

Achieving EU's No Net Land Take (NNLT) targets

How can ECOSYSTEM SERVICE MAPPING support downzoning and ecological enhancement?

An applied research experience in the city of Varese (Lombardy - Italy)

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DIPARTIMENTO
DI ARCHITETTURA
E STUDI URBANI

Laboratorio



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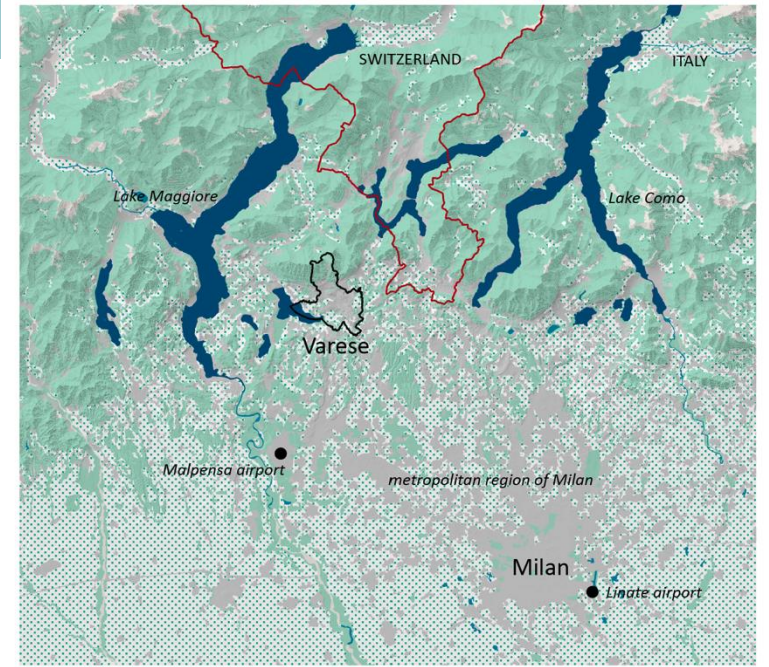
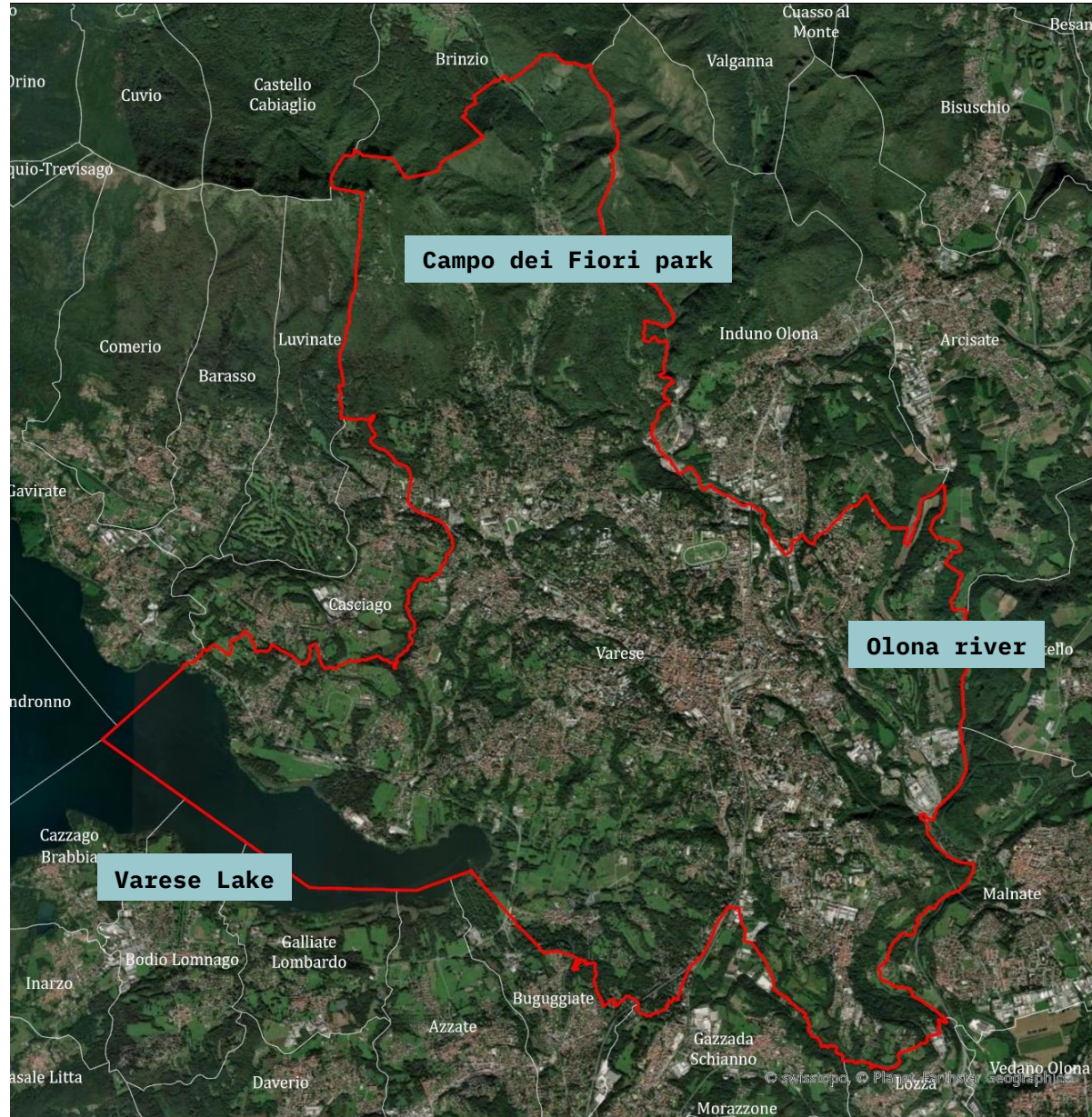
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Case study: Varese city



78,000 inhabitants

Located in Lombardy, 50km northwest of Milan,
near the Swiss border

52 Sq km

"The Garden city"

Elevation 238-1,150 asl

Campo dei Fiori

UNESCO World Heritage Site

Varese's strengths and values



The City is surrounded by a **Landscape of lakes and woodlands** at the foothills of the Alps

Varese's fragilities and vulnerabilities



Abandoned areas



Flooding events



Landslides



Storms



Urbanisation pressure, the escalating **impact of climate change** and inadequate planning have **threatened the city's environmental quality**, making it necessary to **address past decisions** and **embrace adaptive strategies**.

Varese's land take risk – between downzoning and ES approach

- The municipal urban plan, adopted in **2014**, permitted **urban expansion into natural and rural areas** of about **60 Ha.**
 - **High Land Take Risk.**
- The **revision of the current urban plan** has provided an opportunity to address land take risk through **Downzoning.**
 - Application of an **Ecosystem Service (ES)** approach to **support land take risk reduction policies.**
- Building a comprehensive multifunctional **Green-Blue Infrastructure (GBI)**

Downzoning

**The legislative framework
for reducing land take in
the Lombardy Region**

Regional law on Land take reduction

!! Land Take Risk in Lombardy

13.000 ha Transformation Areas (No prescriptive effects)

24.000 ha areas included in the Consolidated Urban Fabric
(prescriptive and binding effect)

=

37.000 ha

!! Definition

natural and semi-natural soils are not considered
more focus on the zoning defined by an Urban Plan than on the existing
conditions

criteria for identifying the areas potentially subjected to land take

Regional law on Land take reduction

Constitutional reform 2001

*Regions may legislate in
Urban Planning field*

Lombardy

Regional Law 12/2005

“Urban planning law»

Regional Law 31/2014

*“Law for land take
reduction and for the
regeneration of degraded
land»*

Regional Law 18/2019

*“Law for urban and
territorial regeneration»*

- ❖ Soil as a **common good** and a **non-renewable natural resource**
- ❖ **Building interventions** primarily focused on already **urbanized, degraded, or disused** areas
- ❖ **Thresholds for reducing land take due to the Transformation Areas forecasted by municipal urban plans**
- ❖ **Land take definition:** *«The transformation, of agricultural/natural land by a planning tool for the first time [...]»*
- ❖ **Review of planning instruments** at all administrative levels, from regional to municipal

Regional law on Land take reduction - downzoning

- **Downzoning** is defined as the **reclassification of land uses** by the planning tool, **converting** areas with **urban development potential into zones with reduced or no building capacity**, to **prevent future land take** and **preserve the ecological functions** of the soil. Lacoere, P., Hengstermann, A., Jehling, M., & Hartmann, T. (2023). Compensating Downzoning. A Comparative Analysis of

European Compensation Schemes in the Light of Net Land Neutrality. *Planning Theory & Practice*, 24(2), 190–206.

Thresholds Systems through multi-level governance approach

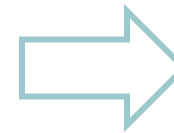
PTR Regional Territorial Plan (regional plan)

PTR provides reference thresholds based on provinces' land take rate analysis.



PTCP Provincial Territorial Coordination Plan (provincial plan)

PTCP, at the earliest opportunity, brings the planning instrument into conformity with the PTR, **detailing and setting the thresholds that the municipalities must comply with** in reducing land take.



PGT Territorial Spatial Plan (municipal plan)

PGT, at the earliest opportunity, brings the planning instrument into conformity with the PTCP, **transposing the land take reduction thresholds and applies them through downzoning.**



*

In the case of the Province of Varese, the PTCP has not yet been updated in accordance with Regional Law 31/2014; this implies the PGT applies the land take reduction thresholds through direct compliance with the PTR.

Regional law on Land take reduction - downzoning

PTR Thresholds Systems

t0

2014

- Definition of Land Take Risk

existing natural or agricultural areas zoned as "urbanisable"

(surfaces with a building potential given by the Urban Plan)

t1

2025

- Target 1a:

-25% for "urbanisable" areas for **residential uses** set in 2014

-20% for "urbanisable" areas for **other uses** in force in 2014

t2

2030

- Target 1b:

-45% for "urbanisable" areas for **residential uses** set in 2014

-20% for "urbanisable" areas for **other uses** in force in 2014

t3

2050

- EU's Target:

NO NET LAND TAKE

Regional law on Land take reduction - downzoning

PTR Thresholds Systems - the case of Varese for residential uses

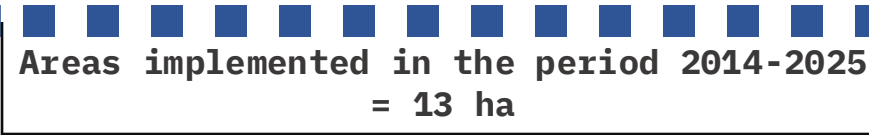
a) 2014 - "urbanisable" surface = 28 ha



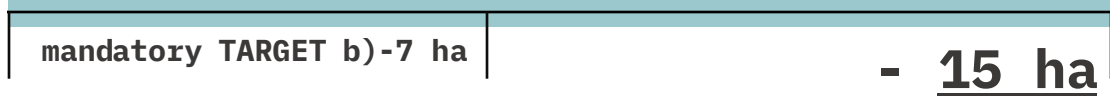
b) TARGET 2025 - -25% of a) = - 7 ha



c) 2025 - "urbanisable" surface = 15 ha



d) NEW URBAN PLAN DOWNZONING



- 55% (related to 2014 «urbanisable» surface)

-100% (related to 2025 «urbanisable» surface)

* Land take monitoring is a critical issue

Regional law on Land take reduction - downzoning

land take reduction thresholds in direct compliance with the PTR - based on 2014 land use plan

Land take reduction applied by the new Varese urban plan

Residential Uses

$$\text{-25\%} = - 7 \text{ ha} \longrightarrow$$

$$\text{-55\%} = - 15 \text{ ha}$$

Other Uses

$$\text{-20\%} = - 6,5 \text{ ha} \longrightarrow$$

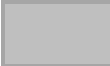



$$\text{-46\%} = - 14,5 \text{ ha}$$

$$\text{total} = - 29,5 \text{ ha}$$

Regional law on Land take reduction - downzoning



Regional law **does not consider areas enclosed within the consolidated urban fabric < 5.000 sqm** as land-take risk.

-  Urbanised surface
-  Agricultural/Natural surface
-  Land Take areas in accordance with R.L. 31/2014
-  **Infills**

Regional law on Land take reduction - downzoning



land take reduction
according to regional
law n. 31/2014

-29,5 ha



Further land take
reduction (infills)

-11,5 ha

=

- 41 ha

Prevented future land take.

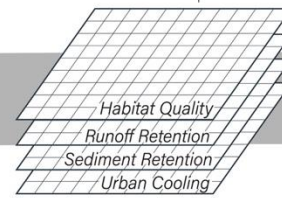
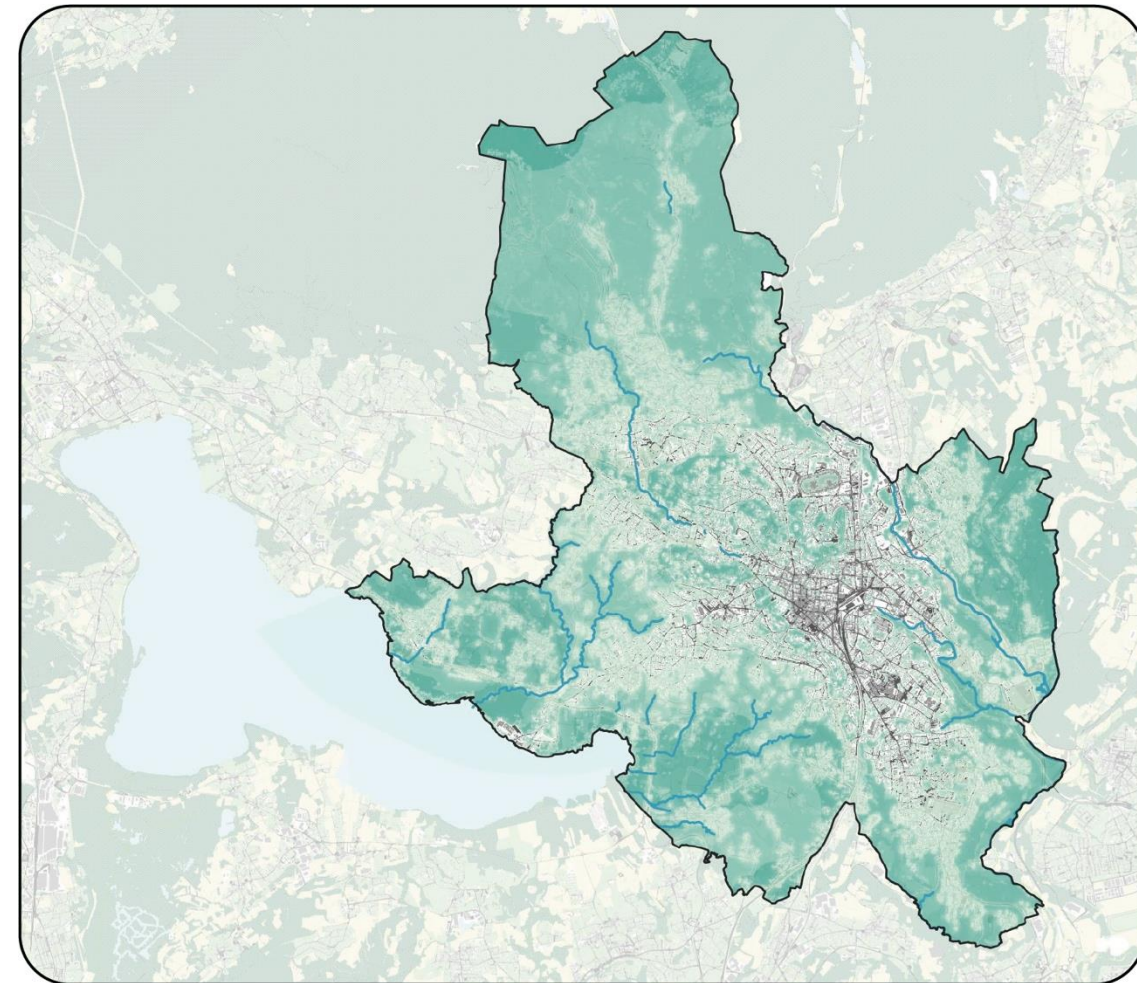
**Total Surface of downzoned
areas from «urbanisable» to
«non urbanisable» by the
new urban plan**

Downzoning

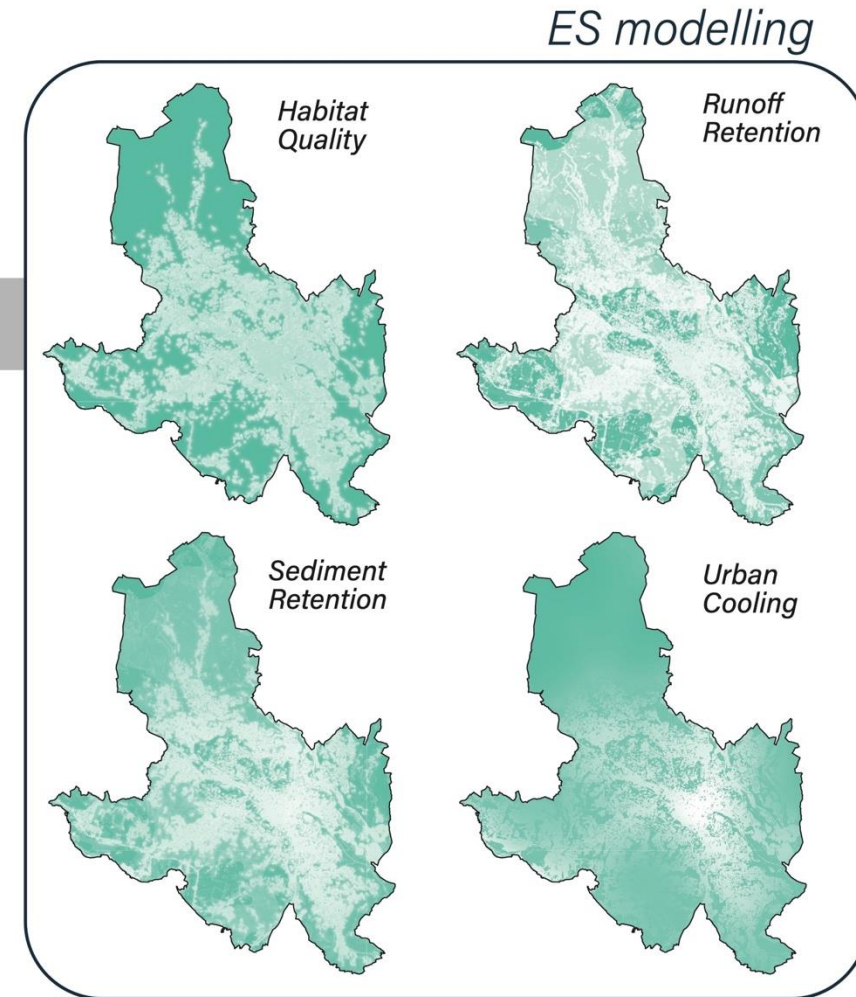
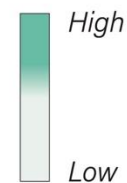
How Ecosystem Mapping has supported the Downzoning process?

Ecosystem services assessment

Assessment of the most context relevant ES to understand and spatialise local **biophysical capacity and vulnerabilities**



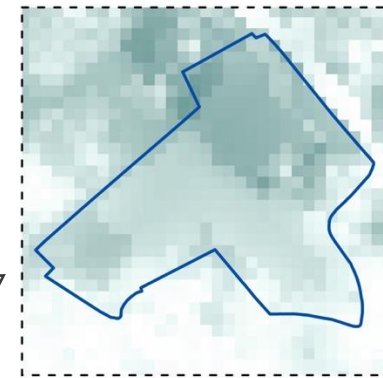
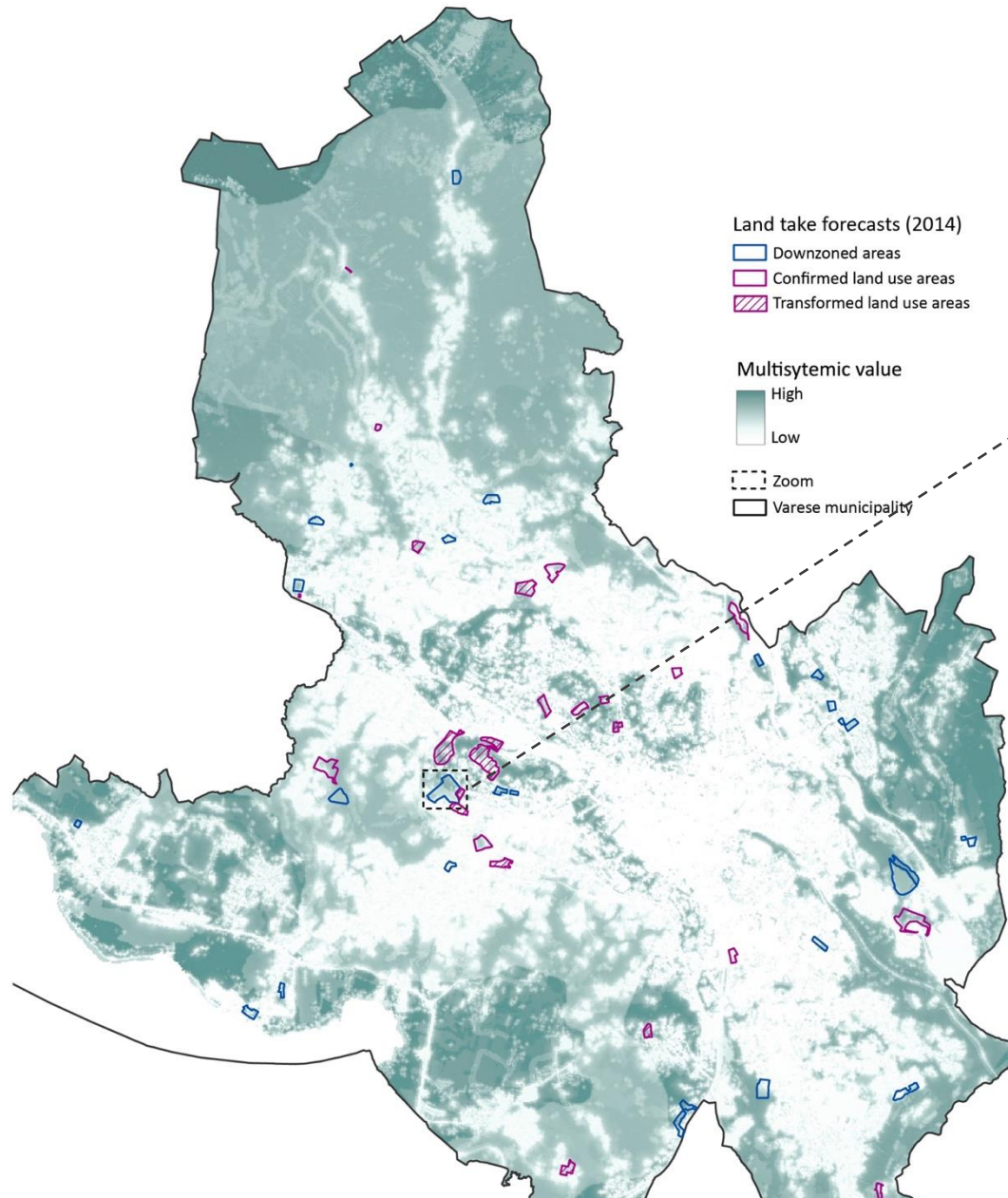
Overlay process
and Composite
analyses



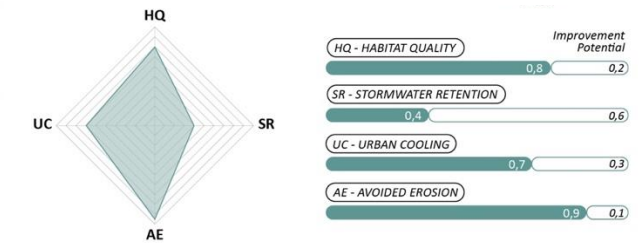
ES modelling

InVEST Software

Downzoning strategy implementation



Downzoned Plot
Ecosystem Assessment



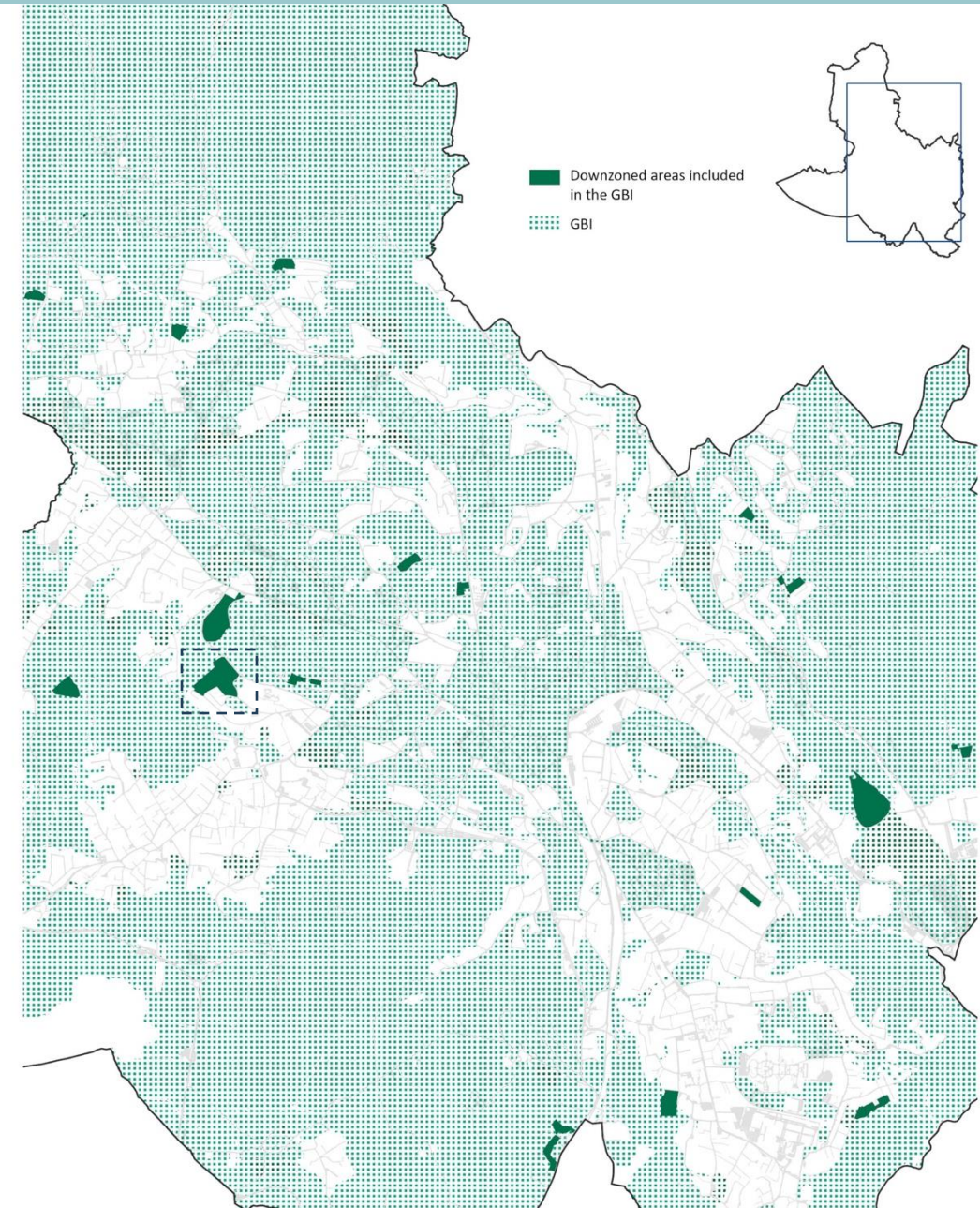
Overlaying the **Land Take Risk** with the **Multisystemic Composite** map

- Define a **threshold of ES** value to be protected
- Identify the Land take **forecast on valuable land**
- Implement the **Downzoning strategy**

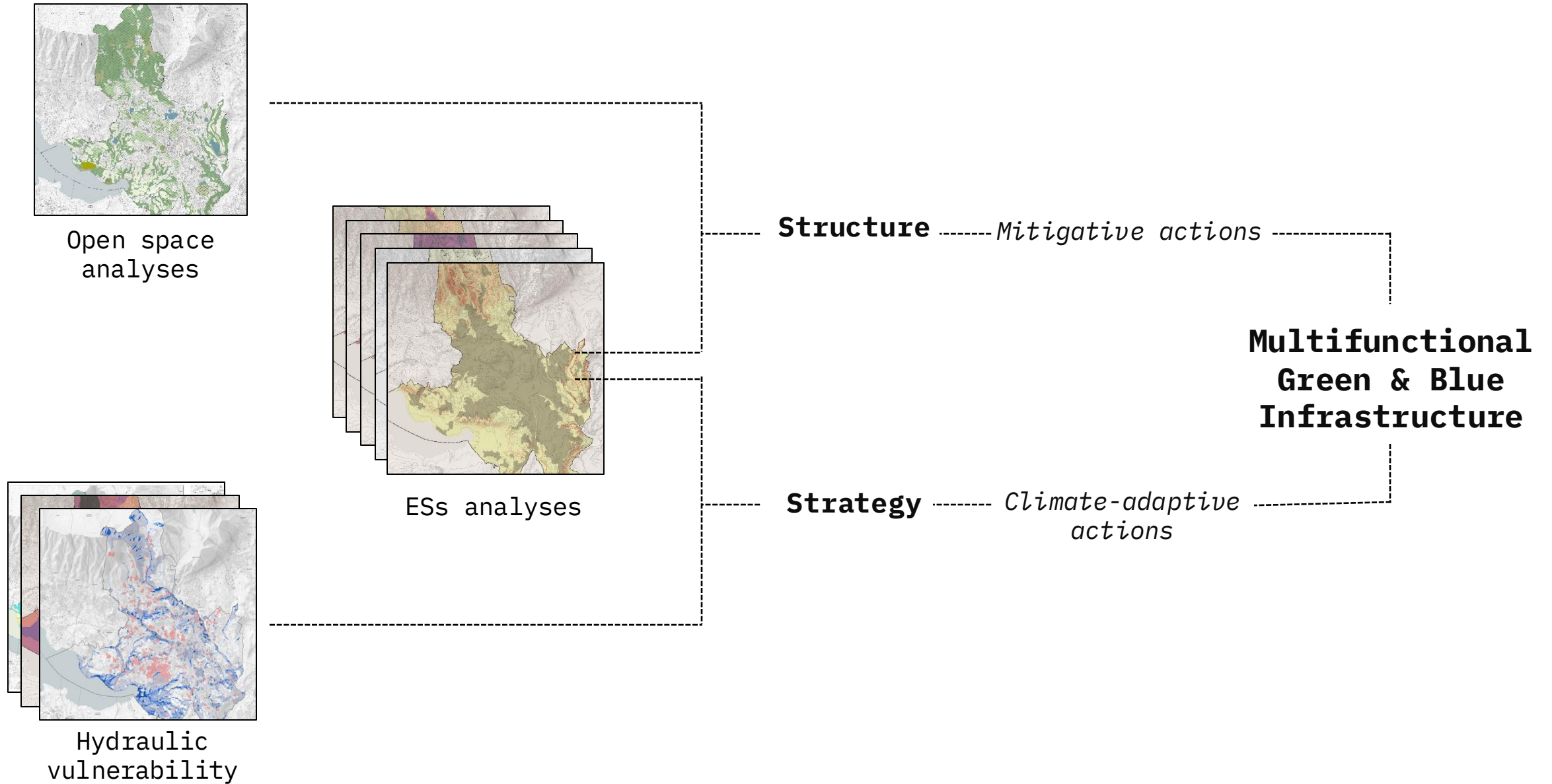
How Downzoned areas are managed?

These areas are included in a **comprehensive Green & Blue Infrastructure** (GBI) project which foresees a coherent and strategic vision for a multifunctional and adaptive GBI at the municipal scale

→ Ensuring the **protection, management and enhancement** of downzoned areas' natural and ecological values



GBI definition process



A comprehensive multifunctional GBI

Structural

High ES and natural value

Urban

Agroforestry

Natural

→ Indications

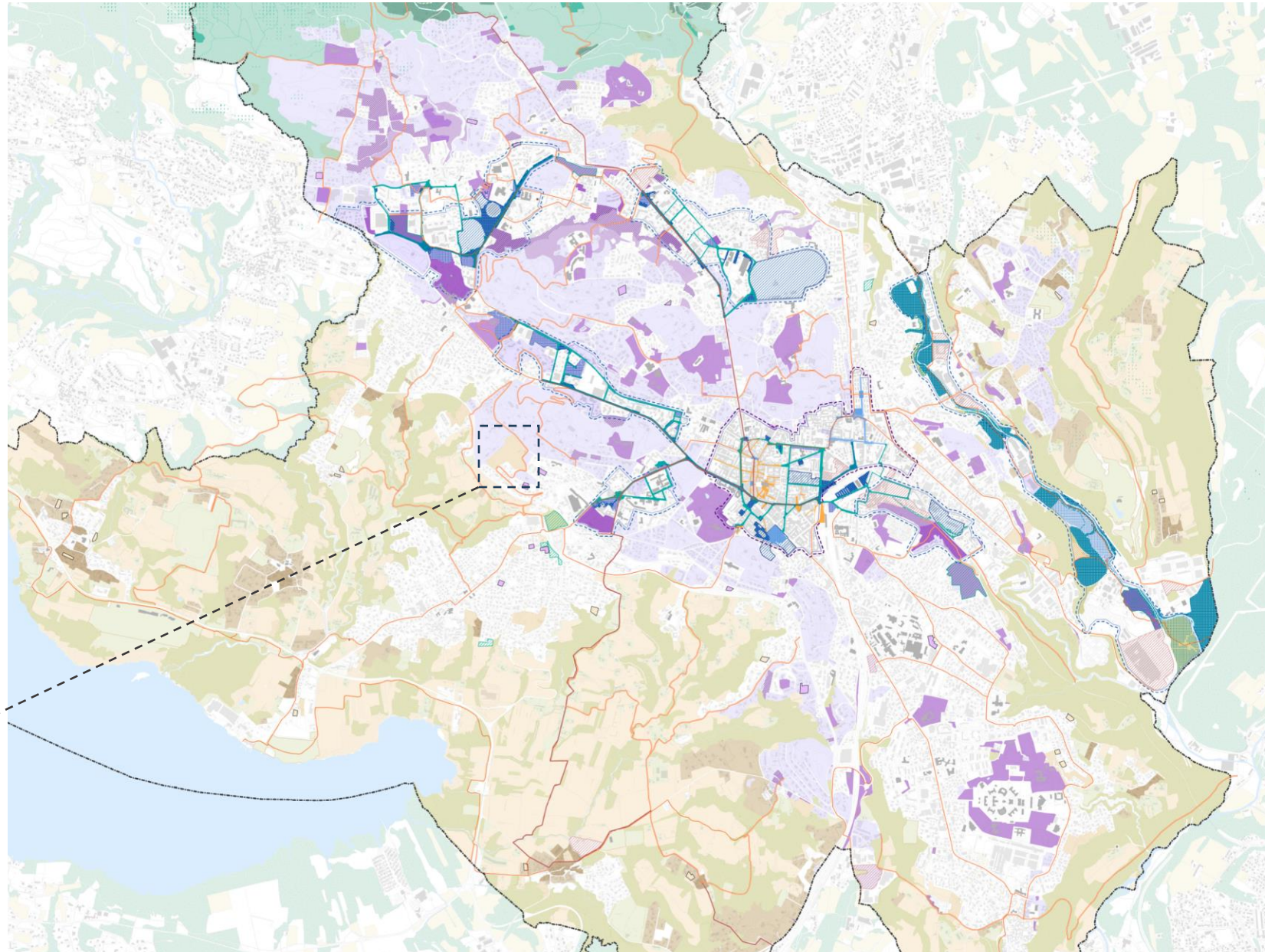
Strategic

Areas at Risk of Flooding and Urban Heat Island Effects

GBI strategic areas

→ Spatially targeted actions

Downzoned plot well integrated in the Agroforestry framework





Thank you!

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