

Green Infrastructure Meets Water Protection

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Content of the Presentation

- Green Infrastructure – Nature Based Solutions
- Finnish Government's Key Project
- Restoration of the River Tourujoki
- Puutarhakatu - Green Street
- Eerolanpuro - Retention Pond

Green Infrastructure

- Nature Based Solutions

Green Infrastructure - Nature Based Solutions



Picture: Virtaa viherrakenteesta. Viherympäristöliitto.

Multifunctional Green Infrastructure

At the city-wide level, green infrastructure

- prevents floods
- supports biodiversity
- protects recreational areas and connections
- functions as carbon storage

One tree

- improves air quality
- enhances biodiversity
- utilizes storm waters
- increases liveability
- etc



Picture: Virtaa
viherrakenteesta.
Viherympäristöliitto.

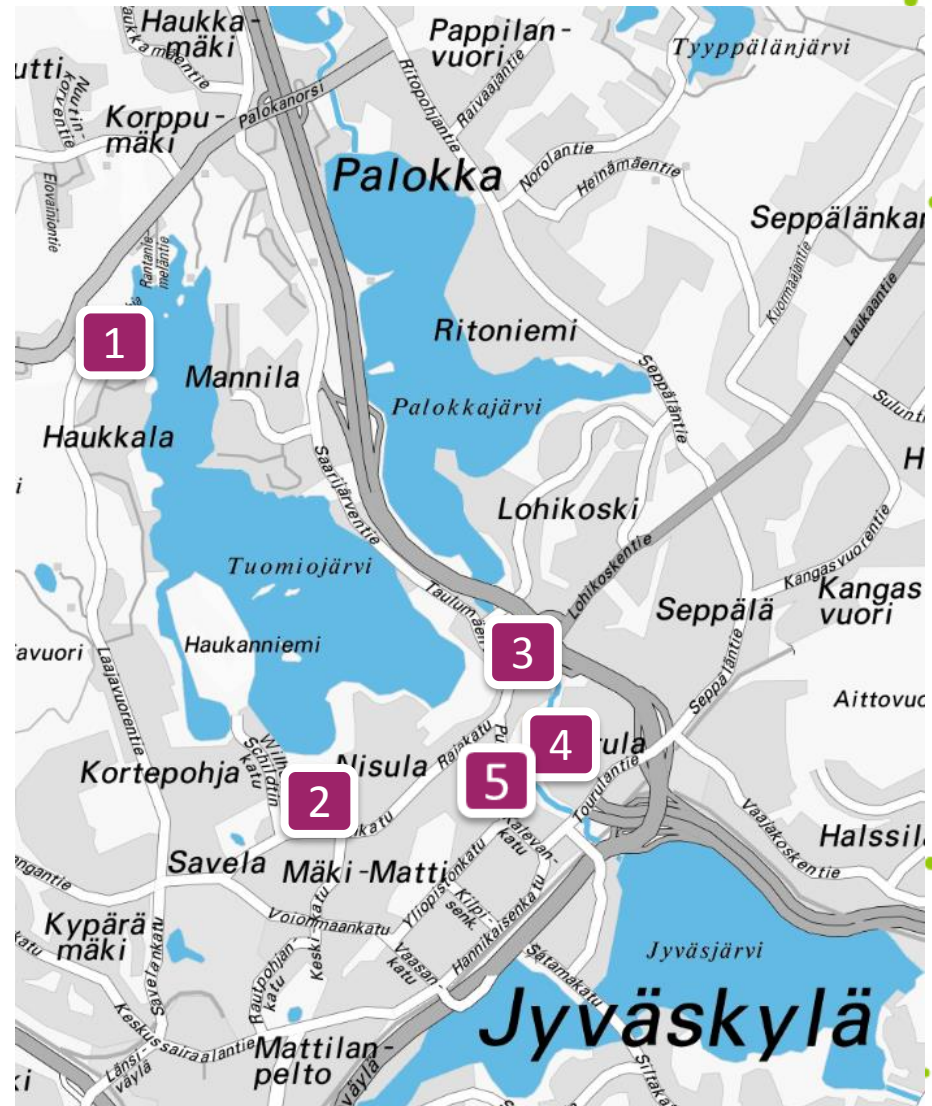


Finnish Government's Key Project

HALLITUKSEN KÄRKIHANKE

Improvement of the Water Quality in the Watershed Area of the River Tourujoki

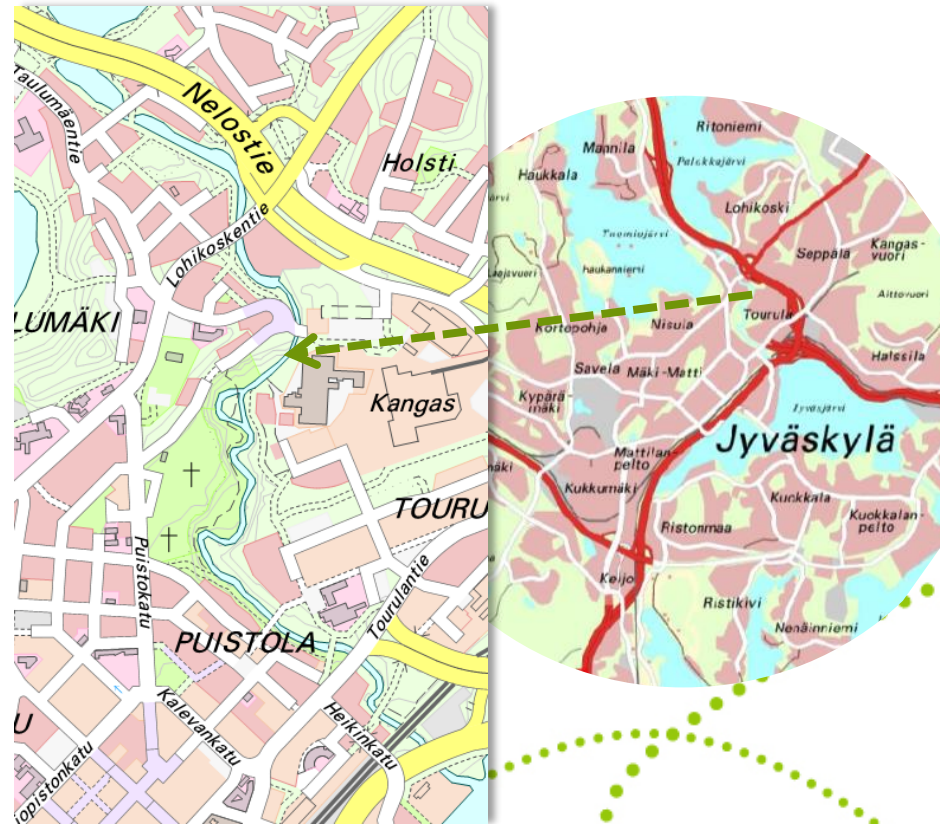
- 1 Green stormwater management in Savulahti
- 2 Retention pond of Eerolanpuro
- 3 Restoration of the river Tourujoki
- 4 Stormwater channel of Kangas
- 5 Green Street -pilot of Puutarhakatu



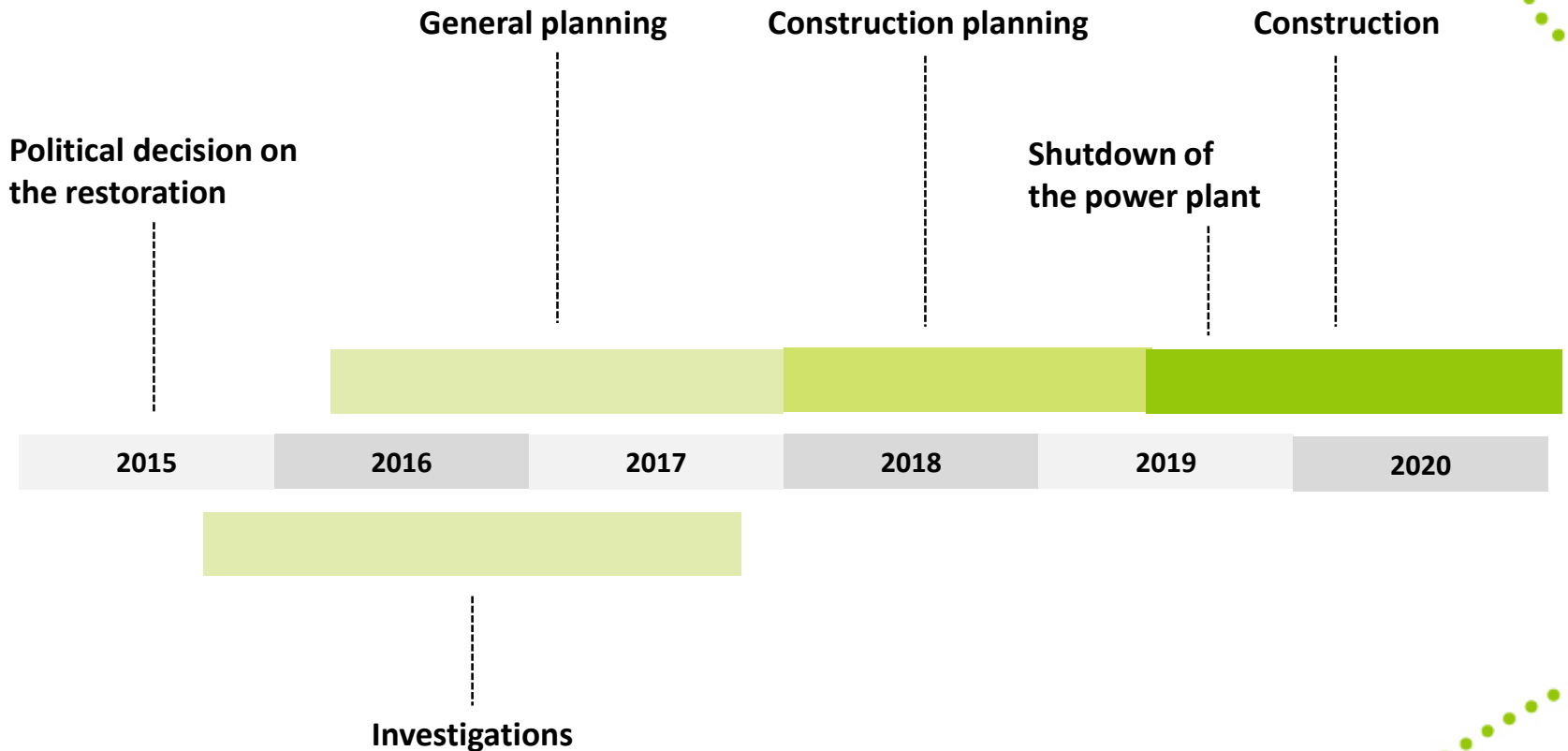
Restoration of the River Tourujoki

The river Tourujoki flows within the city

- the length of Tourujoki is 2.7 km
- a strongly altered waterbody
- power plant established in 1940s
- a paper mill has operated next to the river from 1874 to 2010
- the main urban development project, Kangas, going on in the old paper mill area



Project timetable



The restoration project of the river

Main targets

- to enable migration and reproduction of brown trout
- restoration of river ecosystem
- improvement of recreational values
- development of river landscape
- preservation of cultural-historical values



River restoration in the heart of the city

Special challenges

- restoration to a non-natural route
- many and also conflicting interests
- infrastructure
- culture-historical values
- lack of space
- erosion problems





Puutarhakatu - Green Street

GREEN STREET

street Puutarhakatu

- whether there could be other and possibly better ways to solve the storm water management in city centres, than the present sewer systems
- combine the storm water management systems more closely to urban green infrastructure
- consider the possibilities of trees as a functional part of storm water management.
- options to make the “underground rain gardens “ combined with trees to be a part of green infrastructure
- The objective is to improve the quality of storm waters ending up the river Tourujoki



What is green street?

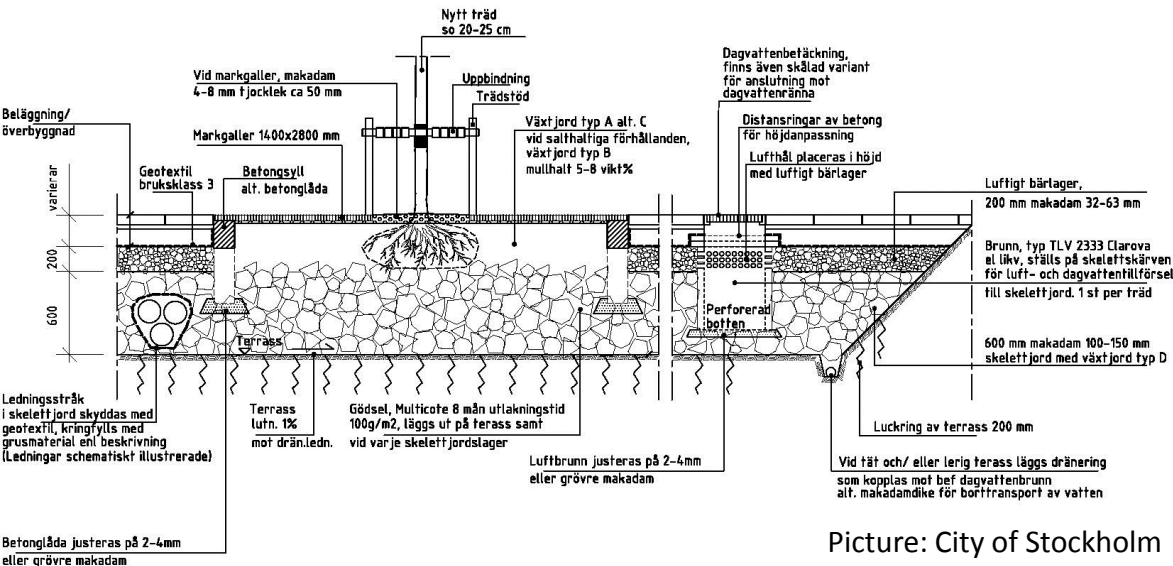
- managing the storm water in street areas with the help of green infrastructure
- mainly a chain of landscape swales or planters that manage storm water at the site
- answers to the requirements of water quality



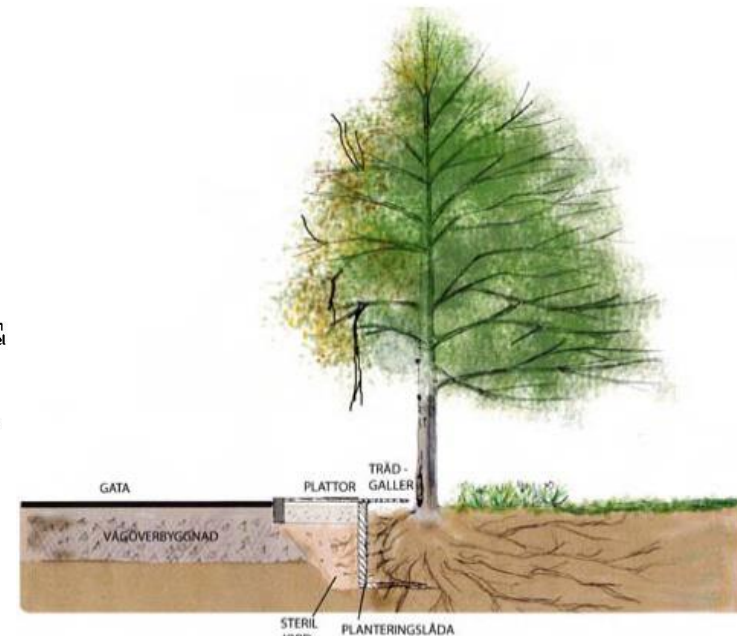
Picture:
City of
Portland

Trees on the streets?

- Challenges of the street trees:
 - the lack of space
 - the lack of oxygen (because of a too tight topsoil)
 - the lack of water.
- The rainfall helps to improve the habitat of the trees
- handle storm water in planting beds



Picture: City of Stockholm



Technical solutions?





HAIHDUNTA

LÄPÄISEVÄ
ASFALTTI

BIOSUODATUS

LÄPÄISEVÄ KIVEYS

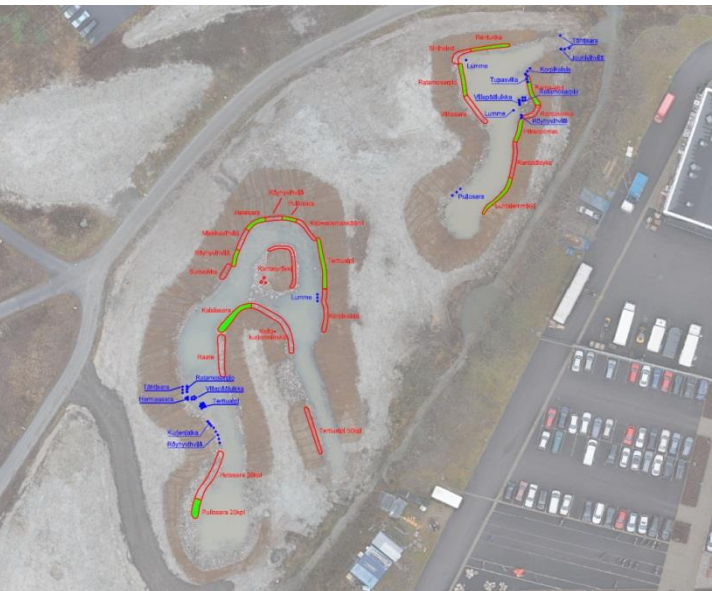
BIOSUODATUS

RAMBOLL

Eerolanpuro - Retention Pond

Retention Bond Eerolanpuro

- Objective was to improve the quality of stormwaters ending up the lake Tuomiojärvi
- Pilot project with VAPO Clean Waters Oy and Natural Resources Institute Finland (Luonnonvarakeskus LUKE)
- Research project:
 - how different species effects the quality of storm waters?
 - which species succes?
 - how different species retend nutrients and pollutants?



“When you innovate,
you’ve got to be prepared
for everyone telling you
you’re nuts.”

Larry Ellison



Thank you!

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JYVÄSKYLÄ

