



# Boverket

Swedish National Board of Housing,  
Building and Planning

## Towards green, resilient and healthy cities

Co-Carbon Seminar, Helsinki, 25 August, 2023  
Ulrika Åkerlund, landscape architect



#### NOISE REDUCTION

Soft ground and greening protects the settlement from noise from the road...



#### REGULATING LOCAL CLIMATE

The trees provide shade and moderate the local climate.



#### KNOWLEDGE AND INSPIRATION

Green areas can give us inspiration and understanding of our dependence on nature.



#### BIODIVERSITY

A variety of species makes ecosystems resilient, robust and viable.



#### AIR PURIFICATION

...and from the air pollution from cars



Illustration: C/O City



#### PHYSICAL HEALTH

Green space and natural areas provide places to be physical active.



#### PURIFICATION AND REGULATION OF WATER

Wetlands and natural areas regulate and purify water and prevent flooding and droughts.



#### PROTECTION FROM EXTREME WEATHER

Trees and natural environments protect the city from extreme weather.



#### MENTAL WELL-BEING

Experiencing nature increases our mental well-being.



#### SOCIAL INTERACTION

Urban parks and green public spaces are important places for people to meet.



#### FOOD SUPPLY

Farming, animal husbandry and fishing provide us with nutritious food.

# Protection from extreme weather



Green space and natural areas protect against extreme weather such as storms, high waves, flooding, downpours, landslides and droughts.



Foto: Bojana Lukac,  
Stadsbyggnadskontoret, Malmö  
stad

# Mental wellbeing



Spending time in green spaces and nature promotes physical and mental health.



Photo: Ulrika Åkerlund/Boverket



# Biodiversity



Variety within species, between species, and in ecosystems, enables adaptation and provides resilience.



Photo: Jonathan Malmberg

# Climate mitigation

*Annual carbon sequestration of an urban tree is 65 kg of CO<sub>2</sub>*

(Mc Pherson et al. 2016. Urban Forestry & Urban Greening 17:104-117)



Illustration: Boverket

*A big tree can absorb 1000 litres of water in the canopy*

*It can transpire 1000 l of water absorbed from the root system*

# Streetscape as carbon sinks



[Urban space as carbon sink – Blue Green Grey Systems for livable streets \(edges.se\)](https://edges.se)

# UN Global Framework for Biodiversity

## Target 12.

Increase the area of, access to, and benefits from green and blue spaces, for human health and well-being in urban areas and other densely populated areas.



**2020 UN BIODIVERSITY CONFERENCE**

**COP 15 - CP/MOP 10 - NP/MOP 4**

Ecological Civilization-Building a Shared Future for All Life on Earth

KUNMING – MONTREAL



# EU – Nature Restoration Law

## Article 6 Restoration of urban ecosystems

1. Member States shall ensure that there is no net loss in the total national area of urban green space, and of urban tree canopy cover in urban ecosystem areas, (...)
2. Member States shall achieve thereafter an increasing trend in the total national area of urban green space, including through integration of urban green space into buildings and infrastructure, in urban ecosystem (...)
3. Member States shall achieve, in each urban ecosystem area, determined in accordance with Article 11(2b), an increasing trend of urban tree canopy cover (...)

([Texts adopted - Nature restoration - Wednesday, 12 July 2023 \(europa.eu\)](#))



# Sweden – Strategy for Liveable cities – Swedish policy for sustainable urban development

## **Milestone targets concerning integration of urban greenery and ecosystem services into urban environments**

- By 2025, the majority of the municipalities must make use of and integrate urban green spaces and ecosystem services in urban environments in the planning, building and managing of cities and towns.

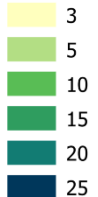
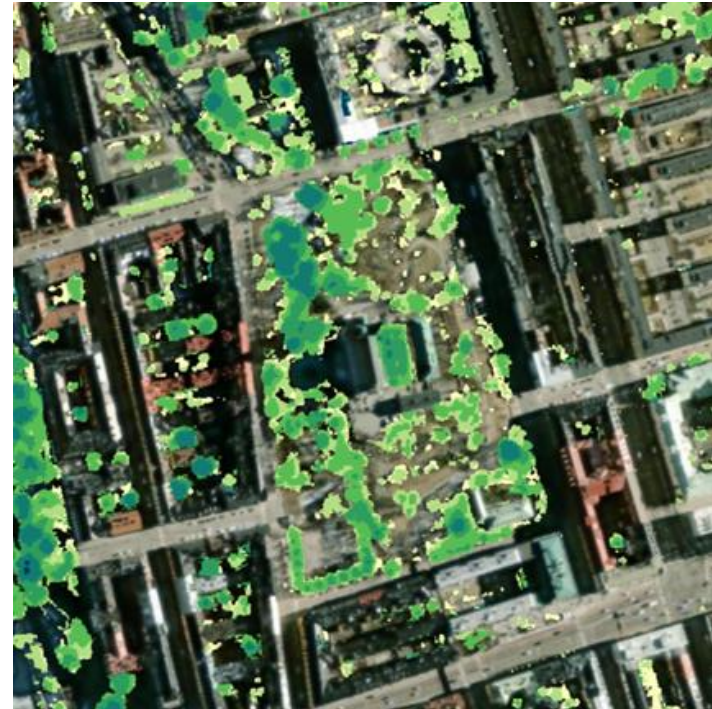


(Regeringens skr.2017/18:230)

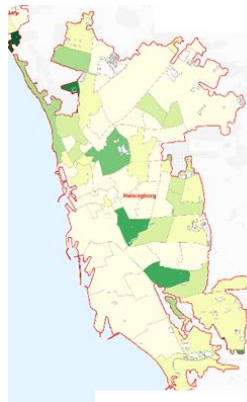
# Status – Tree canopy cover in urban areas

## – national study in Sweden 2023

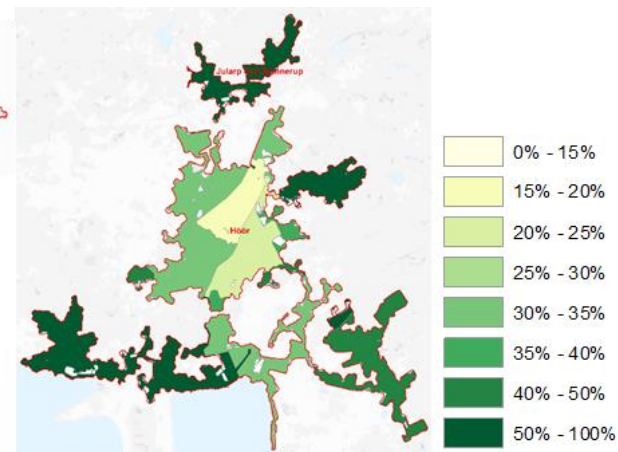
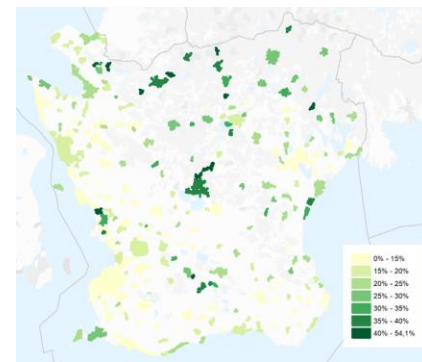
- National survey of prevalence of trees and size of trees.
- Share of tree canopy cover in 200 communities with more than 5000 inhabitants.
- About half of the cities have a canopy of 30 % or more.



# Uneven distribution of trees within cities

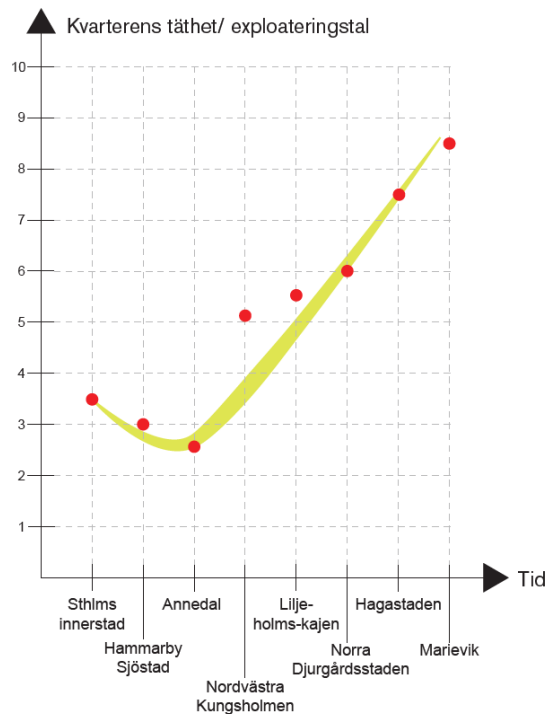


Tätort	Tätortskod	Trädäckning 2020
Malmö	1280TC106	10,9%
Helsingborg	1283TC107	15,9%
Lund	1281TC105	16,4%
Ängelholm	1292TC111	20,3%
Kristianstad	1290TC112	12,0%
Höör	1267TC103	38,6%

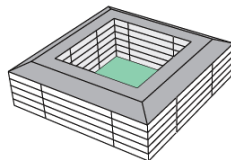




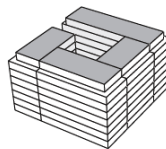
# Urban development – higher and denser



Södermalm  
60 x 60 m  
 $e = 3,45$



Nordvästra  
Kungsholmen  
40 x 40 m  
 $e = 5,45$



Hagastaden  
90 x 40 m  
 $e = 7,98$

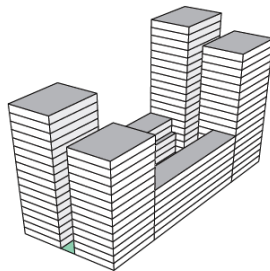




Bild. JM AB



Foto: Elin Henriksson

# Nordic Policy Brief (2022)

Cecil Konijnendijk van den Bosch, Nature Based Solutions Institute

Visions and principles: Proximity, Connectivity, Diversity, Equity

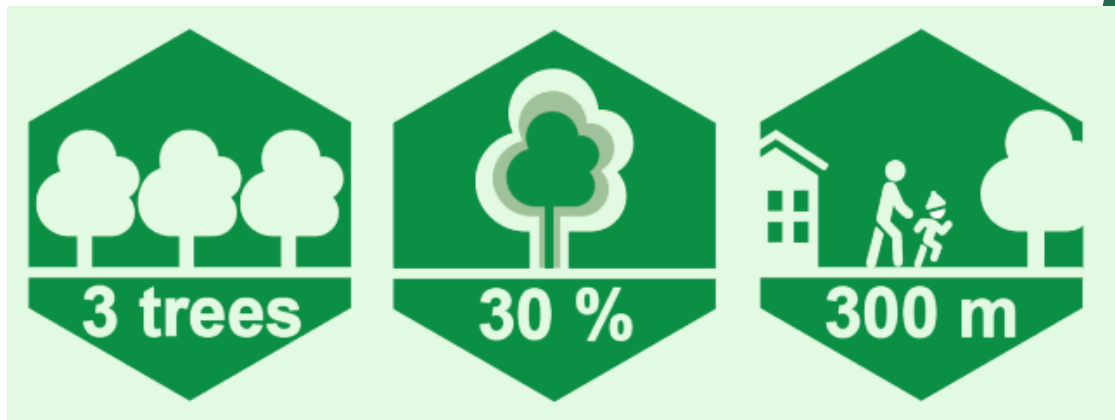
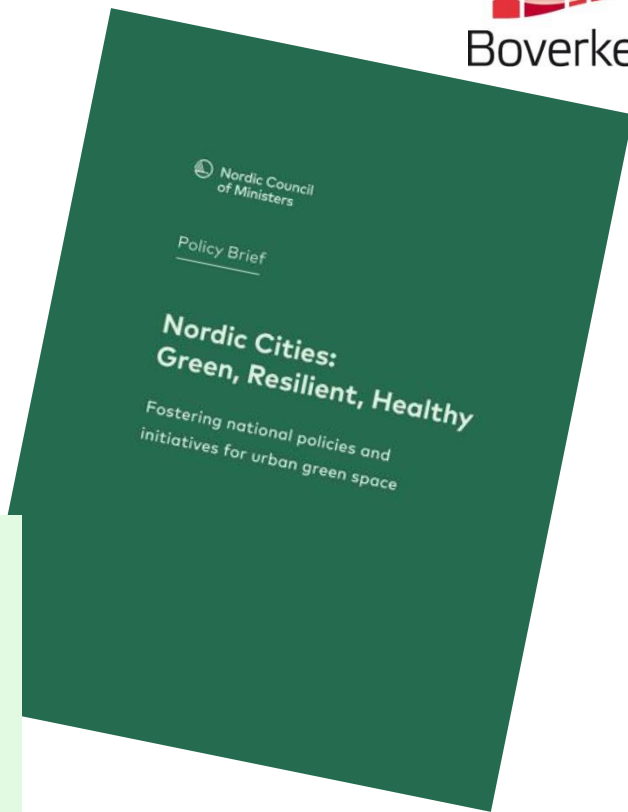


Illustration: Boverket





# Critical infrastructure



Foto: Mikael Svensson/Scandinav



Foto: Ulrika Åkerlund, Boverket



# Proximity

300 metres,

The impact of visible green on  
mental health



# Connectivity

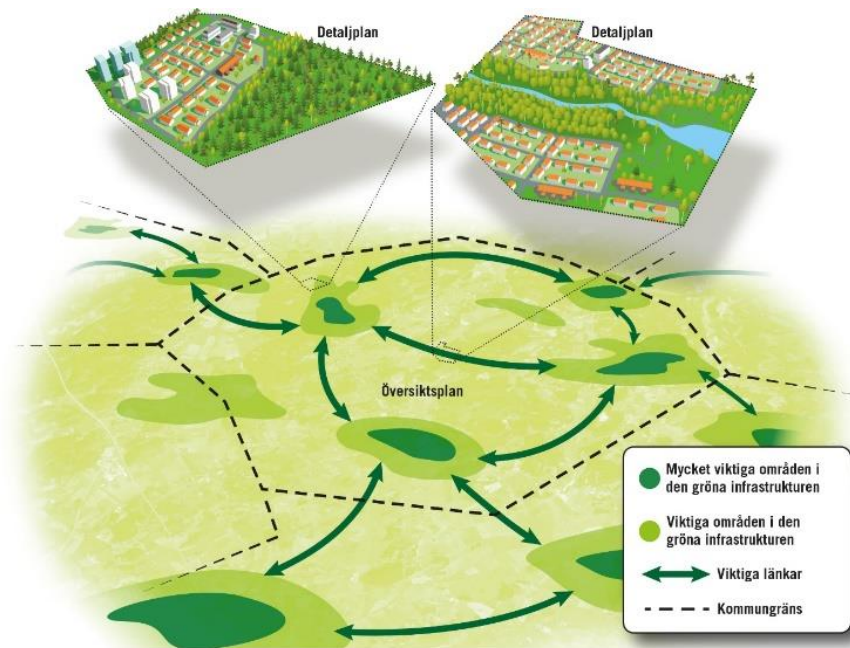


Illustration: Naturvårdsverket



Photo: Ari Heinonen



# Diversity

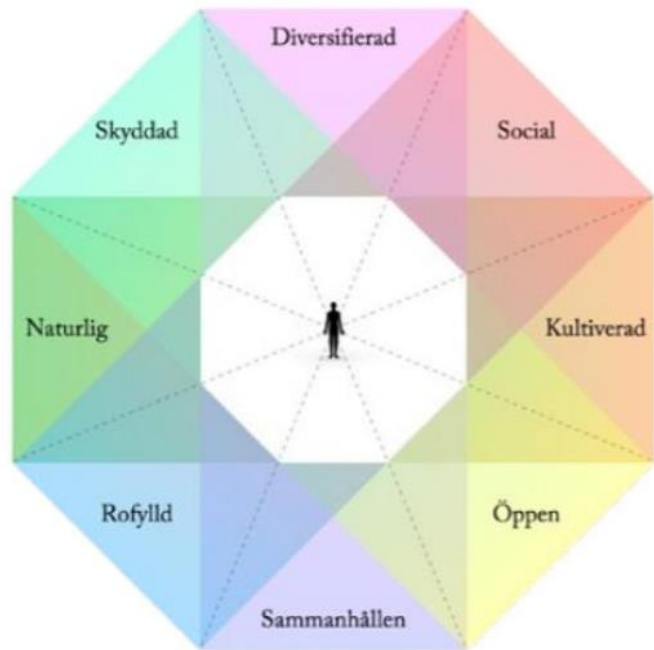
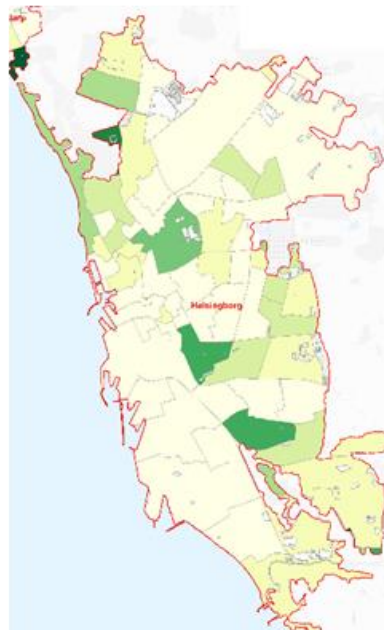


Illustration: Jonathan Stoltz och Patrik Grahn.



# Equity





# ESTER 2.0 – tool for assessment of ecosystem services (2022)

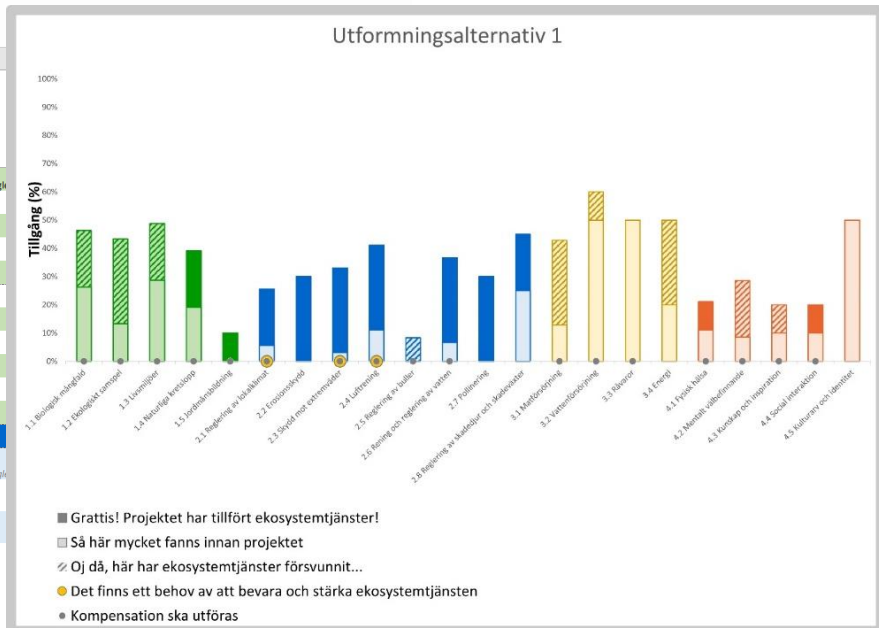
Spara automatiskt | ester-1-1-ifyll | Sök | Akerlund, Ulrika

Arkiv | Start | Infoga | Sidlayout | Formler | Data | Granska | Visa | Hjälp | PLATINA

Klistra in | Tecken | Justering | Tal | Villkorsstyrd formatering | Formatera som tabell | Cellformat | Infoga | Ta bort | Format | Cell | Sortera och filtrera | Sök och markera | Känslighet

H140 | Ingen påverkan

	A	B	C
1	Boverket		
2	Frågor		
3		och näringsämnen som kväve och fosfor.	Finns det betydande mängd växter (t.ex. träd och buskage) i området som utför fotosyntes (och kan bidra till skugga, luft, buller och klimatreglering)?
37			Finns det bördiga jordar i området, väder det bra?
38			Finns det en betydande tillförsel av dött organiskt material till marken, t.ex. löv, barr, grenar och andra döda växtdelar?
39			Tillåter marken och jordgräven i området möjligheter till grundvattenbildning?
40			Finns det naturliga avrinningsvägar för dag- och regnvatten?
41		1.5 Jordmånsbildning Ekosystemens organismer bryter ned material på och i marken och frigör näringsämnen.	Finns det bördiga jordar i området, väder det bra?
42			Finns det en betydande tillförsel av dött organiskt material till marken, t.ex. löv, barr, grenar och andra döda växtdelar?
43			Finns det betydande andel icke hårdgjord mark i området?
44			Är jorden mörk (humusrik) med finfördelat material?
45			Finns det mycket dagmaskar?
46			Får marken i grönzonen lagom tillförsel av vatten och näringsämnen?
47	Reglerande		
48		2.1 Reglering av lokalklimat Grönska och natur bidrar lokalt till jämnare temperatur, ökad luftfuktighet, skugga och vindskydd.	Finns det betydande mängd växter (t.ex. träd och buskage) i området som utför fotosyntes (och kan bidra till skugga, luft, buller och klimatreglering)?
49			Innehåller projektområdet större gröna/naturområden (>500 x 500 m) som bidrar till luftombyte (förutsättning för stadsbris)?
50			Innehåller projektområdet större vattensamlingar som kan bidra till temperaturutjämning.



# Guidelines and tool box (2022)



 Nordiska  
ministerrådet

**Stadsgrönska och  
ekosystemtjänster**  
– en nordisk verktyglåda  
för grönbå strukturer





# Towards green, resilient and healthy cities



Photo: Ulrika Åkerlund/Boverket



Photo: Jonathan Malmberg

# Towards green, resilient and healthy cities

- Momentum – strong policies high up on the global agenda
- Challenges – implementing knowledge and building capacities, creating a mindshift.
- Possibilities – need for testbeds, evaluation and upscaling.



# Thank you!



[www.boverket.se/ekosystemtjanster](http://www.boverket.se/ekosystemtjanster)

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