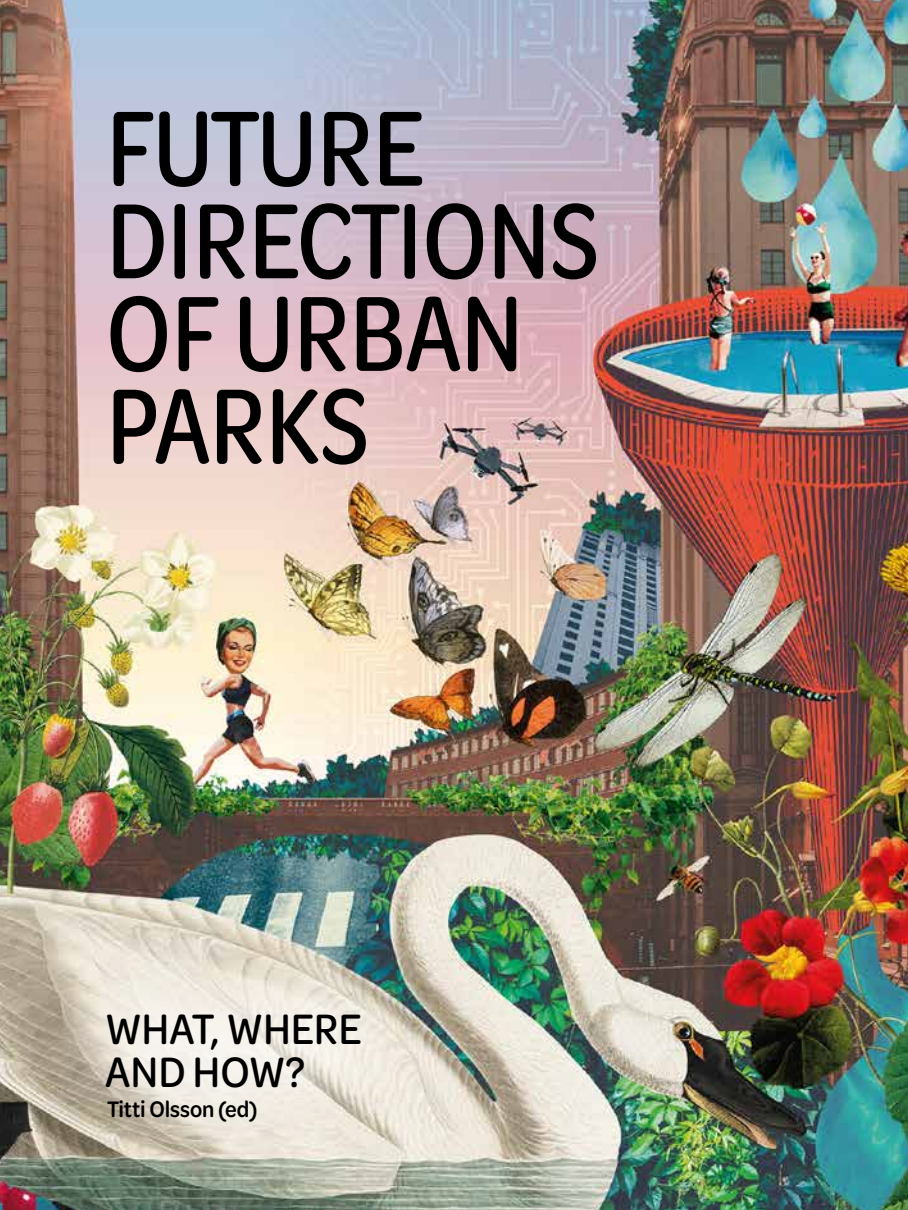
FUTURE DIRECTIONS OF URBAN PARKS



WHAT, WHERE AND HOW?

Titti Olsson (ed)

FUTURE DIRECTIONS OF URBAN PARKS

– WHAT, WHERE AND HOW?

SLU
MOVIUM
THINK TANK

Husqvarna

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PREEFACE

CHIEF GREEN OFFICER? AUTONOMOUS FLEET MANAGER? PARK RESILIENCE STRATEGIST?

THE IMPORTANCE of green spaces in urban areas is underscored repeatedly in numerous reports. Consequently, the number of public green spaces is increasing in urban areas across Europe and, at the same time, they are also becoming more complex. Beyond aesthetics, parks are expected to improve a wide array of environmental and social aspects of urban life – recreation, health and well-being, community development, mitigation of heat, reduce air pollution, provide habitats for wildlife, urban connectivity for biodiversity and more. As a result, the workforce that cares for green spaces will need to evolve correspondingly, but how?

Additional reasons to better understand the future workforce include the current lack of qualified labour and the decreasing number of applicants to landscaping programmes. Can the emergence of new roles and professions possibly make jobs related to green spaces more appealing?

With the ambition of providing new insights and inspiration to decision-makers in the green space sectors and getting closer to understanding which capabilities will be needed, we invited a broad group of experts to share their views on three pivotal questions: What constitutes a future urban park? Where are they situated? Which competences will be required to care for them?

THE OUTLOOKS FROM the 13 experts can be grouped into three areas – environmental sustainability, human well-being and the possibilities of technology. Regardless of area, all outlooks reflect the need for change, the need for a holistic mindset and more collaboration.

Could we therefore expect cities in 2050 to appoint Chief Green Officers, Autonomous Fleet Managers and Park Resilience Strategists? What we know for sure is that change is crucial to ensure the resilience of urban green spaces and that insights help to future-proof organisations in the green sector and provide essential guidance for the education and training of future workforces of green spaces.

I would like to express my deep gratitude to all the contributors to this report. A special thanks to the great team at SLU Think Tank Movium, which was instrumental in gathering the expertise needed to transform a good idea into a solid report and a constructive round table session where new thoughts were formed.

Stockholm, October 2024

Margaretha Finnstedt
Husqvarna Group

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INTRODUCTION

FUTURE URBAN PARKS – 13 PERSPECTIVES ON CHALLENGES AND OPPORTUNITIES

Right now, the wind of change is blowing around the urban park. Great technological advances, such as the internet of things, AI and machine learning create new hopes of being able to optimise and streamline the management of urban parks and people's use of them. These hopes, combined with major environmental and climate challenges in cities, put a new spotlight on what the urban park of the future should be like – what needs and wishes should it be able to meet? Where should it be located and with what knowledge and for what purpose should it be managed?

The park became a key feature of urban planning and development during 19th century amidst industrialisation and rapid urbanisation. As cities grew densely populated and unsanitary, parks offered open space and opportunities for relaxation and social gatherings. In the 20th century, major social reforms in many Western countries transformed parks into vital social resources promoting recreation, health and social interaction. Parks expanded into to include playgrounds and sports and swimming facilities to meet the city residents' various leisure and recreation needs, and emerged in all parts of the city. In the city, you could find the city park, the neighbourhood park and – in many European countries – the public amusement park.

The park became an essential part of the modernistic concept of the ideal city. It influenced new urban planning ideals, spanning from Howard's Garden City to Le Corbusier's Radiant City, which advocated for functional separation of activities and expansive green spaces. The park became the fundamental prerequisite for urban development. Although several values and features have been added along the way, human beings and their wishes and needs have consistently remained the focal point. Will this continue to be the case in the future?

In this anthology, we present 13 contributions where each writer explores the near future from their own perspective, addressing questions such as what is the urban park of the future? Where will it be situated? How is it managed and maintained? The texts are intended as individual debate pieces to stimulate discussions among educators, planners, landscape architects, designers, managers and technicians. Below, we outline potential directions based on the contributions. The writers come from diverse backgrounds, but they share experience and a strong interest in exploring, researching, and working with urban parks.

WHAT IS THE URBAN PARK OF THE FUTURE?

The contributors predict that the park will need to achieve a greater balance between and consider a variety of interests beyond the human needs. The urban park must address climate challenges and actively solve problems created by human beings– while also serving as a space for health and well-being. The parks will increasingly serve as vital meeting places and tools to achieve urban equality. As a result, cities need more parks and green spaces, with rising expectations for what they should offer. However, should we continue calling these areas parks, or is it more suitable to refer to them as green natural habitats – or perhaps something entirely different?

WHERE IS THE URBAN PARK OF THE FUTURE?

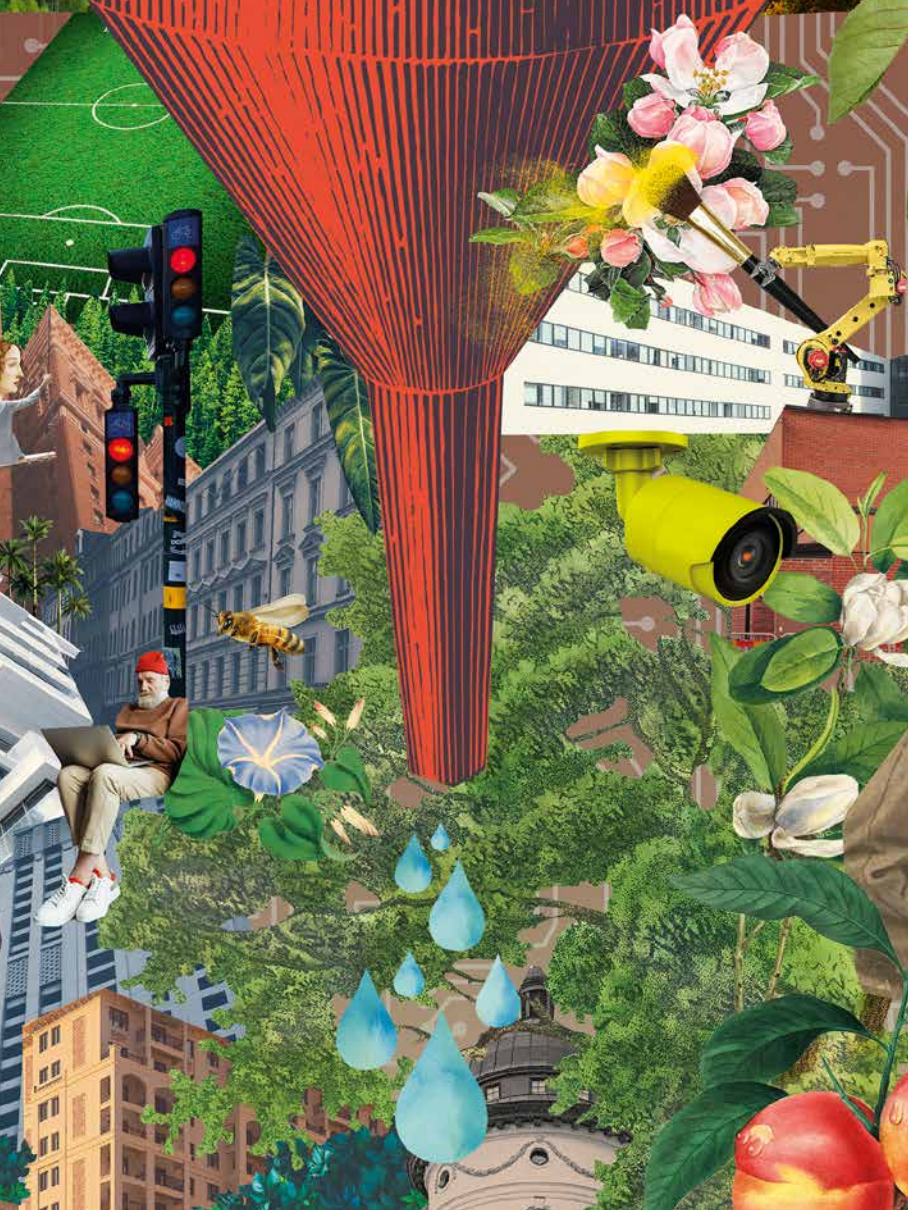
The contributors predict that the park and associated urban nature will be integrated across cities, forming a cohesive entity. The parks will shape residential development and establish the fundamental conditions for urban life. Functionally, they will serve as natural solutions to various climate challenges, positioned in the city landscape based on, for example, water flows rather than on human recreational needs.

HOW SHOULD THE URBAN PARK OF THE FUTURE BE MANAGED?

Managing the future parks is predicted among the contributors to require new and innovative hybrid skills and knowledge. AI and data-driven processes is predicted to revolutionise this work, by streamlining operations, saving resources and improving efficiency. However, is there a broader downside to digitalisation that we cannot fully grasp today? For instance, what will the future global energy footprint be if park management relies on the production, gathering and management of data? Managing parks must be approached as a long-term process where humans, nature and technology interact in a sustainable way.

These new hybrid skills may require technical knowledge in data management and analysis alongside a comprehensive understanding of biodiversity and human needs. As parks are anticipated to serve as both social hubs and technical solutions for various climate challenges, management will necessitate skills in navigating conflicting goals and interests.

Titti Olsson and Lina Berglund-Snodgrass
SLU Movium Think Tank



01

THE CITY OF TOMORROW SUPPORTS BIO-DIVERSITY

Thomas Elmqvist, Stockholm Resilience Centre

URBAN PARKS OF
THE FUTURE:

- Have very different management goals.
- Are distributed across the urban landscape, including the suburban areas.
- Need new and innovative, often hybrid, competencies for planning and management.

A framework to provide society with strategies to manage and enhance biodiversity for multiple purposes known as “The Nature Futures Framework” has been adopted by the Intergovernmental Panel on Biodiversity and Ecosystem Services (IPBES). This framework has recently been adapted to local government scale and is useful for strategic planning of urban parks and green spaces.

The framework is based on three important dimensions of biodiversity: nature for nature, nature for society and nature as culture.

NATURE FOR NATURE – here biodiversity and natural processes are important for rewilding of urban parks with native species and to increase biological connectivity to the wider landscape. One example that illustrates the need for cities to address nature for nature: projections reveal that in two decades, due to rapid urban growth particularly in the global south, 40 percent of the world's protected areas will essentially be urban parks. This will pass the responsibility onto local governments to prevent this development from resulting in large-scale biodiversity loss.

NATURE FOR SOCIETY – here biodiversity and ecological processes underpin the availability of nature-based solutions, such as green infrastructure, green roofs and artificial wetlands. Nature-based solutions are initiated to improve climate, air quality, water quality and improve physical and mental well-being. NBS are often defined as working with nature, as part of nature, while addressing societal challenges and supporting human well-being and biodiversity locally. This is manifested through the integration of nature in built-up environments in and around cities.

NATURE AS CULTURE – here biodiversity is the foundation of the relationship between people and nature in cities, and acknowledges the role of nature for social cohesion, community connection, educational and spiritual benefits. This is manifested in many forms of art and cultural activities involving nature, including urban gardening, the historical heritage of city parks and botanical gardens et cetera. Nature can provide the space in which urban communities reconnect with "place"; establishing a sense of belonging that enables social cohesion, health and well-being.

For cities to respond to the extinction and climate change crises, a transformational approach to urban nature futures is needed where cities seek to maximise the achievement of all three dimensions over time. To achieve this, there will be a need for vastly different and diverse competencies:

NATURE FOR NATURE: urban park resilience strategists, park rewilding specialists, urban ecological corridor managers, city biodiversity guardians

NATURE FOR SOCIETY: hybrid competencies in engineering, architecture and biology to address climate change challenges, health competencies in the role of nature in health therapy, including care for an ageing population

NATURE AS CULTURE: urban nature-culture pedagogues, urban biodiversity festival coordinators, urban planners with a focus on ecological, social and cultural corridors through the urban landscape.

02

THE FUTURE NEEDS GREEN STRUCTURES

Annika Karlsson, City of Malmö

- We need more green spaces which are connected by green corridors where the plant material consists, as far as possible, of native species with layers of plants, shrubs and trees to create habitats for insects, birds and other animals.

- Decision-makers need to prioritise sustainable solutions which are adapted to climate change and ensure that the function of ecosystems is maintained and that our cities are designed to meet the challenges of the future.

- Training courses in green space management need to be developed and be interdisciplinary to guarantee the skills supply in the industry.

To build, densify and develop a city which promotes biodiversity, prevents flooding and, at the same time, is an attractive place to stay requires a combination of strategic planning, innovative design and effective measures for water management.

Developing the existing green spaces and linking them with green corridors of varied vegetation with layers of plants, shrubs and trees, as well as underground storage ponds, not only benefits biodiversity, creates pleasant places to stay but also eases stormwater management.

Choosing the right plants is crucial to support the function and sustainability of the ecosystem. One of the most efficient ways to do this is to plant native plants, as far as possible, since they are adapted to the climate and soil conditions, making them more resistant to diseases and pests. They are also an important source of food and habitats for our local insects and birds.

INSECTS ARE AN important part of the ecosystem since they pollinate plants, break down organic material and are also a food source for many other animals. Unfortunately, insect mortality has become an increasing problem due to factors such as habitat loss, use of pesticides and climate change. By creating and maintaining parks with native plants, cities can offer a sanctuary for insects and other animals and, in this way, help to reverse the continuing trend.

However, the conditions in the city rarely provide a site where our native species can thrive. It is then important to plant a wide range of plants which are adapted to the site, bloom at different times of year and are tolerant enough to withstand drought and wet conditions as well as the temperature changes we face.

One effective method is to implement green infrastructures, such as natural wetlands, rain gardens, green roofs and other water-conducting systems. These features help to absorb and delay rainwater, reducing the load on stormwater systems and minimising the risk of flooding. Green roofs also help to lower the temperature and improve air quality.

ANOTHER IMPORTANT measure is to build and maintain a robust stormwater system which can handle large volumes of water and also functions as a storage pond that is available to vegetation during the dry months of the year.

Advanced technology such as smart sensors and monitoring systems can be used to collect data. The right data contributes to streamlining and development, as well as identifying trends and discovering potential problems in real-time, making it possible to take action quickly when needed. One example is watering new plants: watering only those plants which need to be watered is not only streamlining operations but also helps to reduce transport.

Political decisions play a critical role in the design and administration of these parks and infrastructures. By prioritising sustainable solutions which are adapted to climate change, our decision-makers can ensure that the parks and street environments of the future are not only beautiful and accessible, but also designed to meet the challenges that the future holds.

IT IS IMPORTANT TO develop training courses in land management. In order to be able to develop and manage the green spaces of the future, training courses will have to become more interdisciplinary and cover several different areas. Basic knowledge of plants and green space management will, of course, be required, but being able to use advanced technology requires additional training. In order to be able to record data, interpret information and use it also requires knowledge of machine learning, computer science and programming.

03

CLIMATE CHANGE OPENS UP OPPOR-TUNITIES FOR NEW SPECIES

Henrik Sjöman, SLU and Gothenburg Botanical Garden

SOME OF THE CURRENT CHALLENGES WE FACE IN MANAGING PUBLIC PARKS INCLUDE:

- Being site-specific: It's essential to tailor plant material and design to the unique conditions of each site while also anticipating future challenges.

- Promoting diversity: Incorporating a diverse range of plant species is crucial to minimize the impact of potential diseases and pest outbreaks.

- Climate-Adapted planting: In line with promoting diversity, we must select plants and genetic materials that are better suited to the changing climate, including species from various geographical regions.

The city's green infrastructure, of which parks are one of the most important elements, has for some time been identified as crucial to meeting the challenges we face, such as a changing climate and increasingly intensive urbanisation with more and more people living in our cities. The parks and other green infrastructure are of crucial importance in being able to deliver a variety of ecosystem services that will mitigate the effects of an increasingly erratic climate.

Examples of ecosystem services are the more technical regulatory ecosystem services, such as reducing the effects of heavy rainfall with the risk of flooding, being able to filter air and thus absorb dangerous particles, being able to provide cooling during heatwaves, reducing cold winds in winter, et cetera. In addition to the more technical functions green infrastructure has an important biological function by creating conditions for high and stable biodiversity. From a more social perspective, the city's greenery is of great importance to the residents thanks to its strong recreational qualities: several studies show that we humans recover better after a stressful day if we can spend time in green environments.

What we must be aware of if we want to achieve the above-mentioned functions and services is that it is absolutely crucial that the green environments have the capacity to handle the future challenges we face. The climate scenarios presented to us indicate increasingly extreme weather with a higher average temperature and the occurrence of more extreme weather events, such as heatwaves, heavy rainfall and prolonged drought.

IN THE CASE OF MANY OF THE ecosystem services that the city's greenery can deliver, most of them are linked to large and prosperous green spaces, such as larger trees, tree plantations and larger shrubs, which means that the plant material that will deliver these services must be able to handle this new climate while maintaining healthy development. This means that some of the vegetation that we currently take for granted might not have the capacity to handle this new climate and must be replaced with more robust plant material, as the ability to handle this new situation is of the utmost importance.

Choosing the right plant for the right place and function is where we can make the difference and thus create cities that are resilient to the climate of the future, mitigating the consequences for all city residents. In order to do this, we need to develop our attitudes to the plants we use. This perspective raises a challenge that we need to act on immediately We must decide whether we are prepared to use plant material from outside Sweden – both species and genetic material from native species or from a different geographical origin (outside Sweden).

As the climate is changing so rapidly, it is difficult for the genetic material of native tree species to adapt and develop a tolerance to this new climate. Instead, we urgently need to identify which genetic material from our native species and which other species have the ability to develop successfully in our public green spaces and provide important ecosystem services. This is even more important given the many diseases and pests that have affected, and are expected to affect, many of our native tree species. It is therefore vital that we quickly identify which species we can safely use in our future cities without them becoming problematic weeds.

IN THE PROCESS of identifying future plant material, several universities and botanical gardens in Sweden have developed projects to evaluate not only different species but also their capacity to cope with the climate of the future and thus deliver important ecosystem services. It is equally important to identify the variation within a single species in terms of their capacity to cope with drought, heat or flooding, for example. Several studies have shown that the capacity to cope with drought is strongly linked to the origin of the unique genetic plant material. As an example of a species' distribution, genetic material originating from a warm climate has a higher capacity to cope with heat and drought compared to genetic material from a region with cool and humid conditions.

This may not be difficult to understand, but until now we have been treating species as a united group instead of looking at genetic variation within the species. In order to be able to match plant material to the changing climate of the future, while continuing to use the species that dominate our cities today, we need to update the genetic plant material that is currently in cultivation with more suitable material.

WE NEED to urgently develop our perspective on the main building material of parks, namely the plants, and start talking about the capacity and performance of the material to handle the unique growing conditions of the site today and for the climate of the future, while also discussing the capacity of the plant material to deliver important ecosystem services.

This perspective is not unfamiliar when we talk about machines or building materials for houses, for which we have been discussing the limitations and opportunities of different machines and building materials for a long time – this language must also be developed for plant materials if we are to develop long-term sustainable cities, in which green infrastructure has a crucial role.

04

THE PARK OF THE FUTURE STRENGTH-ENS URBAN FAIRNESS

Åsa Dahlin, Municipality of Södertälje

URBAN PARKS FOR INCREASED URBAN FAIRNESS AND SOCIAL COHESION:

- Counteract people's vulnerability and strengthen biodiversity.
- Promote urban happiness, inspiration and meetings between different worlds of ideas.
- Strengthen cooperation between the city and countryside and civil preparedness for social crises.

Public space confirms our freedom and equality in the city. When our parks are designed with consideration for the most vulnerable people, plants and animals, urban fairness is manifested. The parks become a democratic arena with respect for the equality of human beings and the survival of biodiversity. They become part of an urban transition which counteracts social polarisation and help to reduce the impact of climate change. As UN Habitat put it, “urban action is leaving no one and no place behind”.

The parks reflect their city and its neighbourhoods. Designing a beautiful park cannot compensate for a neighbourhood being disadvantaged, according to urban sociologist and journalist, Jane Jacobs. The entire urban environment must be managed so that people want to use the parks as part of their daily lives. Urban interaction is always there, as well as the risk that the parks will become unsafe, be taken over by certain groups or allow room for criminality. Good design and management of all spaces reduces polarisation and increases fairness. It heals and calms the city's pulsating life and pain. The parks become coherent green lifeblood running through public space.

THE PARKS OF THE FUTURE need to be developed mostly in areas that are densely populated, have many children and young people and where household finances are often tight. Sometimes these neighbourhoods are on the police's list of vulnerable areas in great need of action. Parks are an important component. Inspiration for inclusive city development is available from Sweden and abroad. The authorities, industry and the non-profit sector need to join forces to develop the urban parks. This requires commitment as well as new forms of funding. A wide range of skills are needed for management and design, such as gardeners, construction workers and tree surgeons, as well as educators, cultural and social workers and businessmen. Creating horticultural societies and cooperating with schools and non-profit-making organisations can be essential.

The parks provide opportunities for meetings and discussions to build confidence and trust. We learn about each other's living conditions and world of ideas. Here, freedom of opinion and religious freedom reign, as well as a willingness to understand more and hold discussions. The trees provide green spaces for learning and sensory experiences and perhaps we can leave our mobile phones behind.

THE PARKS GIVE US a place to rest for recovery and reflection to recapture the existential depth and power of thought. They also provide an opportunity for the city's festivals. Here, children and adults can meet and set up long tables and dance to music from all over the world. Different stages are available for sitting down, giving a speech, singing, playing music or putting on a theatre show. The park accommodates play and seriousness, exercise and peace. Children's tree houses are found beside sculptures and other expressions of art.

The parks of the future strengthen the bond between the city and the countryside. We let the countryside move in through urban farming and we create space to sell and trade local produce and other groceries. We might have space for hens, pigs, goats and other animals in the park or cycling between the park in the city and a wildlife park in the intermediate zone.

THERE MIGHT BE kitchen gardens in the park where we grow fragrant and tasty herbs and vegetables, fruit and berries. This would make city kids happy and allow for intergenerational meetings. The parks also help to strengthen civil preparedness for social crises through social cohesion and food supply.

Urban parks provide opportunities for aesthetic experiences in the spirit of the philosopher John Deweys; experiences which are closely related to people's daily lives and sensitive ability to create meaning and beauty. In turn, this provides inspiration and energy which enrich us and contribute to motivation for increased urban fairness and empathy. Those city-dwellers whose lives are the hardest, who are homeless or grieving, need the consolation of the parks. Here, there is space to rest and heal their pain.

05

THE CITY PARK'S NEW CLOTHES

Emilia Molin, LAND Arkitektur

- In the multifunctional parks of the future, urban recreation is balanced against adaptation to climate change.

Expectations for parks of the future are high. If we move from the city centre out towards the city boundary with the surrounding landscape, we encounter three different types of parks, in three different locations, where urban recreation must interact with measures for adaptation to climate change and increased biodiversity.

In the central locations, on the most attractive land in our major cities, space is running out. Spaces which could previously have been planned as parks as they were regarded as too difficult or unsuitable for building on, such as slopes and low-lying land, are being densified. To build a new park, we first have to create more land. By covering existing roads and railways with platforms, new ground for urban development is created, including the artificial parkland of the future. The small and extremely expensive areas which are reserved for greenery must provide supporting and regulating ecosystem services: stormwater treatment, regulation of temperature and increased biodiversity.

USING SKILFUL SPATIAL design, which creates the illusion that these compact micro-oases are larger than they actually are, they might also provide an urban nature experience right in the centre of the city. These small park spaces have technologically advanced plant beds, with preconditions that have been established in the early stages of the planning process. The vegetation design is based on principles that mimic nature and is adapted to the extreme conditions which public parks on platforms entail.

We can already see how adaptation to climate change and measures for increased biodiversity have begun to manifest in the urban park spaces. Existing parks are being adapted above and below ground to handle heavy rain and delay stormwater run-off. This is often accompanied by an educational aesthetic, explaining the reasons behind the design and that we need to get used to the city's green spaces having a wilder look – the classic city park is getting new clothes.

The city park of the future is certain to include more "messy" biotopes, such as different types of meadows and compact thickets. From today's sporadic and specifically designated areas, they are spreading out more and more to form an integrated part of the city park's design.

IN AN INCREASINGLY densely populated city, the demands on the recreational functions that the city park must provide are constantly raised. Today's city park is already a heavily programmed space. It contains outdoor gyms, parkour runs, open-air dance floors and all manner of play equipment, which clearly indicate how the public space should be used. Demand for specific functions will probably continue to increase. Concurrently, these spaces need to be adapted to climate change – a ball court or skate park is also a surface water flooding area. A wooden jetty conceals a waste water treatment plant, and so on. In the city park of the future, multi-functionality is so maximised that every piece of land has another function in addition to the obvious.

On the outskirts of the city, we find the antithesis of a city park in the stormwater park. This park is inherently multifunctional since it primarily consists of a storm-water facility, a buffer zone for flooding, or a space for restoration of a natural watercourse, where the opportunity to combine its main function with urban recreation is made use of. While the city park develops from a "mere" park to a daywater facility, the opposite is taking place in the multifunctional stormwater park.

THIS MOVEMENT creates space for the more low-key park space of the future, with a less controlled programme and an openness to the unplanned. With concern for basic recreational functions such as walking, sitting down, views, discovering and sensory impressions. These are seemingly obvious functions in a park, but risk being displaced in a heavily programmed, technologically advanced park space. When central park spaces are densified with functions, parts of urban recreation move outwards. And as the water's path through the landscape becomes an increasingly dominant factor in urban planning, the stormwater park will become one of our most common park types.

06

ARE YOU A MASTER, STEWARD OR FACILITATOR?

Lisbet Christoffersen, SLU

- Views of nature shape park design and management.
- A shift towards a wilder view of nature is taking place.
- Future park managers must acknowledge and accommodate divergent views.

All efforts are needed to accommodate biodiversity. To allow for a multitude of biodiversity management practices, we need a deeper understanding of different approaches and attitudes. This will facilitate a constructive dialogue, which depends on our ability to recognise and reflect on the different views of nature that exist. There are three different ideal types of landscape managers.

The three *ideal types* are grouped on the basis of different understandings of which landscapes are valuable and how they should be managed. The word "ideal" does not mean "best", but rather refers to an "idea". By constructing ideal types we can illustrate the different patterns of behaviour, thinking and practices that a group exhibits. An ideal type is never identical to a real person, but helps us understand perspectives that differ fundamentally.

THE STUDY WAS motivated by the sometimes heated debates about "wilder landscapes", a trend in both rural and urban landscape management where natural processes and dynamics prevail as a principle. Wilder landscapes imply the acceptance of "non-utility" and "non-conservation", are unpredictable and look different from what we are used to. They span from large-scale rewilding to smaller scale urban projects. The natural processes may be actively initiated, through veteranisation of trees, stopping drainage or re-introducing key species, or passively by stopping lawn mowing to allow for the free development of grass and other vegetation.

Proponents of "wilder" development of the landscape see themselves as *facilitators,* whose role is merely to enable the work that nature does when left to its own dynamics. While this method has been recognised as an important contribution to support biodiversity, it appears to provoke two existing approaches – or paradigms – that aim to accommodate biodiversity:

ONE IS "traditional" nature conservation, which in Europe is quite reactive, aiming to preserve what exists. Proponents see themselves as *stewards*, protecting species and habitats, often by strictly maintaining landscapes at a specific stage of succession, a meadow or heather, both of which would grow into forest if left to natural processes. *Stewards* are more focussed on the landscape elements than on its processes.

The “master” perceives nature as the provider of goods and services for man, and seeks to promote biodiversity through “sustainable development”. To secure the continued supply of natural resources and services for the well-being of future generations, the proponent believes that humans must *master* nature. The value of biodiversity relates to its use-value. Otherwise, it is one of multiple benefits that a productive landscape or ecosystem service can provide. The *master’s* landscape is efficiently adapted to human uses.

STEWARDSHIP SEEMS TO prevail among professional landscape managers and in legislation, while *mastery* in the form of "nature based solutions" gains ground in urban green planning and management. However, the recognition that no areas today are unaffected by human activities appears to instigate a wilder landscape paradigm. The trend goes beyond management; it includes an appreciation of the untamed and unpredictable, perhaps even a longing for landscapes untouched by human activities, and thus a premonition of a shift to a more profound view of nature?

Views of nature shape both landscapes and policies. The alignment of visions and interests is a dynamic negotiation with arguments anchored in different professions, experiences, research fields or management practices. A guiding principle of "sustainability communication" is about disclosing positions or contradictory interpretations. Management of our future parks will include a fundamental debate about human intervention in "natural" landscapes. Hopefully, acknowledging the existence of the three ideal types will ease these debates.


T

07

ACT IN HARMONY WITH NATURE – THINK IN TERMS OF PROCESS

Thomas Barfoed Randrup, SLU

- Nature-based Thinking as the future mindset to management.
- Think long-sighted, in management, in funding and in engagement processes.
- Think in new ways about governing, both horizontally across silos and vertically across administration levels.

The old ash tree stood majestically and proud, sharing its shade over the shrubby undergrowth, and sheltering the grass and flower-rich meadow. Surrounding the meadow, stood other groups of trees, representing various species and ages. Most of the trees were planted as saplings, others were self-generated from seeds.
Some seasons had been dry, others wet, and recently the seasonal variations had increased with both warmer summers and more intense rainfall. Those which survived the changing climate had spent their lifes in calmness and self-control.

The group of trees formed a stark contrast to the meadow, both from an ecosystem and a visual perspective: from the dark to the light, from the covered and protected to the open and exposed. This variation was also found in the old forests of the area, and had been cherished by the locals for many years. Today, the locals valued, used and interacted with the park setting, which provided a sense of local belonging and pride. Not only because the local park represented something indigenous, but also because the place was managed in a multifunctional manner, providing nature experiences, tranquillity and room for leisure, play and social interaction. The place, once a central park, had developed steadily to become a central refuge for all ages, as a quick walkway, meeting place or hideaway.

THE LOCAL government's park administration had transformed the place from a manicured park with free-standing trees and well-mowed lawns into a more natural setting. The old ash had kept its majestic appearance, even though it was now almost dead. Its fading, vigorous glory was compensated for by intensely rich biodiversity – an appearance which signalled both pride and surplus, valued not least by the local community and users.

The park administration had gradually responded to an acknowledgement that nature is a central part of the solution to the many contemporary societal challenges. However, it has also found that a solutionist and anthropogenic approach to solving challenges, such as climate change, could not be dealt with by the use of nature alone. In order for planners and managers and the local community to really embrace nature, transformation beyond solutions-based approaches had been needed. Nature-based solutions, (often technological in their approach), green infrastructure as part of planning and ecosystem services as an expression of capturing the value of nature for human benefit needed to be placed in the broader framework of how we develop, design and manage our cities. Therefore, the transformation of park management was based on a new understanding of the human-nature-organisation relationship.
A mindset known as Nature-based Thinking, driven by three overall dimensions and three principles.

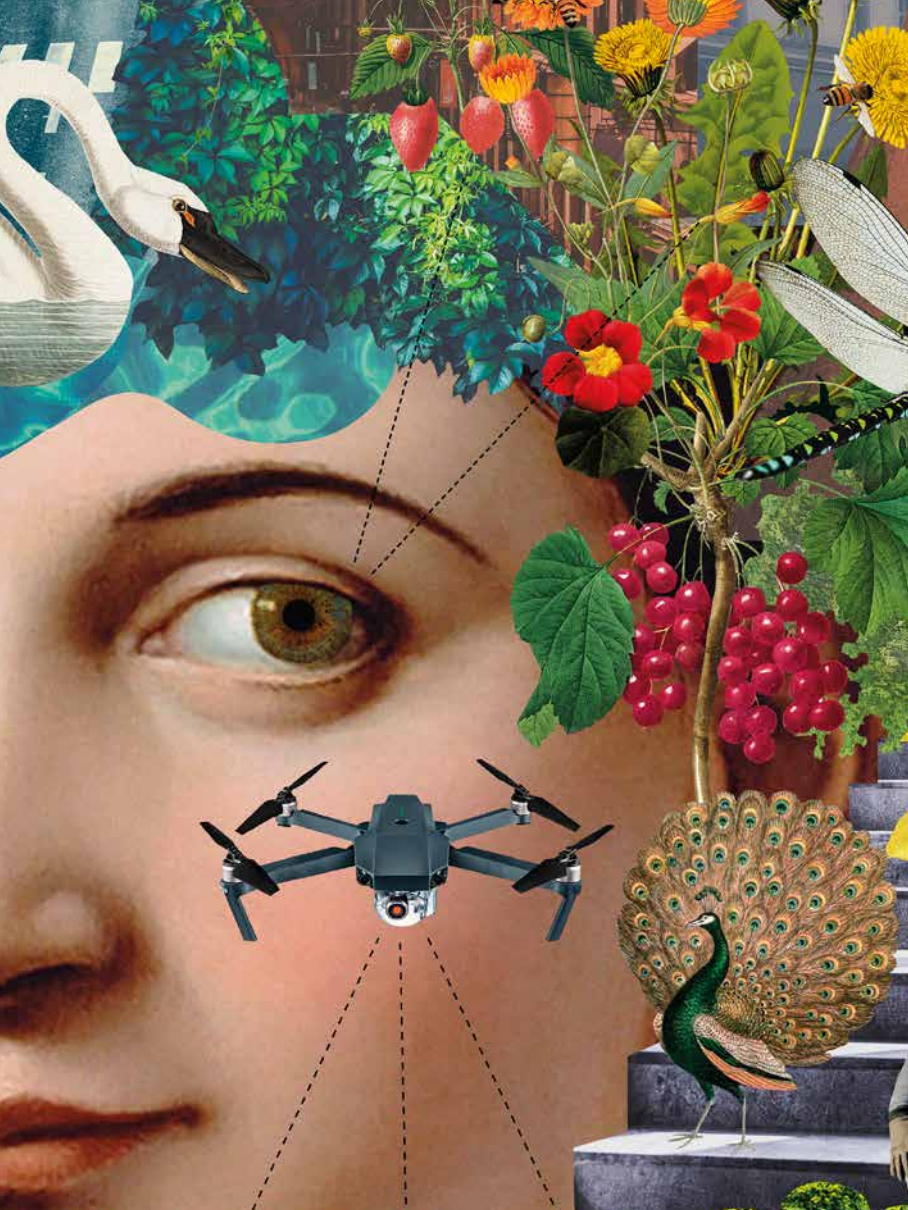
The three dimensions include:

- *Nature itself* and its ecosystems and ecological processes, which hold intrinsic values that have inherent rights to exist, regardless of their usefulness to humans.
- Formal or informal *institutions and organisations*, which own, govern and manage a natural space.
- The *communities* living in, for and with nature and which are connected to nature, both physically and emotionally.

Nature-based Thinking proposes a shift from a solutionist approach to a systemic one in the management of urban nature, suggesting that the changes that cities need could be defined by the interrelations between the three dimensions. The relations between these dimensions are interdependent, all being of the same weight and importance. Three principles are central to the interrelationship:

- Developing *new modes of governing and managing* to adhere to new long-standing visions for transdisciplinarity and inclusivity.
- This will require a *change in human-nature relationships*, from looking at nature *for* people to nature *with* people; and
- To *think and act in a longsighted manner* in all aspects of management. Developing nature takes time, and so does building human relationships and engagement activities.

While the dying ash tree represented a shift from the past to the present, it also represented an institutional shift in how urban park settings were once planned and managed. The local park management had changed from viewing trees, parks and nature in terms of solutions to long-term visions. They no longer looked on park management as a project, but as a process and in line with this, local engagement and involvement had changed from being a time and resource-bound intervention to a long-term interaction.



08

WITH AI AS THE CO-PILOT

Patrik Jägenstedt, Husqvarna Group
Stefan Axelsson, Husqvarna Group

- AI and data-driven ecosystems will revolutionise green space maintenance, optimising city environments for health and sustainability.

- The future of landscaping will integrate autonomous technologies, creating new roles that require a synergy of advanced skills and environmental stewardship.

Picture a city where every tree, shrub, flowerbed and lawn thrives, receiving the ideal balance of water, nutrients and care to deliver good air quality, cooling temperatures, high biodiversity, good water management and healthy communities. By harnessing the power of artificial intelligence (AI) and automation, this vision will be a possibility in 2033 when we transition from calendar-based area management to data-driven maintenance.

The pace of digitalisation and AI adoption in professional landscaping is rapidly advancing. By 2033, Husqvarna anticipates that landscaping teams will be empowered by a data-driven, intelligent and efficient ecosystem that serves as a co-pilot for in-field operators, managers and decision-makers. Consequently, we expect new roles to emerge to accommodate this shift in working practices, as the maintenance of green spaces evolves from upkeep to optimisation to support cities' sustainability targets.

AT THE CORE of this future working model lies data collection and data understanding. Utilising sensors at macro, meso and micro levels, data can be gathered and curated for optimisation. Satellite data enables monitoring of the size and health of urban green areas. Drones assess individual tree health to implement preventive measures. Autonomous solutions equipped with sensors can gather comprehensive data, including surface conditions and subterranean factors such as soil pH, texture, infiltration rate, moisture content and humus levels.

The curated data facilitates the transition to proactive green space management across various tiers.

For the *operators in the field*, data provides actionable insights. By integrating a database of all living species with weather forecasts and park health status, each member of the landscaping team will access curated information to make informed decisions. This could, for instance, help with identifying invasive species at an early stage.

FOR MANAGERS, data will help with resource-planning, cost control, monitoring and reporting. For example, monitoring biodiversity and carbon emission reductions will be of increasing importance to achieve climate neutrality and restoration of ecosystems.

At *city level*, data enables long-term forecasting. By creating a digital twin of the city, decision-makers will be able to analyse and predict city health to optimise care, productivity, resilience and biodiversity. This forecasting capability extends to predicting important metrics such as tree health, cooling effects and optimising necessary care.

The proportion of green spaces is forecasted to grow, yet budgets are not expected to grow correspondingly. This calls for further and faster adaptation of autonomous solutions. Today, solutions for cutting grass save landscaping teams hundreds of hours on an annual basis. In future, we foresee that more tasks will be handled by autonomous solutions. Multi-level data from green spaces can be translated into task lists for autonomous solutions, freeing up landscaping teams from time-consuming jobs such as mowing, watering, mulching, edge cutting, invasive species identification, re-seeding and fertilising – operating 24 hours a day, with minimal downtime for recharging.

THE CONVERGENCE of efforts to achieve net-zero and advancements in technology is poised to have an impact on the landscaping industry's way of working. We foresee that this transformation will forge new types of jobs within professional landscaping, calling for a paradigm shift in both skills and attitudes to incorporate new technology as a fundamental element in everyday operations. It is our hope that these emerging roles will attract fresh talent dedicated to cultivating greener urban spaces across Europe.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09

NEW TECH-NOLOGY CREATES NEW PARKS

Tobias Emilsson, SLU

- Future parks and the park management of tomorrow will be smarter and decisions will be supported by new and emerging technologies.

- Still, there is a need for thorough discussion about possible environmental, social and economic challenges.

Our future cities as well as future parks will rely on smart technology for their operation, management and strategic development. The park workers of tomorrow will have profound knowledge of the function, development and requirements of green, blue and hard surfaces, but their decision-making will be supported by direct measurements of performance through sensor use, different remote sensing-based tools and artificial intelligence. Collected data will guide decisions to improve the experience of parks and green infrastructure, further increasing the efficiency of operation and making better use of scarce resources. Potentially, it could also be used to develop new values or recreate values, functions or habitats that have been lost.

A SMART PARK is also a park that meets the needs of urban citizens. It is probably a place for recreation and where creativity and joining in are stimulated, but there is also a need for a new discussion about how and what the parks and green spaces should be used for and by whom. There is a need for improved discussions or smarter ways to look at the values that urban green spaces are delivering to urban inhabitants and to society as a whole. The last few years have not only shown an explosion in the data that is becoming available, but also in the anticipation of what the green spaces should deliver.

Urban green spaces and urban parks are no longer the sole responsibility or focus of municipal green space management organisations, but something that involves almost every citizen. The green areas have gone from being areas for recreation, admiration and interest, to surfaces which should fulfil multiple functions, mitigate the negative effects of climate change and can be designed to preserve and slow down the rapid decline in global biodiversity. Designing and managing green spaces in a way that fulfils more of these, sometimes contradicting, needs will be challenging, especially as urban centres are undergoing continued densification. Smart technology might help with visualising and presenting some of this data to increase our understanding of the potential of urban green areas.

NEW TECHNOLOGIES will also come with a new set of challenges. The advancement of new tools and automation means that the type and number of workers in the green sector will change. There will be less demand for low-skilled workers doing simpler tasks that can be automated.

However, challenges are also presented by an increased use of smart technology and connected sensors. Future sensors will be smaller and require less energy to produce and operate, but the total environmental cost could be large if deployed across several fields and globally. Producing, maintaining and recycling vast number of sensors can, in the long term, present environmental challenges and cost a lot of money. A simple analogy could be made to the computer systems of the past. The energy-gulping monsters of the past have been exchanged for smaller, more efficient units, but the total energy use has increased enormously. How large this footprint for production, collection and recycling, andmore importantly data processing, will be is hard to determine. Much more work is needed to help us understand these challenges.

THEREFORE, WE ALSO HAVE to make smart decision about how and why we are measuring. We also need to ask ourselves if we are controlling how parks look and are being used to make us feel better or if we are leaving these decisions to smart systems? How much measurement and tracking of our environment are we willing to allow? In the best of worlds, technology supports a diverse, inspired and creative workforce in their work to maintain and create a healthier, more sustainable, more beautiful and inspiring environment, while respecting planetary boundaries, privacy values and fundamental human rights.

10

NEW TECH-NOLOGY CREATES DEMAND FOR SKILLS

Daniel Linderståhl, Green Landscaping

- Future management will mean greater demands on accessibility, more technical skills and, not least, a clearer dialogue between stakeholders on the market.

- Management companies will possess a relatively high level of technical and biological skills, which create significantly more efficient and targeted management than is currently the case.

- In future, humans will also be the most important resource to create beautiful and functional green spaces, but this will be done in a different way than it is today.

We can see that the use of outdoor environments is increasing, at the same time as more green space is being built on and the climate is changing. In a densely populated city, more skilled management is needed to create the required experience. Owners, suppliers, product manufacturers, everyone will be affected in different ways, not least as regards the need for people's skills. Rapid technological development creates the prerequisites for more efficient management and will become a natural part of operations.

Sensors will be found on a large scale and will form the basis for management decisions. Collecting information from different data sources will be a prerequisite for successful management. We will have data about growth, soil conditions, moisture levels, the fullness of bins, weather, traffic conditions, air conditions and probably a lot of information that we have not even thought about today. This data can then be used for planning and analysis.

Machines will mostly be autonomous and, in future, they will be able to perform more tasks than they can today. In 2024, a great deal of cleaning, for example, is still performed manually and there is good reason to believe that there are already other, more efficient ways to carry out this work. Different types of robots will become an obvious feature of future work.

PLANNING AND FOLLOW-UP will be automated and companies with a very high level of technical skills will have a prominent role in the market. AI will support the planning of management at all stages. The measures taken are logged and entered into the system and contribute to improved quality and accuracy in execution. Data forms the basis for the optimisation of resources for the different stages.

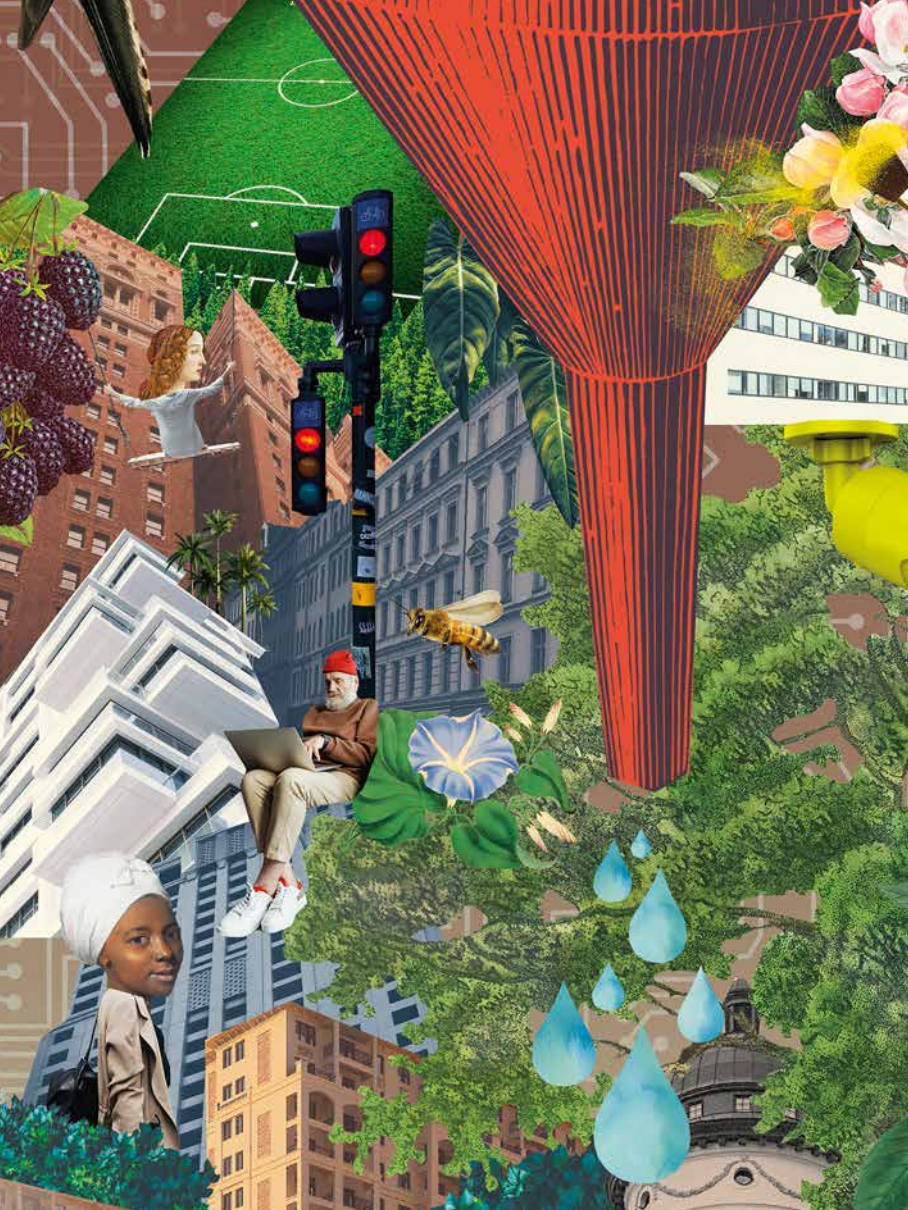
Staff will be given new tasks and new skills will be required in the industry. Roles which are currently performed by machine will be reduced, while the number of machine and robot operators will increase. Employees with a high level of skills in data analysis as well as biosystems will become a much sought-after group for employers to optimise the control of management. In future, humans will be the most important resource we have, but they will work differently than we do today.

The management system which consists of the above-mentioned parts will provide information on which management efforts are needed in the different areas through data gathering and analysis. For example, where there is a need for weeding, mowing, soil improvement, emptying bins etc. The system will evaluate and prioritise the measures which are needed. Planning will be optimised so that each management unit will be given tasks suitable for their skills and availability as regards time and space.

CURRENT MANAGEMENT GROUPS will be supplemented with drones for image analysis, sensors for measurement, service equipment for stationary installations, portable robots for mowing and weeding flowerbeds and flat surfaces. Those companies which are best able to handle the above and make the best use of technology will be the ones which are in demand on the market.

Owners will view their spaces in a new light and cooperation between suppliers and clients will increase significantly. The owners' requirements will revolve more around functionality and the suppliers will have to deal with the question of how to achieve this.

USERS' OPINIONS will be fully accessible to both owners and suppliers and will become a natural part of decision-making and investment processes. The interaction between the different stakeholders will increase significantly and the areas will be made better use of than they are today in terms of what people want. Dialogue will be facilitated using various digital systems, which give all parties a better understanding of how the areas can be developed.



11

NEED FOR COMPLEX SKILLS IN GREEN TRAINING COURSES OF THE FUTURE

Karl Lövrie, SLU

AS A REPRESENTATIVE OF A UNIVERSITY THAT EDUCATES STUDENTS IN THIS FIELD, I CAN SEE THAT:

- We need to increase collaboration with working life and society further to be able to meet future skills needs.
- We need to develop knowledge through more research into complex contexts and conditions, not least the social aspects.
- The development and application of technology will happen so quickly that the universities and relevant companies and consultants need to work together to ensure that we provide students with relevant skills.

What will we need in 2050 in terms of skills for planning, design and administration of successful green, urban environments? Firstly, climate change will be more evident than it is today and accelerate even faster. Biodiversity and the biomass of wild animals have decreased further. On the other hand, we humans are ever increasing in population and live in urban areas and have an even more digital lifestyle than before, for better or worse.

Requirements for the green urban environment will become more comprehensive and complex than ever. At the same time, it will likely also be about a back to basics approach, where the park needs to meet the cities' and inhabitants' basic needs on a broad front. Naturally, it is about the biotechnological challenges and management of more and longer periods of heat and drought, heavy rain and flooding, pests and the invasiveness of plants. It is about the park having to contribute to the survival of plants and animals, as well as being there for the well-being and health of humans, to a greater extent than today.

IT IS NOT UNREASONABLE to think that the increased number of inhabitants will place greater demands on their local environment: that it must be green, accessible, cooling, recreational and rich in experiences. The need to move, exercise, experience reality and meet in real life will be great. This is required to balance out the rest of digital daily life. Inhabitants will likely want to interact with their green outdoor environment in new ways, at the same time as the urban land that is not taken up by buildings and streets will be too valuable not to be used for different types of urban farming. In future, we should also see visitors who partly manage the park.

After 60 years of digital societal development, the park will probably also play an important role in the work of increasing the democratic dialogue and reducing polarisation between people. Knowledge of these socio-cultural needs will be just as great as it is for biotechnological needs.

THE BOUNDARIES BETWEEN the city planner, landscape architect, landscape engineer and social worker need to be less defined. In order to meet these needs, we will also need to have private and municipal organisations or roles which are more integrated. We still need to overcome the remnants of early epochs' enthusiasm for specialisation and their tunnel vision.

It is clear that large amounts of knowledge are needed for such a complex future. Knowledge of how that knowledge should be integrated and used is also required. It is therefore about establishing an interdisciplinary, holistic system perspective, at the same time as we need increased support from specialist knowledge within technology, for example.

Today, we cannot yet understand the extent of the AI revolution, but knowledge of managing advanced technology will become a central skill in many professions. Optimisation using generative AI will naturally take place in everything from urban planning and design to care and management of urban parks and green environments.

Using even more advanced visual analyses than today, we receive information on use, wear and tear and the status and needs of individual plants, allowing us to adapt and get indications of necessary development and maintenance action. But AI does not mow lawns or prune trees. However, AI can be integrated with an increased use of robots, although a lot of the traditional type of manual work will still be required. Skills will be essential, not only for managing the technological options ourselves, but also to understand how we should best be governed by technology.

WITH ALL DUE RESPECT for the development of technology, there will also be a vast request for knowledge within the social sphere. Future park rangers will need educational and social skills to inform, support and guide visitors when they want to stay in and interact with the park, on their own or together with others.

Visitors' activities need to be interwoven with other necessary and existing functions, such as increasing biodiversity or supplying vegetables to the local restaurant. The park will become a central place for the city's inhabitants, even more than it is today, and generally play a greater role in the urban environment.

12

NEW AESTHETICS ARE BORN FROM AN UNDERSTANDING OF BIOLOGICAL DIVERSITY

Douglas Wells, Acre

- There should be more engagement from politicians and urban planners to educate themselves together with arborist and tree experts on the importance of diverse urban parks.

- The future of urban parks requires people to become more educated on the value of biodiversity. This knowledge needs to coexist with and work alongside the aesthetic demands of urban park users.

Regardless of where we travel in the world we are constantly drawn to the unbelievable energy and beauty of nature. This beauty can come in different forms such as, a waterfall, a mountain, a forest or a park. Nature is all around but it can be easy to forget the importance and soul satisfying experience we get from spending time in a park when living in a city. It might be that you do not have the time to enjoy the forest or live close to a wooded area, but you might have a park close by. A park in the urban environment can give you that needed break from the pulsing city. Urban parks are a place in which we can kick off our shoes, forget the goings- on of the hecticness of life and enjoy the simplicity and freeness of nature. An urban park is so much more than just a space, it's a living organism.

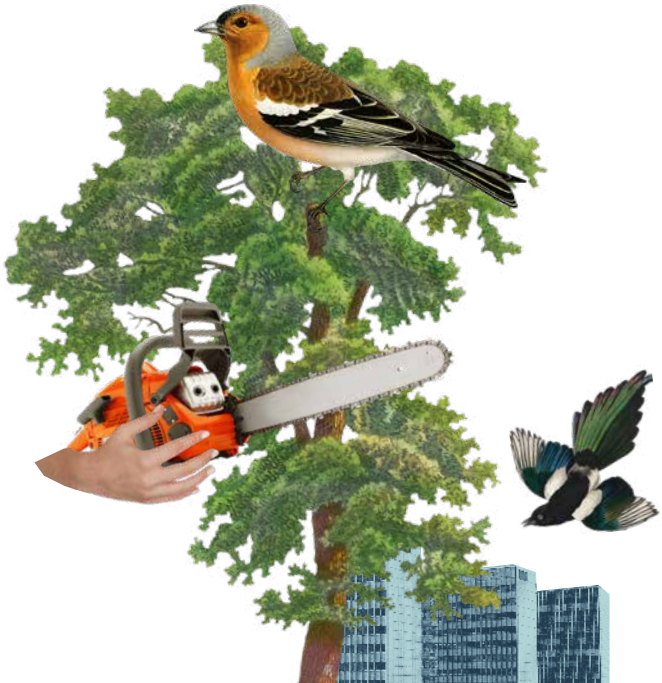
From my personal experience of living in Scandinavia, people have a high tendency to gain sun exposure during the spring and summer months. This is connected to the low amount of sun hours for a large part of the year. Urban park visitors are very rarely in the shade and some studies have shown that wellbeing for them comes in the form of experiencing the openness of the landscape. Studies with regards to park preferences have suggested that western cultures tend to prefer a sparse park landscape with a scattered tree planting scheme and large areas of continuous grass.

DIFFICULTY COMES IN trying to find a balance between park visitors' needs regarding park aesthetics and the importance of a well-balanced naturally diverse park. A park that would yield a high natural value and richness in biodiversity would have an unkept look, which can be off-putting to some users and concerns about safety can also arise. Often the unkept look of an urban park attracts not only the biodiversity needed in the urban environment but also attracts undesirable park users. To create the required balance in urban parks, there should be controlled unkept areas which are behind barriers with informative signs to tell the public that all areas are important and controlled in different ways. An experienced and educated arborist will be able to suggest solutions for maintaining a suitable balance within urban parks.

Urban parks should be planned to be multipurpose with both green areas and waterways. Trees and other shrubs should be planted to make use of the ecosystem benefits, such as moderating temperatures in the summer months, to act as sound dampening, to create familiarity and comfort for the residents, as well as to include the reconstruction of biodiversity within the urban environment. The benefits mentioned above should be the primary focus when building new parks or maintaining existing parks.

THE PROBLEMS FACED by a lack of true political emphasis and understanding can lead to problems for future generations. It seems that old-time urban planners and politicians understood the importance and value of nature together with urban development and that is why we have parks and green areas in our cities today. Somewhere it seems that this understanding and knowledge have been forgotten and maybe even passed over for profit.

Regarding the amount of research showing health benefits, there should be more emphasis on retainment, creation and easy accessibility to urban parks. Since the occurrence of the COVID pandemic in 2020, there has been a strong rise in the use of urban parks, which has also created more engagement from the appreciative public. This engagement should be encouraged with more education on the importance and value of urban parks.



13

THE BEGINNING OF A NEW ERA

Anna María Pálsdóttir, SLU

IN THE FUTURE:

- We will have stepped out of the urban park box and challenged the traditional way of defining the city.
- We will have rethought the term "urban park" as an isolated island for visits and extended the term to a sustainable and health-promoting natural system.
- We will have created a biophilic city where nature is let into Swedish cities.

Urban parks, often referred to as the “lungs of a city“, are vital components of urban settings. Despite being labelled as green spaces, they encompass more than just plants and vegetation; they also include elements such as stones, water and various animals. Birds, in particular, are frequently cited for their ability to fascinate and restore depleted minds.

Additionally, water features, including waterfronts, coasts and rivers, constitute essential natural environments in urban areas. They are often perceived as soothing and cooling elements. Engaging with nature is a multisensory experience that can positively stimulate all our senses.

Beyond visual beauty, the sounds and smells of natural surroundings are crucial for a pleasant experience. Studies suggest that natural sounds are more enjoyable than mechanical or man-made ones, while the scent of nature has been shown to reduce stress and evoke pleasant memories. Hence, urban green spaces should aim for diversity and enrichment to effectively support human well-being, emphasising the importance of health and happiness.

GROWING EVIDENCE indicates that contact with nature and the natural environment offers humans comprehensive social, mental and physical benefits. Research shows that such interaction can reduce stress, enhance perceived health and decrease the risk of chronic conditions and the need for anti-depressive medication.

Despite this knowledge, urban parks and green spaces are often cut off from the nearby neighbourhood by roads and other built infrastructure. Parks are usually standalone green islands. Numerous studies have investigated the relationship between proximity to green spaces or travel time to them and perceived health. They generally find that closer proximity leads to better health outcomes.

However, despite the desire for proximity, many individuals must navigate through traffic or crowded public transport to reach the nearest park or natural area, which can detract from the positive experience. This raises the question: why do we need to visit parks at all? Instead, why not integrate nature into the urban landscape so that we do not need to travel to connect with nature, but can immerse ourselves in it right on our doorsteps?

THE BIOPHILIC APPROACH, a concept which is gaining traction in urban planning, offers a promising solution. It advocates integrating abundant nature, diverse biodiversity and various natural landscapes into the urban environment. This shift from manicured parklands to embracing nature's organic shapes and forms, with meadows, wild vegetation and thriving wildlife, not only enhances the city's aesthetic appeal, but also significantly improves the health and well-being of its residents.

It is constructed on different scales and levels, but an important dimension is the use and enjoyment of the users. In addition, instead of one layer, i.e. ground surface, the biophilic design utilises roof troops and vertical surfaces, i.e. walls. In a biophilic city, residents reside within nature rather than merely visiting it. This approach can create a sustainable and health-enhancing living environment for humans, animals and the ecosystem, embodying a holistic "One Health" approach, good health for the environment, humans and all other living creatures in the ecosystem.

BIOPHILIC DESIGN has already been implemented in city planning worldwide with good results and lessons learned to be shared across the globe in planning and management. It is time to rethink the term “urban park” in the Nordic context as an isolated island for visits and extend the term to a sustainable and health-promoting natural system, a biophilic city. In the future, we have to step out of the urban park box and challenge the traditional way of defining city and urban parks and the conventional way of managing them. It is time to close the urban park and let nature into Swedish cities.

THE IMPORTANCE OF GREEN SPACES in urban areas is underscored repeatedly in numerous reports. Consequently, the number of public green spaces is increasing in urban areas across Europe and, at the same time, they are also becoming more complex. Beyond aesthetics, parks are expected to improve a wide array of environmental and social aspects of urban life – recreation, health and well-being, community development, mitigation of heat, reduce air pollution, provide habitats for wildlife, urban connectivity for biodiversity and more. As a result, the workforce that cares for green spaces will need to evolve correspondingly, but how? Additional reasons to better understand the future workforce include the current lack of qualified labour and the decreasing number of applicants to landscaping programmes. Can the emergence of new roles and professions possibly make jobs related to green spaces more appealing?

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