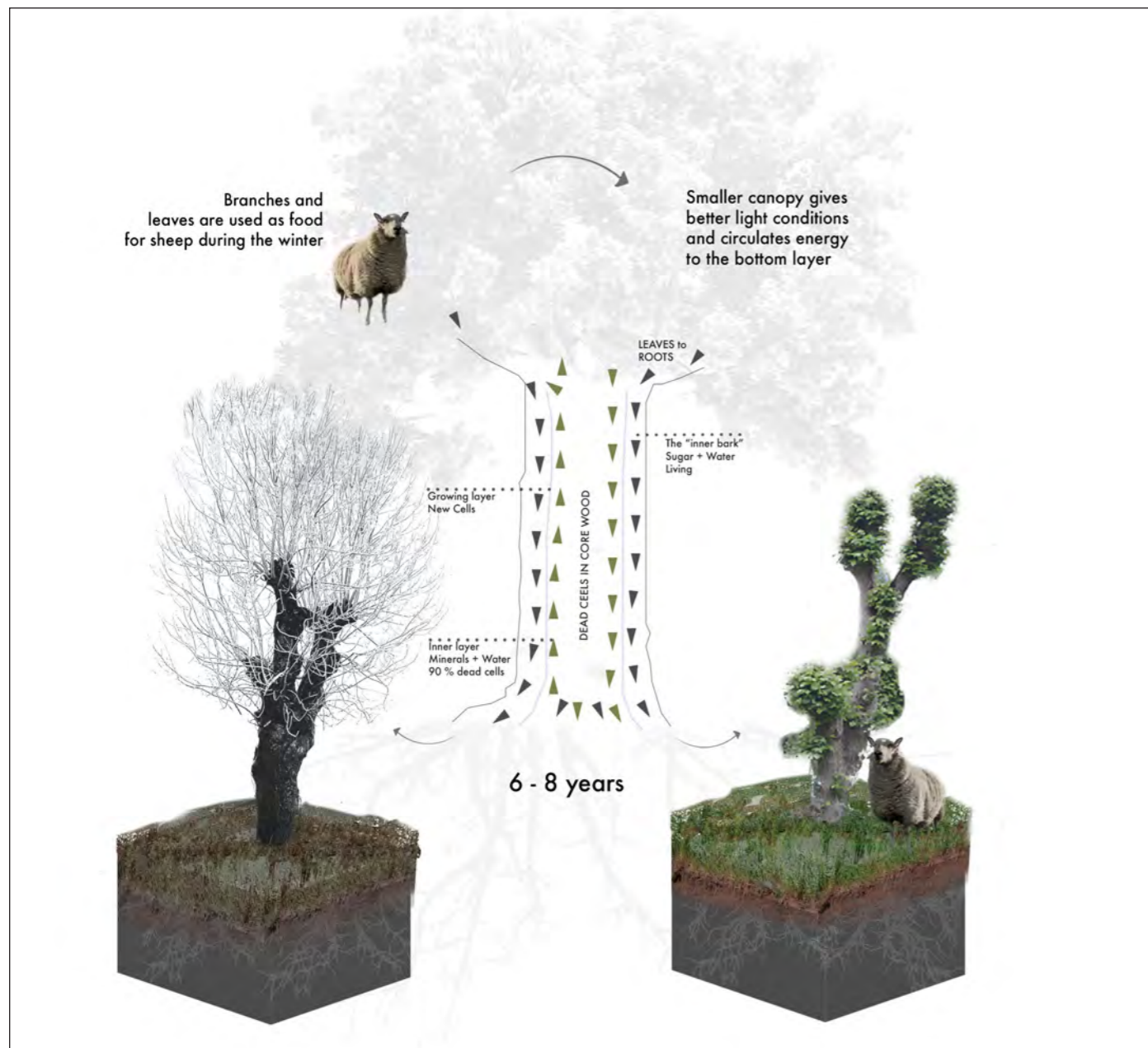


Fig. 4 The map of Anthropogenic Biomes (2001-2006) ranging from Urban Settlements to Wildlands shows that large extents of the globe are altered by humans.

“As cities and metastasizing suburbs forsake their natural diversity, and their citizens grow more removed from personal contact with nature, awareness and appreciation retreat. This breeds apathy toward environmental concerns and, inevitably, further degradation of the common habitat.”

- Robert Pyle; Beatley, 2011, p. 23

Fig. 5 The management practice of the leafy meadow, makes it a biodiversity rich and productive cultural dependent landscape.



A cultural landscape is a term used to describe a symbiotic relationship between human activity and the environment (Sauer, 1925). These spaces are places or landscapes shaped or influenced by human use. Cultural landscapes come in all shapes and sizes, and they have evolved following local, regional and global development (Norderhaug et al, 2007, p. 14). Agricultural landscapes are often the first that come to mind when thinking about traditional cultural landscapes. Before the industrial revolutions, especially before the artificial fertilizers' arrival, many farmsteads worldwide were run circularly. And before globalization, many were locally sourcing materials and living off the land, rhythmically with nature's cycles (Kvamme et al, 2007, 21 - 36). Today, few keep using these methods other than mainly indigenous groups. The IPBES acknowledges the importance of these landscapes and advocates for learning from these practices and methods in seeking sustainable development (2019).

In Norway, some practices in cultural landscapes are supported by the public, reasoned in their cultural heritage value as well as biodiversity (Jf. nml. § 52; Landbruks- og Matdepartementet, 2018). One such landscape type is leafy meadows (Jf. Forskrift om utvalgte naturtyper etter nml. § 3,1. section). The leafy meadow (løveng) is an example of

a culturally dependent landscape that is highly productive, seen with a biodiversity outlook (fig. 5) (Austad & Norderhaug, 2007, p. 147 - 153). Nevertheless, this type of landscapes is dependent on analog management regimes, making it threatened (Austad & Norderhaug, 2007, p. 147 - 153). Following changes or time, as society relies upon technological development and pressures of effectiveness, resulting in less interest in these analog management methods.

Because agriculture and rural areas is steadily characterized by monoculture, our urbanized areas become more important for biodiversity (McKinney, 2002). Conscious management of the land surface is vital as modification of land of waterways, spreading of invasive species, and human-caused alternation of geochemical cycles – often lead to landscape fragmentation, homogenizing of landscapes, and habitat degradation (Norderhaug et al, 2007, p. 17). These effects make land-use change the single biggest threat to biodiversity loss (IPBES, 2019) (fig. 6).

2.3 Non-Human Movement & Habitats

Although Urban Environments primarily are habitats for *Homo sapiens*, we have settled on land that has and is hosting a range of other species. Common urban wildlife such as squirrels, badgers, mice, hedgehogs, and birds thrive in the park, cemeteries, wastelands, construction sites, and the city's multilayered architecture. Currently, animal populations are increasingly migrating to cities around the globe (Gross et al, 2021). One reason is that the food supply in cities is often better than in rural areas dominated by agricultural monocultures (Barkham, 2017).

Non-humans use the urban environment differently than us humans (fig. 7). They move along places where we undoubtedly set our feet, in places we don't think too much about when we plan our urban environments. This way, what's left of the urban nature – the habitat of the non-human, become fragmented, increasingly detached from other or bigger potential habitat areas. This reduces non-humans' opportunity for movement, and thus threatens the livelihood and conservation status of many native species. In UK, the earlier common species red squirrel is now threatened of extinction due to human disturbances (UK Squirrel Accord, 2022.). Results of

anthropogenic effects such as these, combined with threats of biodiversity loss and food security, emphasize the need for trying to think differently around planning and design of urban landscapes, putting non-human entities into consideration. While urban disturbances such as noise, roads, major infrastructure, and pollution is a risk to the movement and livelihood of many urban non-humans, some species

fit better to survive in the concrete jungle (Lowry et al, 2013). While animals such as predator birds have found ways to thrive in urban settings, nesting on roofs of tall buildings overlooking their hunting grounds, other species suffer greatly, as modification of land and waterways fragments landscapes, creates significant barriers, and reduces habitat areas and food accessibility (Lowry et al, 2013). By learning about the non-human

species inhabiting our urban environments and their habitat requirements, we can strengthen their livelihood. Measures such as wildlife bridges and tunnels, installation of hives, and hiding places can, together with strategic green infrastructure planning, secure and help build diverse urban biotope areas (Beatley, 2011, p. 88).



2.4 The Problem with Lawn

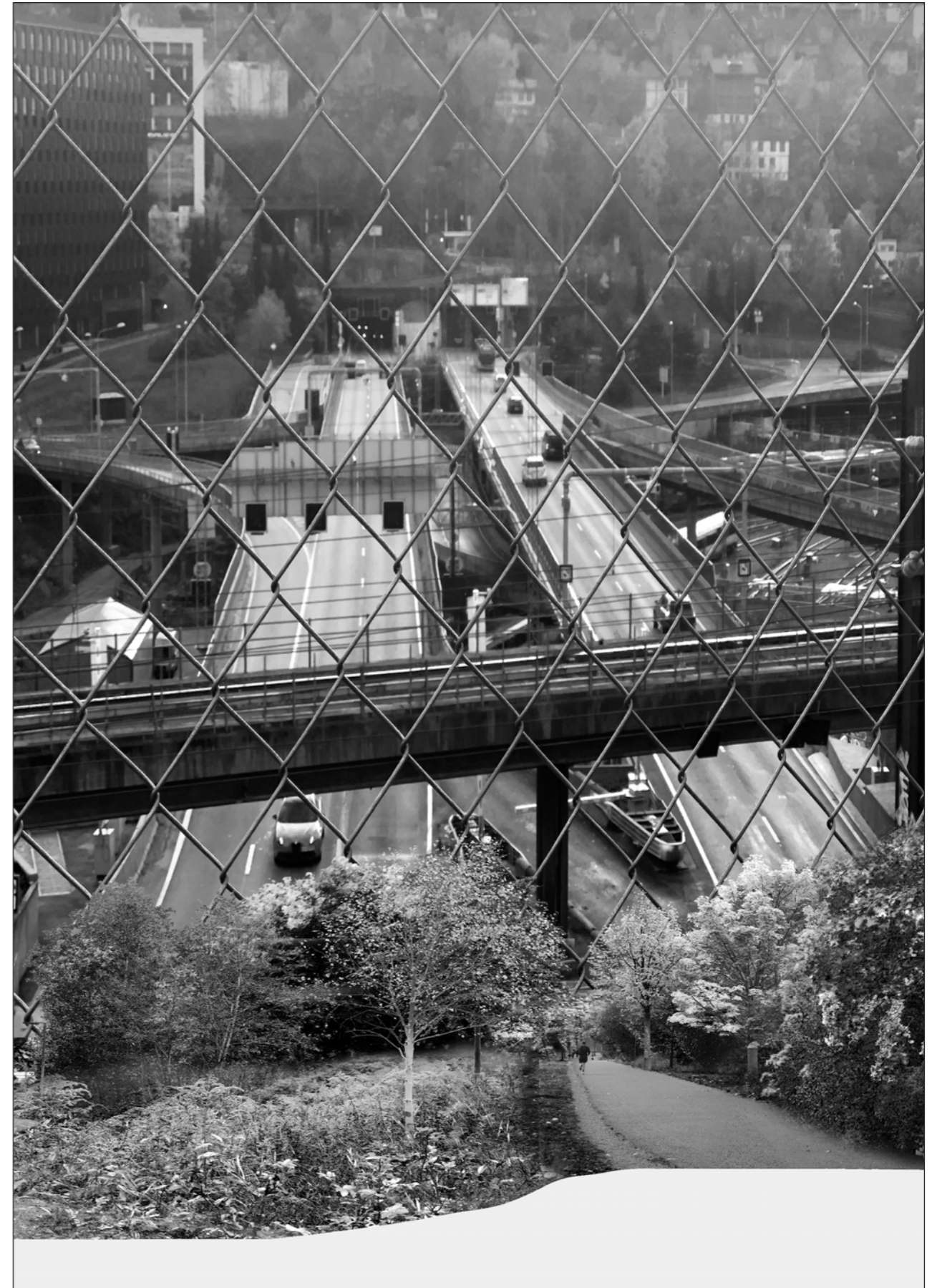
One of the most prominent landscapes shaped by human beings, especially in the western world, is the lawn, where it occupies up to as much as 70–75% of the urban green open space (Ignatieva et al, 2015). These modern urban culture landscapes are often named “green deserts” due to their low value as habitats for many non-human species (Ignatieva, 2013). With influence from architectural approaches such as French formal, English picturesque, Victorian gardenesque, and the 20th and 21st-century modernism, the lawn is one of the most potent symbols of modern urban landscapes (Ignatieva, 2010). According to research from 2009, most people in the Western world regard lawns as a “natural,” even compulsory, part of the urban landscape, with no regard for their social, ecological, or aesthetic values (Stewart et al., 2009).

Maria Ignatieva writes about modern lawns, and shares that intensive management practices, such as frequent mowing and herbicide and fertilizer spraying, have raised concerns about lawns’ potential negative impact on the urban environment (Ignatieva et al, 2015). Moreover, all previous research on urban biotopes have revealed that lawns are strikingly similar in terms of plant species composition and, in their modern manifestation, are significant contributors to the

homogenization of urban landscapes and the loss of urban biodiversity (Ignatieva et al, 2020). By consisting of grasses primarily originating from the same seed mixtures and nurseries, lawn-clad landscapes result in habitats that have no equivalent within the native environment they are situated in (Stewart et al, 2009).

Lawns are often designed for social, sports, and recreation purposes, or historical, aesthetical, and cultural purposes such as viewing, picnicking, football, or walking. They moreover vary in management. While conventional lawns are intensively managed, getting frequently cut short, more meadow-like lawns also exist. Being more like natural grasslands, they often consist of a higher number of species. The environmental impact of lawns is determined mainly by the level of management, furthermore, emphasizing the potential that lays within management of cultural landscapes to improve urban nature quality (Cameron et al., 2012).

Fig. 6. As human beings creates and modifies urban cultural landscapes, we should be aware of the consequences these changes might have for biodiversity.



2.5 Urban Wildscapes & Rewilding Cities

When thinking about a type of urban nature that are often overlooked, Urban Wildscapes comes to mind. Urban wildscapes, as mentioned in 2.1, is a type of remnant urban nature “...were natural as opposed to human agency appears to be shaping the land, especially where there is spontaneous growth of vegetation through natural succession” (fig. 8) (Jorgensen, p. 1, 2012). Wildscapes can exist at various scales, ranging from cracks in the pavement to much larger urban landscapes that include woodland, unused allotments, river corridors, and derelict or brownfield sites.

In the book *Urban Wildscapes*, Anna Jorgensen argues that there is no dichotomy between regulated and wild urban spaces; instead, there is a continuum ranging from “wilderness” to ordered spaces, with varying levels of wildness existing at multiple different scales in each location (2012, p. 2). Wildscape, in this sense, “can be viewed as an idea, a way of thing about urban space, rather than a closed category that can be spatially located” (Jorgensen, p. 2, 2012).

Rewilding is a trendy term used to describe the idea of bringing nature back, most often to urban environments (Moxon, 2019). Siân Moxon, a researcher, and architect dedicated to rewilding, especially in private gardens and communities,

argues how small changes to private gardens can transform them into wildlife habitats (Webb & Moxon, 2021). These ideas promote design that, in many ways, seeks to learn from the aforementioned urban wildscapes.

Similarly, WWF Norway has recently (March 2022) been initiating a campaign for rewilding. The slogan is that “every square meter counts.” Furthermore, the project seeks to engage the public to “rewild” unutilized space in gardens, shared outdoor spaces, and balconies. In order to promote rewilding, WWF (2022) presents seven tips: (1) Choose pollinator-friendly species, (2) Plant for the entire season, (3) Establish a flower field, (4) Reduce maintenance work, (5) Build habitats, (6) Establish water sources, (7) Choose non-toxic.

Since the initiation of this WWF project, 1 504 758 m² have been signed up as rewilded (WWF, 2022). The projects Facebook-group, “We make Norway’s gardens wilder” (Vi Gjør Norges Hager Villere), currently has (30. June 2022) 11 500 members, showing great engagement in making every square meter count. According to Steffen Lehmann, an architect, professor, and director of UNLV’s Urban Futures Lab, rewilding measures can help solve three problems: biodiversity loss, urban overheating, and climate resiliency (Lehmann, 2021).



Fig. 8. Image of an Urban Wildscape by Alnaelva in Oslo

”To allow for the emergence of an ethic, practice and politics of caring for animals and nature, we need to renaturalize cities and invite animals back in — and in the process re-enchant the city.”

- Wolch, *Biophilic Cities*, 2011, p. 11

2.6 Biophilic Design

It is not only the non-human species that benefit from urban environments promoting cohabitation. The Biophilia hypothesis states that humans have an instinctual desire to connect with nature and other life forms (Joye & De Block, 2011). It is proven scientifically that contact with nature improves well-being and health in humans (Maller et al, 2006).

Today, human beings spend most of their time inside, in our homes, at work, and in places such as gyms and libraries. Biophilic design aims to counteract this and promote humans' connection with nature by emphasizing our adaptations to the natural world through the evolution of time that advances human health, fitness, and well-being (Kellert & Calabrese, 2015). By using Biophilic Design (fig. 9), the calming and cooling effect of nature is used as a tool in urban planning by biophilic urbanism. It is about finding new ways to combine density and greenery with improving urban resilience, and thus promote urban nature diversity (Lehmann, 2021).

Inspired by and mimicking nature, the book *Biophilic Cities* share the message that there are many lessons to learn from nature; especially that through thousands of years of evolution, plants and animals can do things and possess features that we should aim to replicate in design (Beatly, 2011, p.49). This presumption reflects a humility over nature's wisdom and the systems of nature (Beatly, 2011, p. 49)

Fig. 9. Biophilic Design: Elements and Attributes, after Kellert et al 2008, p. 7-15.



“A fuller appreciation of and deeper caring for the animals and nature around us, then, can imbue cities and suburbs with new meaning—an “enchantedness,”... creating places that are inherently shared by a fascinating and wondrous subset of the planet’s biological diversity.”
– Wolch, Beatly, 2008

2.7 Landscape Ecological Principles

Landscape Ecology is a field that studies how we can improve links between ecological processes in the environment and specific ecosystems (Turner, 2005). Urban Ecology integrates natural and social sciences to research and identifies altered local environments and their effects (Grimm et al., 2008). When used as a basis for areal planning and landscape architecture, these fields can help shape the resilient cities of tomorrow by guiding how to distribute areas in a biodiversity-promoting manner, and thus help enhancing qualities of urban nature.

The following pages show nine areal-use principles that promote biodiversity (fig. 10). The principles are from the Norwegian Environmental Directorates guidelines for planning of urban green space (2014) and are based upon knowledge about various requirements both for the animal- and plant species.

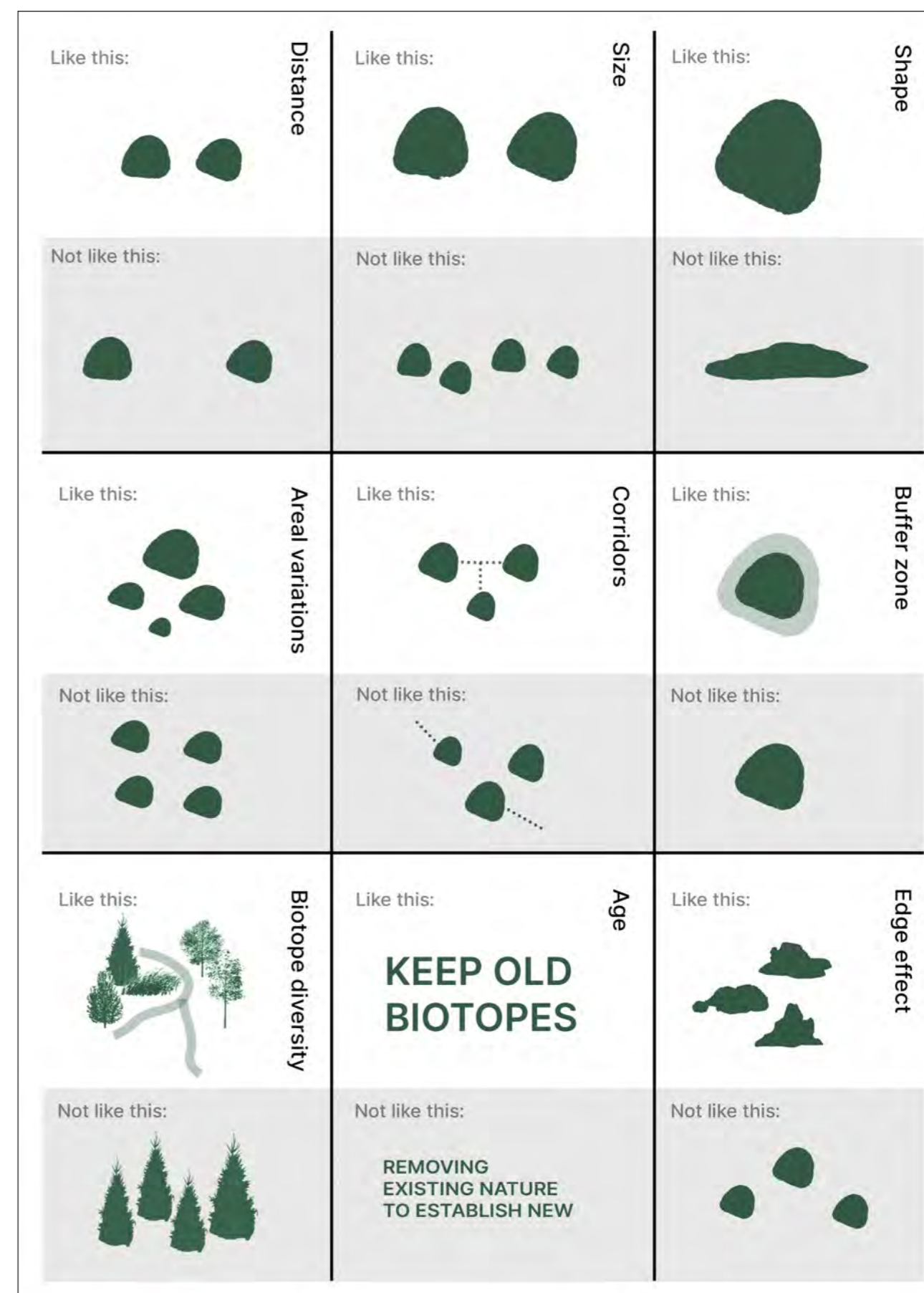


Fig. 10. Landscape Ecological Principles

1. Distance

It is advised to keep the distance between green areas as short as possible. Different species have varying degrees of mobility and spread. As a result, establishing concrete norms that apply to all circumstances is difficult.

2. Size

Larger green areas are better suited to host a variety of species than smaller ones. These areas are frequently habitat and reproduction areas for various animal and plant species. The trend in the landscape is for areas to be continuously fragmented, making it even more critical to preserve the already existing large areas.

7. Biodiversity

A diverse range of biotopes should be sought within a given area. Each biotope has the potential to reflect the uniqueness and history of the area. The local variety of biotopes and their content will serve as the foundation for preserving local species diversity.

9. Edge Effect

The transition zones between the different biotopes can also be seen as their own biotope. There are often special ecological conditions that cause what is known as the edge effect. This edge effect usually is positive because the edge zones are typically rich in species. However, due to the extensive fragmentation of the landscape, the edge biotypes are now numerous and common. Species that thrive and live in the edge zones are firmly on the rise at the expense of other species entitled to larger areas today. When designing the green structure, it is essential to consider how the edge zones affect biodiversity. However, the most important thing is to secure smaller and more extensive "large areas" to secure species that require protected core areas.

3. Shape

The shape of the area is vital for the ecological functionality of the landscape. It is critical to consider the most important ecological function that the area should preserve when it comes to shape. It is, for example, natural for a corridor to be long and narrow. An important point with focusing on the shape is to ensure that not the entire green structure ends up being corridors.

4. Areal Variation

In conclusion to the previously mentioned principles about shape, size, and distance between green spaces, variation in different sizes of green areas is a general recommendation. As a result, the larger and more diverse the areas are, the more resilient they will be to influences.

8. Age

It takes time to establish a diverse ecosystem. Save nature from encroachment rather than destroy it to create a new one. Nature's diversity will be lost, and it will take a long time for nature to re-establish itself with natural diversity as a foundation for a wide range of species. It will take a long time, for example, for dead wood to form as tree falls and trees die, which are essential as a food medium for insects and cave-breeding birds. Introduced species are frequently found in newly planted vegetation. These often do not provide much food to the local fauna. It is critical to take care of the upper part of the soil and spread this when laying. Seeds and plant debris in the soil will aid in the regrowth of local vegetation.

5. Corridors

A central goal in planning should be to secure and establish corridors that sustain connectivity between green areas. Many species rely on corridors as migration routes between the habitats and ensure genetic exchange between populations.

6. Buffer Zone

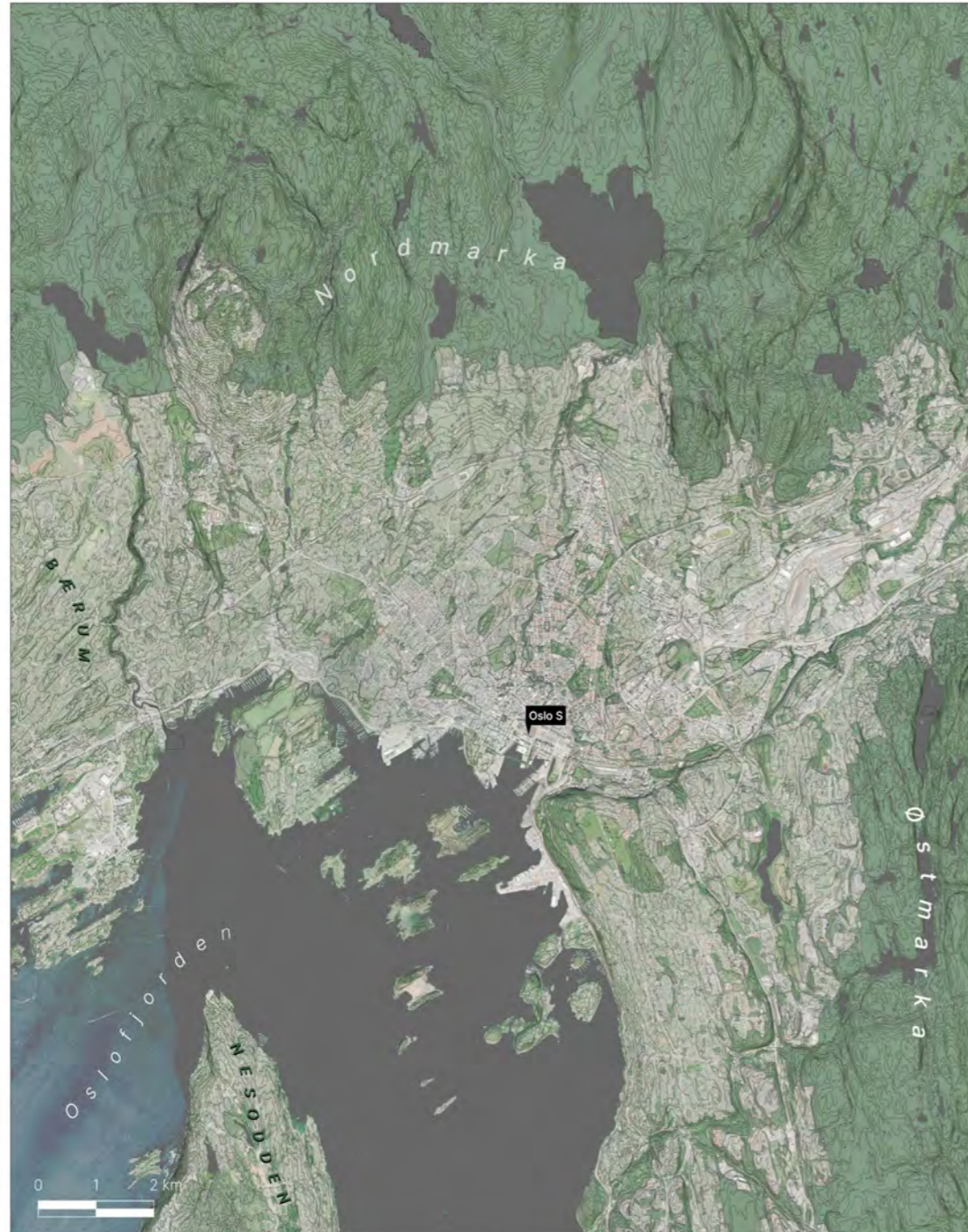
Keeping a zone free of significant intervention and developments around larger green areas is preferable. The more impacts there are in the so-called buffer zone, the more disturbances the green area within is subjected to. A vegetated residential area or a burial ground, for example, can serve as a buffer zone around a public green space.

3 Oslo

- 3.1 The Green Capital: Oslo
- 3.2 Hovinbyen: Visions of the Future
- 3.3 Method & Guidelines
- 3.4 Green Spaces in Hovinbyen

This chapter contextualizes urban pressures on urban nature through the case of Oslo and its currently most prominent development area, Hovinbyen.

3.1 Oslo: The Green Capital



The capital city of Norway (fig. 11) held another capital title in 2019 when it was named the European Green Capital of the year. The European Commission, which awarded Oslo, praised Oslo’s holistic approach, which included a wide range of themes such as biodiversity, public transportation, social integration, and citizen health, all of which were grouped under the overall theme “City for everyone, putting people first” (European Commission, 2019).

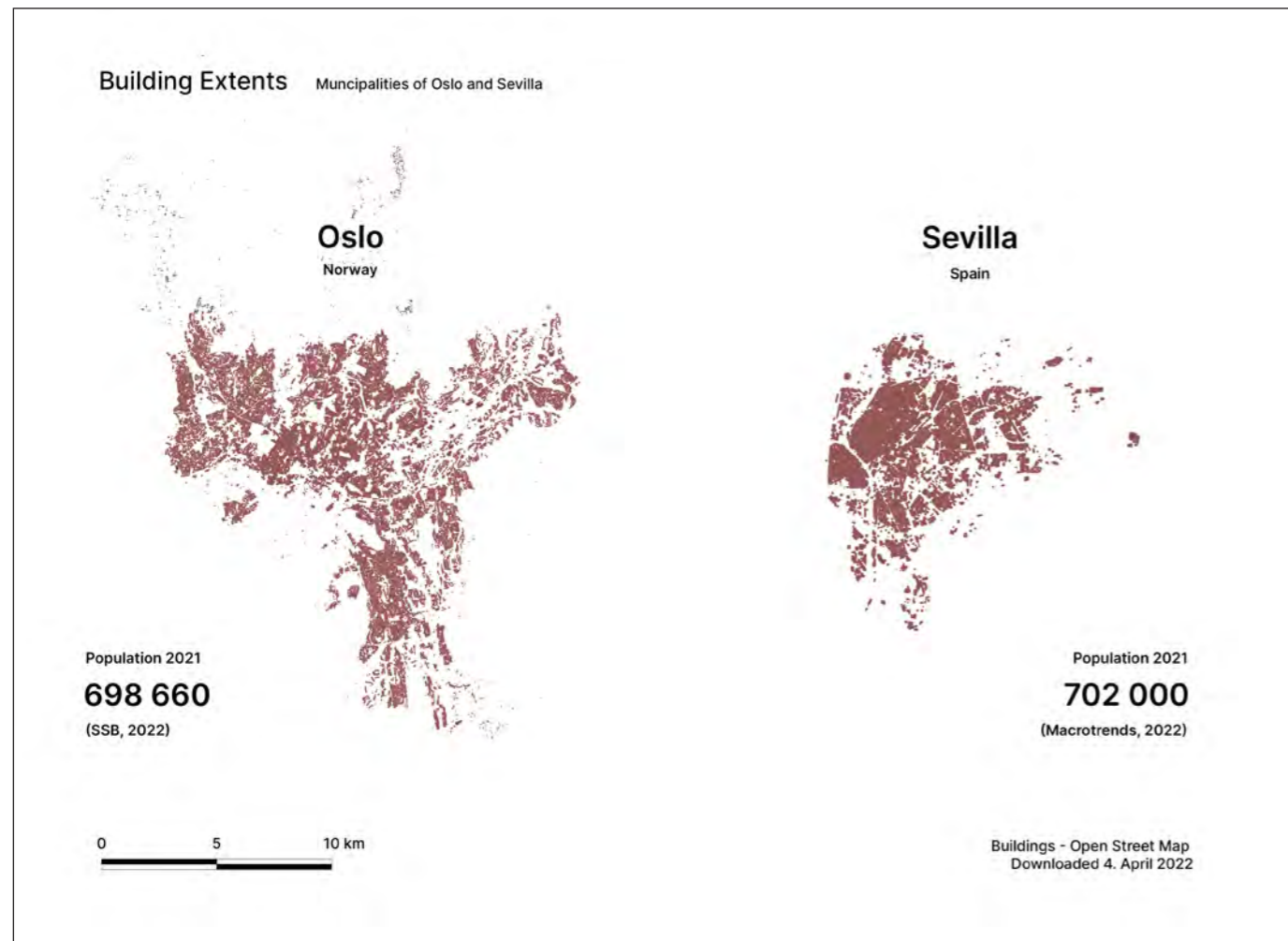
The romantic vision of nature is integrated profoundly into Norwegian identity (Myhre et al, 2022.). In Norway, open urban landscapes have been and continue to be tied deeply to nature. The strong link to nature is due mainly to crucial geographical features such as climate, morphology, and the relatively low number of inhabitants, hence the cities’ small population sizes (Jørgensen, 2021, p. 133).

Together with many Nordic cities, Oslo is well-known for fostering greenspace accessibility, maintaining natural landscapes, and providing green public space inside densely populated areas (Nilsson et al., 2021, p. 13-33). Simultaneously, several forces threaten access to urban green and recreational

space. Increasingly permissive planning is progressively commodifying land, and even long-term beneficial practices are threatened by development pressures (Nilsson et al., 2021, p. 13-33).

“The blue and the green and the city in-between” was the slogan of Oslo in the 1970s, and it’s still used today as a goal for planning of green infrastructure (PBE 2010). The tagline describes how the city roots its identity in the fjord and the surrounding forests. To limit urban development, the Oslo Municipality formed the markagrensa (Marka-border) in 1934. Initially, the limitation was predicated on the difficulties of supplying water beyond the Marka-border height. The border formed a barrier between the city and its surrounding green hills and forest, and the transition zone remained a focal point of park politics for decades (Jørgensen, 2021, p.135.) As the technology evolved and water supply constraints became obsolete, the case for conserving the region from development became based on the developing city’s need for recreational spaces (Jørgensen, 2021, p. 135) (fig. 12).

Fig. 11. Map of Oslo showing location between the forests and the fjord.



3.2 Hovinbyen: Visions of the Future

Hovinbyen is an 11 km² area on the east side of Oslo. The rising shortage of available development land in Oslo and the decreasing necessity for industries to be located inside the city limits recognize Hovinbyen as an area of opportunity. The Objective with Hovinbyen is for the area to take a new turn and become a mixed-use urban living neighborhood, estimated to host between 60 000 – 80 000 residents and between 50 000 – 100 000 new workplaces (Municipality of Oslo, 2022). Hovinbyen aspires to be a place for the future with a sustainable orientation.

When greenspace became appreciated as a solution to pressing environmental concerns at the beginning of the twenty-first century, a new surge of interest in protecting the area began (Jørgensen, 2021, p. 135). In 2019 the City of Oslo permanently passed the Marka Act to save the green belt (Markaloven, 2019). However, in recent decades, the city has endured an increasingly pressing housing market, partly due to a lack of spaces to build new housing developments (Winther, 2018, p. 169). With our present time’s environmental focus, this direction has further emphasized the importance of developing and transforming spaces into green, simultaneously dense urban areas in Oslo and other urban realities.

Fig. 12. Even though Oslo have building constraints towards its surrounding forests, its building extents reaches wider than cities with the same number of inhabitants. Density Map of Oslo, compared to Seville.

The area is located on the outskirts of what once were the established Oslo, along the Alna River. Furthermore, it is an area that was gradually transformed into an industrialized area during the (second) industrial revolution, from being an area primarily containing agricultural land and deciduous forest (Encyclopedia of Oslo, 2022). With consumer optimism and the rise of the automobile in the postwar period, the area became more centered on consumerism and housing developments (Encyclopedia of Oslo, 2022).

Fig. 13. Central Points in Hovinbyen placed in relation to Oslo and its greenstructure.

- Major Roads
- Rails
- Rivers/Ponds
- Forest
- Cemetery
- Public Park
- Semi Public Green
- Football Fields
- Sports Arena

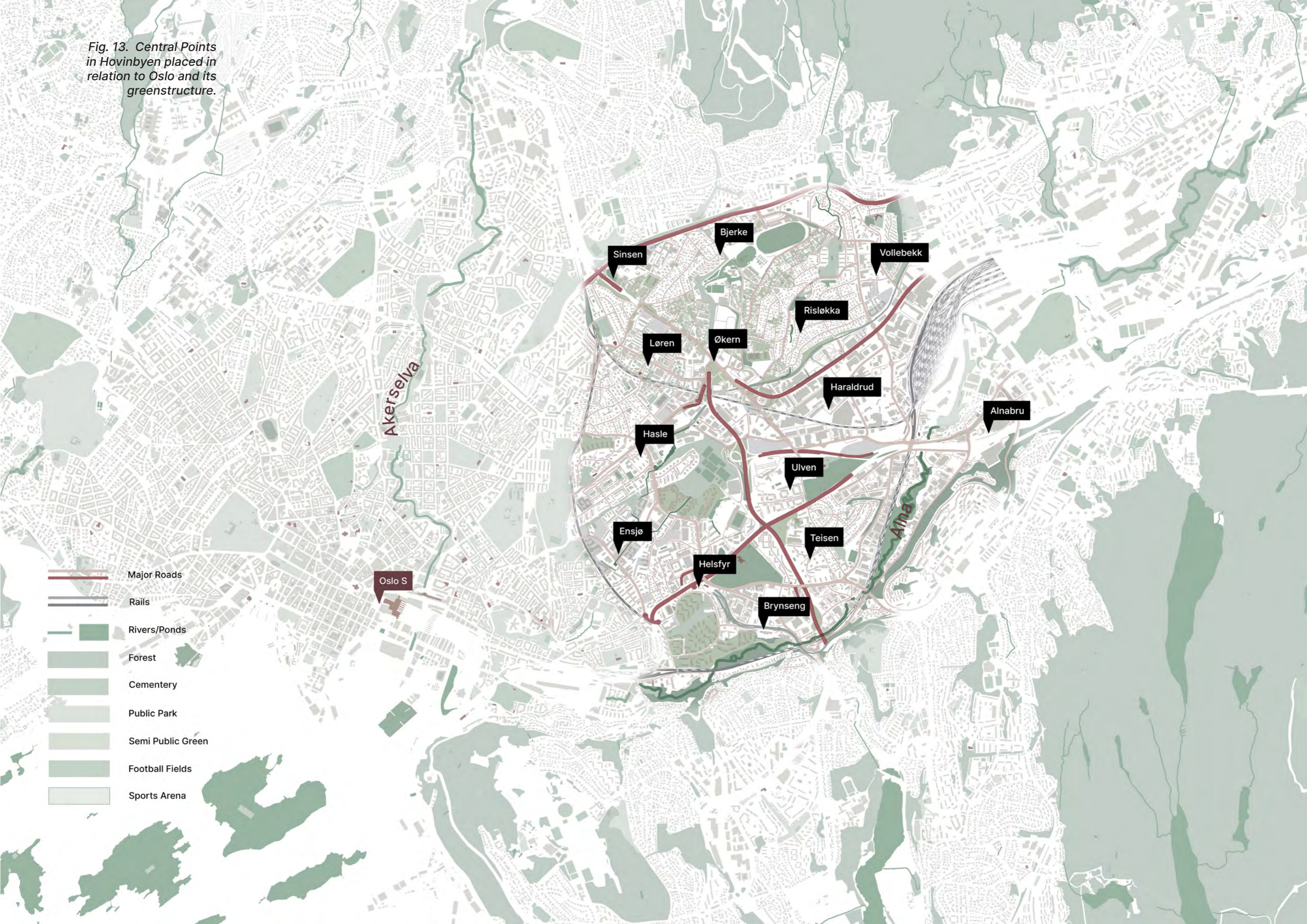


Fig. 14. Land Use Change in Hovinbyen from 1937 to 2011. Agricultural landscapes turning into housing areas and the appearing of roads and railroads allowing transport in and out of the City.



As the infrastructure systems grew, transforming the area into an infrastructural machine, the previously green landscape – got gradually fragmented, reducing connectivity and living conditions for pedestrians and non-human species alike (fig. 14) (Winther, 2018, p. 169). The diverse and fragmented character of the area raises a need and possibility for a plan that addresses the complexity of the Hovinbyen area and creates synergy effects in the process of seeking sustainable urban development.

The Municipality of Oslo launched 2014 an architecture competition aiming to seek solutions for Hovinbyen's future. After, the initialization of the planning work began publicly in December 2014, by the publication of the plan- and idea competition, four teams were awarded as winners in 2015. The jury says that the four winning proposals can contribute to making Hovinbyen one of the most interesting "urban laboratories" in the next 10-15 years (PBE, 2015).

Hovinbyen shall be a pioneering project for environmentally friendly urban development that will house a large part of the housing growth in the years ahead and ensure good access to green areas.

- Ellen S. De Vibe, former director of the Planning and Building Agency, Municipality of Oslo

The awarded proposals (fig. 15) have been included in making a strategic plan for Hovinbyen, ratified in 2018 (Municipality of Oslo, 2018). The plan emphasizes the establishment and strengthening of green infrastructure as one of the core strategies in the development of Hovinbyen. There are three main goals for Hovinbyen in the plan; (1) Hovinbyen must be a future-oriented and climate-smart urban expansion. (2) Hovinbyen must have a diversity of attractive urban areas intertwined closely with each other and the rest of the city. (3) Walking, cycling, and public transport should be the most accessible and most attractive travel methods in Hovinbyen.

Despite Hovinbyen's green focus, more development areas have also been criticized for not adequately prioritizing green spaces (Brochmann, 2017, Brochmann, 2019). The neighborhoods of Ensjø and Løren have, during the last years, endured significant transformations and have rapidly been developed into areas primarily characterized by new apartment buildings. On multiple occasions, the developments have been criticized for seemingly not prioritizing the green lungs advertised in sales for homes, and for gray and "uninviting" streetscapes (Berg, 2019, Lundgård, 2021; Brochmann, 2021.). The "gray" character of the area development has especially been met with much opposition by the interest group the Architecture-revolt (Arkitektoprøret),

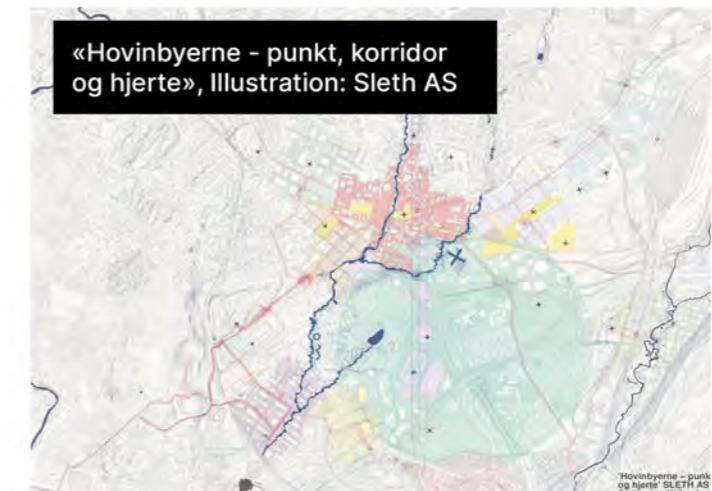
Fig. 15. Green Visions for the Future of Hovinbyen

2014

The Municipality of Oslo launched 2014 an architecture competition aiming to seek solutions for Hovinbyen's future. After, the initialization of the planning work began publicly in December 2014.

2015

Four teams were awarded as winners in 2015. The jury says that the four winning proposals can contribute to making Hovinbyen one of the most interesting "urban laboratories" in the next 10-15 years (PBE, 2015).



Winners Competition

«Plussby50», Team: Norske Rambøll Oslo /Rambøll Energi/To romturister





Fig. 16. Pressured green spaces in rapidly developing areas in Hovinbyen

which believes that much of today's newly built architecture is uninviting and counteracts the uniqueness and identity of the places it is situated in (Zerener et al, 2021).

A central part of the plans for the green spaces in Hovinbyen is the "The Green Ring" (PBE). It's proposed as a 6 km long network of green corridors connecting central parks and landmarks in the Hovinbyen-area (Municipality of Oslo, 2). Aiming to generate

and distribute movement and city life between Hovinbyen's most important parks and squares. At the same time, it is proposed to function as a coherent green corridor to create a livelihood for a diversity of plant and animal species (Municipality of Oslo, 20).

One of the critiques of the green ring have been that the green spaces will be narrow and that it will be a ring, not connected to other green infrastructure outside the ring, says Iwan Thompson from the landscape architecture office LaLa Tøyen. He describes the character

of the proposal as low on ambition, questioning whom the project is serving, and stating that it is losing a lot of its first envisioned quality as green recreational space due to small sites with little light and air (Winther, 2019).

Together with the "green ring," a lot of the discussion around these development areas in Hovinbyen has focused on who and what is to blame for lack of anticipated green spaces. These problems have been accused of resulting from fragmented plans, where the development and sale of as many homes as possible

have been a primary driver, rather than the development of liveable areas (Zerener et al, 2021). Strict requirements for land use and the number of housing units have also been blamed for the regions becoming less green than the visions Hovinbyen initially sent signals about (Brochmann, 2021). With development pressure as in these areas, good ideas about sustainable and "green" development meet themselves on the doorstep, as the premise for the action lies on nickels and pennies. At the same time, plans are met with limitations from several actors (Winther, 2019.).

3.3 Method

In the Spring of 2021, I investigated the mapping of green surfaces to understand landscape ecological functionality in urban areas. I chose Hovinbyen as a study area to find out (How) including private gardens and other «green surfaces» in the mapping of green spaces can benefit urban landscape ecology thinking in planning urban areas. The results showed that while mapping green spaces does not accomplish much on its own, it serves as a starting point for conducting insightful urban landscape ecology analyses (Moen, 2021). The project further intrigued me to investigate more in-depth what was behind the green areas on the map in this thesis, to see what the urban nature in Hovinbyen looks like.

Mapping

The mapping of all green spaces was conducted in spring 2021 using orthographic maps from Mapbox. The maps are later, in spring 2022, combined with data from Open Street Map, showcasing infrastructures such as public green space, buildings, roads, and rails.

Map data used Open Street Map data downloaded in February and March 2022. For the more detailed site plans, there is used FKB-data, and cadastral data in UTM32 Euref89, downloaded from Geonorge in March 2021, made by Geovekst.

Observation

In order to get to know Hovinbyen as a study area, and especially to understand what kind of nature exists there, I went on several study trips. During these trips, I observed what is beyond the green areas and strokes you see on the map.

On my study trips to Hovinbyen, I spent most of the time walking to and between different central areas, trying to follow different routes for every visit to see as much as possible. There is a selection of the photography that I took on my visits on the following pages. The photography of urban nature is structured into different geographical areas considered high-density green spaces.

While the mapping of green space in Hovinbyen showed all green surfaces, the observation of the following high-density green space areas will use smaller scale orthographic photos, combined with photography, in order to read into what kind of green spaces the areas consist of.

The photographs included in the analysis portray the variety of urban nature found in each area; meanwhile, the text and map aim to convey some of the areal use changes the area has endured and the impression of the green areas in a general landscape ecological perspective. The information of the assessed neighborhoods is gathered from the online Encyclopedia of Oslo (Oslo Byleksikon), published by Oslo Byes vel. Used articles are listed in the references.

Analysis

The analysis and design are conducted from the perspectives presented in the introduction and background chapter, looking critically at the urban environment's room for hosting non-human diversity.

In order to get to know the study areas, I completed site visits to observe and photograph. Data about biodiversity is collected from Naturbase and Artsdatabanken. Since Artsdatabanken uses data that the public can collect, it can contain mistakes. Other data about the area is primarily from the online Oslo Encyclopedia, from Oslo Byes Vel, and planning documents published by the Planning and Building Agency in the Municipality of Oslo.

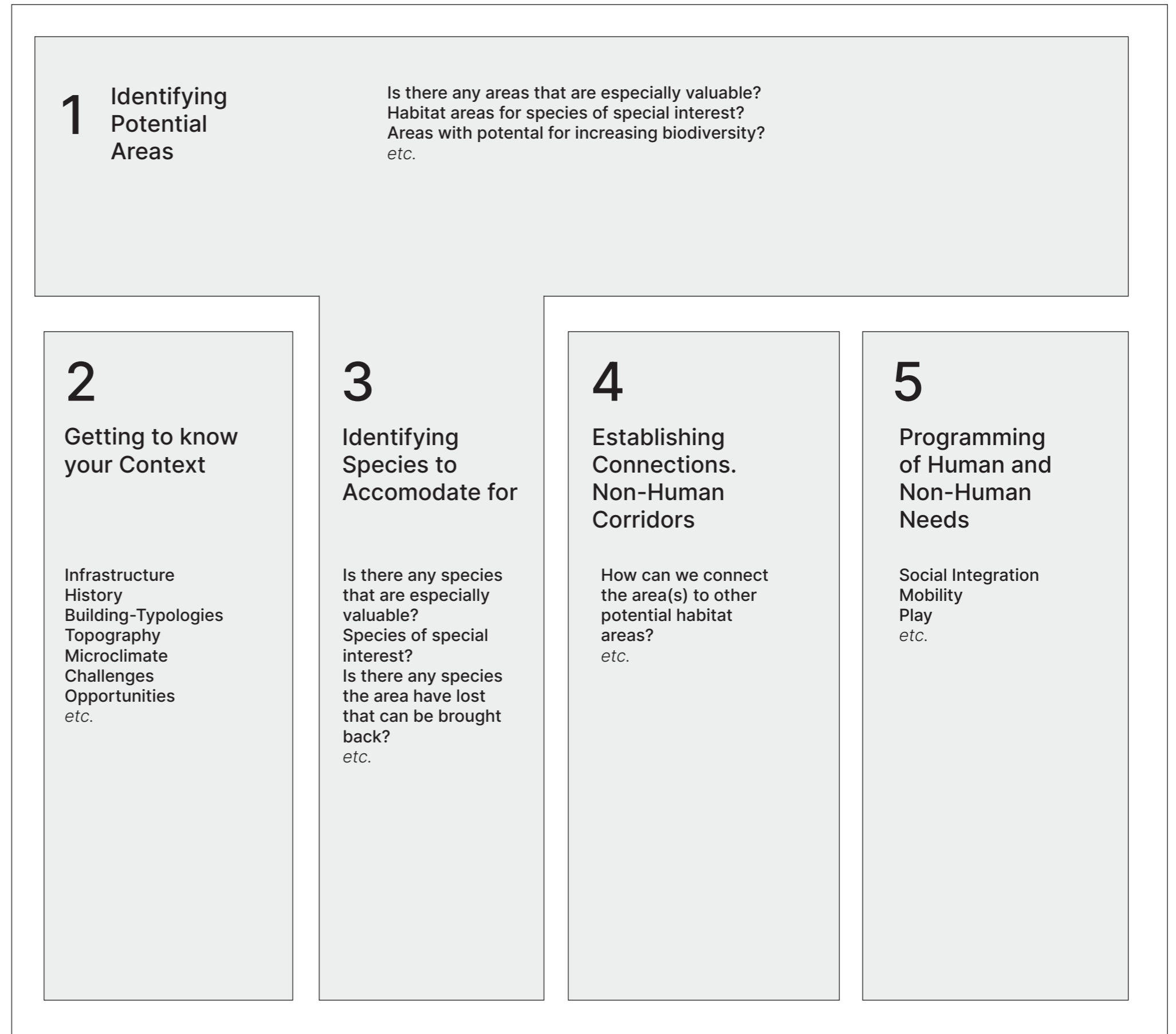
In order to analyze the data and design, I have used QGIS, AutoCAD, Illustrator, SketchUp, and Photoshop.

Methodology for Analysis and Design

Aiming to analyze and design for promoting urban nature quality, the approach for the analysis and design started with (1) identifying areas with potential before (2) getting to know more about the context these areas are situated. (3) Learning about species to accommodate for and then try to (4) establish connections for the species, and then finalizing with (5) programming of Human and Non-Human Needs (fig. 17). The neighborhood analysis addresses pertinent topics to comprehend the identity, context, and function of the location relevant to the objective of the thesis.

The analysis is carried out to shed light on the area's characteristics, which will lead to a better understanding of the place's opportunities and threats in promoting urban nature quality.

Fig. 17. Proposed Methodology for Analysis and Design aiming to promote Urban Nature Quality through Landscape Design



Guidelines & Plans

Throughout the thesis, eleven guidelines are used in goal management to ensure that the thesis is relevant to local, regional, and global practices and visions of sustainable landscape planning and design.

The European Landscape Convention (ELC) (2004) The Council of Europe

To achieve sustainable development based on a balanced and harmonious relationship between social needs, economic activity, and the environment.

Acknowledging that the landscape is an integral part of the quality of life for people everywhere: in urban areas and the countryside, in degraded areas as well as in areas of high quality, in areas recognized as being of outstanding beauty as well as everyday areas;

Sustainable Development Goal nr. 11 (2015) United Nations (UN)

Make cities inclusive, safe, resilient, and sustainable.

National Expectations for Regional and Municipal Planning (2019-2023) The Municipal- and Modernization Department

The government emphasizes that we are facing four significant challenges:

- *To create a sustainable welfare society*
- *To create an ecologically sustainable society through, among other things, an offensive climate policy and sound resource management*
- *To create a socially sustainable society*
- *To create a safe society for all*

State Guidelines for Coordinated Housing-, Areal- and Transport Planning (2014) The Municipal- and Modernization Department

Planning areal-use and transportation systems shall promote efficient socio-economic use of resources and safe and sound traffic flow. The planning shall contribute to developing sustainable urban and rural environments, facilitating recourse generation and business development, and promoting health, the environment, and quality of life.

The Urban Space Handbook (2016) The Environmental Directorate

A good network of urban spaces will enhance attractivity, connect urban environments, and increase livability. Everybody should have access to various types of urban spaces with different characteristics. They should be adapted for diverse and specific purposes and activities the community and the inhabitants need.

Planning of Green Structure for Urban Environments (2014) The Environmental Directorate

The area-regulation type green structure (PBL: 2008) will be used to secure and further develop:

- *continuous greenery*
- *parks and other developed green areas*
- *other large and smaller nature areas in the construction zone*

Oslo Municipal Development Plan (2015 -2030) The Municipality of Oslo

Vision: Oslo towards 2030 – Smart, Safe & Green

Oslo Urban Ecology Programme (2011 – 2026) The Municipality of Oslo

Oslo will be a sustainable urban community where everyone is entitled to clean air, clean water, and access to attractive outdoor recreation areas.

Green Space Plan for Oslo (2010) The Municipality of Oslo

- *The plan will sustain and strengthen Oslo's identity as "the Blue-Green City between the hills and the Fjord."*
- *The plan will contribute to securing inhabitants' needs for sufficient green space in the building zone.*
- *The plan will contribute to the city's development in line with urban ecological principles.*

Strategic Plan for Hovinbyen (2016) The Municipality of Oslo

- *Hovinbyen will be a forward-thinking and climate-smart extension of the city.*
- *Hovinbyen will have a diverse network of attractive urban hotspots connected to each other and the city.*
- *The most accessible means of transportation in Hovinbyen will be on foot, by bicycle, or public transport.*

3.3 Green Spaces in Hovinbyen

Mapping have been conducted in order to get an idea of the structure of the overall green spaces within the Hovinbyen area.

The first map (fig. 18) shows the mapping of all green spaces, categorized by the type of green areas. The map conveys that some areas contain more connected green spaces, such as parks and housing areas, while others have little to no green space.

The second map (fig. 19) portrays the hard surfaces and infrastructures existing in Hovinbyen today. Hovinbyen is an infrastructural key-point and entry-point to Oslo, making significant roads and rails dividing up Hovinbyen into smaller defined areas.

The third map (fig. 20) is a synthesis of the two first maps, showing the mosaic of the land-use surface in Hovinbyen today. It shows how the high-density green areas are divided by infrastructure and how the central points are disconnected from the edges, creating few cohesive extensive green areas.

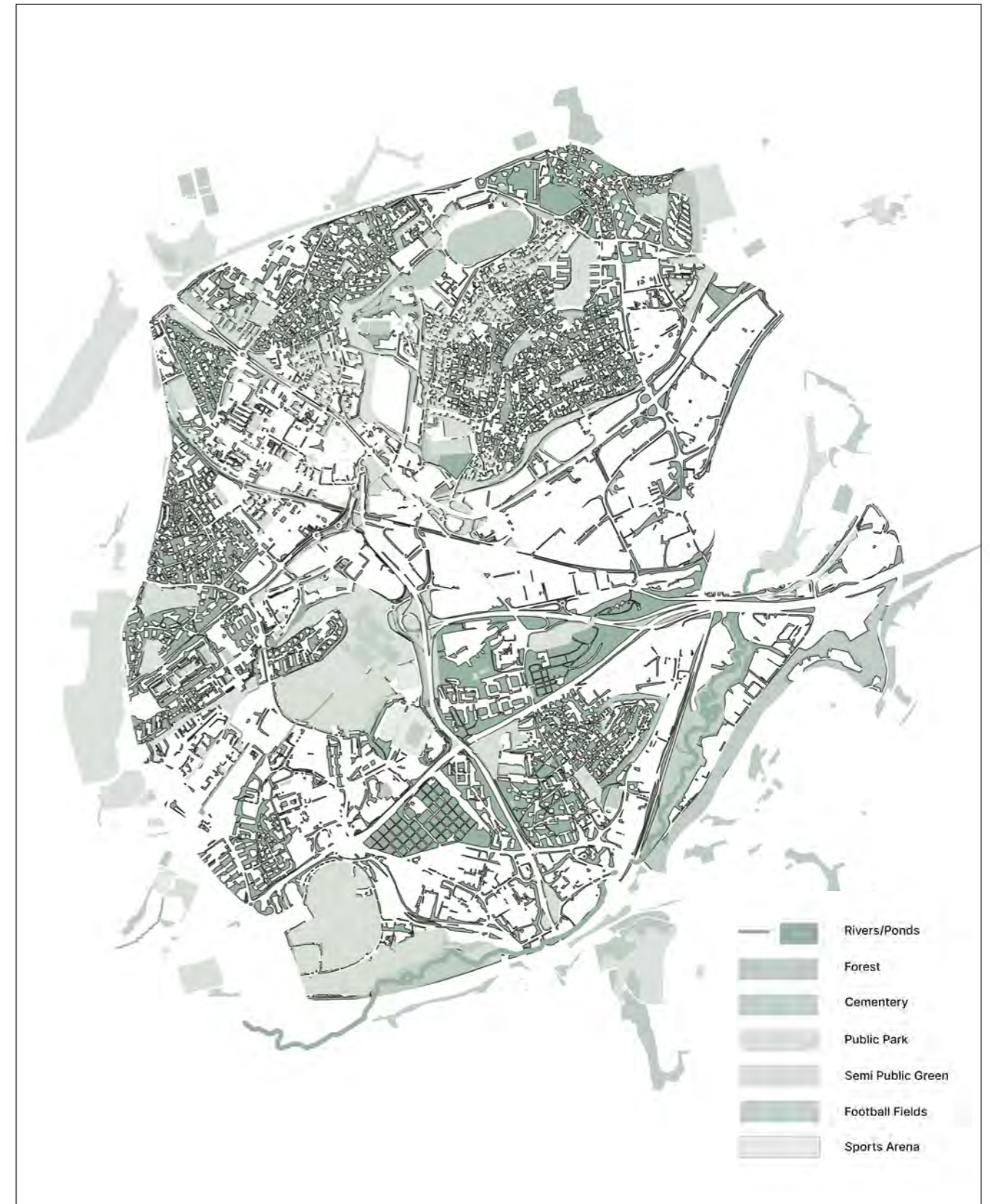


Fig. 18 All Green Spaces in Hovinbyen.

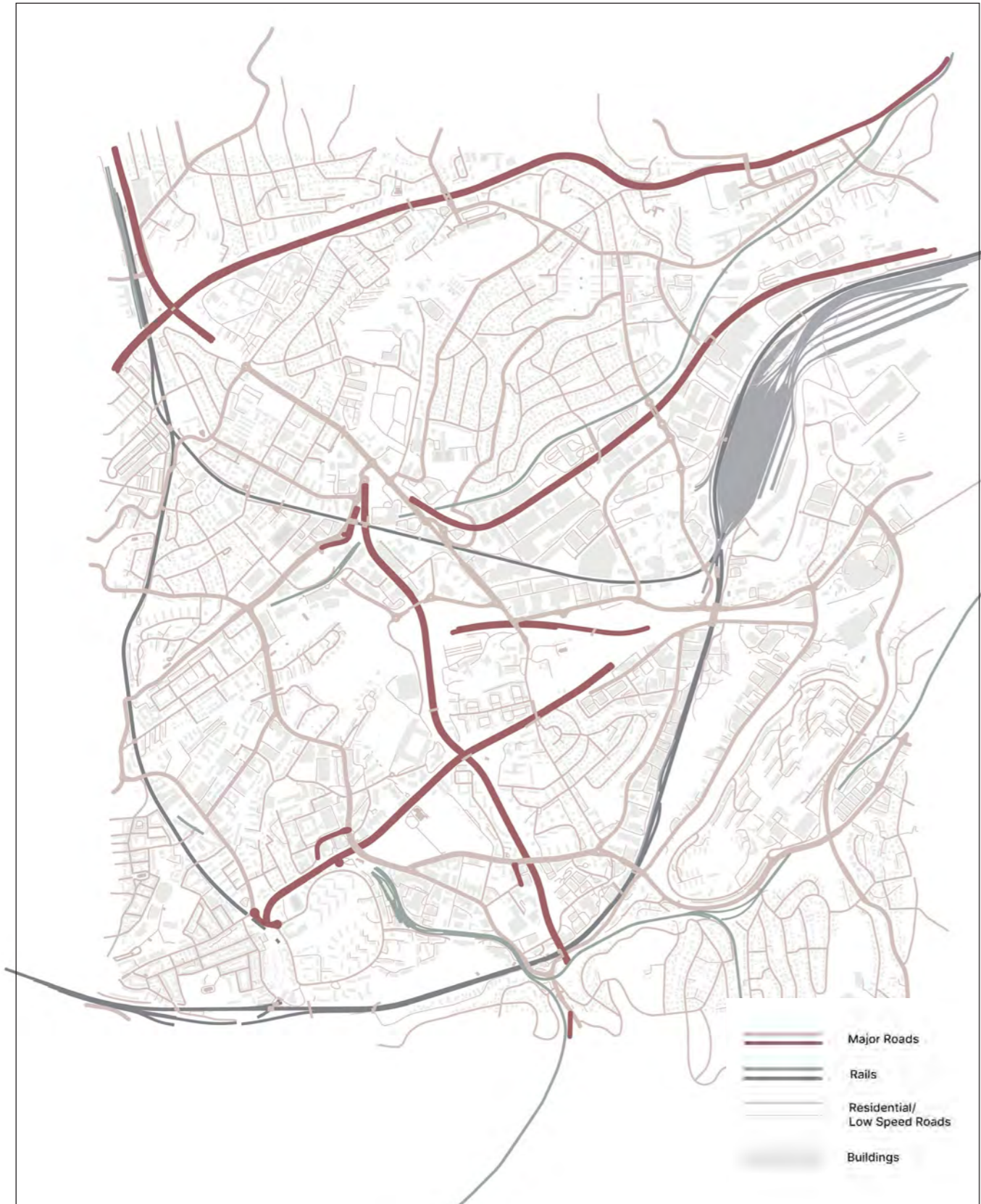


Fig. 19 Infrastructure and buildings in Hovinbyen.

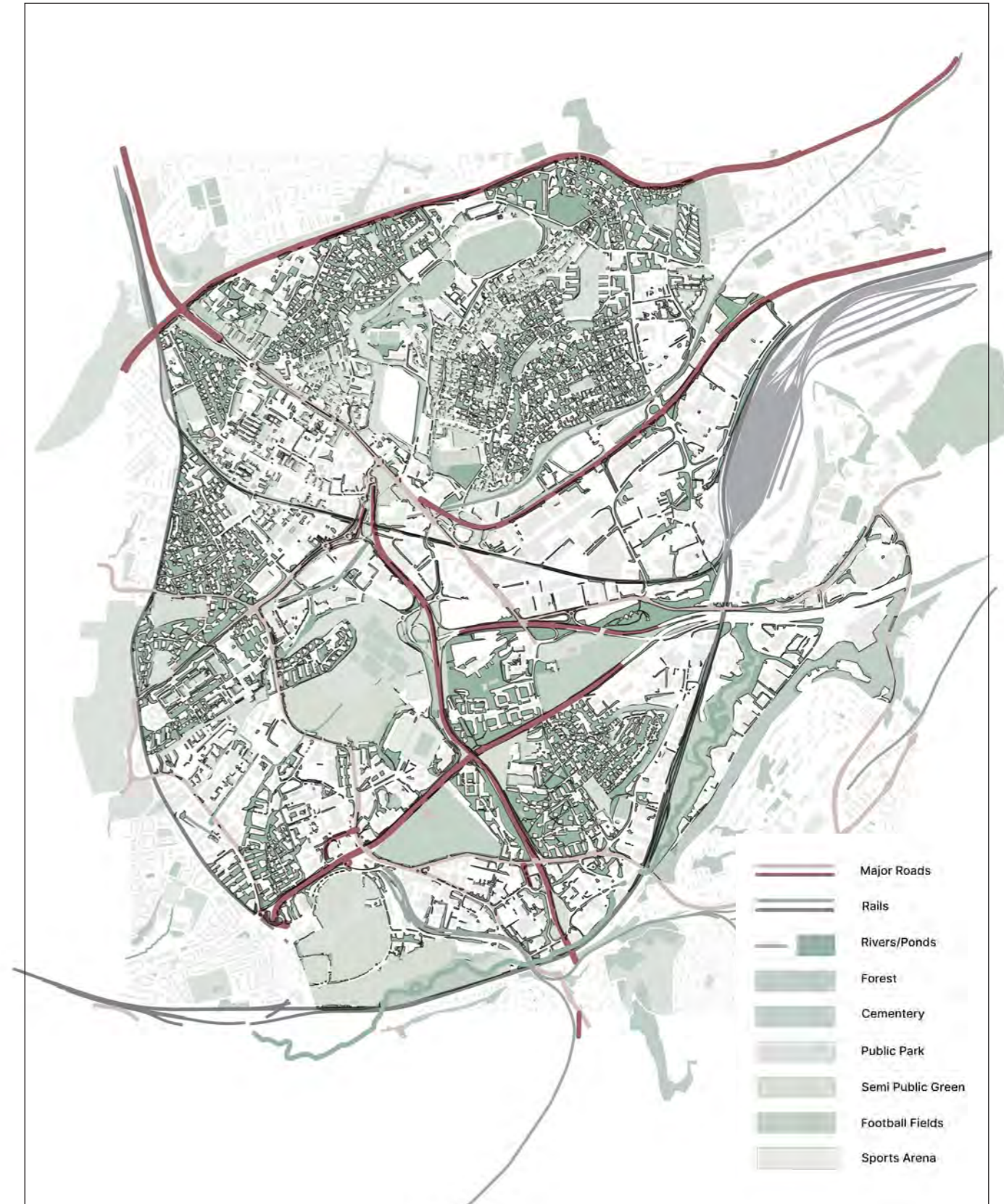


Fig. 20 All green spaces, buildings and infrastructural barriers in Hovinbyen.

Observing Established Green Spaces

1 Identifying Potential Areas



Observations have been made to get a more detailed idea of what the urban nature in Hovinbyen looks, feels like and functions of. The map (fig. 21) shows the different locations of the photography used to document the observations. The photography of urban nature is structured into different geographical areas considered connected high-density green spaces.

Based on valuing established green spaces and focusing on what we already have, through the landscape ecological principle of age, the assessed areas are Valle Hovin, Ulven, Teisen, Østre Cemetery, Svartdalen, and Etterstadsletta.

Fig. 21 Map over Observed high-density green areas in Hovinbyen.

Valle Hovin

Between Grenseveien and Ring 3 is Valle-Hovin (fig. 22-35), a residential and recreational area named after the farms Valle and Hovin. In 1933, a portion of the region was earmarked for an airport, but it was never built. The residential area is made up of 1950s-era block structures.

Helsfyrbekken operated through the area until roughly 1950. It was chosen to pipe the stream in connection with plans to create the first Helsfyr Hotel, a campsite, and a school close to the hotel so that the area could become a continuous green space. In 1952, Helsfyr Hotel and the surrounding campsite opened for business. Later, it was decided to use the area as a central sports facility, like it's used today

The area is mainly characterized by extensive areas of lawn, as well as big trees and the pond, Hovindammen. In the housing areas centered around Valle Hovin the greenery is generally more varied than throughout the park, with areas also consisting of shrubs and some places ornamental flowers. Throughout the edges of Valle Hovin, both towards the north and along Hovinbekken towards Ensjø, there are borders of trees and shrubs, making patches of urban forests.

Valle Hovin is characterized by vast open areas with lawn.



Fig. 22



Substantial parts of the area is dedicated to fenced football fields.

Meanwhile other areas are defined by lawn and electricity lines (fig. 23-24).



Around the pond there is lush trees and grasses.



The area with the pond and the lawn attracts birds as well as human spectators (fig. 27-28).



The Housing areas along Valle Hovin contains patches of shubs and hedges and rows of trees, but are mainly characterized by lawn, parking and access roads (fig. 29 - 30).





Fig. 31



Fig. 32

The sloped edge area in the north of Valle Hovin contains of forested areas (fig. 31-32).

There is a belt of trees surrounding Hovindammen, defining an enclosed zone within the open Valle-Hovin area (fig. 33-34).

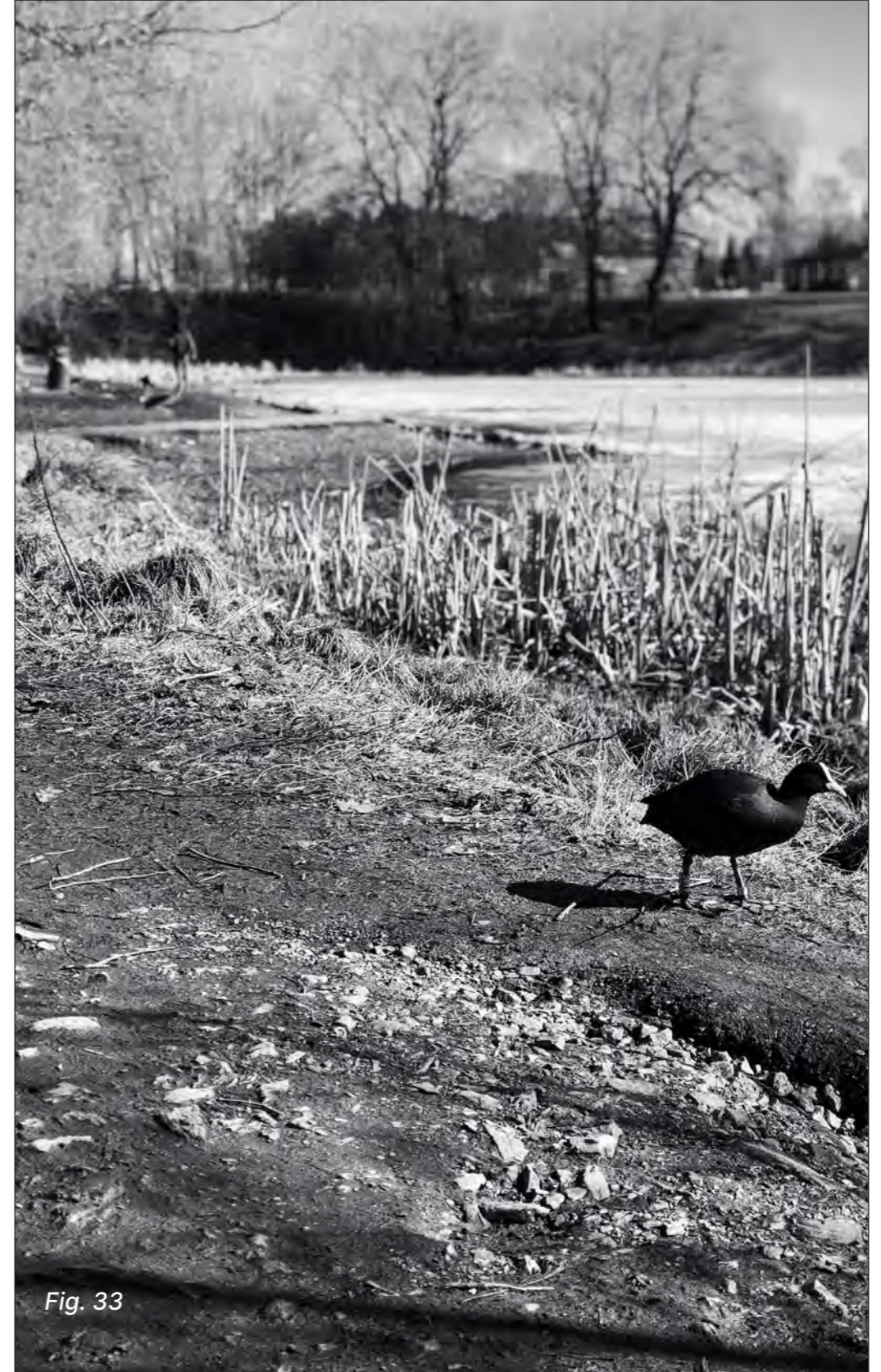


Fig. 33



Hovindammen

Fig. 35. Various Areas within Valle Hovin.



Ulven

The area Ulven (fig. 36 - 47), encompasses several sub-areas. Østre Aker cemetery lies near the Østre Aker church and is a 140 daa. big area. In 1860, the cemetery was established alongside the Church. In 1855, Aker municipality purchased the plot from the farm Ulven. Later, the cemetery was expanded. Both extensions eventually decreased slightly due to the construction of principal road routes slicing through the area.

Uvenhaugen, a hill in between two roads, is characterized by the electricity lines, the views over the industrial area, noise from the roads, and the remnant vegetation. There are both big trees, smaller shrubs, flowers, and grasses. In summer, the area flourishes with wildflowers. In addition to the variety of the graveyard, there are primarily open areas around the apartment buildings and the transformation station, providing the Ulven area with diverse green areas.

The pilgrimage path leads pilgrimages over the remnant urban nature area of Uvenhaugen.





Situated on a slight high, Ulvenhaugen serves a view over the industrial sites at Haraldrud, and opposite, towards forested hills around Oslo. Together with the views, the area gives an seemingly unique experience, consisting of a variety of remnant vegetation, bordered major roads, and visually affected by the electricity lines and transformation towers running over the area and towards the distant (fig. 37-39).

Fig. 40



Fig. 41



When crossing the lawn-clad bidge over the E6 motorway, you get a view over the surrounding infrastructure (fig. 40-41).

Fig. 42



Fig. 43

The tower of Østre Aker Church.

View from the Cemetery. Area consisting mainly of lawn, seasonal flowers and many mature trees.

The vegetation at the cemetery both consist of deciduous and coniferous tree species, native and ornamental species.



Fig. 44

Fig. 45



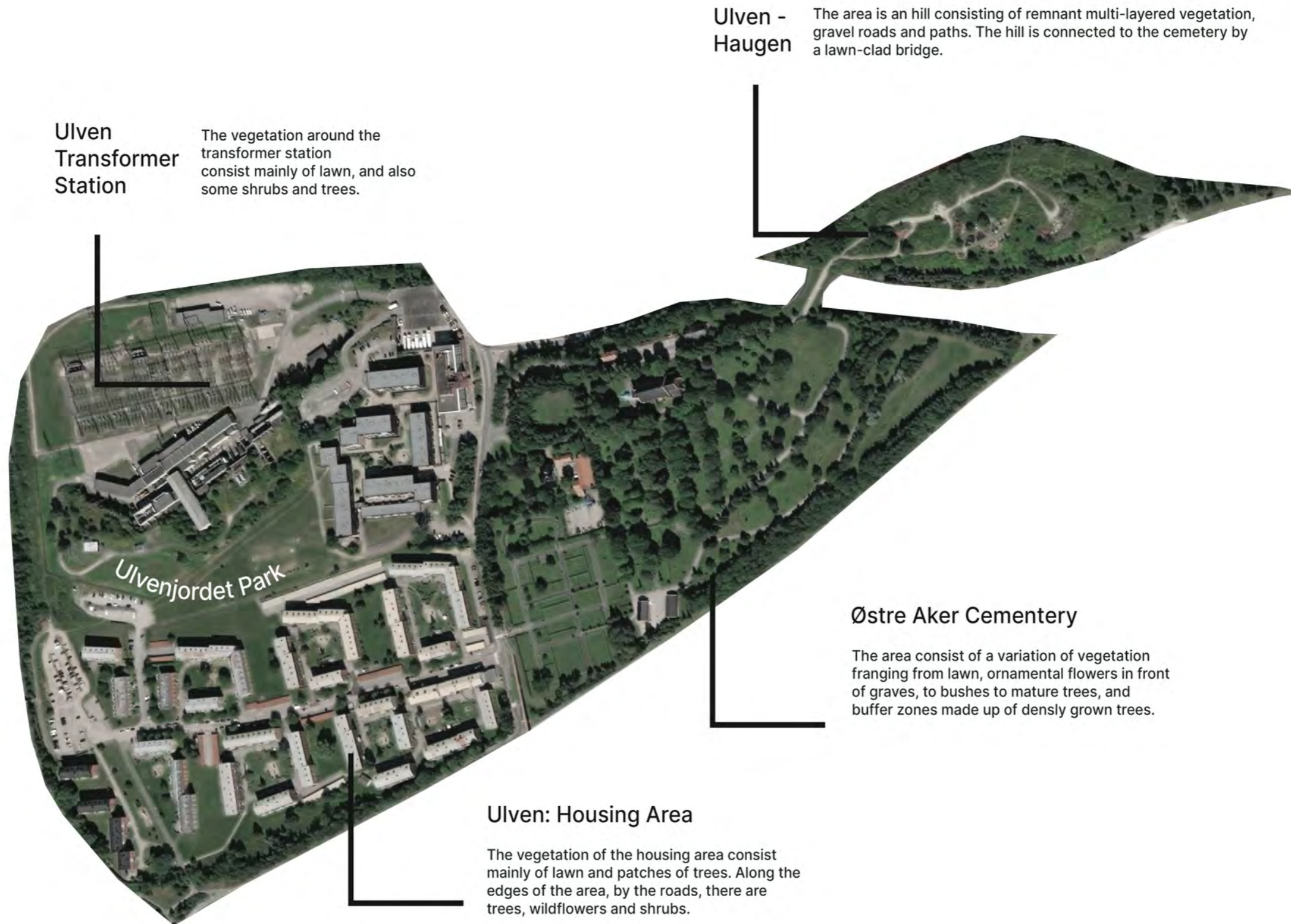
In March, the area without leafed trees and shrubs appear more open.

The transition zone between asphalt, puddles and lawn can be used for activities such as playing.

Fig. 46



Fig. 47. Various Sub-Areas within the observed Ulven Area.



Teisen

Teisen (fig. 48 - 61) is a residential neighborhood in the district Alna between Valle-Hovin and Tveita, named after the Teisen farm. Søndre Teisen was established in 1582 for free grazing and cattle farming for the residents of Oslo, and it was counted as part of the castle grounds from 1666. Before the housing development started, Teisen was a significant agricultural area. Teisen Coppelstone Fabric closed operations in 1883. Kristiania municipality purchased Teisen meadow in 1918. Before the war, the area north of Østre Cemetery, where Teisen farm was located, was relatively rural with big fields.

From roughly 1950 to ten years later, there was a substantial development at Teisen under the sponsorship of OBOS, based on designs and drawings by the architects Frode Rinnan and Olav Tveten, formerly known as Teisen-byen. The establishment of Ring 3 (Store Ringvei), which cuts through the residential area, has significantly altered the neighborhood.

Today, it is primarily a housing area built around the 60s with both villas and apartment buildings. Meanwhile, the villa areas offer a wide range of garden vegetation. The areas around the apartment buildings are primarily open, consisting of grass and trees. In some places, plantings of herbaceous flowers and shrubs can be found around the apartment buildings.

Along the E6 motorway and Ring 3, there is buffer zones of cut grass and various trees.





Fig. 49



Fig. 50

Also the Teisen area consist of many open spaces containing lawn (fig. 49-50).



Fig. 51

There is a small park in the center of the observed Teisen area.

Trees frames the view over the motorway and softens the impression of the load traffic.



Fig. 52



Fig. 53

Some places there are sporadic clusters of planted trees and seating.



Fig. 54

Trimmed hedges and lighting contributes to making the area somehow inviting.

Teisen



Green spaces between apartment buildings are characterized by lawn and use of various tree species.

Teisen

There are many old trees in the observed Teisen area.



Terrain variation provides views over nearby forested areas in Tveita, giving the impression of closeness to nature.



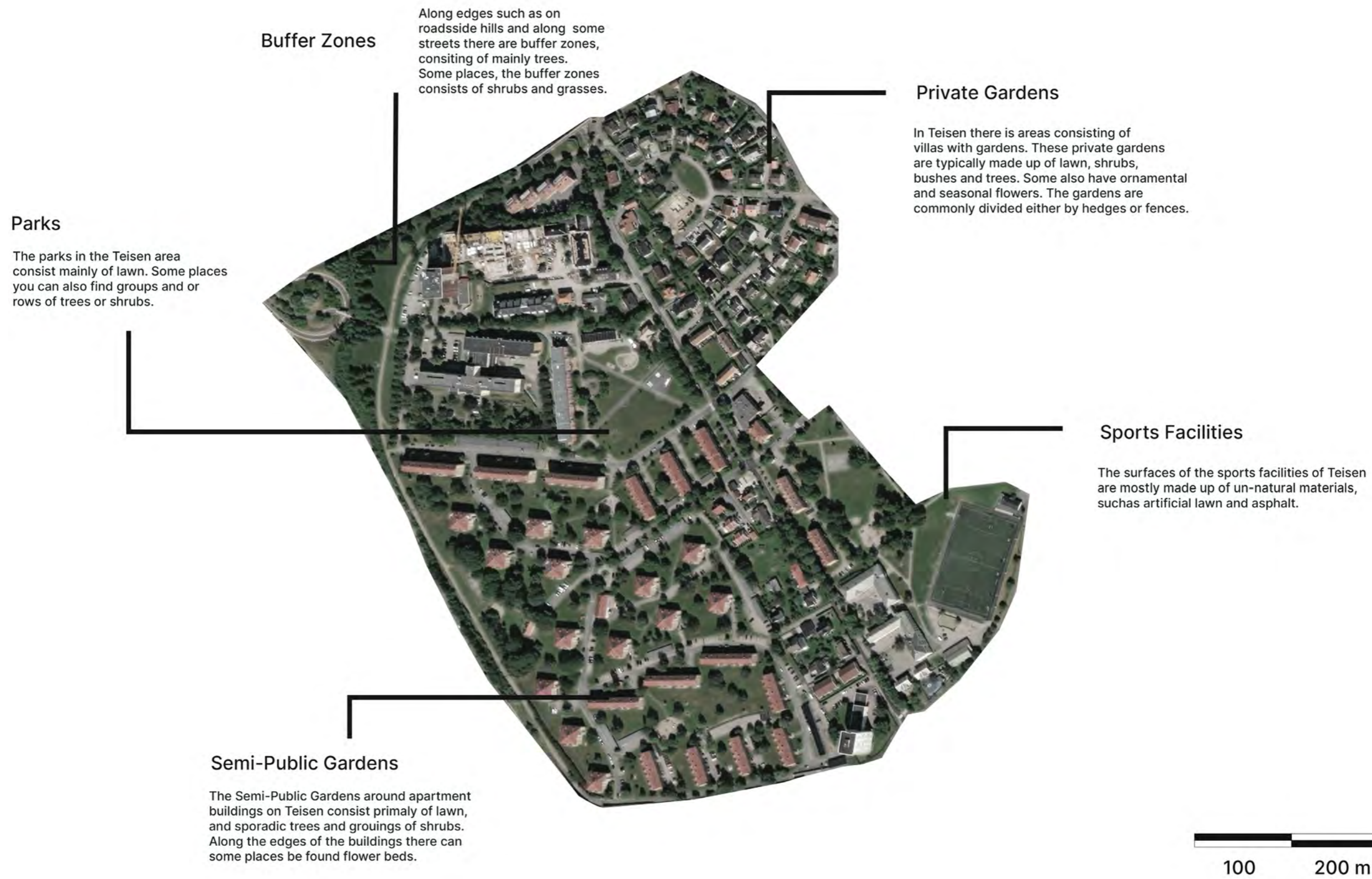
Rows of trees aligns some of the roads in the Teisen area.

Also the common black-listed species *Rosa rugosa*, rugosa rose, is planted along some of the roads at Teisen.

The path along the motorway, is bordered by noise-shielding fences, trees and strips of lawn.



Fig. 61 Sub-areas within the observed Teisen Area



Østre Cemetery

Østre Gravlund (fig. 62 - 71) is located near Hølsfyr. The cemetery was established in 1895, following the purchase of the Hølsfyr farm by Kristiania municipality in 1892. The burial grove was enlarged multiple times, most notably in the 1920s and 1930s. It is currently 140 daa.

The area consists of rows of trees, a mix of coniferous and deciduous tree species, established shrubs, and lawns. Around the graves, there is mostly a mix of seasonal flowers. Although some places, graves are planted with shrubs. Large mature trees are abundant in the cemetery. The vegetation composition can provide hiding places for animals, yet the area is surrounded by infrastructure, diminishing some of this functionality.

Rows of trees contribute to define some of the main axes in Østre Cemetery.



Fig. 62



The vegetation around the chapel reflects the style of the building.



Inside the cemetery, there is a zone where plantings of lush grasses softens the impression of the ordered burial ground.



Fig. 65

The planting in front of the chapel is ordered symmetrically.

Several layers of vegetation, in addition to the variety of species growth types, sections the spaciousness of the cemetery into multiple layers.



Fig. 66



Fig. 67



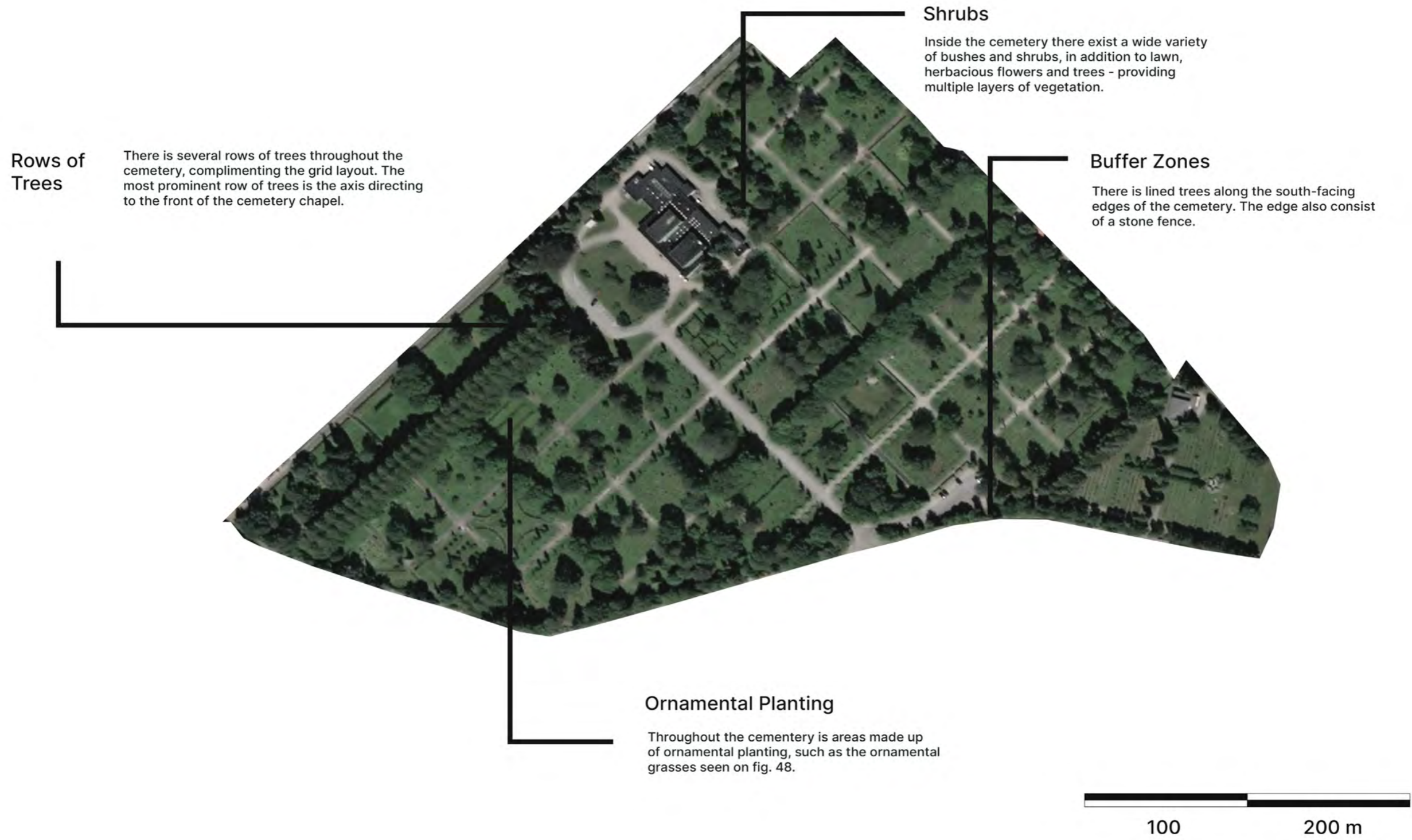
In some places, the vegetation shapes visual walls against the surroundings; other places areas appear more open and, thus, less shielded (fig. 68 - 70).





Fig. 70

Fig. 71 Sub-areas within the Østre Cemetery area.



Svardtalen

Svardalsparken is part of the Alna River green belt. 90 daa was rehabilitated in 1993 after being established and maintained as a park in the 1930s. A 900 m long hiking track, part of Alnastien, runs across the area connecting Klosterenga with Bryn.

Svardalen (fig. 72 - 84) is a narrow-cut valley above Kværner through which the Alna River rushes in rapids and falls. The name is derived from the black mountain walls that run along the valley's south side. Enebakkveien towards Lodalen, Konows gate, Svartdalsveien and Arnljot Gellines vei from the boundaries of Svartdalen. A former mill and sawmill were located here. In 1948, the Kværner waterfalls were piped. Svartdalen is a mainly intact natural environment with a dense deciduous forest and a diverse fauna consisting of species such as elm, ash, oak, linden, maple, willow, and blackthorn.

375 meters of the trail is a walkway under two railway bridges and a road bridge, and the rest of the route is a boardwalk on high pillars across a gorge. The hiking track winds through primeval forest with a significant component of deciduous woodland, where dead and dying flora is allowed to lie as a foundation for a diverse biological community.

The Svartdalen area consists of contrasting vegetation, from the ordered Svartdalsparken in the south, to the ancient forest along the Alna river in the north (fig. 72 - 73).



Fig. 72



Fig. 73

Fig. 74



The winding path and walkway allows close contact with the Alna river (fig. 74-76).

Svartdalen



Fig. 75

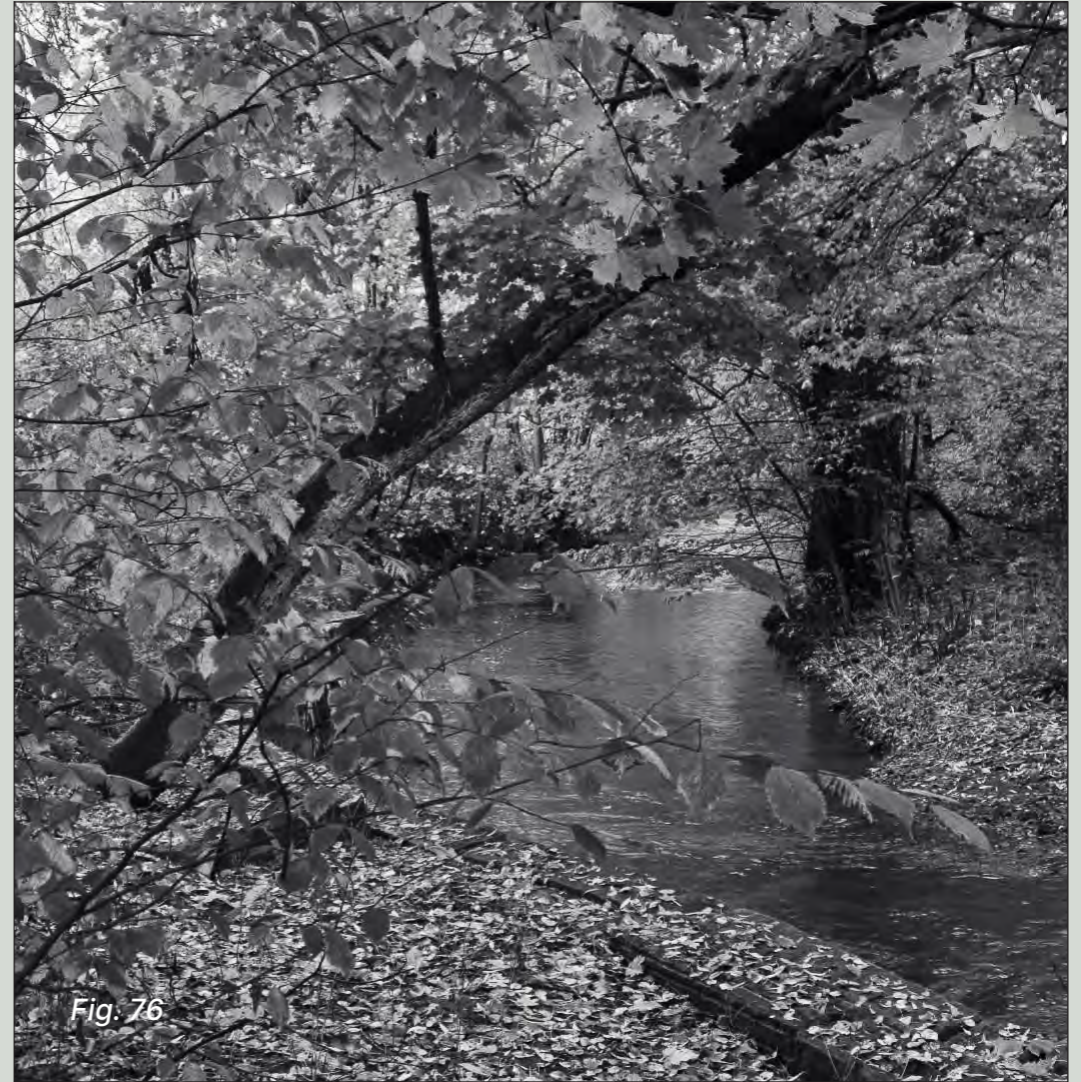
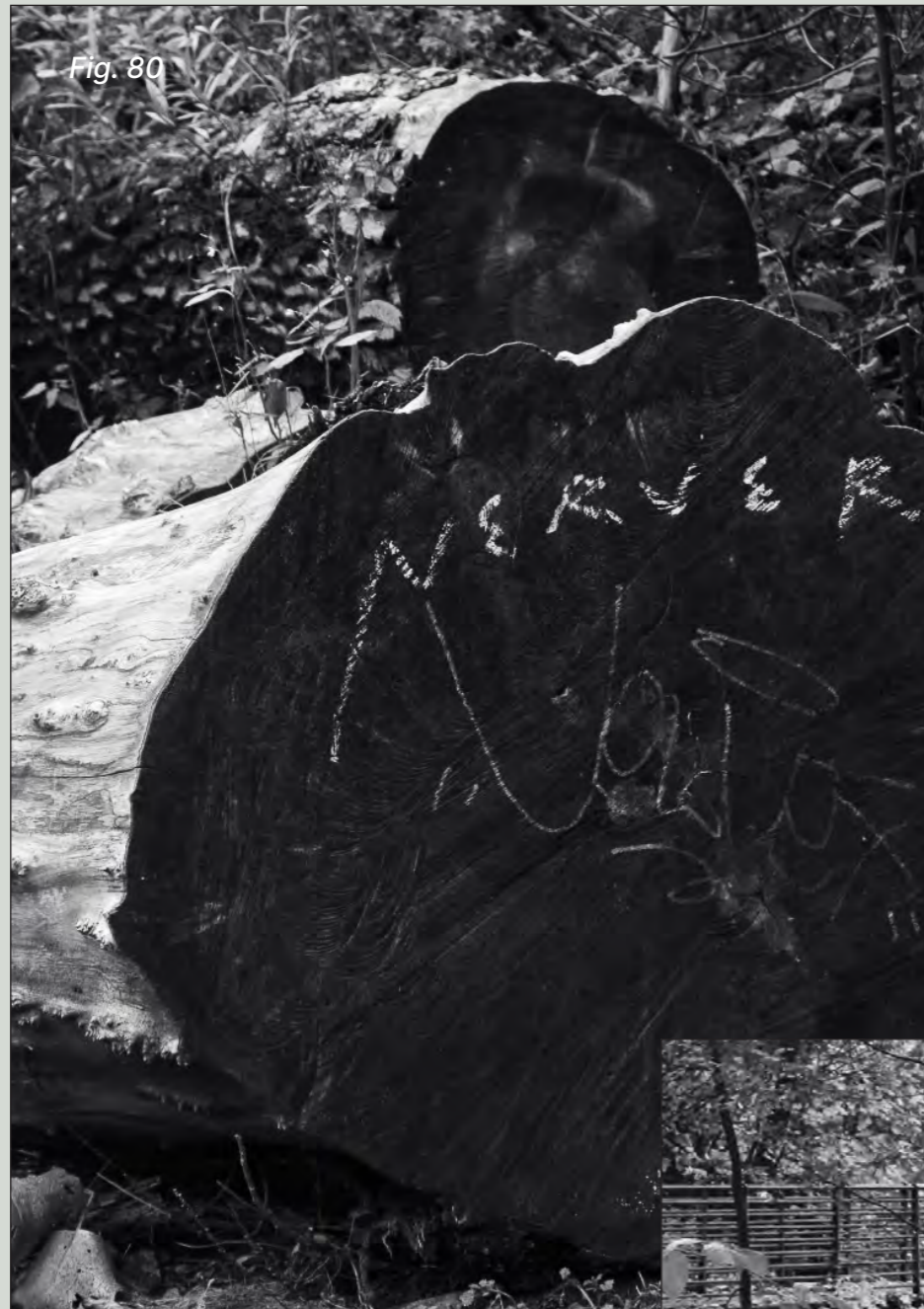


Fig. 76



The views throughout the area, varies from ordered areas, to hillsides consisting of remnant vegetation and forest, to placed piles of decaying wood (fig. 77-81).

Svartdalen



Svartdalen

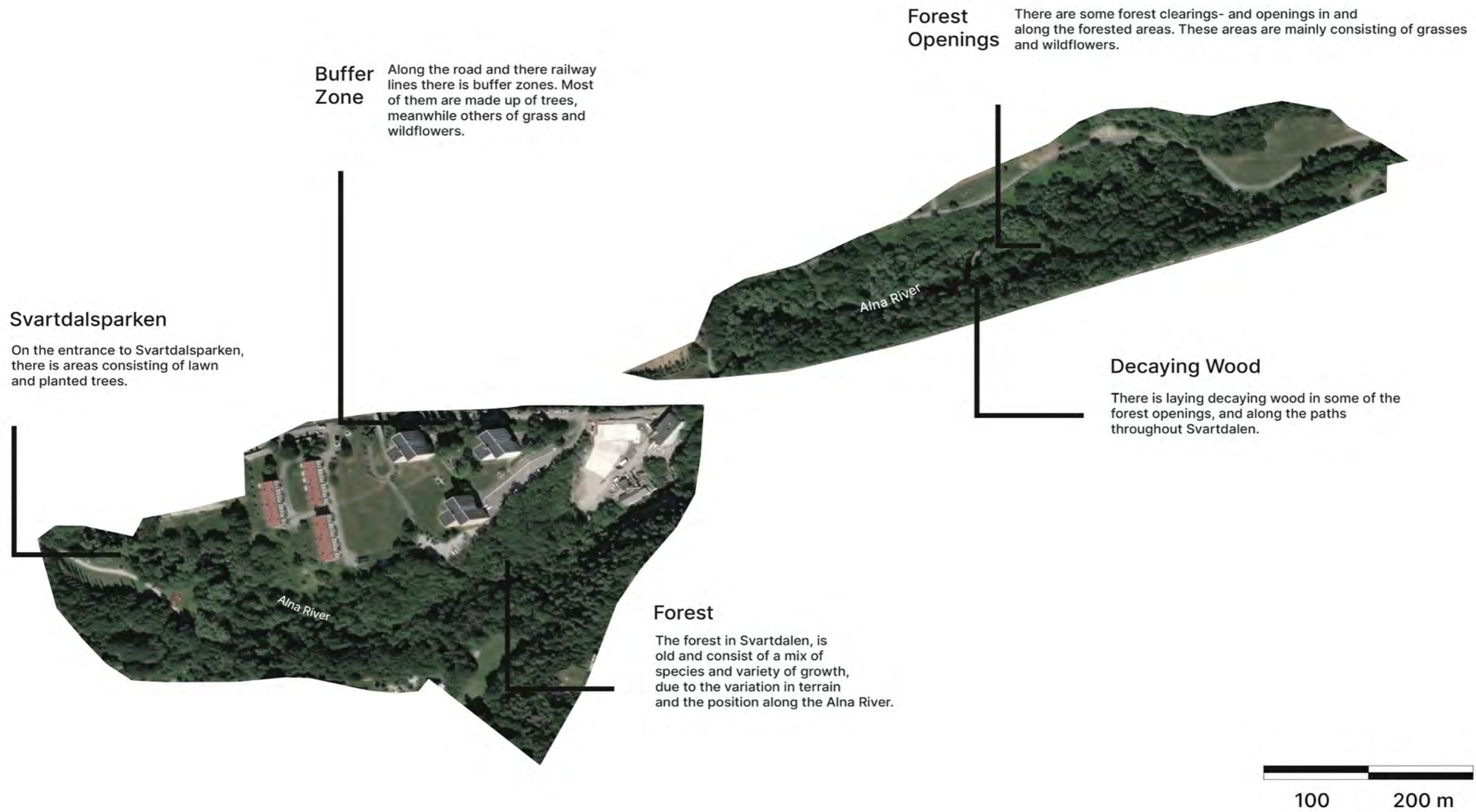


In some places, you get a glimpse of the surrounding housing areas, but for the most part, the Svartdalen area allows you to feel like you are submerged in a forest, despite its central location in Oslo (fig. 78-81).



Fig. 83

Fig. 84 The Observed Svartdalen area consist of various sub-areas.



Etterstadsletta

Etterstadsletta (fig. 85 - 98) is part of the area Etterstad, an area in Gamle Oslo. The area is named after Etterstad farm. Etterstadsletta is the former name of the plain used by the army as an exercise area from 1795 to 1881, and where annual military exercises were held for the city's surrounding area. Housing construction began here prior to the war. During the occupation, there was located a large military camp on the field named Etterstad. The city annexed the neighborhood in 1946, and housing construction was completed in the postwar years.

Today, the area appears as a big, connected area, with no disturbance from traffic within the core of the area. It has a public park in the middle, Etterstadparken. As the area lies in a south-facing slope, and holds a lot of space between the buildings, the park appears open and filled with light. The vegetation consists for the most part of two layers, mainly big lawns and mature trees, that contribute to the feeling of openness.

Etterstadparken is a public park arraying through the Etterstadsletta housing area. The park is mostly consisting of lawn, bordered by various mature trees.

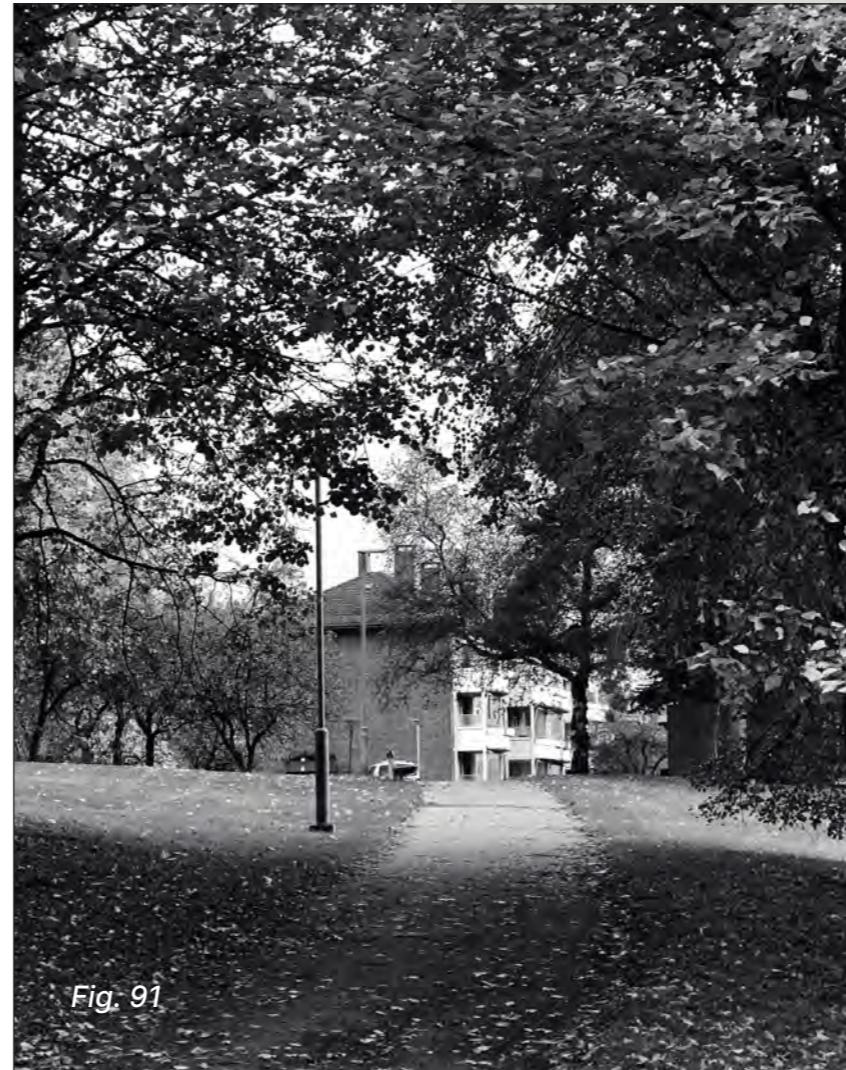


Fig. 85



The area consist of different visual zones, varying from the open areas in front of the high school, to the lawns in facing the apartment buildings, the clusters of mature trees in the middle of the park, and the open area in the stretch towards Helsfyr T (fig. 86-89).





As the topography slopes through the park and mature trees border different zones, the walk through the park allows for many different visual experiences. However, the layering of the vegetation stays mostly monotonous with two layers (fig. 90-92).

Etterstadsletta



Fig. 93

The Etterstad area is characterized by the connected green space areas, as access roads are distributed to the sides of the neighbourhood.

Etterstadsletta



Fig. 94

Today, some of the area facing Etterstadparken, is allocated as a building site for the expansion of the High School.

Etterstadsletta



Etterstadsletta



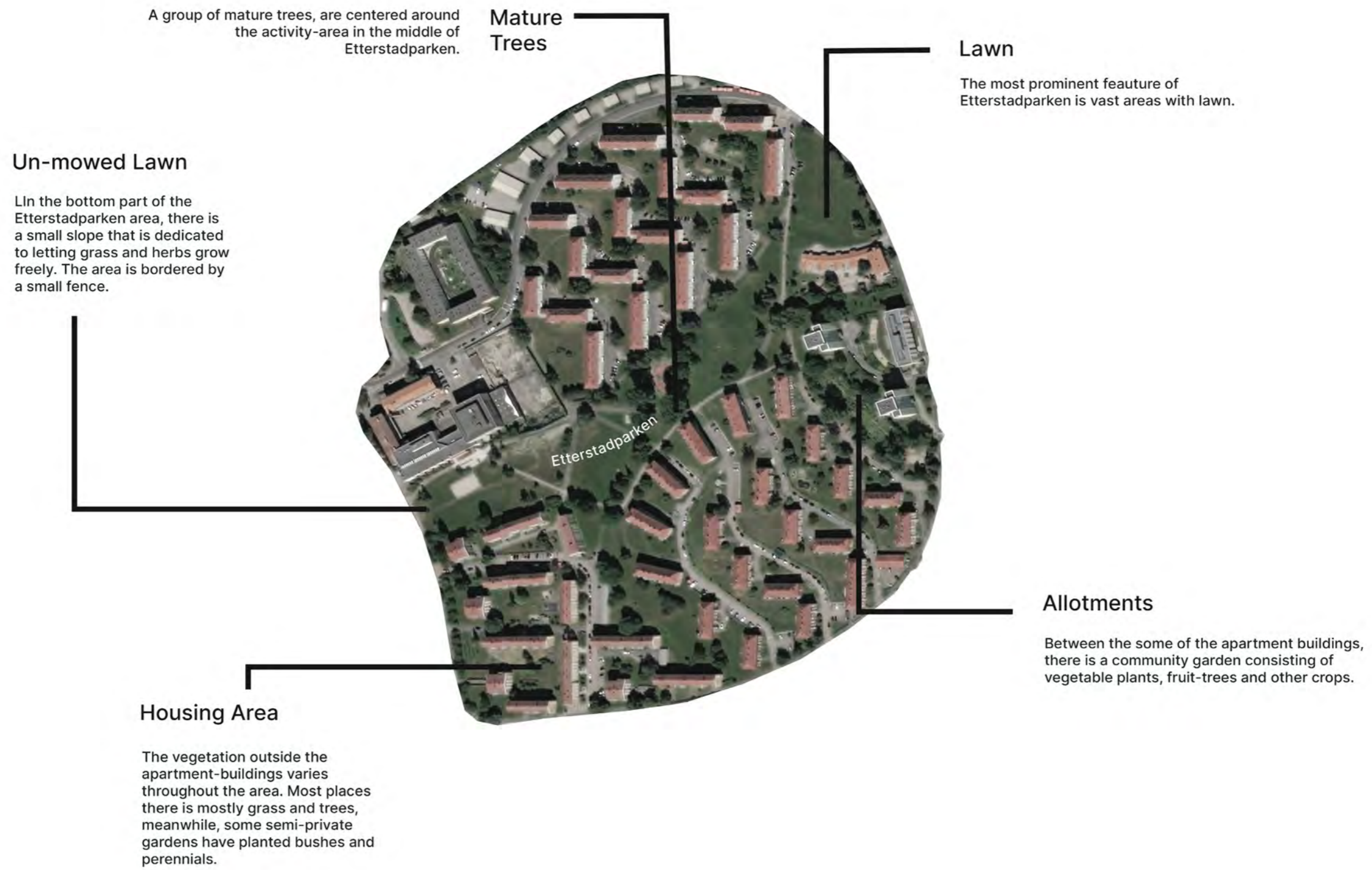
There is an activity-zone around the middle of Etterstadparken consisting of playground and an outdoor-gym, in addition to a small community garden and a stage (fig. 95-97).



Fig. 97

The scale of the trees in the middle of Etterstadparken compared to the light posts and park benches are immense.

Fig. 98 Various types of plantings in the Etterstadsletta area.



Resulting Overview of Observations

A pattern observed both on-site and while mapping green spaces was that a significant share of the areas with a higher density of green spaces consisted of few vegetation species. Many areas very characterized as open, with cut grass as the most prominent element. Most areas had only two layers, grass and tree/canopy, but few had more, such as bush and herbaceous layers—those layers were, if existent, restricted to smaller areas, often close to edges. The exceptions from this pattern were areas such as burial grounds, edges in steep terrain, and urban forest areas.

An area that especially caught my attention was Etterstad—positioned at the edge of the Hovinbyen area, bordered by significant infrastructure elements like rail, motorway, and subway lines. Simultaneously, it's an area that, at its core, consists of a vast continuous green open space with a public park, Etterstadparken.

Several other public green areas are in proximity to Etterstadsletta. Neighboring the opposite sides of the infrastructure is both a burial ground, an allotment garden, and the urban forest area along Alna River, Svartdalen. In addition, it's located close to infrastructure connections, Helsfyr, and Vålerenga, in the direction of Oslo's city center, which all in all gives the impression of an area with great potential for improving urban nature qualities (fig. 99).

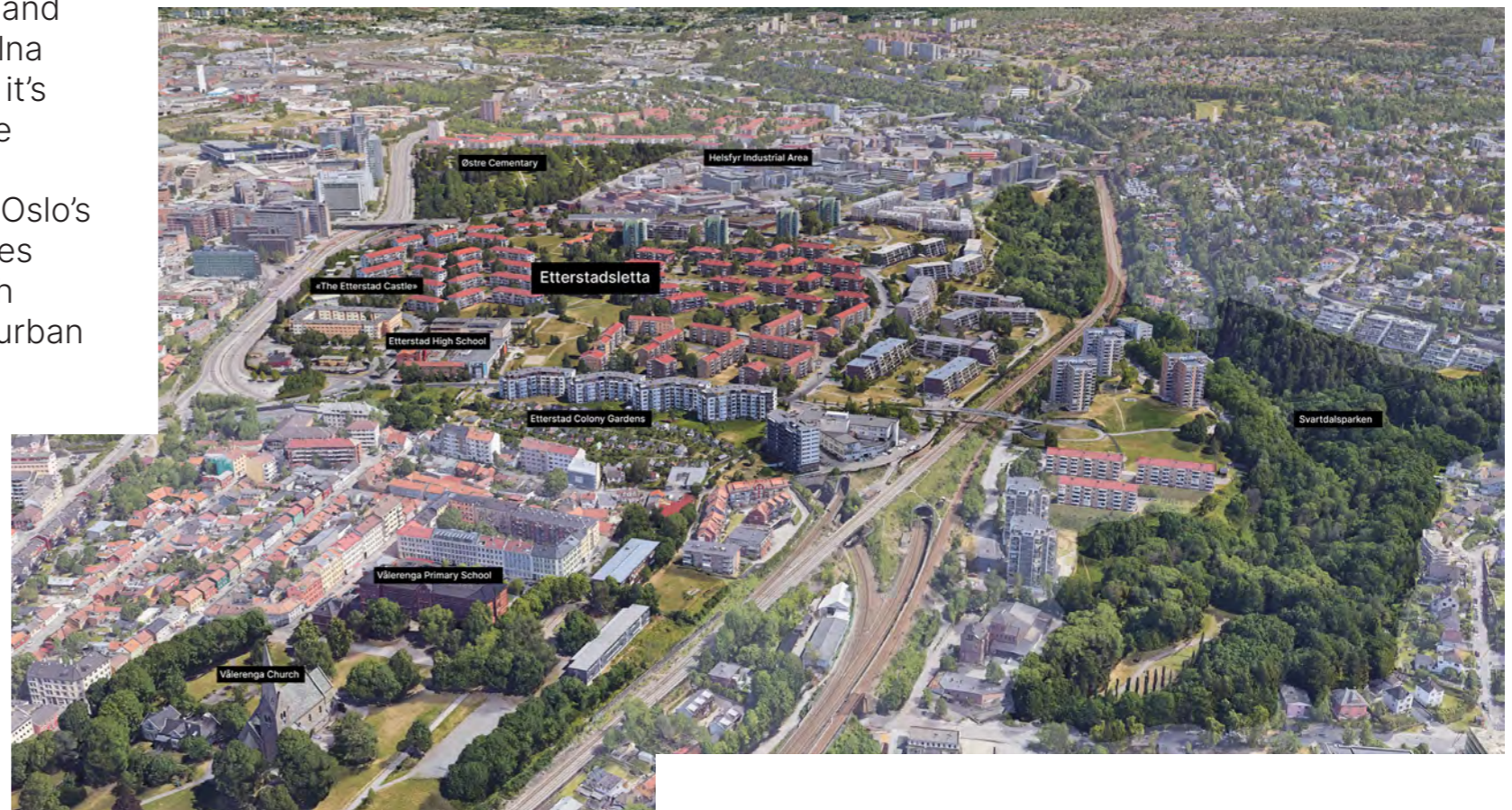


Fig. 99 Etterstadsletta with nearby green areas

With a background in the exciting location, the size of the connected green space area, and the neighboring green areas, I decided to choose Etterstadsletta as my project area.

4

Etterstadsletta

- 4.1 Neighbourhood
- 4.2 Connecting Urban Nature
- 4.3 SWOT - Analysis
- 4.4 Design Proposal
- 4.5 Design Strategy

This chapter uses the proposed methodology to analyze and design Etterstadsletta to promote urban nature quality.

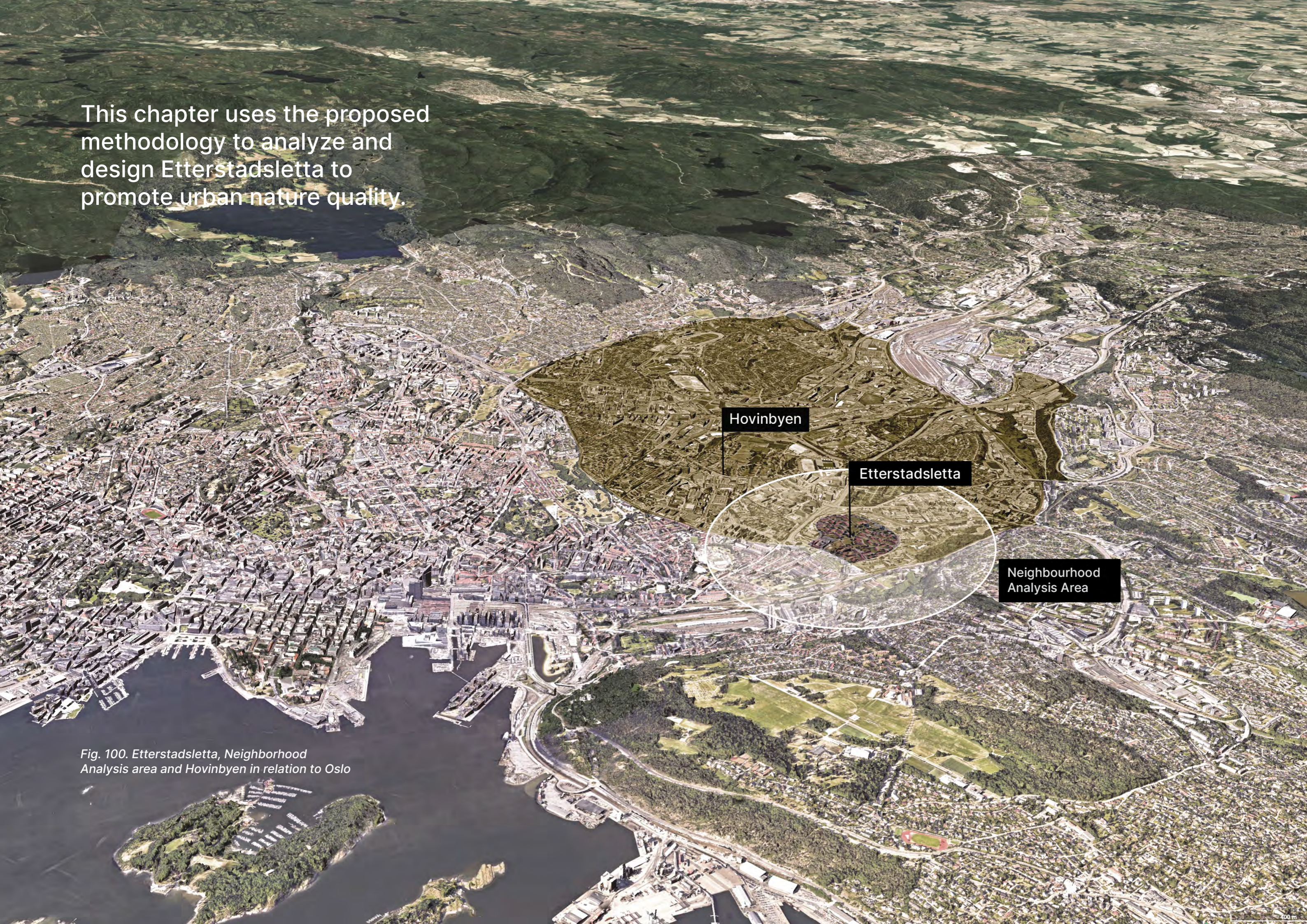


Fig. 100. Etterstadsletta, Neighborhood Analysis area and Hovinbyen in relation to Oslo

4.1 Neighbourhood

Etterstad is located at the edge of the Hovinbyen area (fig. 100 - 101). Neighboring industry and trade areas consist of office buildings and industrial facilities. Towards the south, its adjacent to Etterstad colony gardens and Vålerenga, consisting of small-scaled historic wood buildings. The Etterstadsletta area is also home to Etterstad High School in the south and a day home for elderly in the north.

The public park consists of an activity area with a playground and gym. There is a small stage in the center of the park. Behind the activity area is a small allotment garden belonging to the neighborhood's inhabitants. In front of the high school, there is a volleyball field. There are benches and light posts sporadically placed through the park, around the activity area, and in front of the high school.

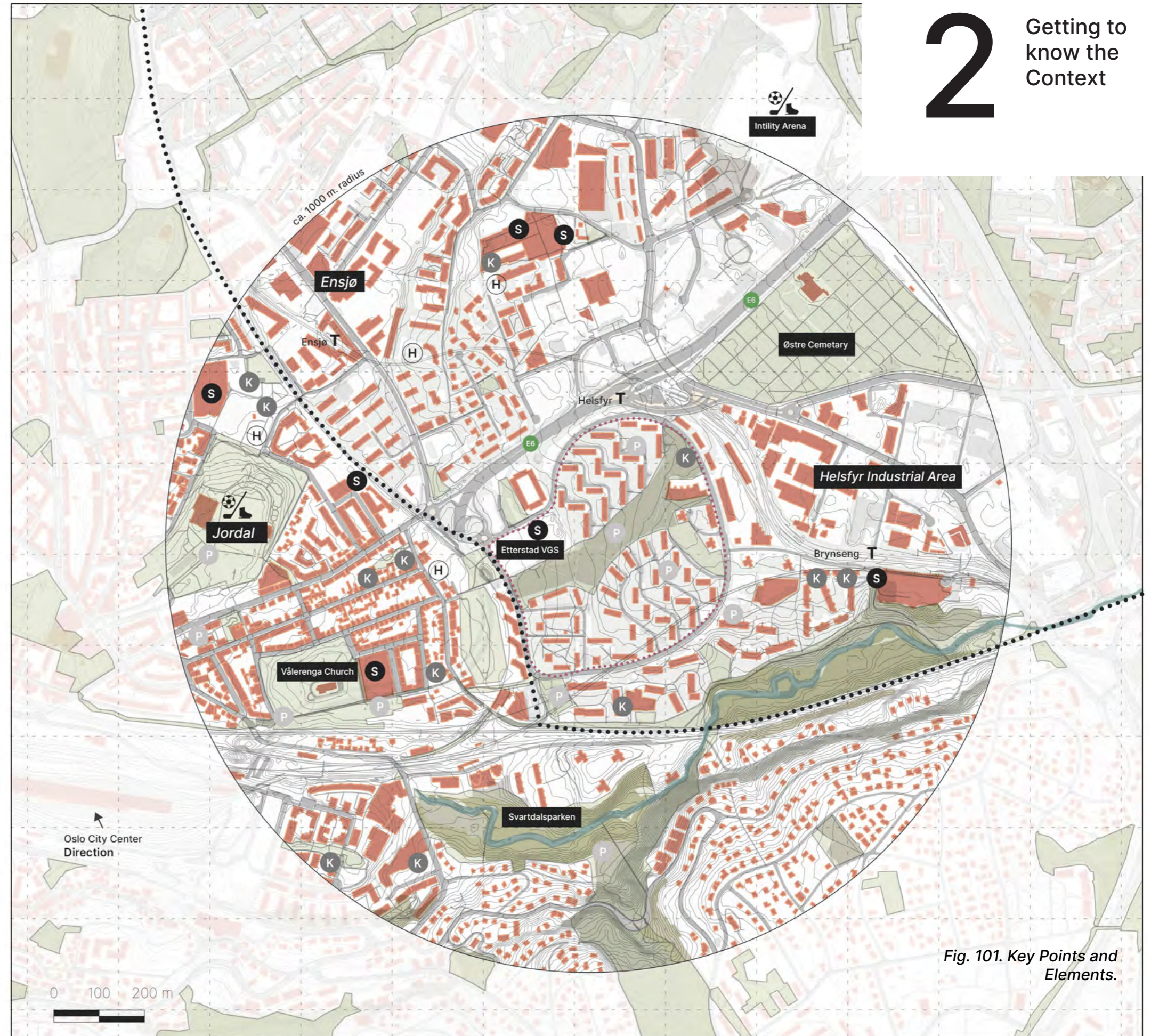


Fig. 101. Key Points and Elements.

History

As the Norwegian name implies, (translated field) the Etterstadsletta has been an open grassland area, part of a manor (Oslo City Encyclopedia, 2022) (fig. 102 - 103). In 1908 the first ever flight in Norway took off from Etterstadsletta (Oslo City Encyclopedia, 2022.). Etterstad is also home to the characteristic building “Etterstadsloftet” (The Etterstad Castle), which is designed with features both from neoclassicism and functionalism (OBOS, 2021). The building is characterized by its structure built around a courtyard, and it is the first housing association building built in Oslo. After WWII, the Etterstadsletta area was further populated by apartment buildings built by the Norwegian Public Housing Association, OBOS.

One of the modernist ideas of the building style in the post-war period was to use simple design that created open, bright neighborhoods where there was sufficient space to partake in character-building activities and play, and for workers to rest (M. Kohout & J. Kopp, 2019). Thus, the outdoor areas were not programmed to contain anything other than lawn at the time, which can be seen on the aerial photos (fig. 102).



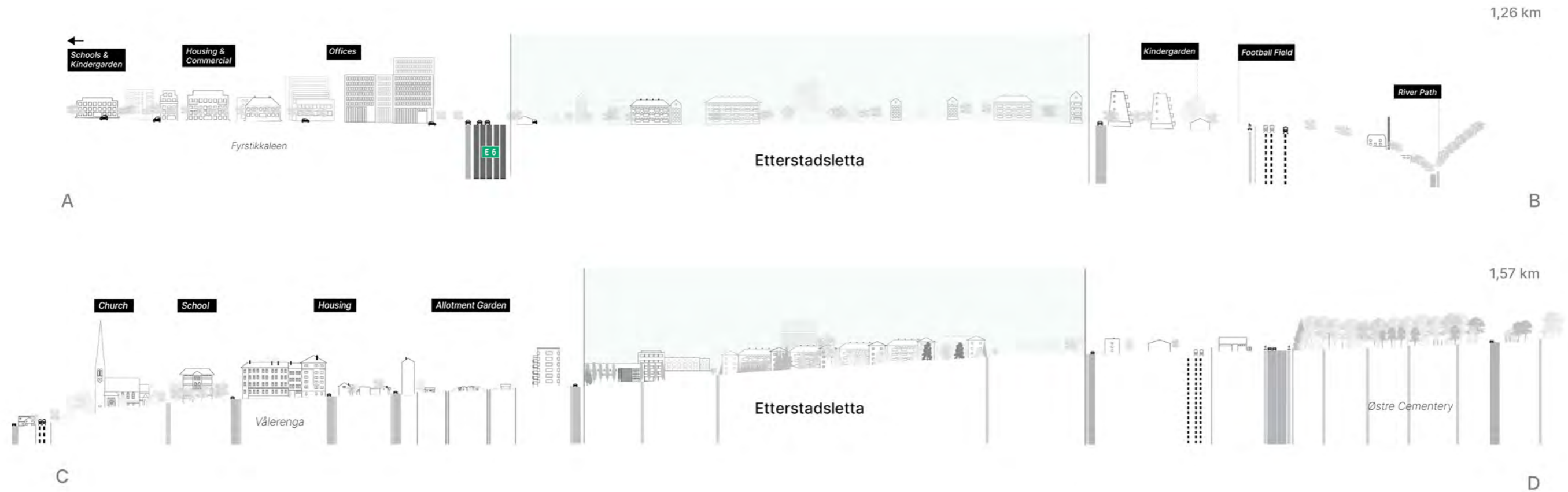
Fig. 102 Timeline of Etterstadsletta.



Fig. 103. View from Etterstad. Painted by Carl Fredrik Vogt in 1815 pictures how Etterstad looked like before the area became part of Oslo. Accessed from Oslo Museum.

View from Etterstad.
Painted by Carl Fredrik Vogt, 1815.

Fig. 104
Illustrative Sections through
the Neighborhood



Section A to B (fig. 104) shows the area from Fyrstikkaleen, through Etterstadsletta, towards Svartdaldalen, a deep creek along the Alna River. This section shows how Etterstadsletta in this direction is connected in the inner area, with parking on the edges. The area around Fyrstikkaleen primarily consists of office buildings, schools and kindergarden, and some housing. After Etterstadsletta, towards Svartdalen, there is terrace housing. Further, remnants from the industry once energized by the river are located on the slopes after the rail lines.

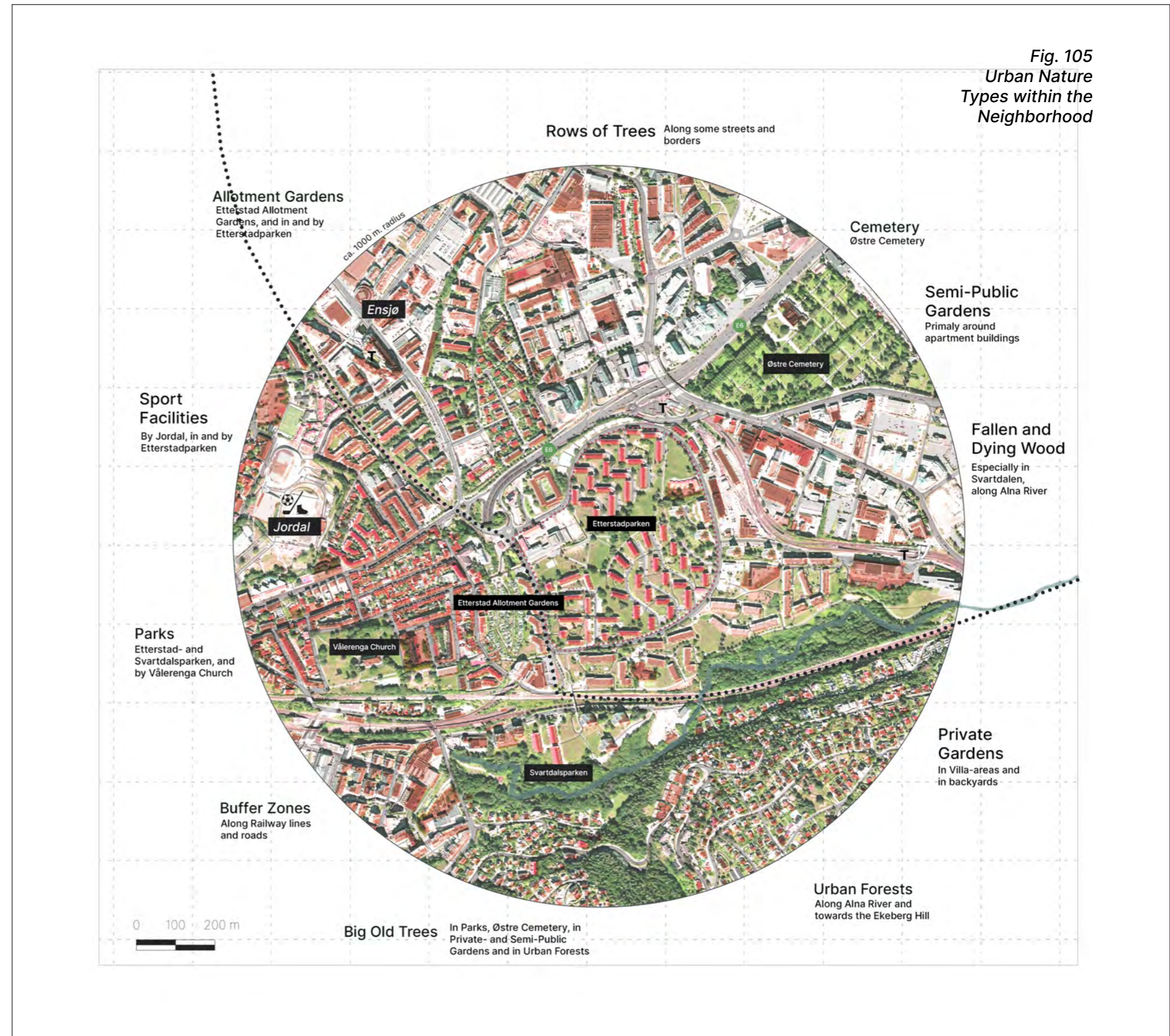
Section C to D runs from the railway lines below Vålerenga Church towards Vålerenga, Etterstad Allotment Gardens before running through Etterstadsletta and towards Østre Cemetery. This section shows the contrasting housing typologies, reflecting different building epochs and developments. Vålerenga consists of protected wooden house environments from around the 1830s. The Church from 1902, and Vålerenga school from 1893–95 (Encyclopedia of Oslo, 2022). The allotment gardens are a fenced area primarily open for the public to pass through (in the summer until 21 in the eve). These small-scale cottages were established in 1908. In 2004, the apartment buildings between Etterstadsletta and the Allotment Garden were built on "a lid" over the railway (Encyclopedia of Oslo, 2022).



4.2 Urban Nature & Connectivity

Today the Etterstad neighborhood is made up of various types of urban nature (fig. 105). As the observation of urban nature hinted at, these types are ranging from contagious areas of urban forests to cemeteries, private gardens and strips of buffer zones.

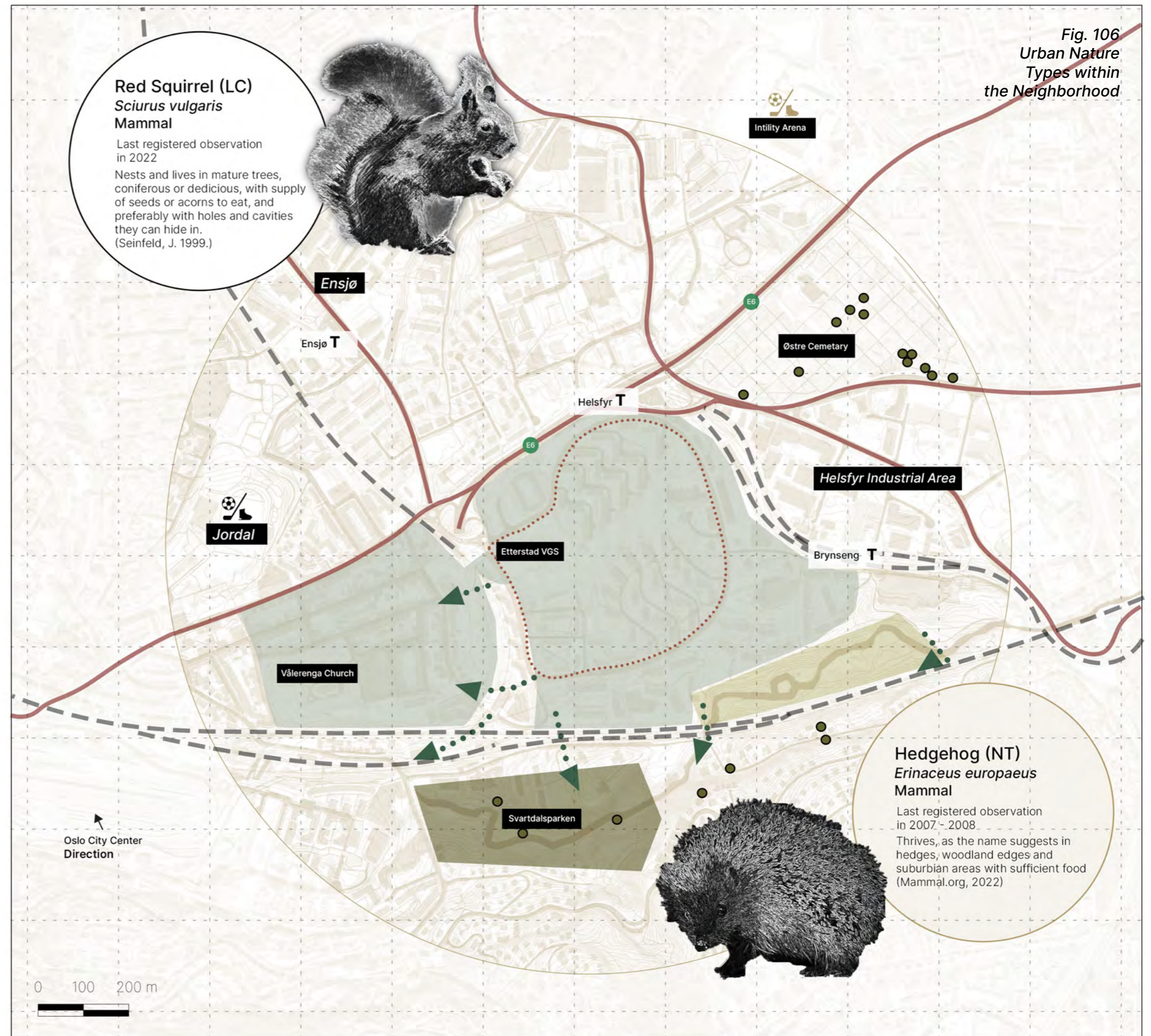
The location of Etterstadsletta on a south-facing slope allows plenty of sunlight to reach the area. Climate zone is currently H3-4 (Det Norske Hageselskap, 2022). NVE calculations point out that there are no current nature dangers in Etterstadsletta. However, Climate Service Center projects changes in flood conditions and magnitude, landslides, floods, and storm surges in the Oslo and Akershus region (Klimaservicesenter, 2022), which all contribute to the need for adaptation to heavy rainfall and increased surface water problems.



Urban Nature Connectivity within Neighbourhood

By looking at registered data from the Environmental Directorate together with observation data from Artsdatabanken, we can get an idea of existing habitat areas for species of management interest throughout the neighborhood (fig. 104). In Svartdalen there is registered habitat areas for two threatened species of fungi. While both Etterstadsletta and the Vålerenga area were in 2006 registered as a habitat area for hedgehogs, there have not been registered hedgehogs in this area after 2008. Since the Hedgehog is a nocturnal animal, it's still probable that the species could exist in or in proximity of the study area. The hedgehog is registered on the Norwegian Red List as near endangered (NT) (Artsdatabanken, 2021). Another mammal that has been registered in proximity of Etterstadsletta is the more common species red squirrel, *Sciurus vulgaris*. The red squirrel is registered both at Østre Gravlund and in Svartdalsparken during the last couple of years (Artsdatabanken, 2022). Squirrels' conservation status in Norway is rated as LC, viable, on the Red List of 2021.

Similarly, to as mapped and observed in Hovinbyen, in chapter 3, the Etterstad neighborhood is clearly divided by infrastructural barriers. Both the E6 motorway, the railway and metro lines as well as other major roads, works as barriers between the habitat areas shown in figure 106.



In order to work systematically with promoting urban nature quality, there will be favorable to choose some relevant species to accommodate the landscape design for. With background in the Etterstad areas registration as habitat for hedgehogs, along with the registrations of squirrel in the proximity, red squirrels and hedgehogs make up the chosen species.

Selected Species – Hedgehogs and Red Squirrels

Hedgehogs are nocturnal. The autumn & winter months are their most crucial months as they gather more food to gain weight before hibernation, which is typically from December to March. Predator birds hunt hedgehogs, as well as red foxes, dogs, and badgers (Mammal Society, 2022). Hedgehogs thrives in areas where there is plenty of hiding places, and foods. Tall grass, bushes, composts, fields, holes in the ground as well as stone fences, can all be hives for hedgehogs (Mammal Society, 2022).

The hedgehog (*Erinaceus europaeus*) was once a deciduous forest species, but it can be found in villa gardens, parks, cultural landscapes and other green spaces (Miljølære, 2022). They thrive in shrubs, bushes, meadows, ditches and untidy gardens and areas where you can find a lot of food and good hiding places and hive materials (Mammal Society, 2022). They feed on large insects, larvae, snails, earthworms, chicks, mouse chicks, worms, frogs, scavengers, fallen fruit, berries and fungi. And they build round hives of dry leaves and grass, usually 30 – 60 cm in diameter (Miljølære, 2022).

In Norway, similarly to many other countries, the conservation status of the hedgehog is endangered (red list, Artsdatabanken, 2022). With threats to their livability such as, habitat fragmentation, pesticides, and incidents with lawnmowers and cars, the decline of hedgehog populations is considered as an indication of a decline in health of ecosystems (Cornwall Wildlife Trust, 2020). Thus, the promotion of livability for hedgehog by securing connections, food and shelter is oppositely benefitting for the health of these urban nature environments.

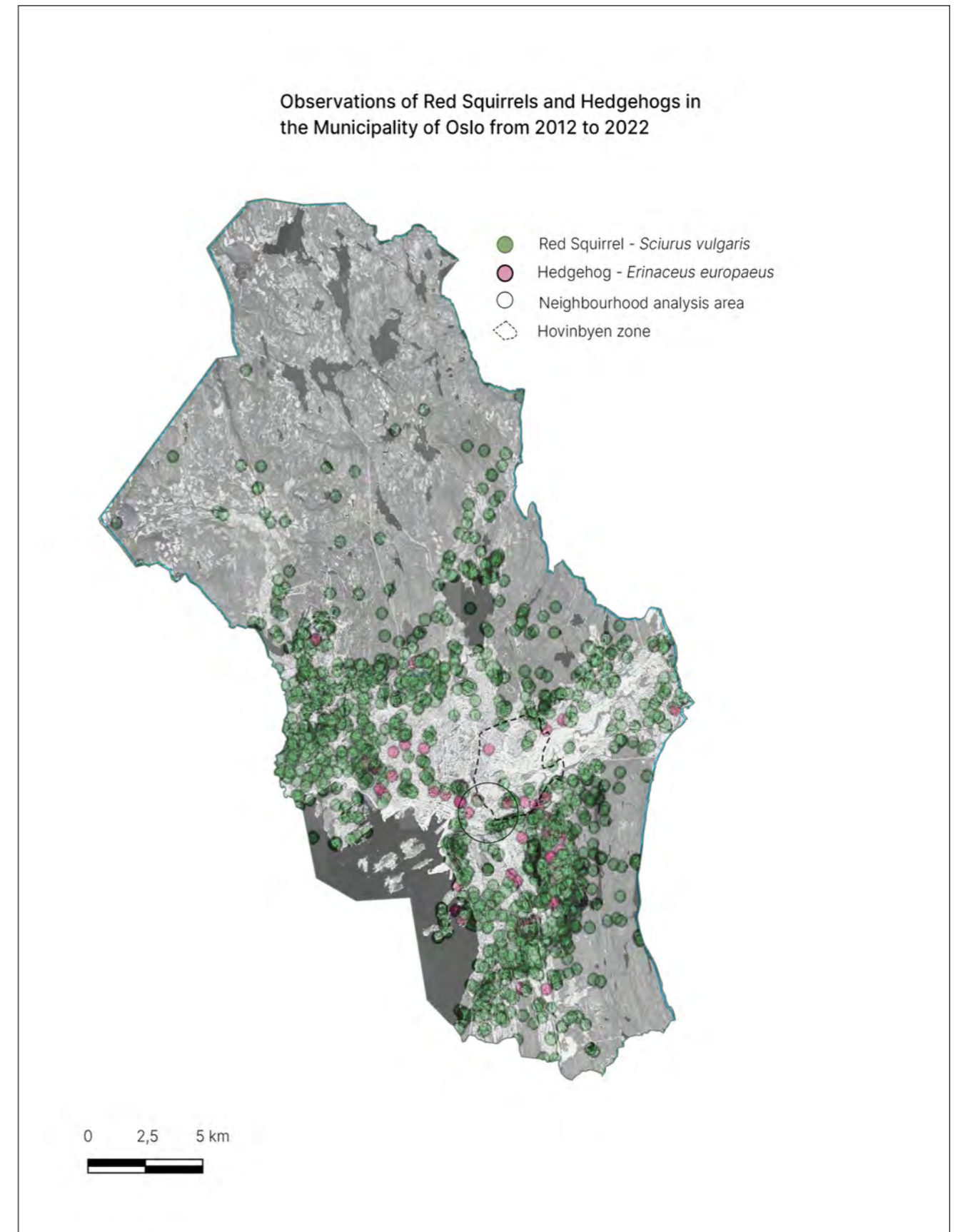
The Squirrel is often more resilient to urban disturbances as they move from tree to tree by often jumping or crossing power lines. The red squirrel (*Sciurus vulgaris*) lives and nests in mature trees, with supply of seeds or acorns to eat, and with preferably holes and cavities they can hide in (Østbye, E. & Frafjord, K., 2022). They are active during the day. Predator birds such as goshawk (*Accipiter gentilis*), hunts squirrels (Mammal Society, 2022). Squirrels can also be preyed on by red foxes as they move on the ground (Østbye, E. & Frafjord, K., 2022). They have an important role in forest communities as they contribute to spreading seeds. Forgotten seeds or nuts often sprout to new

trees (Østbye, E. & Frafjord, K., 2022).

On international basis, also the squirrel's conservation status is registered on the red list, as near endangered NT (Artsdatabanken, 2021). The expert committee on mammals, evaluating the conservation status of squirrels in Norway, wrote that the squirrel is not exposed to habitat fragmentation to the same extent as in many other parts of its global distribution area (Artsdatabanken, 2021). And furthermore, that the species also has no competition from introduced gray grains from North America, which outcompetes the Eurasian squirrel in Great Britain and Italy (Artsdatabanken, 2021).

The map (fig. 107) shows the observations of red squirrels and hedgehogs within the Municipality of Oslo from 2012 to present date. Although the observations might not be fully reflecting the actual situation, as registrations can be made by professionals and the public, and with hedgehogs being nocturnal, it portrays the prevalence of the chosen species in areas with less urban disturbances and more connected green space. Moreover, the map shows the lack of these species in vast parts of the Hovinbyen transformational area.

Fig. 107



Key Areas

Aiming to promote the urban nature quality of the area, the first step is to find connection to extend the habitat areas of the selected species. There are three key areas (fig. 108) that should be investigated to find solutions to create connections.

4 Establishing Connections



Fig. 108 Key Areas for Establishing Connections

A Connection to Østre Cemetery

Area A is the connection to Østre Cemetery (fig. 109). This area is characterized by intersections of infrastructure. For pedestrians aiming to cross from Etterstadsletta to the Cemetery, they must walk under an underpass leading to the Helsfyr T and bus-station in the middle of the intersection, before walking under a bridge and following the motorway E6 until arriving at the first gate into the cemetery. This route is 300 meters. And this busy intersection area is not fitting to be a place for either hedgehog and squirrels to stay, due to the many disturbances and the potential danger. Here, it's possible to look at squirrel-bridge solutions hindering access to the intersection, meanwhile allowing access to Etterstad and Vålerenga for the squirrels.

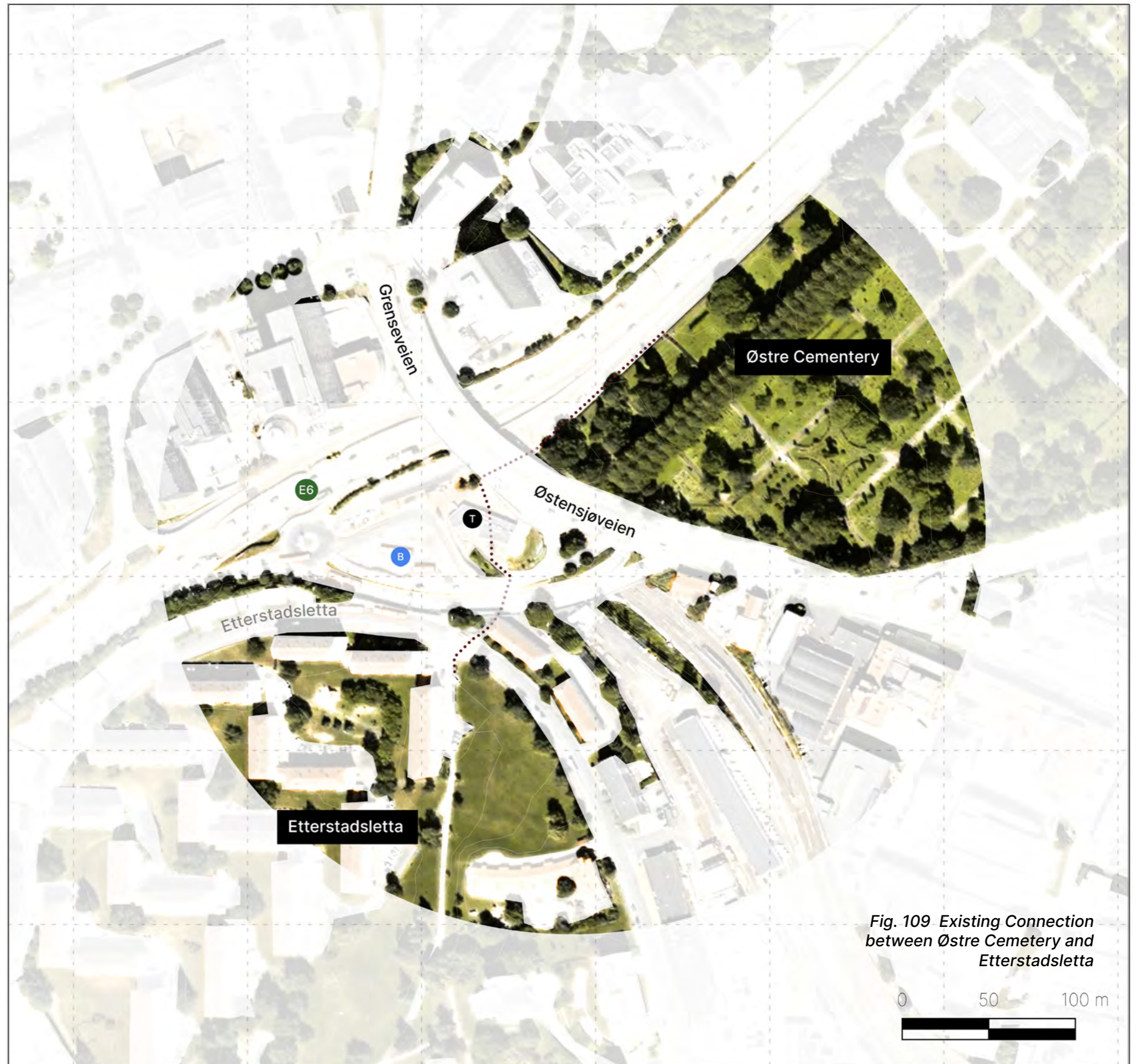


Fig. 109 Existing Connection between Østre Cemetery and Etterstadsletta

- B** Bus Station
- T** Subway Station
- E6** E6
-** Walking Route (Human)

B Connection to Vålerenga

The connection between Etterstadsletta and Vålerenga Church (fig. 110) is a pretty 250 meters long walk for pedestrians, passing by the Etterstad allotment gardens. This area is not busy by any means but is rather characterized by mellow residential streets and passages. Nevertheless, for the chosen species, the walk isn't necessarily that straight forward. There is a lot of fences creating barriers and lacking hiding places for hedgehogs. For squirrels, there are plenty of trees to jump between until Etterstadgata. In the section between Etterstadgata and the park before Vålerenga school, the trees are scarcer and smaller today. The park-area around Vålerenga church is mainly consisting of two layers, being covered in lawn and with several mature trees. The area could be a potential habitat for squirrels but is not ideal for hedgehogs today.



Fig. 110 Existing Connection between Vålerenga and Etterstadsletta.

- B** Bus Stop
- S** School
- Walking Route 1 (Human)
- Walking Route 2 (Human)

C Connection to Svartdalsparken

The third connection to Svartdalsparken (fig. 111) is partly following the same route as the one to Vålerenga, following Biskop Jens Nilsøns street. This street is bordered by shrubs and trees in a slope towards the sidewalk. This section can work as a corridor for both squirrels and hedgehogs. The main challenge is the bridge crossing the railway. Today, the bridge is narrow and contains no hiding places, not making it an obvious route for the squirrel nor the hedgehog.

Even though forested areas aren't an ideal habitat for hedgehogs, forest edges are. In addition, this south-connection to Svartdalsparken, can provide the hedgehog access to other areas which are more ideal. At this connection it's feasible to look at the possibility of expanding the bridge to provide a green connection.

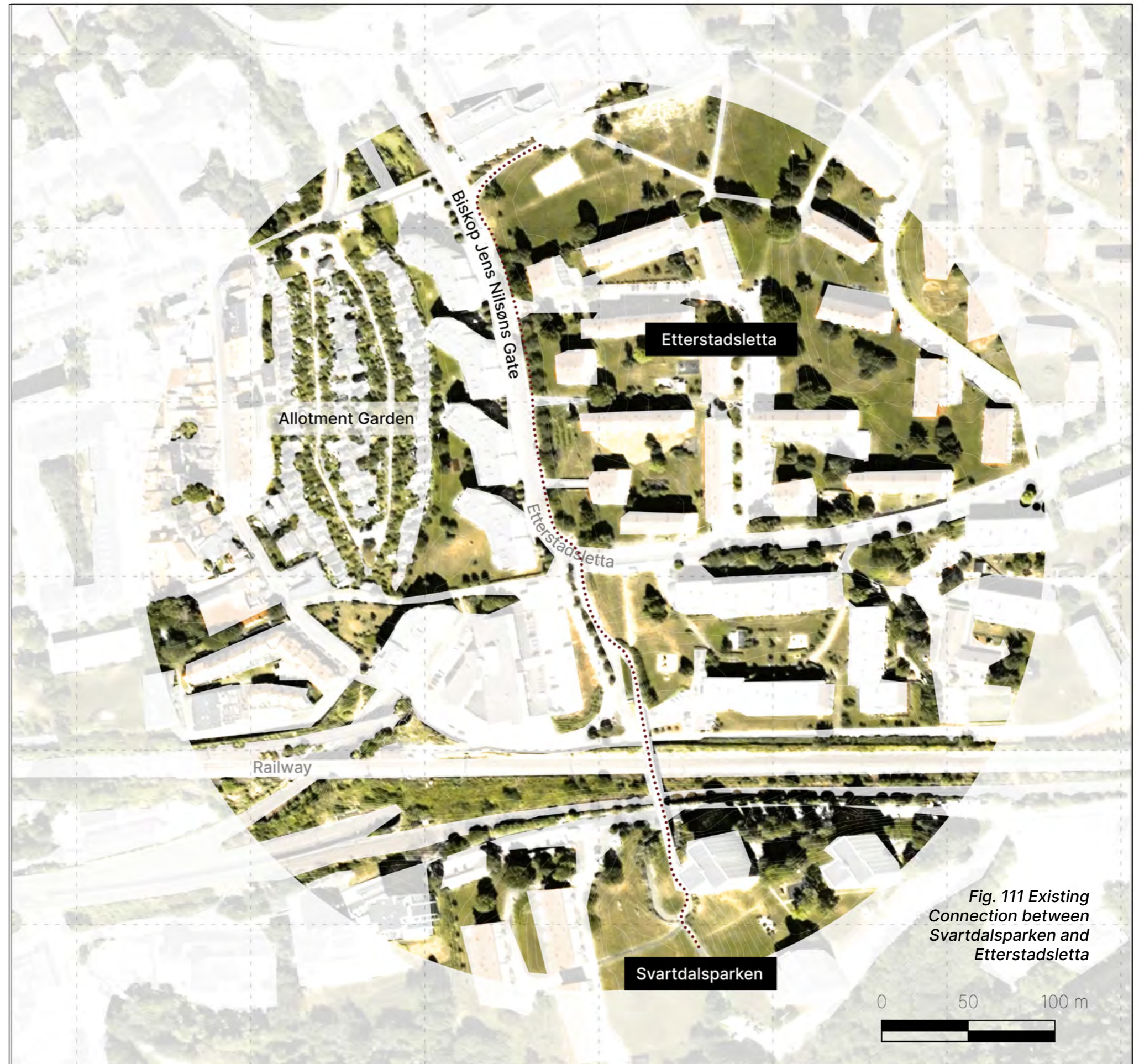
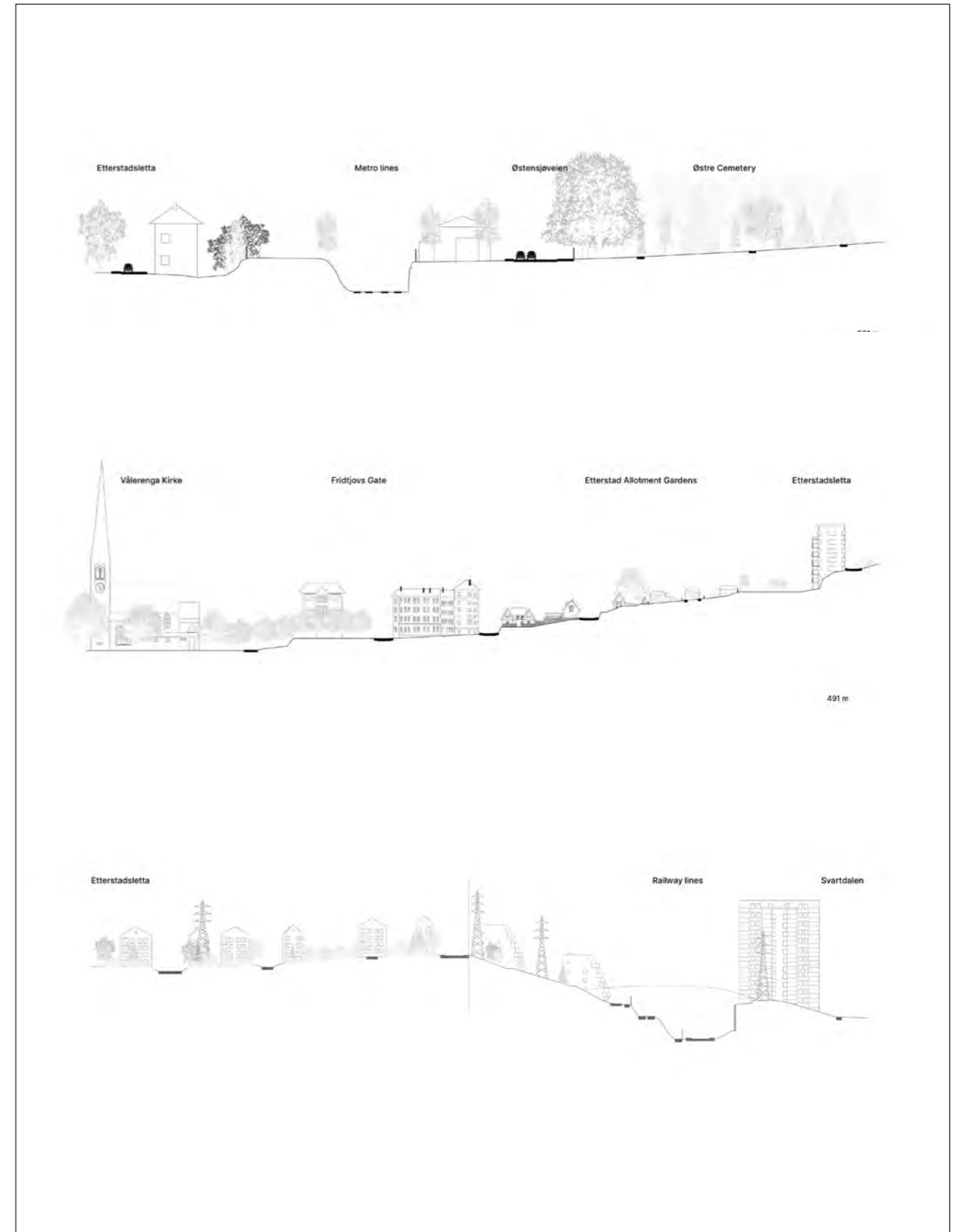


Fig. 111 Existing Connection between Svartdalsparken and Etterstadsløtta

..... Walking Route (Human)

Sections Connection A, B C

The sections (fig. 112) shows the existing connections between Etterstadsletta and the green areas Østre Cemetery, Vålerenga and Svartdalen.



*Fig. 112 Existing
Connection between
Etterstadsletta and
areas of interest,
Østre Cemetery, Vålerenga
and Svartdalen*

Existing Trees in Etterstadparken

Today, Etterstadparken consists mainly of two vegetation layers, mostly grass and mature trees. By using the newly published online tree map over public trees in Oslo, the range of tree species in the park have been identified (Municipality of Oslo, 2022) (fig. 113). The most prominent tree species is *Betula pendula*. In addition to several deciduous species groups such as, *Quercus*, *Acer* and *Populus*, the park also contains coniferous species groups like *Pinus* and *Abies*. In the established allotment garden section in the north-section of the park, there is fruit and berry trees like *Malus domestica* and *Prunus avium*. In the south section of the park there is a small approximately 3 times 4 meters section where grass is allowed to grow freely, for a flower meadow to be established naturally. Although the existing vegetation could potentially provide the needs of squirrels, the vegetation is less sufficient for hedgehogs needs of movement and hiding places.

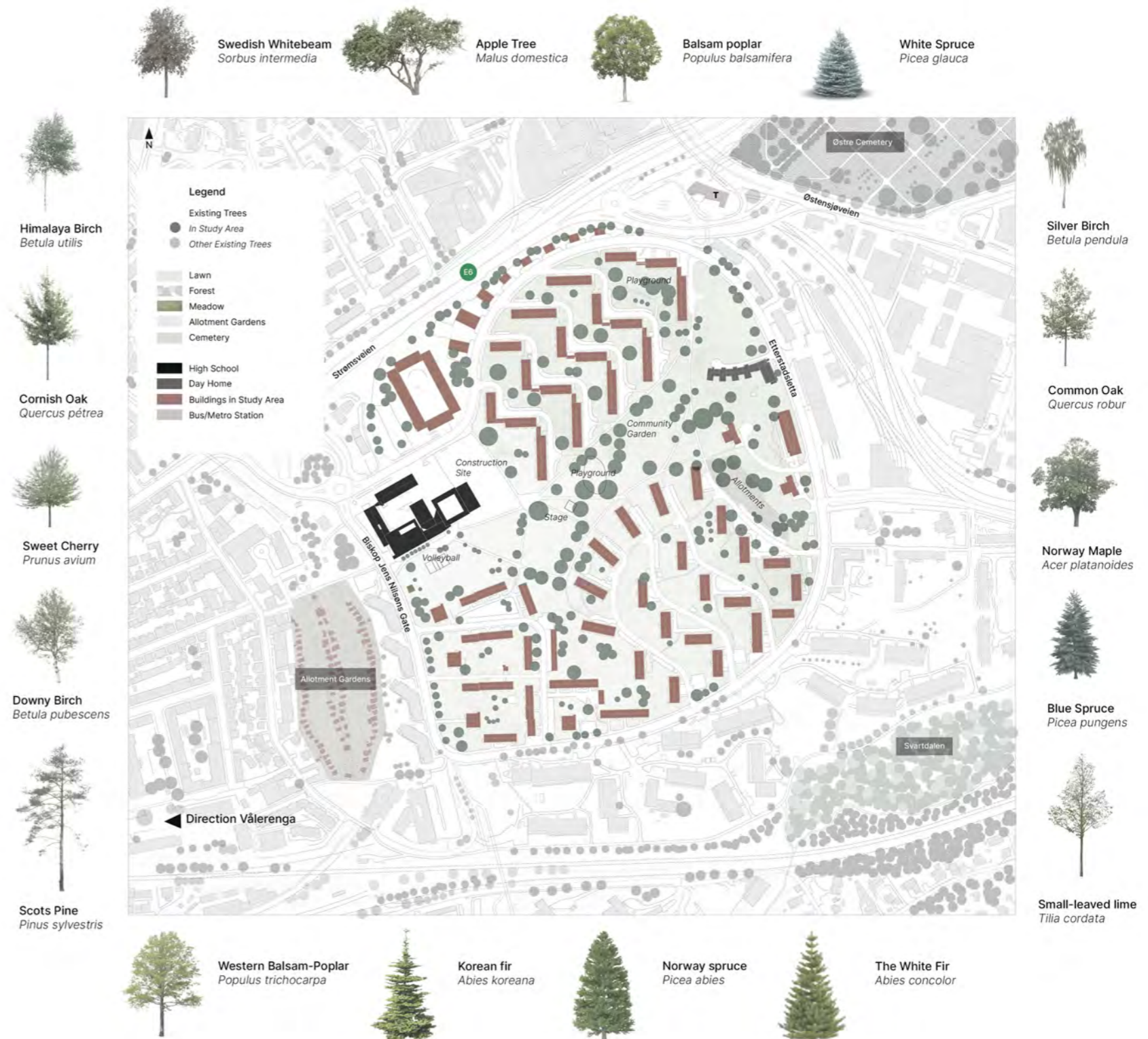


Fig. 113 Tree Species in Etterstadparken

4.3 SWOT - Analysis

A SWOT-analysis was conducted in order to get an overview over the strengths, weaknesses, possibilities and threats of the study area before making the design strategy.

S

Etterstadparken is a big green open space

The Neighbourhood has several green spaces, with various functions, within short distances

Topography - View

W

The area is partly isolated - surrounded by barriers for humans and small mammals

Etterstadparken consists of few vegetations layers, few places to hide for small mammals

O

Connecting green areas to each other to create bigger habitat areas

Implement more vegetation layers to host more species

T

Private/public areas

Road regulations

Helsfyr T is complicated to design around, with little space and several barriers

4.4 Design Proposal

The design (fig. 114 - fig. 115) is based on the place, shapes, general planting, terrain, and functions that already exist on Etterstadsletta today. Inspiration is taken from observing urban nature, in addition to projects in general that show good examples of harmonious designs between vegetation and functions.

Although the design phase was based on the desire to create a design that promotes urban nature, also developing a design that could be experienced both harmoniously and multifunctional for relevant users of the area is desirable. The design will open for encounters between people and nature, functioning as a park, a thoroughfare for walking and cycling, a habitat, and a link between different target points for both humans and non-humans.

Fig. 114 Idea for design of Etterstadparken accomodating habitat preferences for hedgehogs and squirrels.



0,5 meter equidistance
1: 5 000, A2

Fig. 115 Plan for design of Etterstadsletta accomodating habitat preferences for hedgehogs and squirrels.



Legend

- Existing Trees
- In Study Area
- Other Existing Trees
- Lawn
- Forest
- Meadow
- Allotment Gardens
- Cemetery
- New trees
- Shrub zone
- Forest zone
- Retention Pond
- Green Connections

Fig. 39. Site Plan/Design proposal



4.6 Design Strategy

Based on the analysis of the study area, the context and the background chapter, the design strategy (fig 116.) has been made to promote urban nature quality. The first intervention is to establish and strengthen connections for non-humans, especially for our two chosen species, the red squirrel and the hedgehog. In order to increase vegetation variation and promote native species, its proposed to establish various management zones. These will be varying from meadows trimmed every year, to small patches of forest understory/shrubs that can be trimmed every 3 – 5 years depending on the density and the use of the shrub-belts. Further will the use of pollinator-friendly species along with planting with the entire season in mind be secured through the appearing of spontaneous vegetation that the design allows. And by adding extra elements, the park can provide hives, hiding places and access to water, to strengthen the area's functionality as a habitat for the chosen species, as well as an attractive park for human visitors.

Measures to Promote Urban Nature Quality on Etterstadsletta

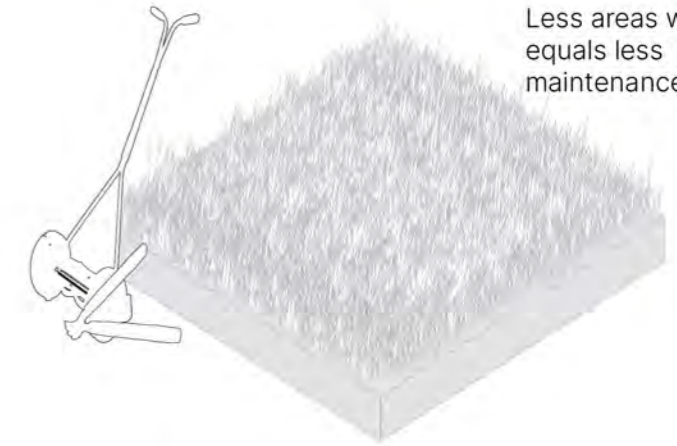
Use of Pollinator-Friendly Species

Pollinators love wildflowers



Putting Maintenance-Work to Rest

Less areas with lawn equals less regular maintenance



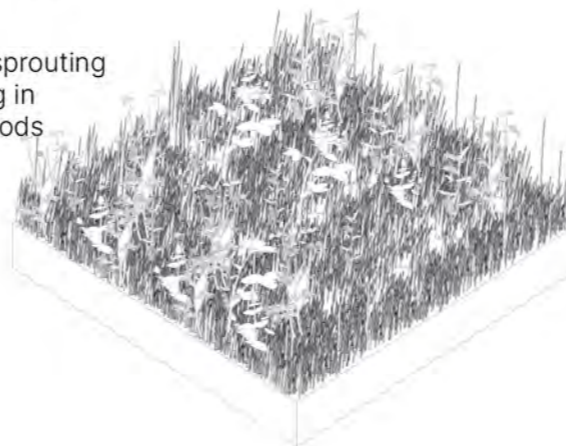
Establishing & Strengthen Connections for Non-Humans

- Existing habitat for Red Squirrels
- Proposed habitat for Red Squirrels
- Existing habitat for Hedgehogs
- Proposed habitat for Hedgehogs



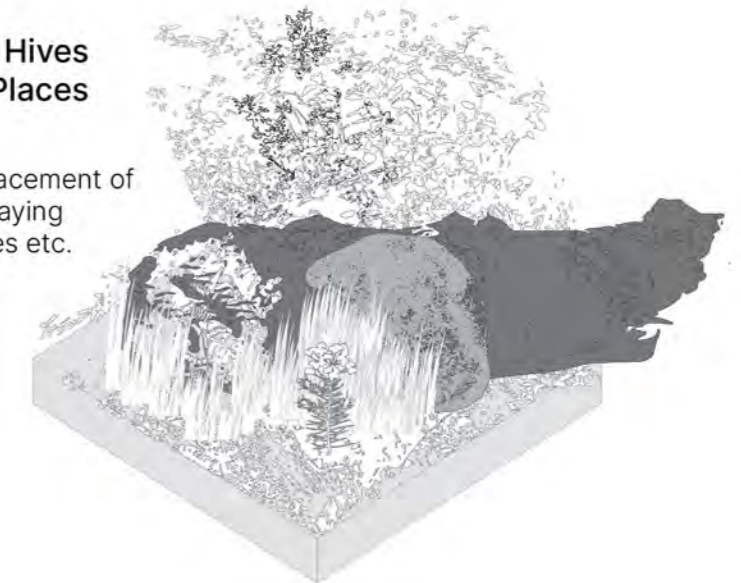
Planting with the Entire Season in Mind

Wildflowers sprouting and blooming in different periods



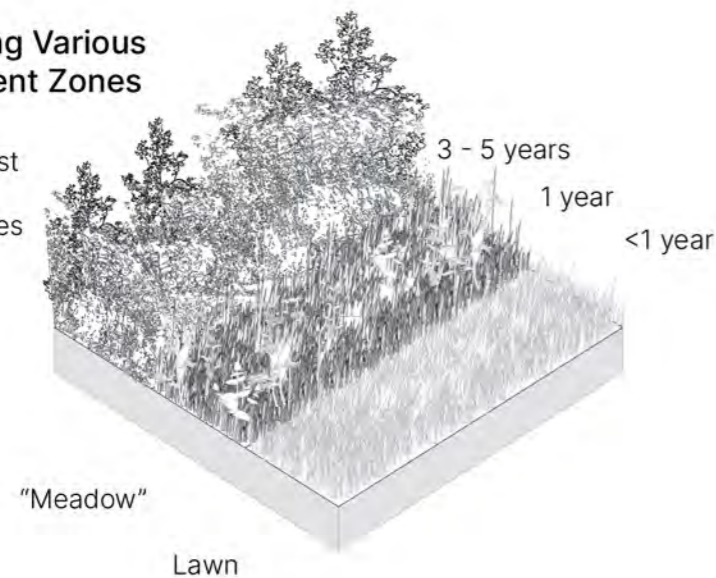
Providing Hives & Hiding Places

Strategic placement of shrubs, decaying wood, stones etc.



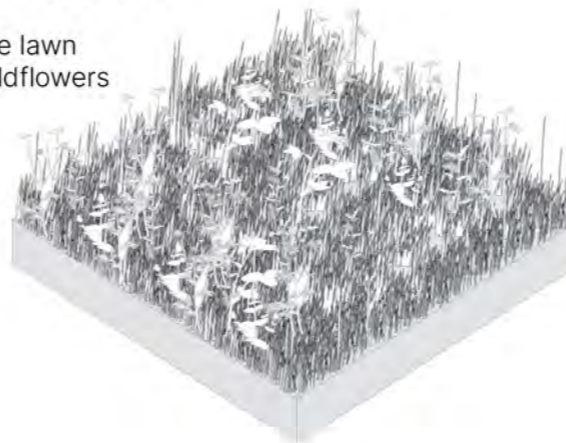
Establishing Various Management Zones

Shrubs/ Forest Understory/ Forest Patches



Establishing Wildflower Meadows

By letting the lawn grow and wildflowers to settle



Providing Access to Water

Animals need water just as humans

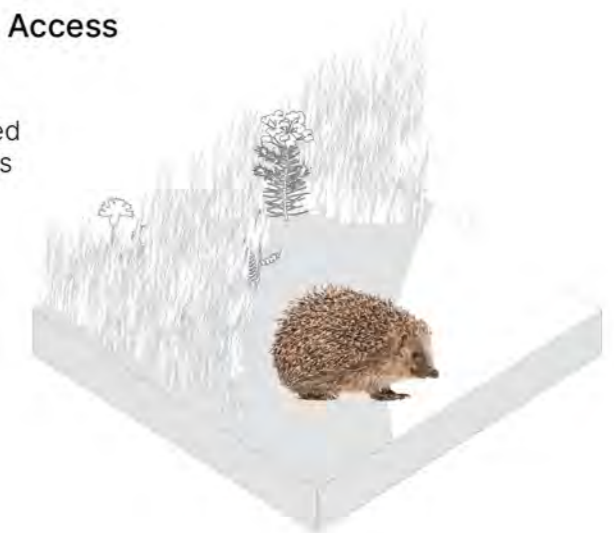


Fig. 116

Planting Strategy

The design and planting strategy (fig. 116 - 117) has been designed to consider the existing character of the study area and especially to retain the open atmosphere in the central part of Etterstadparken. Continuous zones with shrubs and dense tree planting are located primarily along edges and where it is already wooded. Using long grass with herbs in "flower meadows" does not threaten the open feeling but is still set in borders. This placement aims to create edge effects and allow appropriately placed grass areas to remain lawn for use as seating, for play, and more.

Although the plan and illustrations (fig 113.) show clear demarcated areas with different zones, the design will, in reality develop a smoother transition due to natural edge effects. In these transition zones, it will be possibly created exciting vegetation compositions. Whether these planned area delimitations should be strictly considered in future maintenance should depend on how the area grows. Where it appears appropriate with a more intensive cutting, this should be done, while other places may receive milder or no treatment. In order to decide how the area should be managed, supervision by professionals such as botanists and ecologists is recommended to value areas and identify any invasive or threatened species.

Planting Strategy

Along with “the edge effect”, the design plays on applying the landscape ecological principles presented in chapter 2. The connecting and extension of spaces applies to the principles of shape, size, corridor, areal variation and distance. While applying and placement of management zones and diversification refers to principles of biodiversity and buffer zones. Furthermore, the basis of promoting and building on established green areas applies to the principle of age.

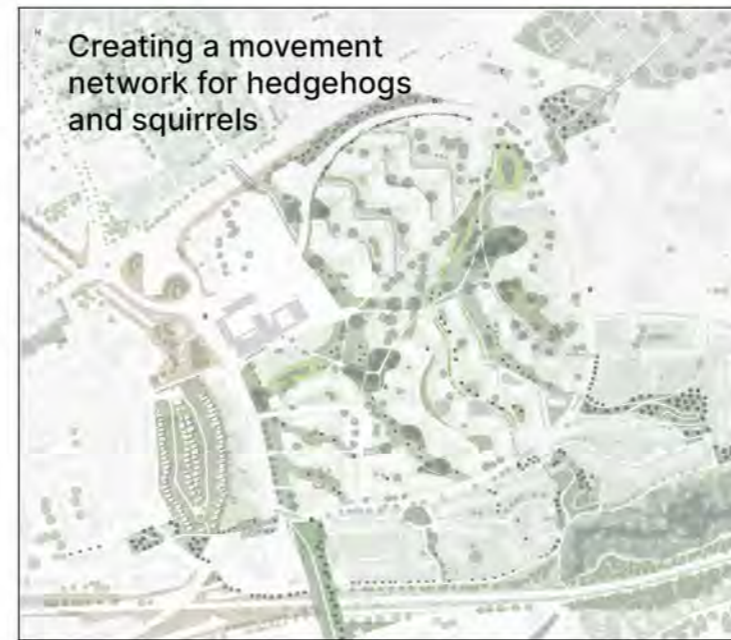
Part of the purpose of the design is to create an area that can function precisely as a laboratory for how succession and spontaneous vegetation based on an existing park can be generated. The goal of this is multifaceted, as the design aims both to promote the connection and view of spontaneous vegetation and to serve as an example of how relatively simple steps can be taken to promote quality in urban nature.



Hedgehog
Erinaceus europaeus



Red Squirrel
Sciurus vulgaris



Promoting existing and native vegetation

The Planting Strategy plays on what’s already existing on and in vicinity of the site and creates a continuous network of the different management zones through the site, that allows for spontaneous vegetation to settle

Promoting edge effects

The management zones are distributed in order to create transition zones between the different zones.

Implementing differentiated management zones

The management zones will contain different spontaneous species based on the growing conditions such as light, temperature water and nutrients access. Etc. where tree canopies is bigger, the forest understory might grow less dense, and opposite where there is more light coming through. By managing with a primary goal of making the park a place for hedgehogs and squirrel to thrive, there could be added or removed extra growth based on what’s needed.

Adding elements to change microclimates

Stones to generate heat and creating borders. Piles and bits of gravel to create dryer environments and decaying logs to increase nutrients, and water to increase moisture and cooling effect.

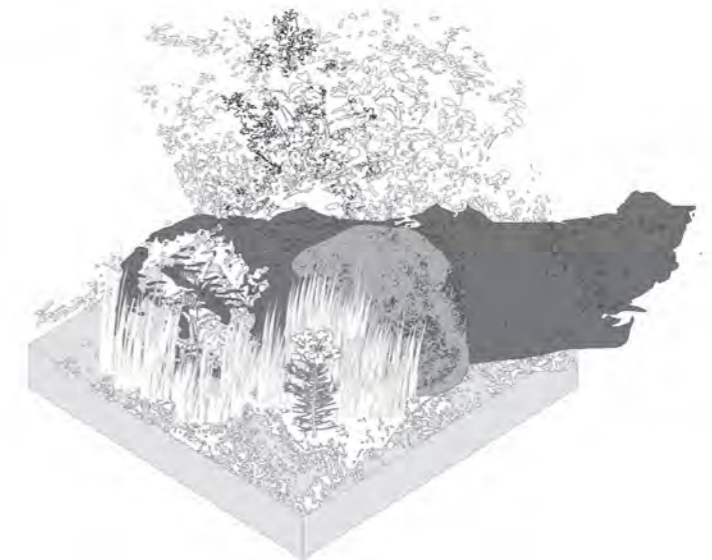
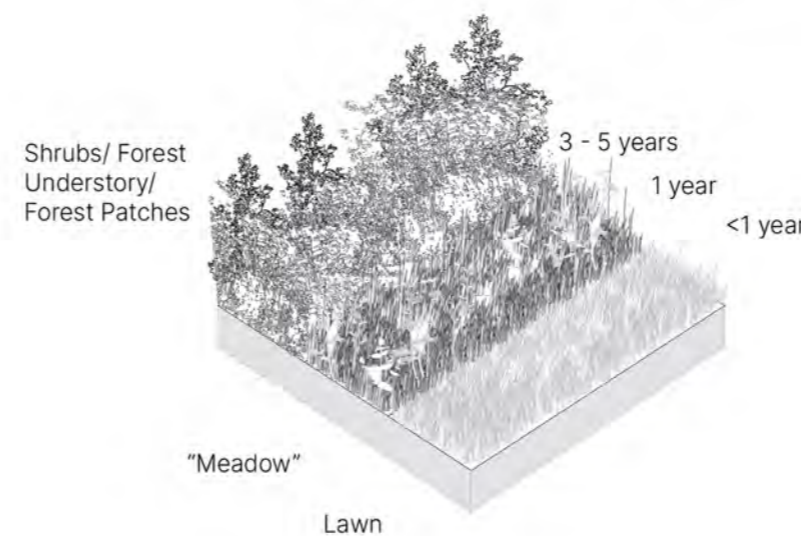


Fig. 117 Planting Strategy.

A Connection to Østre Cemetery



Fig. 118 Proposed Connection to Østre Cemetery

The connection to Østre Gravlund (fig. 118) is proposed to be solved by establishing a cover over the submerged metro line and a bridge over Østensjøveien. The lid allows for a park where you can retreat, despite being near one of Oslo's busiest intersections. The bridge over Østensjøveien is designed not to be too large to protect the existing structure at Østre Cemetery and avoid removing and relocating established trees and graves. The bridge still has room for edge vegetation with hedgehogs in mind. In addition, the bridge has lines where squirrels can traverse and climbing plants can be established.

B Connection to Vålerenga



The design has added several vegetation zones to create a better connection to Vålerenga (fig. 119). First, a thicker belt down to the Etterstad allotment garden before reaching a new green space at the intersection between the walkway and Etterstadgata road. It is proposed to remove several tired sheds around the intersection, and parts of the garden of the apartment building to Biskop Jens Nilssøns gate 23 to create a green meeting place that can both be inviting to the neighborhood residents and to create better conditions for the selected species. The "square" connects to the outdoor areas and the road in front of Vålerenga school. Today, the park around Vålerenga church is not suitable as a habitat for hedgehogs. If this is to become relevant, several layers of vegetation must be added to the park, which today consists of mature trees and lawns.

Fig. 119 Proposed Connection to Vålerenga Kirke

C Connection to Svartdalen

Fig. 120 Proposed Connection to Svartdalen



Several connections to Svartdalen and Svartdalsparken have been improved in the proposed design (fig 115). The first connections extend through Etterstadsletta before passing through the neighborhood with terrace homes. From this area, there is a connection to the north side of Svartdalen. Here, belts with vegetation and paths have been proposed that consider the terrain variation. The area offers opportunities for views of Svartdalen and Ekeberg from living areas and a bed/pool for surface water management, with possible drainage to the Alna River.

A wide bridge has been designed with plenty of space for vegetation to get to the south side of Svartdalen and Svartdalsparken (fig. 120)(area B). Vegetation should be planted here, which acts as a movement zone for the selected species and a buffer zone towards Svartdalsparken. Considering the natural values found in and associated with the ancient forest in Svartdalen, it is advantageous to both protect these values, and provide an opportunity for species, such as epiphytes, to have the chance to establish themselves and enrich further areas. Therefore, the tree varieties in this area should be selected concerning known vegetation in Svartdalen.

5

Programming of Human and Non-Human Needs

Designing for Human and Non-Human Benefit

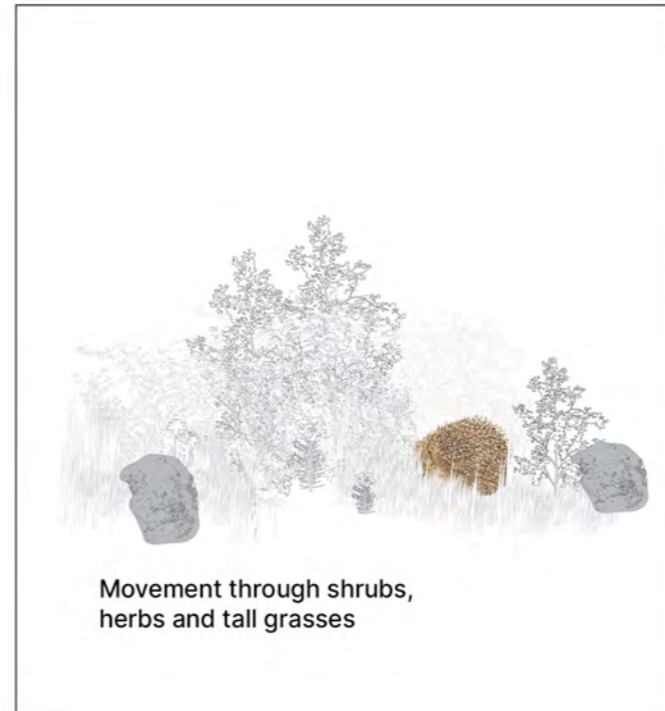
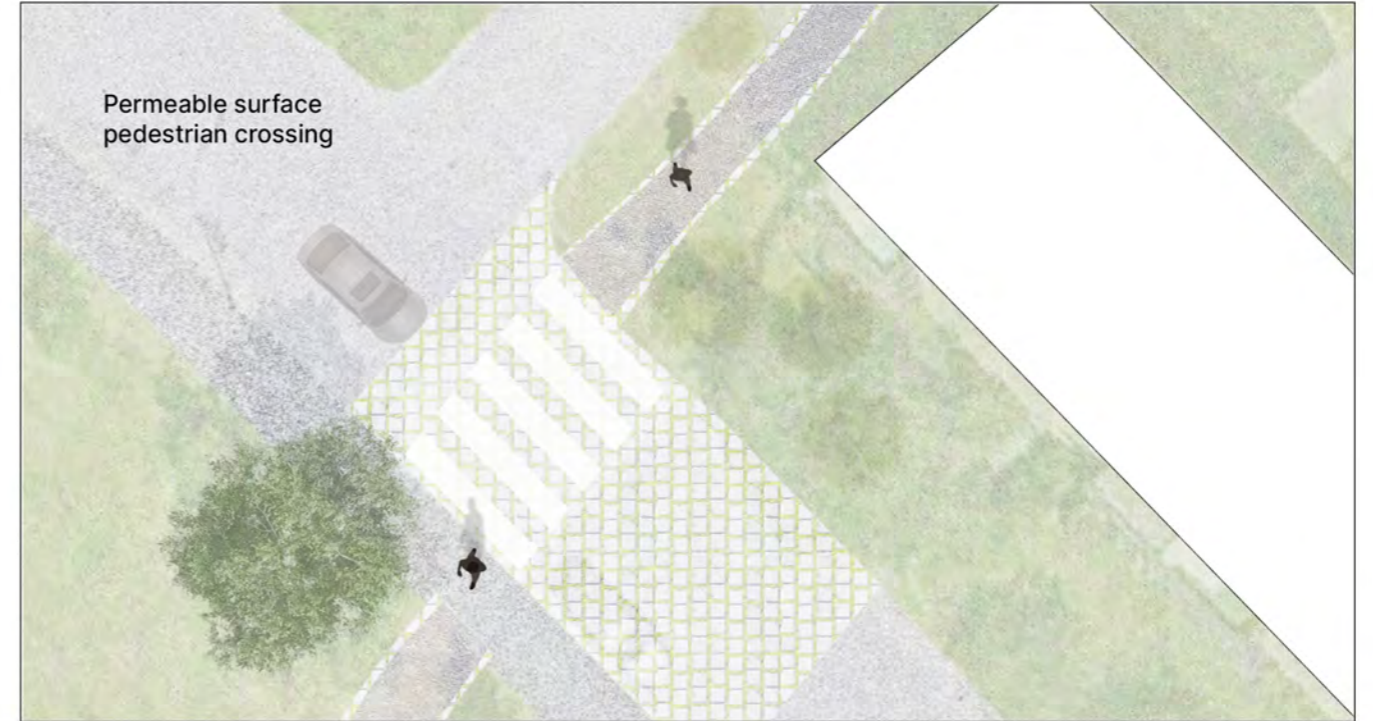
Consideration for squirrels and hedgehogs has been central to the design process. The area has been designed as a network of habitats and movement zones for the selected species' needs. For the squirrel, adding extra trees has been intended, along with establishing larger contiguous areas with forests, and not least, connections to and from the study area. For the hedgehog (fig. 121), the zones with tall grass, shrubs, and bushes will be helpful and added hiding places under rocks, logs, and verandas. For the hedgehog's part, attempts have also been made to design the connections to nearby green areas with movement zones allowing the possibility of hiding. Other proposed interventions are also to encourage garden owners in the connected neighborhoods to provide holes in their fences to allow access for hedgehogs between gardens.



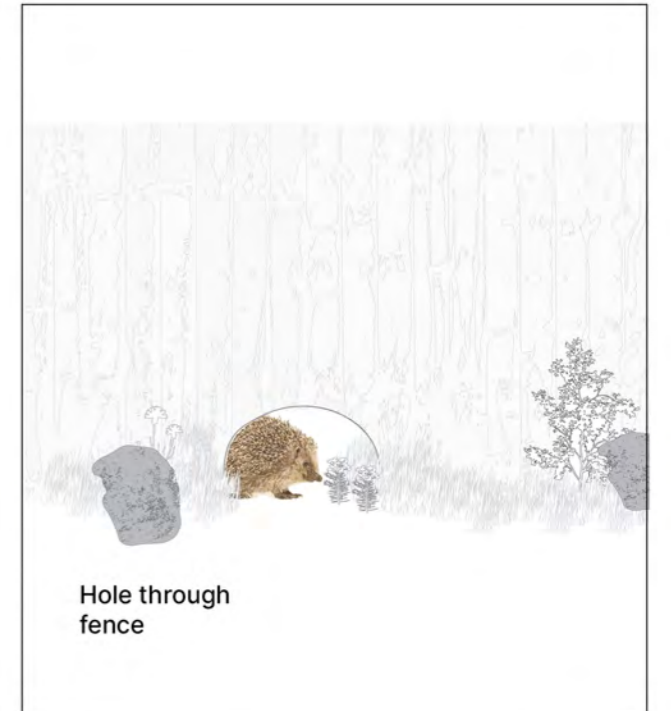
Hedgehog

Erinaceus europaeus

Fig. 121 Design Interventions to Promote the Livelihood of Hedgehogs in the Study Area



Movement through shrubs, herbs and tall grasses



Hole through fence

The providing of information to locals and visitors, is also part of the design scheme, in order to serve an understanding of benefits the “unconventional” park design can contribute to. By using signage to encourage drivers to slow down before “hedgehog crossings” and with information signs in the park’s central parts (fig. 122), the visitors can learn about the intention with the design to promote living qualities for hedgehogs and red squirrels, and furthermore the quality of urban nature.

Fig. 122 The crossings from the park are emphasised with permeable surfaces and signs to make drivers slow down, and for users to orient themselves.



Fig. 123 Design Interventions to Promote the Livelyhood of Squirrels in the Study Area



In addition to the connections to and from Etterstadsletta, interventions made with considerations of the squirrel is primally the establishment of belts of trees, throughout and around the study area. In the addition will the extensions of the forest areas such as the buffer zone at the edge of Etterstadsletta towards Strømsveien (E6) be of benefit as an enlargement of the squirrel's habitat area.

In the belt facing the E6, Strømsveien, the existing parking garages have been removed to establish a forest zone, which can act as a buffer against the road (fig. 123). And can contribute to reducing perceived noise levels from the motorway. It is proposed to build a larger parking garage on several floors in the broadest part to make up for the removed parking spaces. Behind the parking garage, a bridge connection has been proposed that connects to the existing residential area on the other side of Strømsveien. This area consists of gardens that may be relevant habitat areas for the selected species. In addition, this connection will be positive for green mobility in the direction of Ensjø. This bridge will be particularly favorable for the upper secondary school located on Etterstadsletta as it will create a green connection that will encourage walking or cycling and provide a safer school road.

Although the design will positively affect the selected species and the experience value and mobility for the humans who use the area, the design can also have positive ripple effects on other species and natural processes; for example, local surface water management, cooling, and functionality as habitat for several species, such as herbs, insects, and birds.

Both to make the green area larger and to connect Etterstadparken more closely to associated green spaces; it is proposed to remove some of the access roads to the homes on Etterstadsletta (fig. 124). The sections where roads have been cleared should be used for pedestrian and bicycle paths and green corridors. Rain beds are intended in some passages, while others can function as smaller shrub zones. Belts with vegetation in front of the buildings will act as a boundary that clarifies the semi-private zone in front of the apartment buildings. This zone provides space for accommodation and possible planting for the residents.

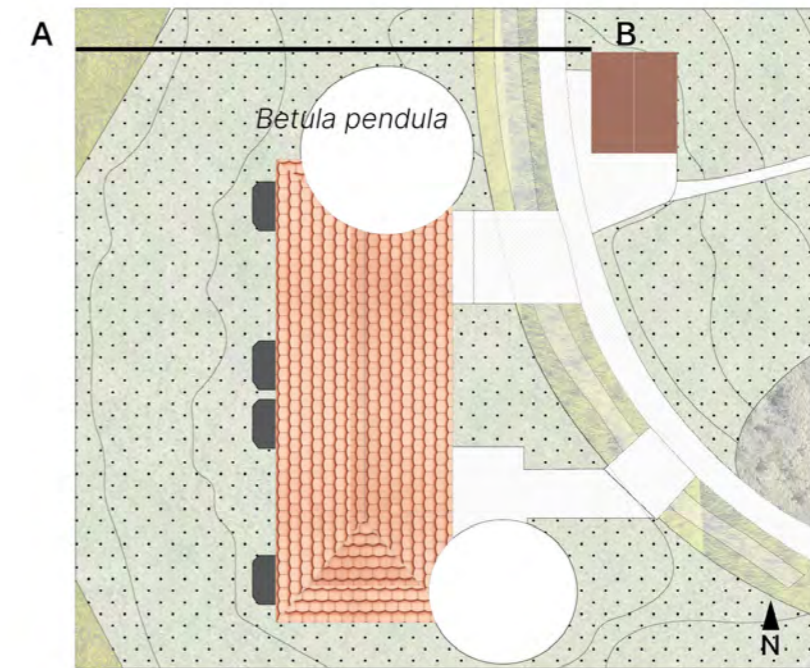
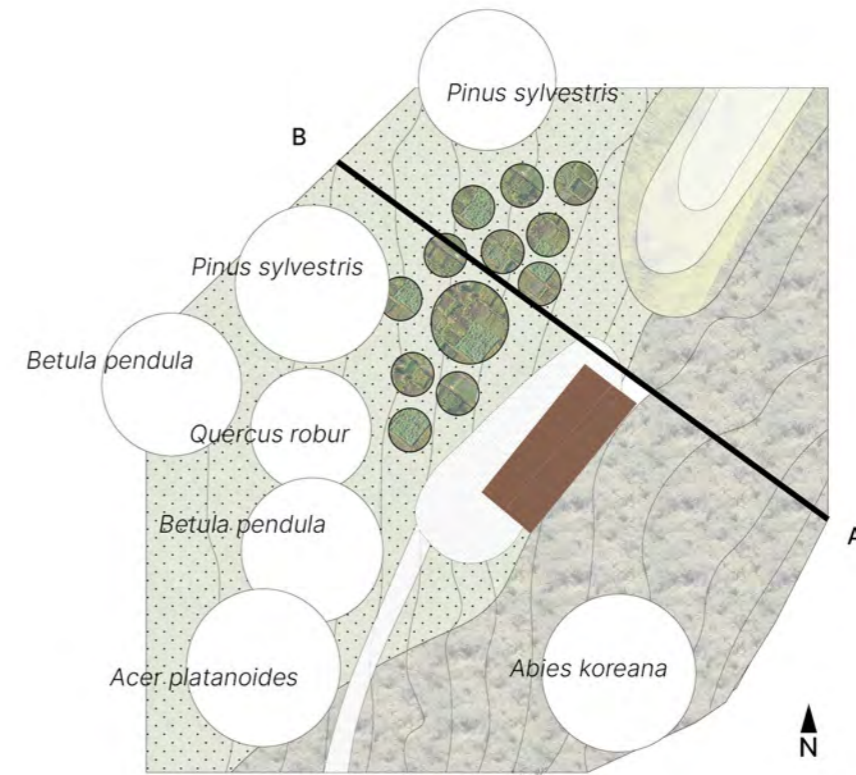


Fig. 124 Design Interventions to Promote the Livelihood for Humans- and Non-humans in the Study Area

Other functions that have been provided in the new design of the park is an enlargement of the small community garden (fig. 125) that is already established in the middle of Etterstadparken. Here, there will be possibility to gather under a roof covering seating. This part of the park can both work as a social meeting point, as well as a place to retreat depending on the activity levels in the park at given time.



The shrub-zone both consists of spontaneous vegetation as well as some planted, and other added elements such as rotting wood

Raised planters is proposed both to make the community garden more accessible, and to isolate the planted species, as many vegetable species are alien to the norwegian flora

A
65 meter

Fig. 125 Proposed Expansion of the Community Garden in Etterstadparken

Retention Pond



A retention pond has been added to the northern entrance to Etterstadparken (fig. 126). Today this area only consists of a lawn. The retention pond allows for water to be gathered during heavy rainfalls and provides both functionality as a strengthening of the local storm water management, as added habitat, and as a calming and cooling element for the users of the park. Throughout this area there is added two new paths. One going towards the connection to Østre cemetery, and one towards the entrance point from Helsefyr T. The path towards Helsefyr T is added in order to steer ahead of the car park in front of the adjacent apartment building.

Fig. 126 Retention Pond

In the space in front of the High School there is added a zone for people to hang out and meet up to compliment the volleyball field (fig. 127). This activity area is surrounded by a belt of grass, to allow for further use. Different overlapping vegetation zones, meadows, shrub zone, retention pond and a diverse species of trees is further framing this area. The vegetation in this space is placed in order to connect to the vegetation throughout the park, as well as encouraging play and contact with urban nature.



Fig. 127 Activity-Area mixing different Vegetation Zones in front of the High School



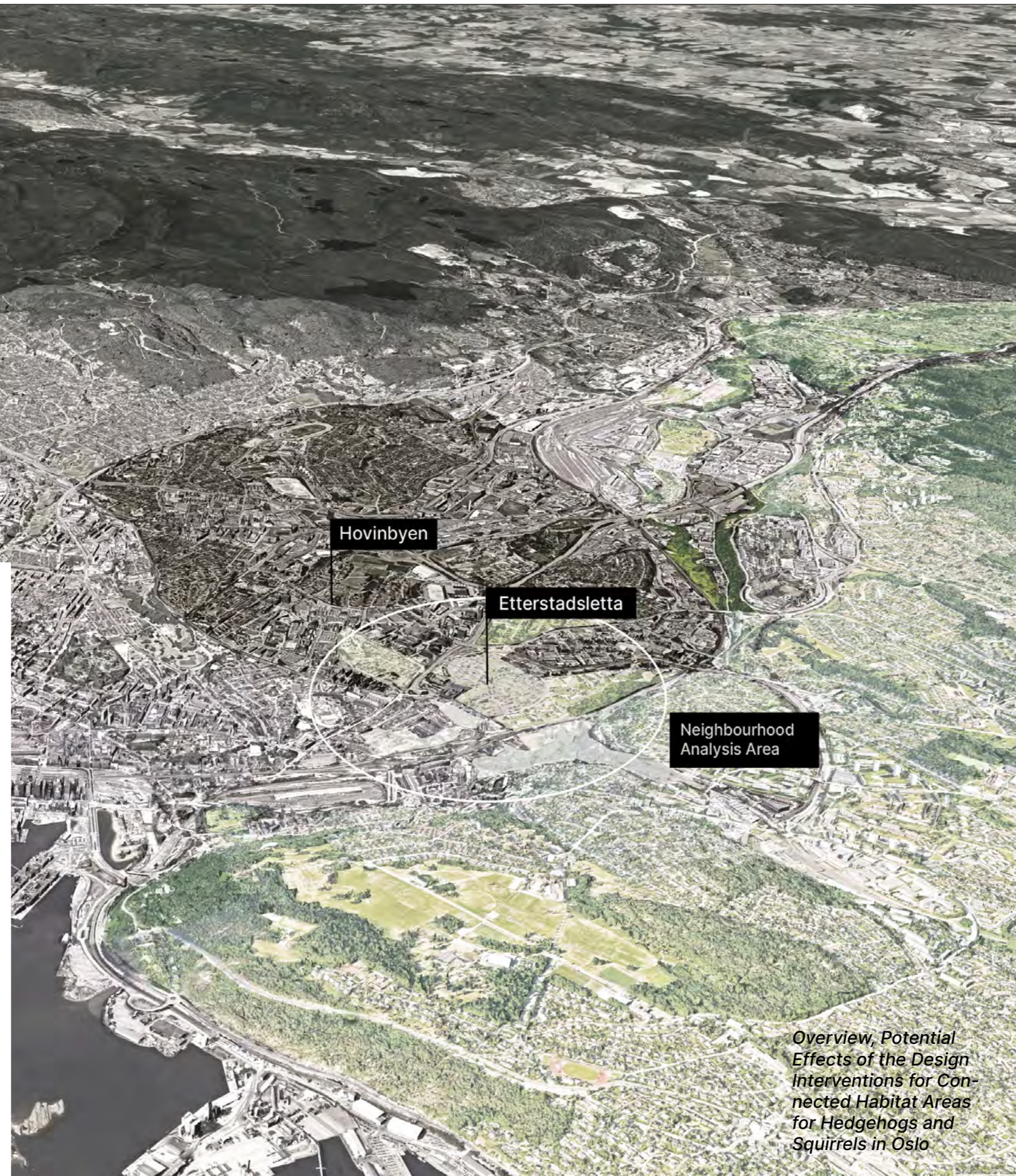
Fig. 128 The Design is shaped to encourage Humans and Non-humans to move freely

The design invites users, both human and non-human to experience the sensory qualities of the urban nature that will evolve in the area. By leaving the management zones with no boundaries, users are encouraged to use the areas freely (fig. 128). This way, users can take direct and indirect part in shaping the vegetation, by the way they move and use the zones. This can for example reveal places where there is beneficial to add new paths and connections.



Etterstadsletta

Fig. 129 The design proposal can allow for the connection of potential habitat areas for red squirrels and hedgehogs way beyond Hovinbyen and the Neighbourhood Analysis area.



Zooming out from the study area to the extent of Oslo (fig. 129), it is possible to see how implementation of the methodology and the design strategy can contribute to extend the potential habitat area of the chosen species, hedgehogs and red squirrels. This reveals the quality of Etterstadsletta, at the edge of Hovinbyen, as a strategic point for connecting Oslo's private and public green (infra)structure with urban neighborhood.

Overview, Potential Effects of the Design Interventions for Connected Habitat Areas for Hedgehogs and Squirrels in Oslo

5

Discussion

- 5.1 Research Problem and Findings
- 5.2 Interpretation through Guidelines
- 5.3 Limitations of Study
- 5.4 Recommendations for Implementation
- 5.5 Conclusion

5.1 Research Problem and Findings

This thesis has explored the shaping and the increasing importance of urban nature due to urban pressures such as urban sprawl, land degradation, areal-use conflicts between humans and urban wildlife, climate anxiety, and the resulting biodiversity loss that encompasses the Anthropocentric era. And have through the case of Oslo and Hovinbyen found an example of how areal use change has fragmented the urban nature, many places dividing it into islands surrounded by heavy infrastructure.

By developing a design methodology based on the background chapter, the thesis has sought to use landscape design to promote urban nature quality. In which urban nature quality symbolizes the combination of the promotion of both biodiversity and human utility and benefit, thereby naming the thesis “Urban Nature: for human and non-human benefit.”

Specifically, the thesis has explored existing “connected” green areas within the Hovinbyen development area. And have found a multitude of types of urban nature ranging from managed lawns to primeval forest. The thesis identified Etterstadsletta as an area to improve the quality of urban nature through landscape design, strengthening habitat and movement qualities for hedgehogs and red squirrels.

5.2 Interpretation of Methodology and Design through Guidelines

The design proposal suggests strategies based on landscape ecology principles and idealistic design that allow the Etterstadsletta area to connect to potential habitat areas for red squirrels and hedgehogs that extend beyond the study area. By further using and adapting the design methodology and strategies, more green connections and habitat areas can be created throughout Hovinbyen, applying and contributing to the goals of the Strategic Plan for Hovinbyen to be an “a forward-thinking and climate-smart extinction of the city,” that “..host a diverse network of attractive urban hotspots connected to each other and the city” securing that “The most accessible means of transportation in Hovinbyen will be on foot, by bicycle, or public transport” (PBE, 2016).

The suggested methodology further applies to the Green Space Plan for Oslo and the Oslo Urban Ecology Program, by encouraging strengthening of access to and connectivity between green spaces, contributing to secure “...clean air, clean water, and access to attractive outdoor recreation areas” (Municipality of Oslo, 2011). Moreover, these design measures can contribute to strengthen Oslo’s identity as the “Blue-Green City between the hills and the Fjord”, as well as the vision of Oslo for 2030 to be Smart, Safe and Green.

On national level, the methodology aligns with recommendations from the Urban Space Handbook (2016), to enhance attractiveness, access and especially connect urban environments and increase livability. Additionally, the methodology and design answers to the guidelines for Planning of Green Structure for Urban Environments (2014), by as aforementioned encouraging continuous greenery, and nature areas in the construction zone. Furthermore, aligning with the National Expectations for Regional and Municipal Planning (2019 – 2023) and the State Guidelines for Coordinated Housing-, Areal- and Transport Planning (2014), by responding to significant environmental and societal challenges and by “...promoting health, the environment, and quality of life”.

5.3 Limitations of Study

On European level, the European Landscape Convention (ELC), from 2004, recognizes that “the landscape is an integral part of the quality of life for people everywhere: in urban areas and the countryside, in degraded areas as well as in areas of high quality, in areas recognized as being of outstanding beauty as well as everyday areas”. This guideline is thereby in line with the thesis’ perception and value of the multitude and complexity of urban nature, and the importance of urban nature for humans living in urban environments. The methodology, ideas and suggestions of the thesis furthermore aligns to the general vision of ELC, “to achieve sustainable development based on a balanced and harmonious relationship between social needs, economic activity and the environment.”

Globally, UNs Sustainable Development Goal (2015) nr. 11 focuses on the inclusivity, resilience and sustainability of cities. The thesis has through regard for the urban and climatic pressures society are facing, together with aiming to benefit urban nature, made a methodology that contribute to “strengthen efforts to protect and safeguard the world’s cultural and natural heritage” as SDGs 11.4 suggests - through applying strategic analysis and design adaptable to sites worldwide, that will allow for creation of landscape designs based in the uniqueness of the place, promoting both cultural and natural identity.

Knowledge Informing Decision-making

Due to the limitations of time, knowledge of relevant matters, and the general objectives of the thesis, some of the proposed design solutions might be debatable.

Generally, there is a concern about the feasibility of the proposed design regarding costs, and other restrictions, especially concerning “big” interventions such as the overpasses and bridges. Additional limits can encompass challenges with planning across private and public realms, property boundaries, planning restrictions, and physical construction limitations. Additionally, due to the lack of information and knowledge about the ecological situations, there are not adequately informed consequences of the proposed design solution.

Throughout the analysis and design of the case study Etterstadsletta, the knowledge informing decision-making was found mainly on online databases such as Artsdatabanken, Naturbase, information from the Municipality of Oslo, and the Oslo Encyclopedia. Although these knowledge bases were accessible and functional for the objectives of this thesis, “a real-life situation” would require more in-depth and possibly more quality-assured

sources, especially to make as informed decisions as possible to mitigate negative consequences. Therefore, conducting more detailed surveys on subjects such as soil and soil quality and the existing biodiversity throughout the analysis area would be beneficial. Mainly to ensure that valuable nature areas such as Svartdalsparken would be secured

Moreover, the access to such critical public data used in the analysis is generally something that is not necessarily public elsewhere, outside of Norwegian and European borders. Such data gaps can threaten the methodology’s transfer value by requiring professional surveys on relevant subjects. On the other hand, new research published in May 2022 argues that the publishing of a new global biodiversity database containing 167 sources and several comprehensive reports can enhance the accessibility of biodiversity data for conservation efforts (Stephenson et al. 2022). Sharing open access data of other related topics to urban nature can further contribute to enabling landscape design to promote urban nature qualities.

Specifically, something that can be seen as controversial is the proposed removal of several parking spaces and access routes throughout the area to increase green space and connectivity and improve stormwater management. Although fewer people use cars in

cities like Oslo than before, access to entrances with vehicles such as renovation, ambulances, and firetrucks is of social security concern. Therefore, it is essential in those areas where access routes are removed to dimension the paths wide enough for, e.g., emergency services and taxis to enter and turn, to ensure that the housing area stays a place where people of all physical abilities and disabilities can live.

Another potential challenge with the proposed design, especially the management zones, is the definition of the boundaries of the different zones. Especially in the first years of the park’s establishment, the border between the different zones would be hard to read for those who manage the area. Although park managers could read the edges on a map, management would be most effortless if physical boundaries defined where and what should be trimmed. To counteract this challenge, I propose restricting boundaries using low sticks and lines in different colors that could stay up for the first 5-7 years.

Public Participation

Additionally, another layer or information that would have been beneficial to the case design, is public participation, both in order

to understand users' perceptions and needs associated with the site design and as a means to engage locals in the topic of urban nature. Accordingly, a design informed by users could enhance the design result's social dimensions and functionality (WHO, 2017). The inclusion of such public participation is especially crucial and an opportunity in the planning-process and establishment of the green space area around the Etterstad High School-expansion.

Perceptions of Urban Nature and Urban Wilderness

Another challenge with the design result is the public's perception of urban nature and urban wilderness. As the suggested design is somehow unconventional and contradictory to the existing manicured lawn-clad site, challenges to the public perceptions could be raised. In order to counteract this, the design proposal suggests using information signs to clearly state the intentions of the design, promoting urban nature quality, and especially designing for squirrels and hedgehogs to thrive. Such measures are supported by a study on perceptions of urban nature from 2020, stating that humans perceive urban nature areas as more beautiful if associated with promoting biodiversity (Hoyle, 2020). Thus, informing visitors of the design's intentions is essential for the experience value and perception of the design.

Nevertheless, a study from Fischer et al. contradicts the assumption that humans perceive urban nature diversity

in a particularly negative light (2018). The field survey, conducted in five European cities, found that people favor more plant species richness in urban greenspaces (for example, parks, wastelands, and streetscapes) and believe that more plant species make cities more liveable (Fischer et al., 2018). This result adds a favorable layer to the ethos of the design, believing that users will perceive and appreciate the importance of the site design and further develop a stronger connection and appreciation for urban nature containing spontaneous vegetation.

Although research has found that Europeans appreciate biodiverse urban nature, people in other parts of the world might hold other perceptions of biodiversity. A study from Brazil and Nicaragua suggests that many users associate biodiversity-rich nature with fear and shun areas containing biodiverse nature (Bradshaw et al., 2020). The study further claims that the fear results in nature areas being torn down to create paved, open spaces with bright colors (Bradshaw et al., 2020). This perception further highlights the importance of regarding safety as a relevant issue in planning of urban nature, especially striving to provide openness and clear sight lines. Thus, creating a middle ground where biodiversity-rich urban nature exists alongside safety-assuring elements such as streetlights to reduce the association with risk.

Urban nature's association with risk, can furthermore be connected to the range of wildlife, especially fauna, existing in

various urban realities. A new report from WWF and UNEP, named The Need for Human – Wildlife Coexistence, mentions how urban populations perceptions of wildlife interaction often differ from those living in rural areas, where they for example more often are facing threats of predators attacking livestock (2021). While the Norwegian urban fauna exists of few species associated with risk, allowing for the measures suggested in the design, the same interventions could pose consequences of increased human-wildlife conflicts in other realities. Such consequences would counteract the intentions of the design and does further increase the importance of conducting nuanced analysis, addressing these complex systems to assure both wildlife connections and barriers, and adequate management where needed.

A new report from UNEP, named Making Peace with Nature, encourages change in perceptions of nature, claiming that the transformation of humanity's relationship with nature is essential for a sustainable future (2021). In order to do this, the report suggests addressing Earth's environmental emergencies collectively, given the interconnected nature of climate change, biodiversity loss, land degradation, and air and water pollution (UNEP, 2021). The report suggests that such a multiple-issue response can reduce multidimensional vulnerability, minimize trade-offs and maximize synergies needed to counteract these issues, enhancing the relevance of multidimensional approaches such as landscape design promoting urban nature quality and, consequently, perceptions of urban nature.

How we perceive urban nature, depend on socio-economic background such as profession, academic background, connectedness to nature and where we live – Hoyle, 2020

5.4 Recommendations for Implementation and Further Research

In order to overcome the limitations of the research for further implementation, it is crucial to include knowledge from associated professions, such as construction engineers, botanists, forest ecologists, and architects. Professionals should also be used to monitor the results of such green space interventions, to secure the proposed use as a laboratory for promoting urban nature (WWF, 2017). Secondly, there is a great potential in using the knowledgebases such as resources used in the analysis. Services such as the Norwegian Artsdatabanken and Oslo's new map over public trees were helpful during the analysis phase. Implementation, updating, quality assurance, and publishing of such databases can be of much importance to give more people access to knowledge about urban nature, making it more obtainable to work with promoting urban nature qualities.

Thirdly, it is essential to consider how to overcome the challenge of implementing green space planning over such vast areas as proposed in the design. As seen in the case of Hovinbyen, although overbearing goals of municipal and area transformation planning might be of great ambition, implementation is often challenging due to the many actors and the number of projects

these areas are fragmented into. Further research would need to investigate using various planning measures, such as regulations, provisions, consideration zones, and making large-scale green space plans to secure urban nature in larger geographical areas across private and public boundaries.

In a time where urban nature areas are threatened due to building pressures, such planning measures need to be acknowledged to make landscape design that re-connects fragmented areas possible. A functional multidimensional practice of such planning would open possibilities for the appliance of the suggested methodology and, accordingly, adaptation of the design strategy to work in urbanized geographical areas across the globe, to make planning less anthropocentric.

“As we begin to understand the true complexity and holistic nature of the earth system, and begin to appreciate humanity’s impact within it, we can build a new identity for society as a constructive part of nature. This is ethical. This is optimistic. This is a necessity.

This is what it means to “design with nature”.

- Richard Weller, Frederick Steiner, and Billy Fleming: The McHarg Center, 2022

5.5 Conclusion

By acknowledging that urban landscapes are heavily affected by culture, we also admit that humans have the means to change these landscapes for the better. What is allowed to thrive and what is not is a decision often deliberately or accidentally made by humans. By thinking this way about urban nature, landscape design can facilitate habitat creation and strengthen green spaces for humans and non-humans. The proposed methodology enables ideas of creating connections between green spaces and improving habitat conditions suited for species of conservation interest or other relevant species in individual localities through strategic analysis and design.

Moreover, using ideas from sciences such as landscape ecology and idealistic design practices such as biophilic design, in addition to opening up to learn from cultural landscape management practices in landscape design processes, we can create a more comprehensive understanding of how to face current situations and adapt them to tomorrow's urgent needs. In such a manner, we can build resilience in facing urban pressures and the effects of climate change in urban and rural sites worldwide.

Landscape designers can encourage broader perceptions of nature in cities, geographically and idealistically, through design, by opening up for new ideas, management practices, and approaches to let nature grow and develop more on its terms. This way, landscape designers can significantly contribute to creating more livable neighborhoods, as well as generating positive benefits for public health, resilience against climate change, biodiversity, and food security.

Using this way of thinking about urban nature, we can finally start acknowledging the idea that nature does not exist solely in untouched landscapes. By changing these perceptions, we can increase the appreciation of the magnificence of nature that surrounds our everyday lives. A perspective change which is beneficial to both protecting and strengthening of urban nature qualities, and for humans to live more peacefully alongside nature.

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6.2 List of Figures

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