



School of Architecture Urban Planning Construction Engineering
MSc Sustainable Architecture & Landscape Design

LATENT LANDSCAPES

Design Methods for Post-Infrastructural Territories

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CONTENTS	
ACKNOWLEDGEMENTS	4
ABSTRACT	6
I. LATENT LANDSCAPES	10
Building a Vocabulary of Latency	14
Temporal Dimension: Post-Infrastructural	18
Material Dimension: Abandoned	19
Potential Dimension: Latent	20
Conceptual Framework	21
Methodological Structure and Research Scales	22
XL SCALE	26
II. LATENT INFRASTRUCTURES TYPOLOGIES	28
Matrix of Conditions	41
Extraction of Patterns and Analytical Insights	44
Typological Archetypes	47
III. LEARNING FROM REACTIVATED INFRASTRUCTURES	60
Design strategies for reactivation	74
L SCALE	80
IV. TERRITORIAL READING: NORTHERN ITALY	82
Regional + Historical Investigation	82
The Case Study: Canale navigabile Cremona - Milano	86
Morphological Reading	91
Archetype Identification	105
M SCALE	108
V. THE CANALE SPINADESCO	110
Key Analytical Dimensions	111
Regeneration Goals	122
S SCALE	126
VI. PROJECTUAL REINTERPRETATION	128
Zone Strategies	128
Vegetation Scheme	131
Zooms	135
VII. REDEFINING LATENT INFRASTRUCTURES	144
Methodological Framework	145
BIBLIOGRAPHY	148
DATA-MINING	153

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This thesis is a statement of collective support.

ABSTRACT

Infrastructure systems structure the development of territories, enabling the movement of resources, people, and information while shaping the spatial organization of cities and landscapes. Yet as technological, economic, and political conditions shift, many of these systems lose their original functions, resulting in a growing number of abandoned, incomplete, or underused infrastructure worldwide.

Despite their scale, these structures are often overlooked within architectural discourse. They are also frequently reduced to technical elements instead of being recognized as spatial systems that continue to influence the environment after their operational life has ended.

This thesis addresses this gap by investigating abandoned infrastructures as active components of what is defined here as latent landscapes: territories shaped by systems that remain materially present and continue to structure ecological processes, spatial organization, and cultural perception even when no longer functional.

The research explores how they can be interpreted and which conditions represent a final state or potential for reactivation through design. To answer these questions, the work develops a multi-scalar methodology combining theoretical review, comparative analysis and research by design.

At a global scale, a curated dataset of case studies is analyzed through a matrix of spatial, temporal, and ecological criteria. This is complemented by a study of interventions, from which ecological strategies are extracted.

The methodology is then applied at the regional and local scales through the case study of the Canale Spinadesco in Northern Italy. The application tests how the canal can be reinterpreted as an active landscape system and explores different degrees of intervention, from ecological integration to spatial activation.

This thesis emphasizes the role of green strategies, adaptive reuse and site-specific design. In doing so, it contributes with a methodological approach and a set of design principles, offering tools to architects, urbanists, and decision-makers engaged in the transformation of latent landscapes.

ABSTRACT

I sistemi infrastrutturali strutturano lo sviluppo dei territori, abilitando il movimento di risorse, persone e informazioni e plasmando al contempo l'organizzazione spaziale di città e paesaggi. Tuttavia, con la mutazione delle condizioni tecnologiche, economiche e politiche, molti di questi sistemi perdono la funzione originaria, determinando una crescente diffusione di infrastrutture abbandonate, incomplete o sottoutilizzate a livello mondiale.

Nonostante la loro rilevanza dimensionale, tali strutture sono spesso trascurate nel discorso architettonico. Esse vengono inoltre spesso ridotte a meri elementi tecnici, anziché essere riconosciute come dispositivi spaziali in grado di influenzare l'ambiente anche dopo la cessazione della vita operativa.

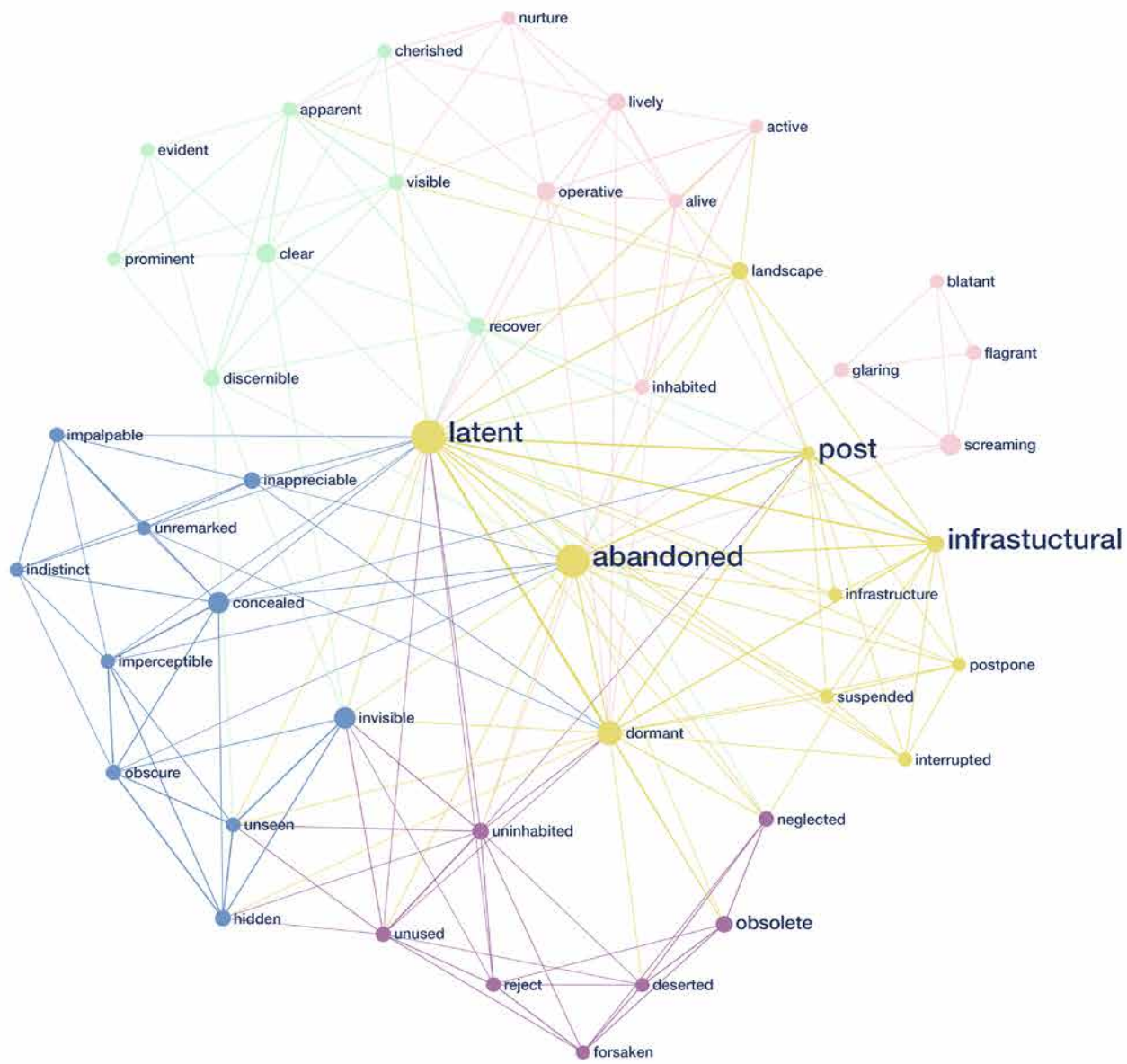
La presente tesi affronta questa lacuna indagando le infrastrutture abbandonate come componenti attive di ciò che qui viene definito paesaggi latenti: territori conformati da sistemi che permangono materialmente presenti e continuano a strutturare processi ecologici, l'organizzazione spaziale e la percezione culturale anche in assenza di funzionalità.

La ricerca esplora le modalità con cui tali sistemi possono essere interpretati e le condizioni che ne rappresentano uno stato conclusivo o un potenziale di riattivazione. Il lavoro sviluppa una metodologia multiscalarare che integra la revisione teorica, l'analisi comparativa e la progettazione.

A scala globale, un dataset di case studies è analizzato mediante una matrice di criteri spaziali, temporali ed ecologici. A ciò si affianca uno studio degli interventi realizzati, dal quale si ricavano strategie ecologiche.

La metodologia è applicata alle scale regionali e locali attraverso il caso del Canale Spinadesco, nel Nord Italia. La tesi verifica le possibilità di reinterpretazione del canale come sistema paesaggistico attivo ed esplora vari gradi di intervento, dall'integrazione ecologica all'attivazione spaziale.

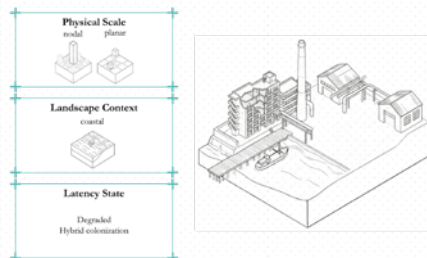
L'elaborato sottolinea il ruolo delle strategie di rinaturalizzazione, del riuso adattivo e del progetto site-specific. In tal senso, la tesi contribuisce con un approccio metodologico e con principi progettuali, offrendo strumenti ad architetti, urbanisti e decisori coinvolti nella trasformazione dei paesaggi latenti.





Coastal Ruin

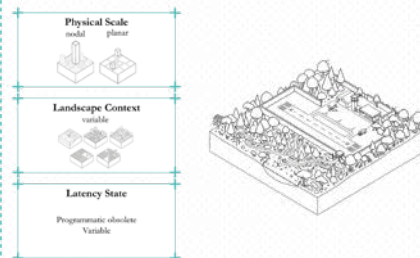
Coastal industrial-settlement systems degraded



Suffers from coastal degradation due to humidity exposure

Enclave

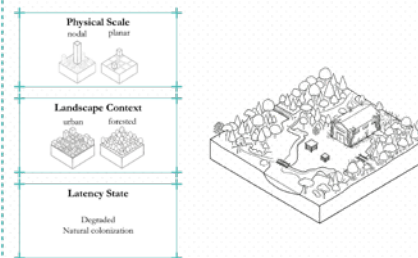
Isolated facility with no integration to the surrounding landscape



"Island" logic due to its isolation from the context
Existing boundary that difficult accessibility

Green Ruin

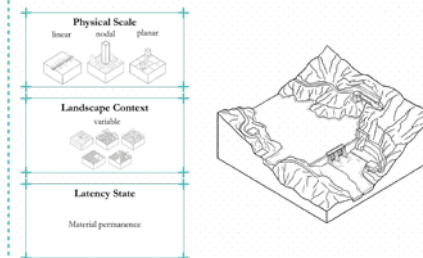
Infrastructure remains that were colonized by vegetation



Natural colonization with little intervention.
Usually far from urban expansion tensions

Hydro-Structure

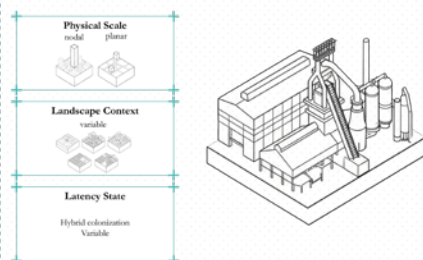
Hydraulic earthworks
Dams and water canals



Big artificial structure in green landscapes that caused environmental impact on its construction

Industrial Monolith

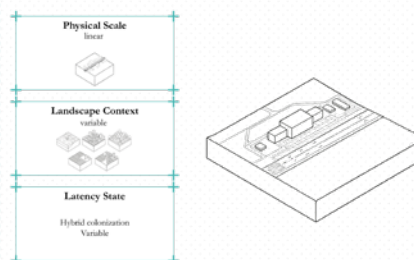
Industrial facilities with sociotechnical latency



Large, monofunctional, engineered complexes
Big in scale

Linear Corridor

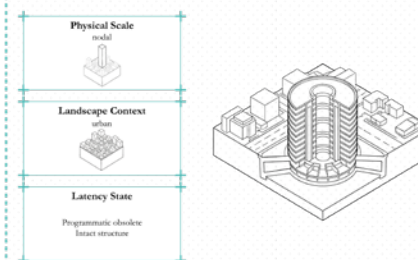
Long and linear mobility corridors



Corridor logic that maintain circulation patterns around it

Urban Megastructure

Big nodal infrastructures in urban centers



Architectural inertia but active in the landscape.
Still affects urban systems around it





Coastal Ruin



Key Analytical Dimensions

Blue infrastructure
Green infrastructure
Land use

Regeneration Goals

Cultural Activation;
Heritage Preservation; Ecological
Spatial Outcome
Cultural hub; Public space

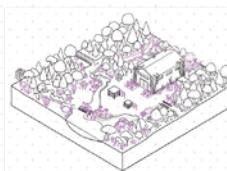
Degree of Intervention

Architectural Moderate; Heavy
Environmental Moderate; Heavy
Stakeholders Public + Private

Ecological Strategies

Soil remediation
Flooding adaptation
Structural reinforcement

Enclave



Key Analytical Dimensions

Mobility network
Land use

Regeneration Goals

Cultural Activation; Heritage Preservation
Spatial Outcome
Cultural institution; Touristic

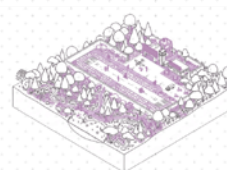
Degree of Intervention

Architectural Moderate; Heavy
Environmental Heavy
Stakeholders Public

Ecological Strategies

Reuse of existing structure
Programmatic adaptation
Native vegetation insertion

Green Ruin



Key Analytical Dimensions

Green Infrastructure
Environmental Impact

Regeneration Goals

Ecological
Spatial Outcome
Ecological public landscape

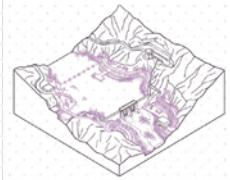
Degree of Intervention

Architectural Light
Environmental Moderate
Environmental Public + Community

Ecological Strategies

Soil remediation;
Successional vegetation

Hydro Structure



Key Analytical Dimensions

Blue infrastructure
Flooding risk
Green infrastructure

Regeneration Goals

Ecological; Infrastructural;
Urban Regeneration
Spatial Outcome
Linear park; Bathing zone

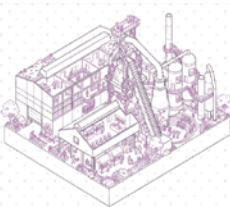
Degree of Intervention

Architectural Moderate; Heavy
Environmental Moderate; Heavy
Stakeholders Public

Ecological Strategies

Ecological banks
Water purification
Mobility integration

Industrial Monolith



Key Analytical Dimensions

Mobility network
Land use
Structural conditions

Regeneration Goals

Cultural Activation; Ecological
Spatial Outcome
Cultural/Social infrastructure

Degree of Intervention

Architectural Light; Moderate; Heavy
Environmental Moderate; Heavy
Stakeholders Public + Private

Ecological Strategies

Adaptive reuse
Soil remediation
Reduced demolition waste
Vegetation insertion

Linear Corridor



Key Analytical Dimensions

Green infrastructure
Land use
Mobility network

Regeneration Goals

Urban Regeneration; Mobility Integration;
Cultural Activation
Spatial Outcome
Linear park

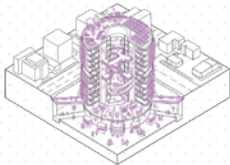
Degree of Intervention

Architectural Light; Moderate
Environmental Light; Moderate; Heavy
Stakeholders Public

Ecological Strategies

Meadow restoration
Permeable soils

Urban Megastructure



Key Analytical Dimensions

Mobility network
Land use
Structural conditions

Regeneration Goals

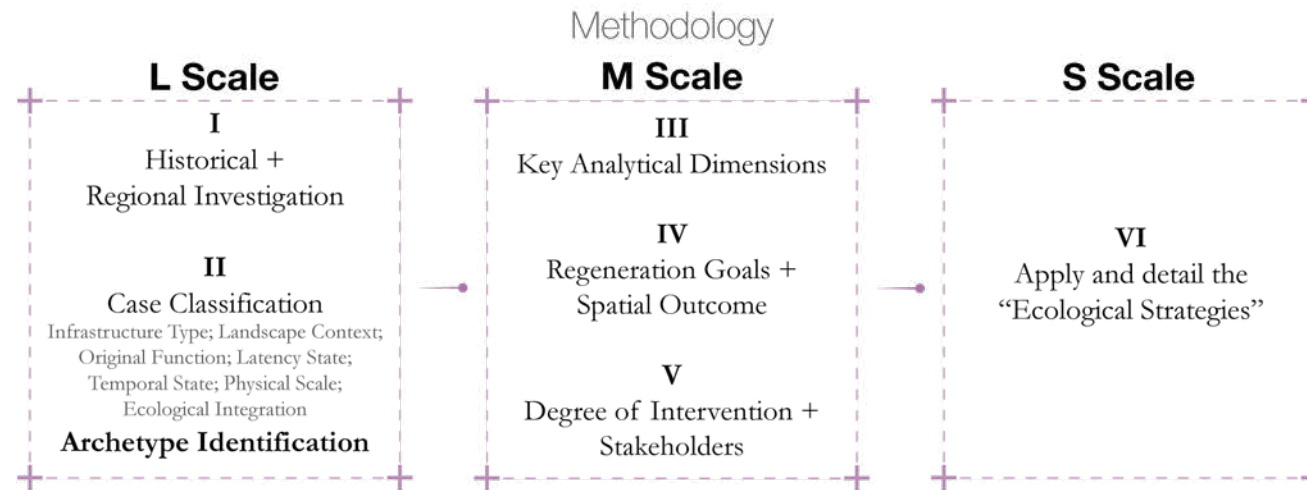
Heritage Preservation; Urban
Regeneration
Spatial Outcome
Hybrid public/commercial space

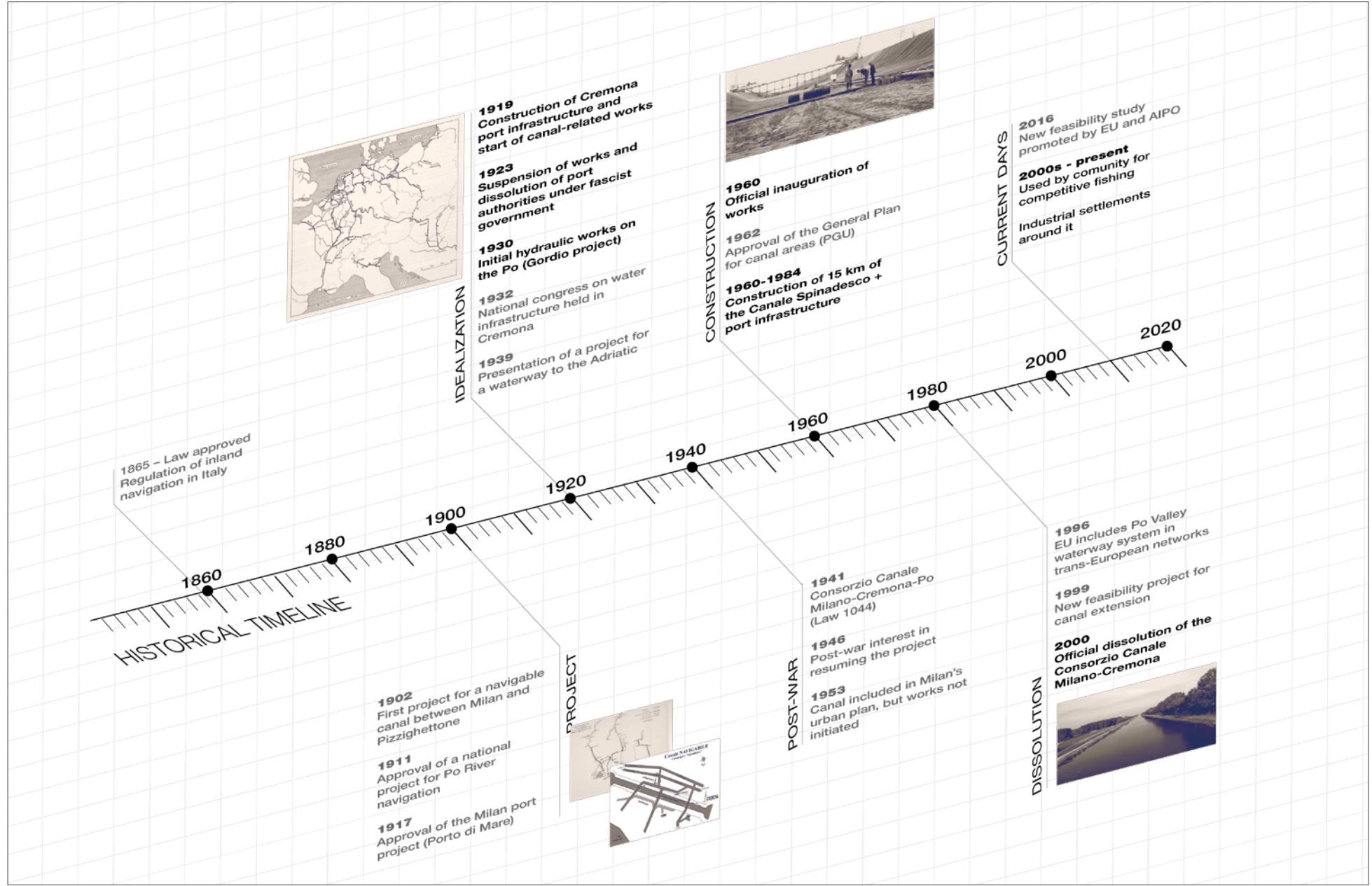
Degree of Intervention

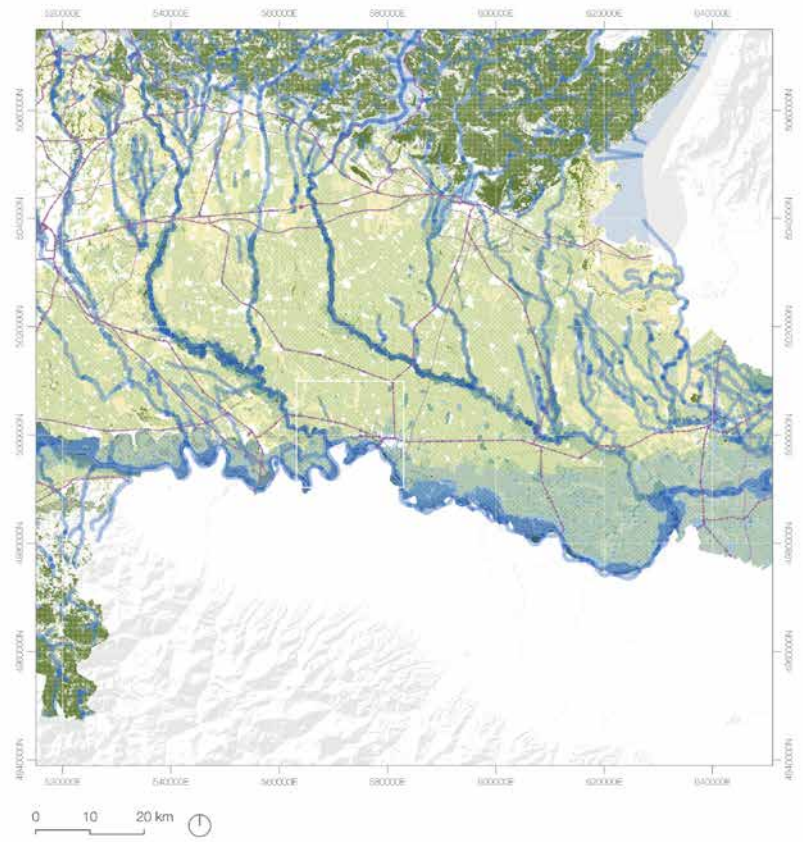
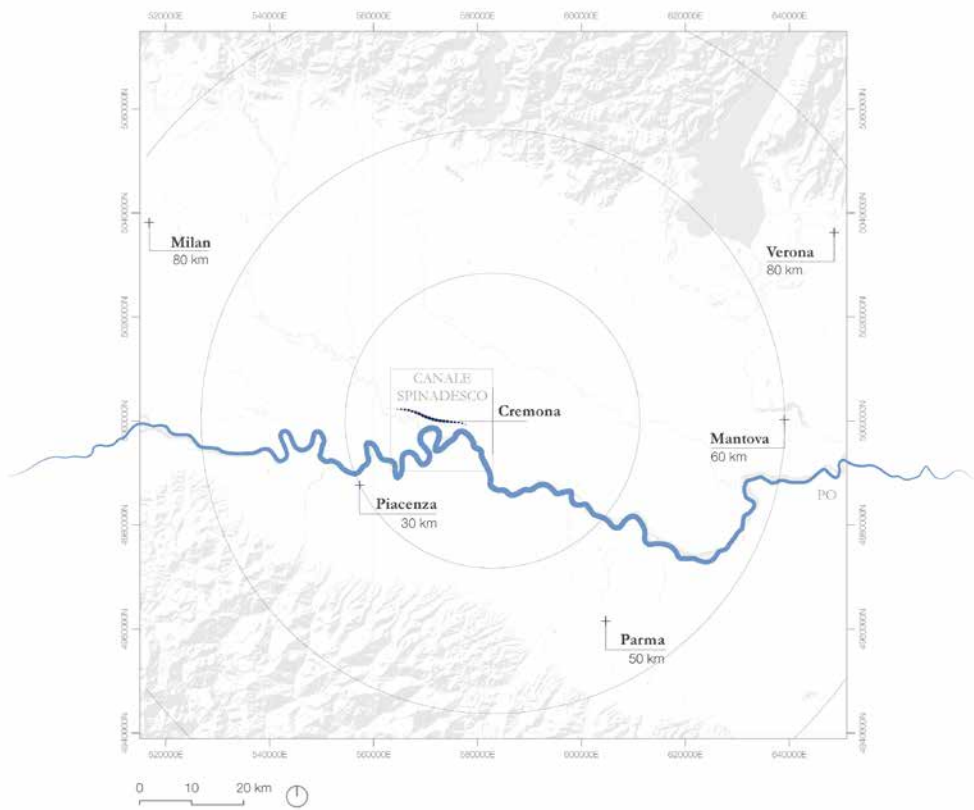
Architectural Light; Moderate; Heavy
Environmental Light; Moderate; Heavy
Stakeholders Public + Private

Ecological Strategies

Reuse of structure
Energy efficiency
Roof gardens
Vegetation insertion

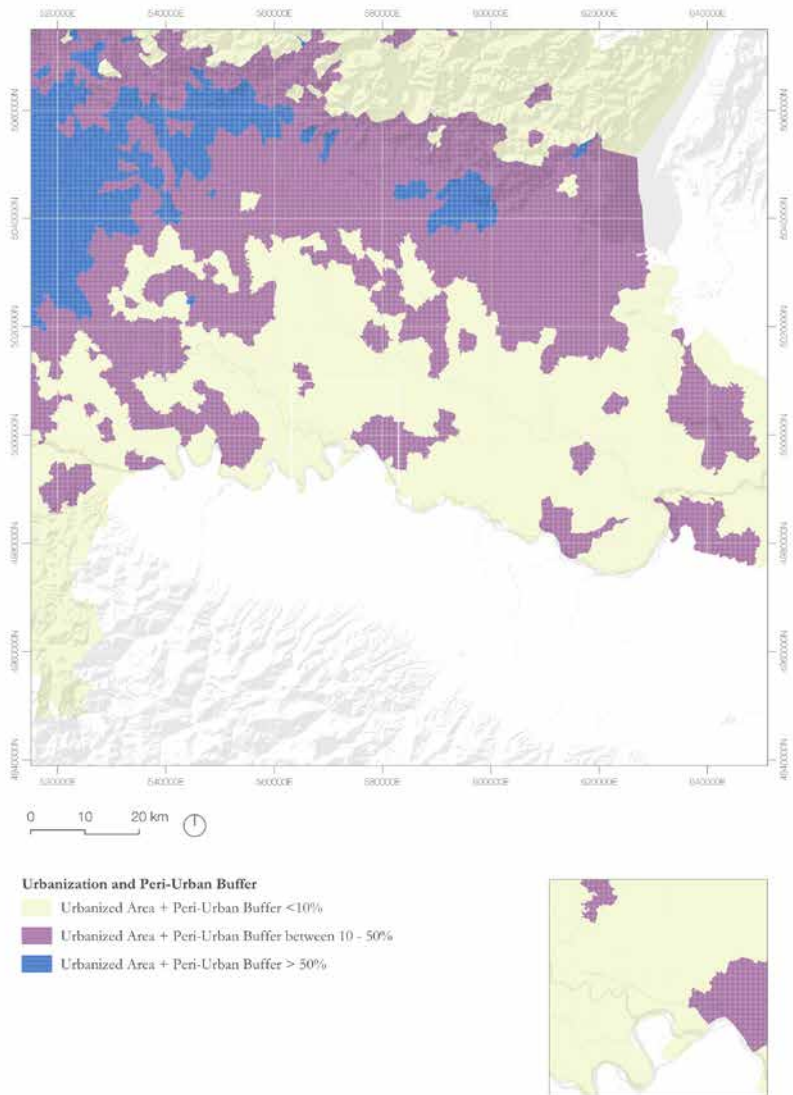
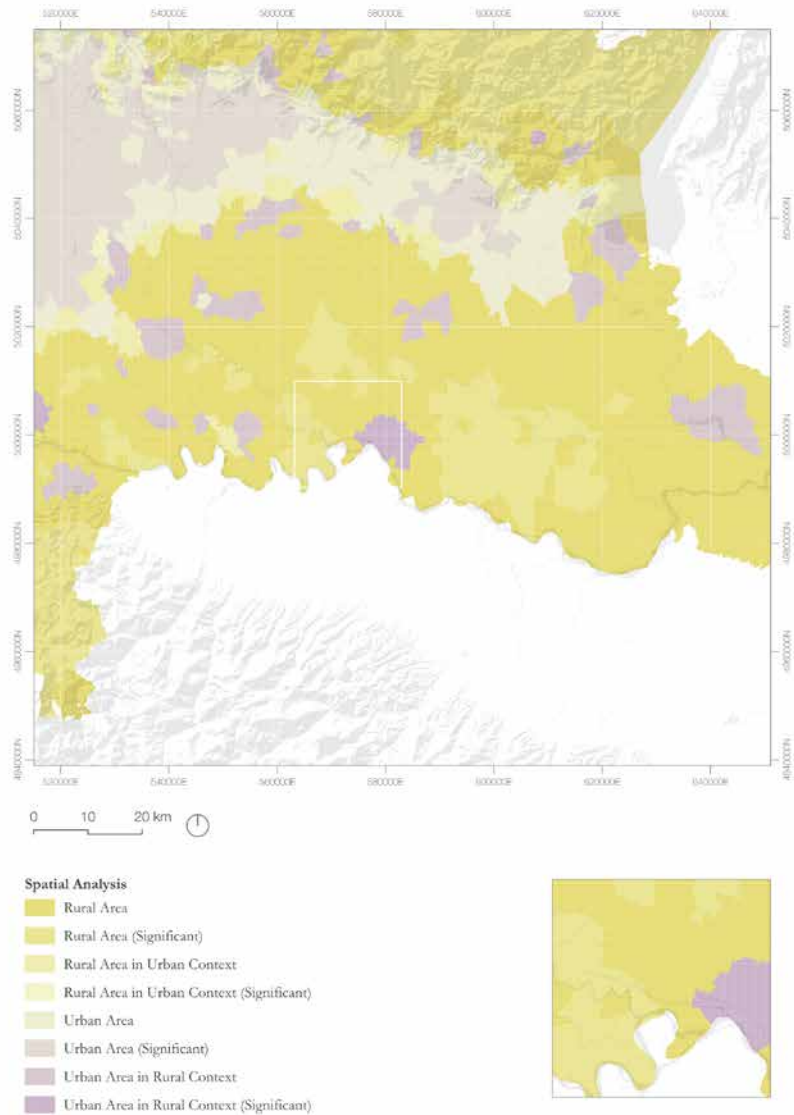


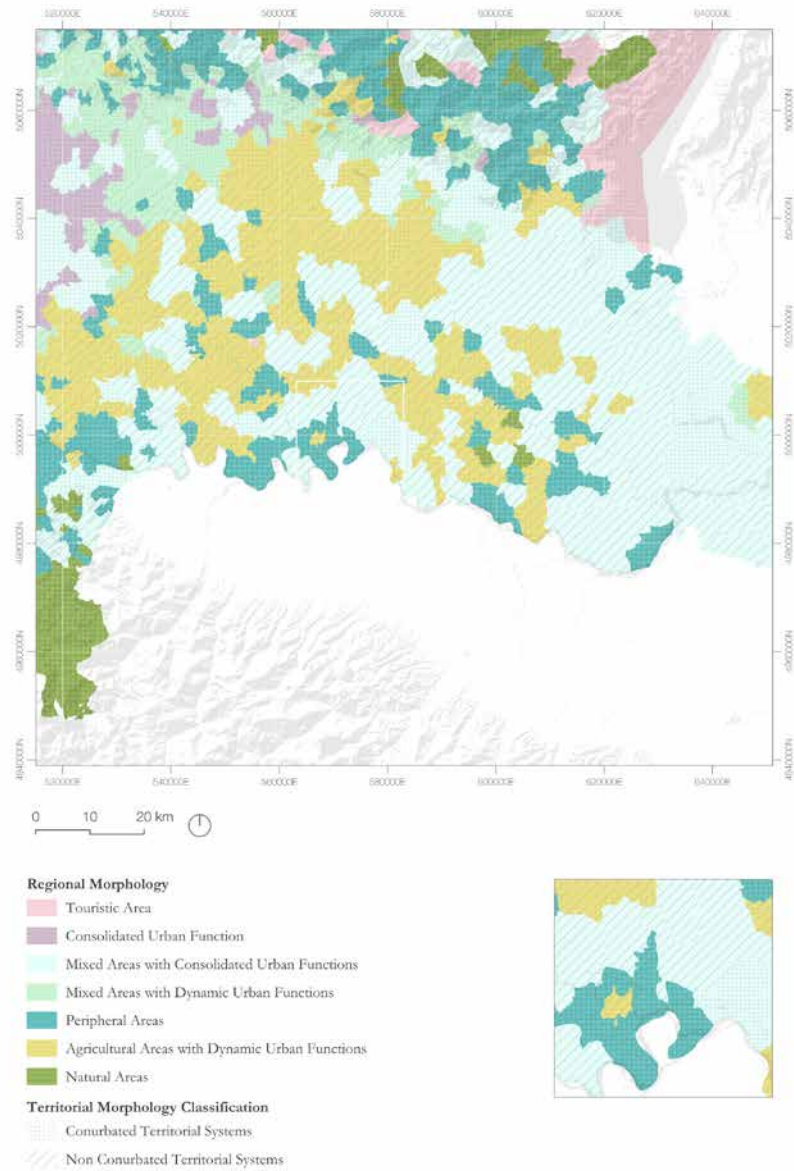
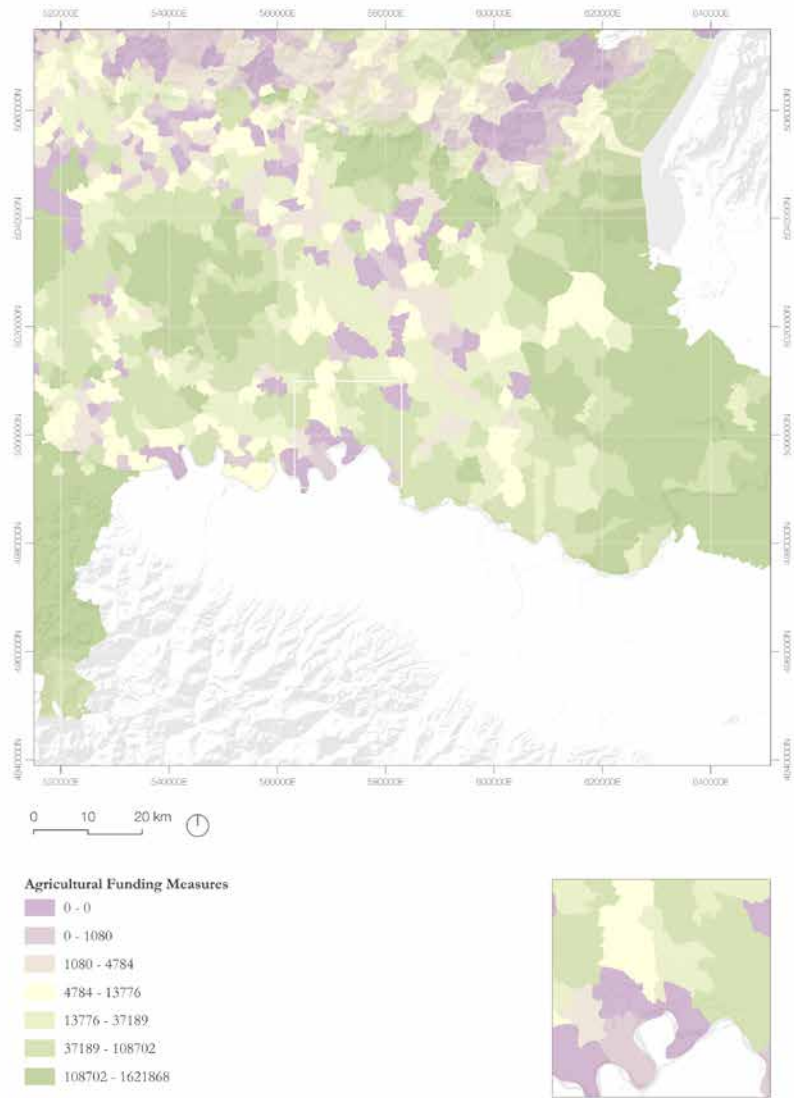


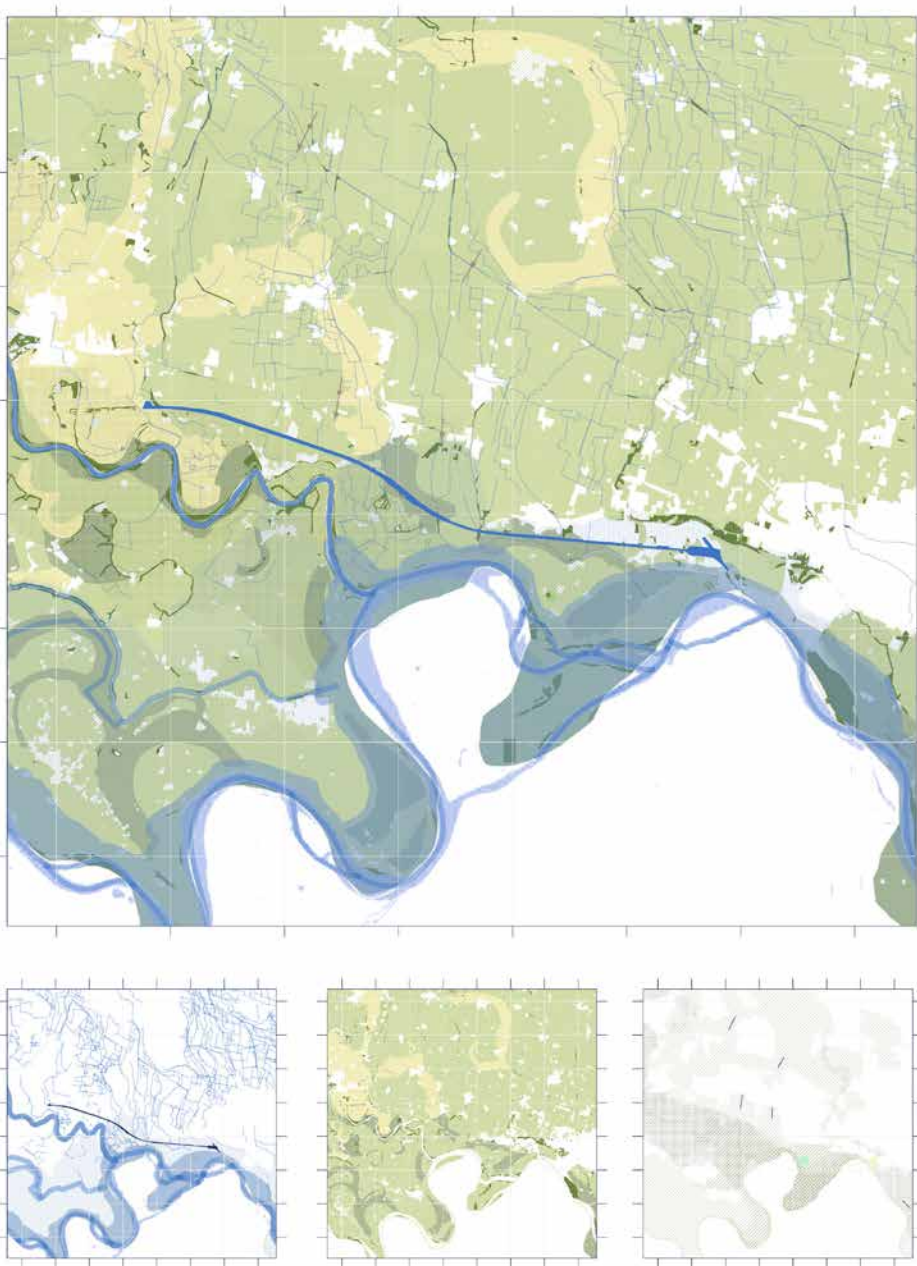


- | | |
|---------------------------------|-----------------------------------|
| Grey Infrastructure | Blue Infrastructure |
| Mobility Infrastructures | — Main Watercourses |
| — Railway | ▨ Po River System Protection Area |
| — Highway | ▨ Po River Protection Area |
| Hazards | Green Infrastructure |
| Floodings | ■ Dense Vegetation |
| Flood Risk | Soil Mapping |
| ▨ Low | ■ Forest |
| ▨ Moderate | ■ Degraded forest |
| ▨ High | ■ Arable land |
| ▨ Very high | ■ Forage crop |









0 1 2 km



Blue Infrastructure

- Main Watercourses
- Minor Watercourses
- Po River System Protection Area
- Po River Protection Area

Green Infrastructure

- Dense Vegetation

Soil Mapping

- Forest
- Arable land
- Forage crop

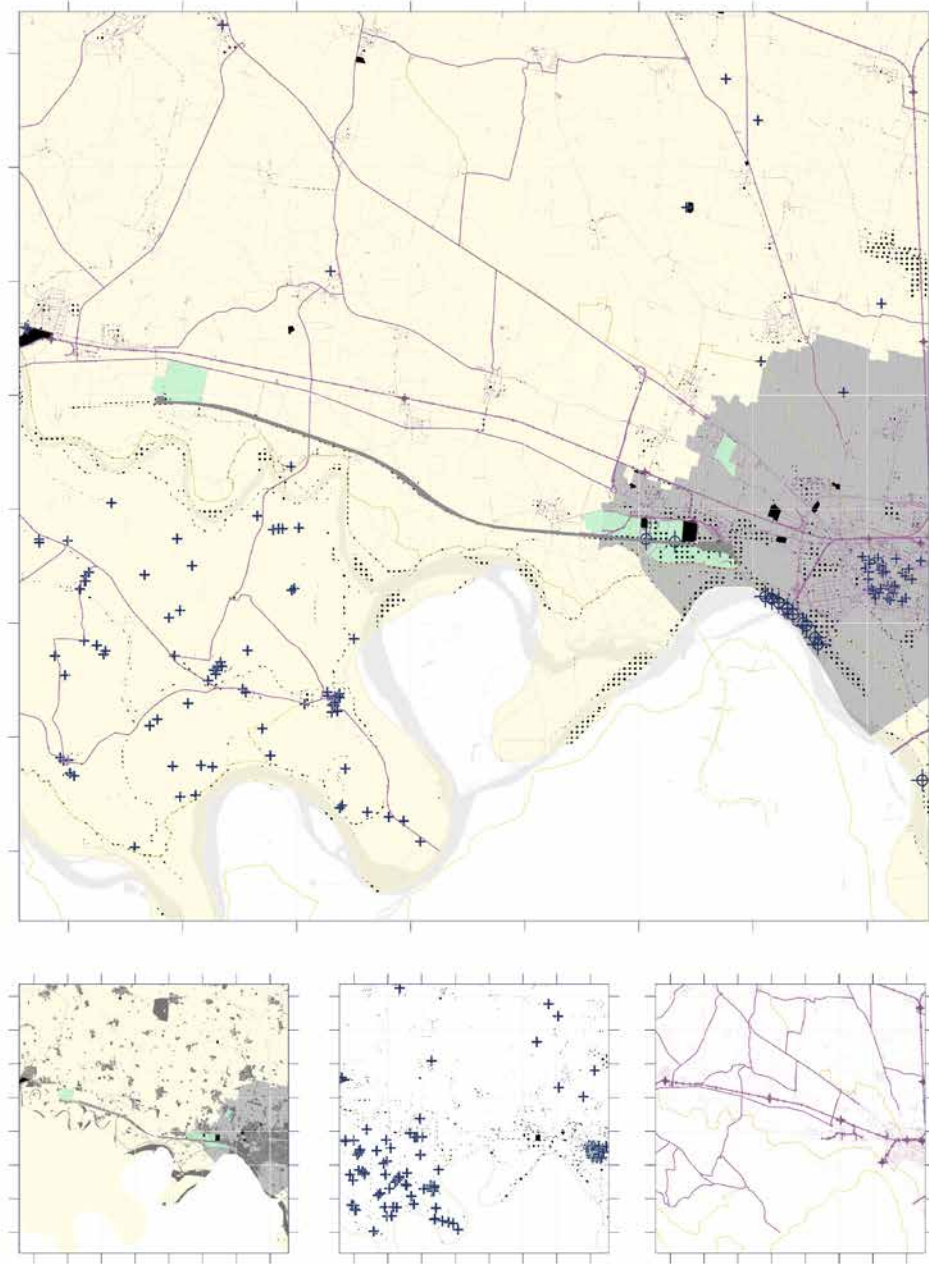
Protected Areas and Landscape Plans

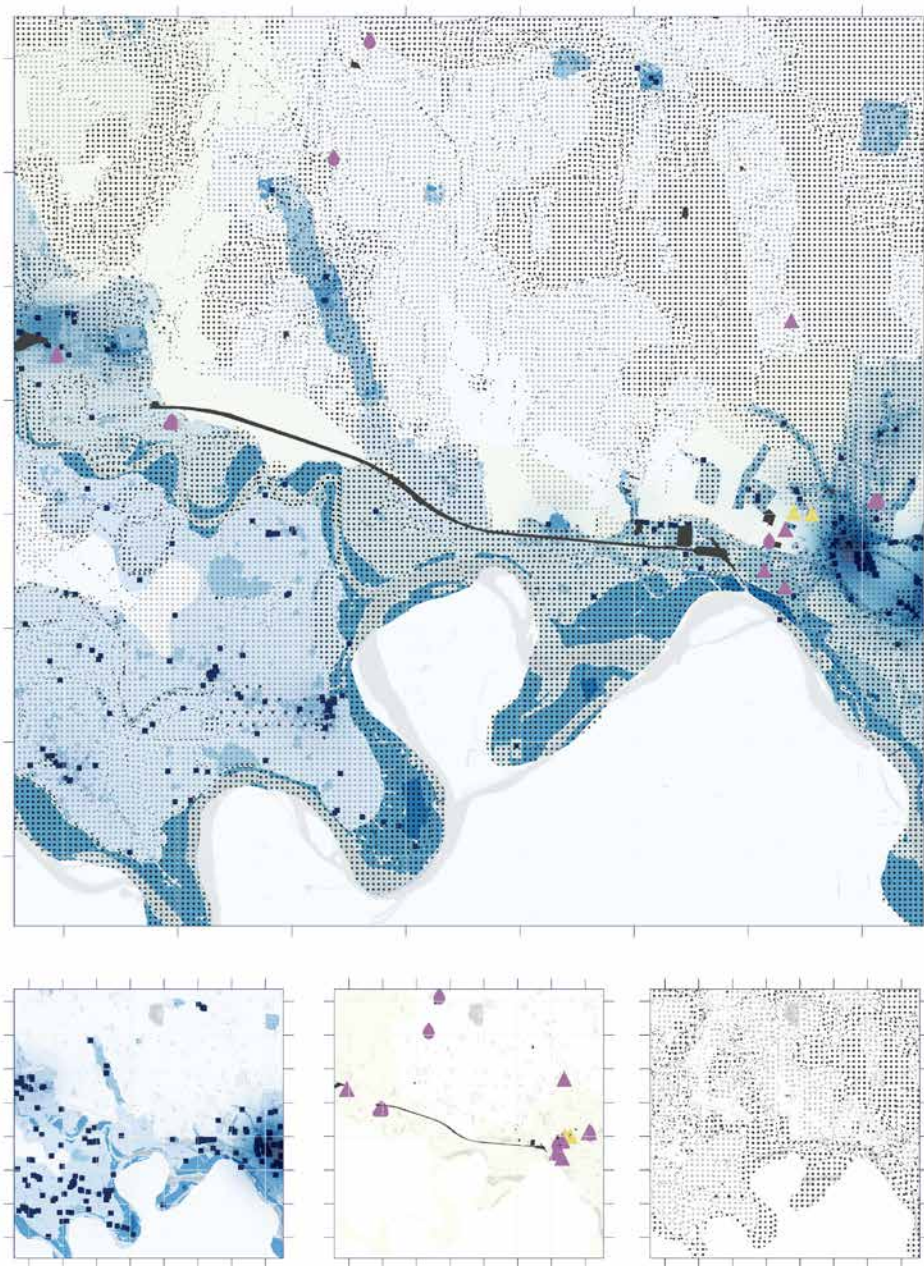
Green Protected Areas

- National Park
- Local Park

Regional Landscape Plan

- Geological Sites
- Protected View Corridors
- Critical Ecological Passages (RER)
- Rete Ecologica Regionale (RER)
- Rete Natura 2000





0 1 2 km



Hazards

- Fluvial Erosion
- Abandoned Areas

Contaminated Areas

- Abandoned industrial area
- Active industrial area
- Mining or extractive activities
- Fuel storage

Floodings

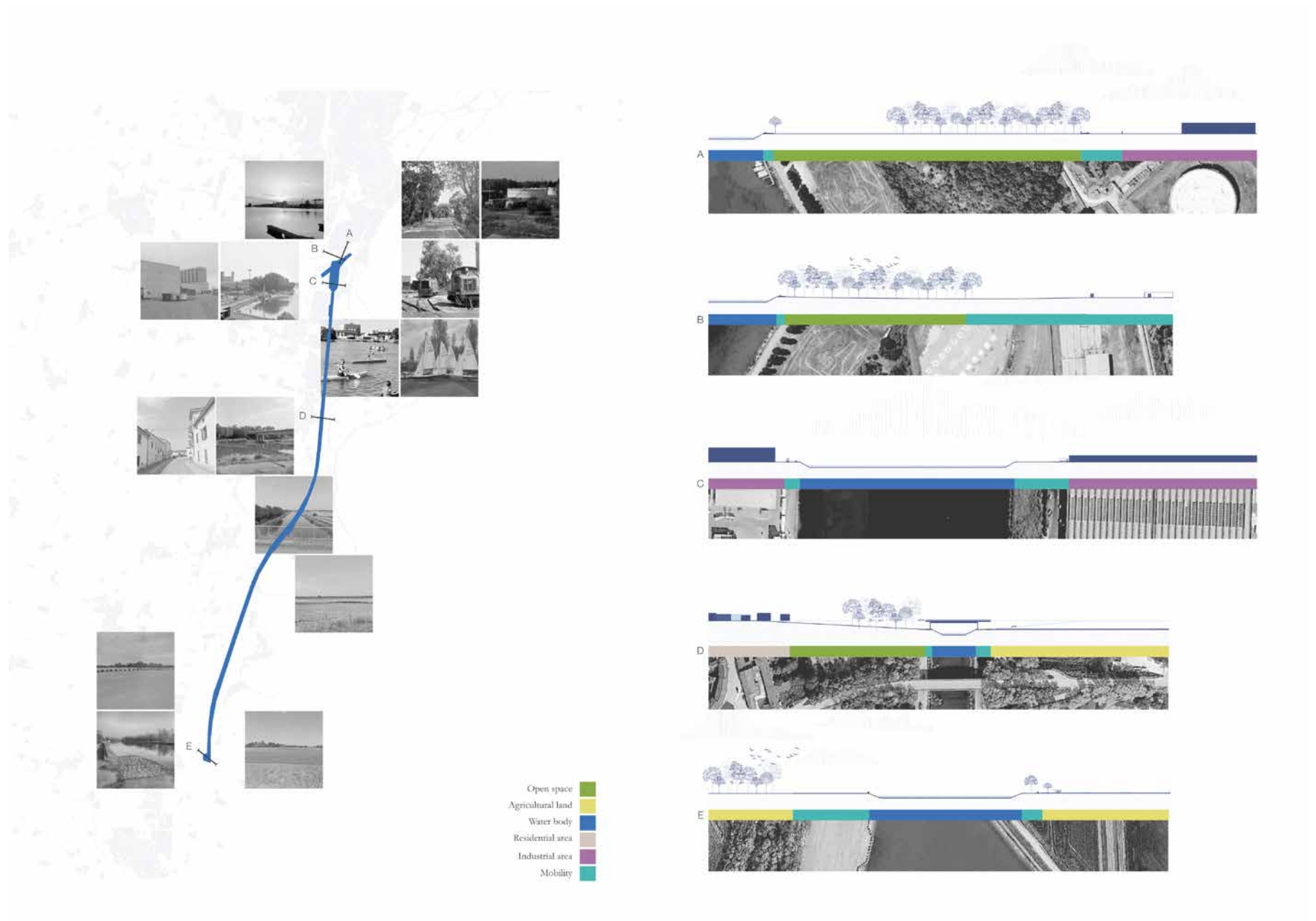
- Elements Affected

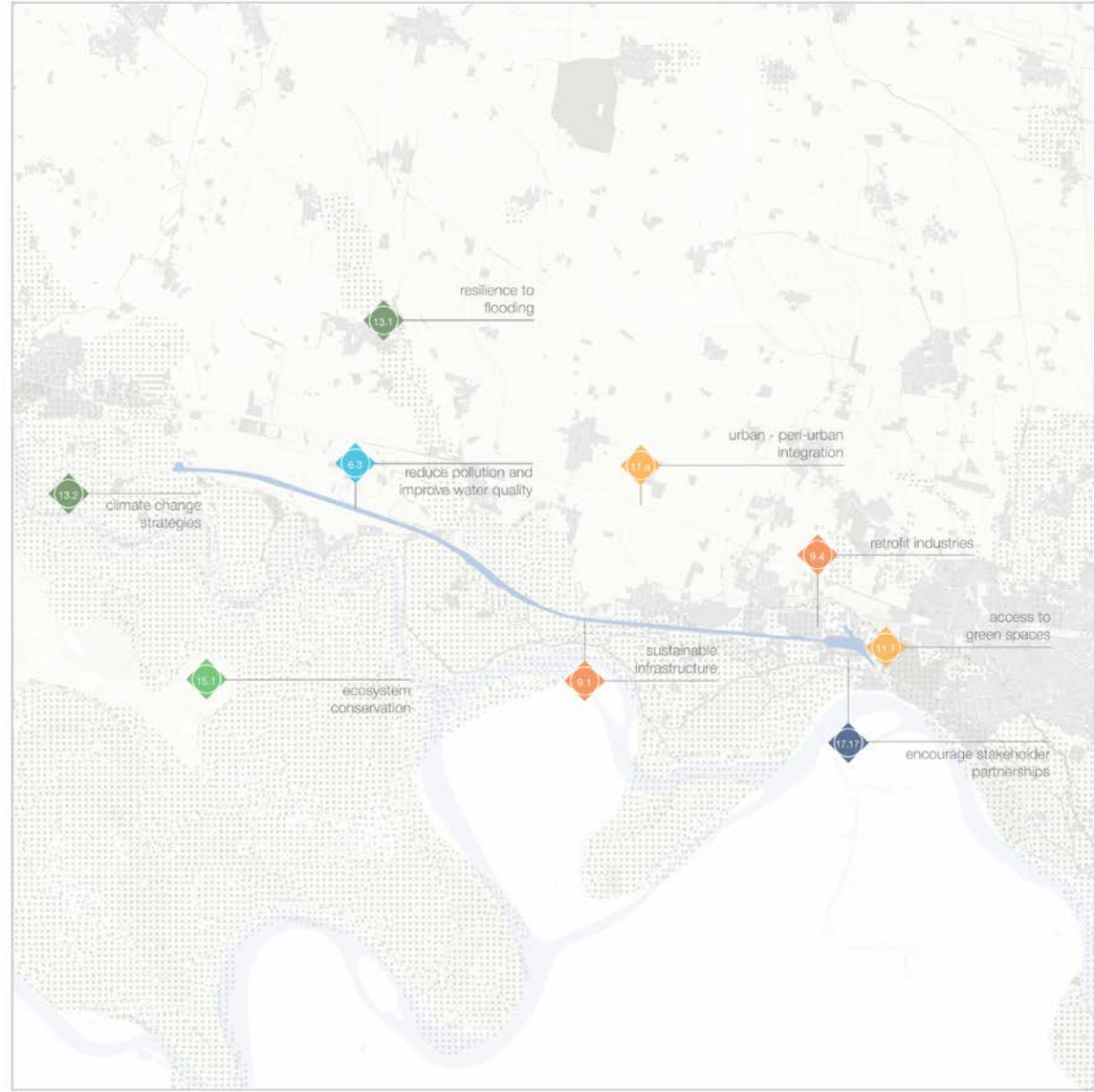
Flood Risk

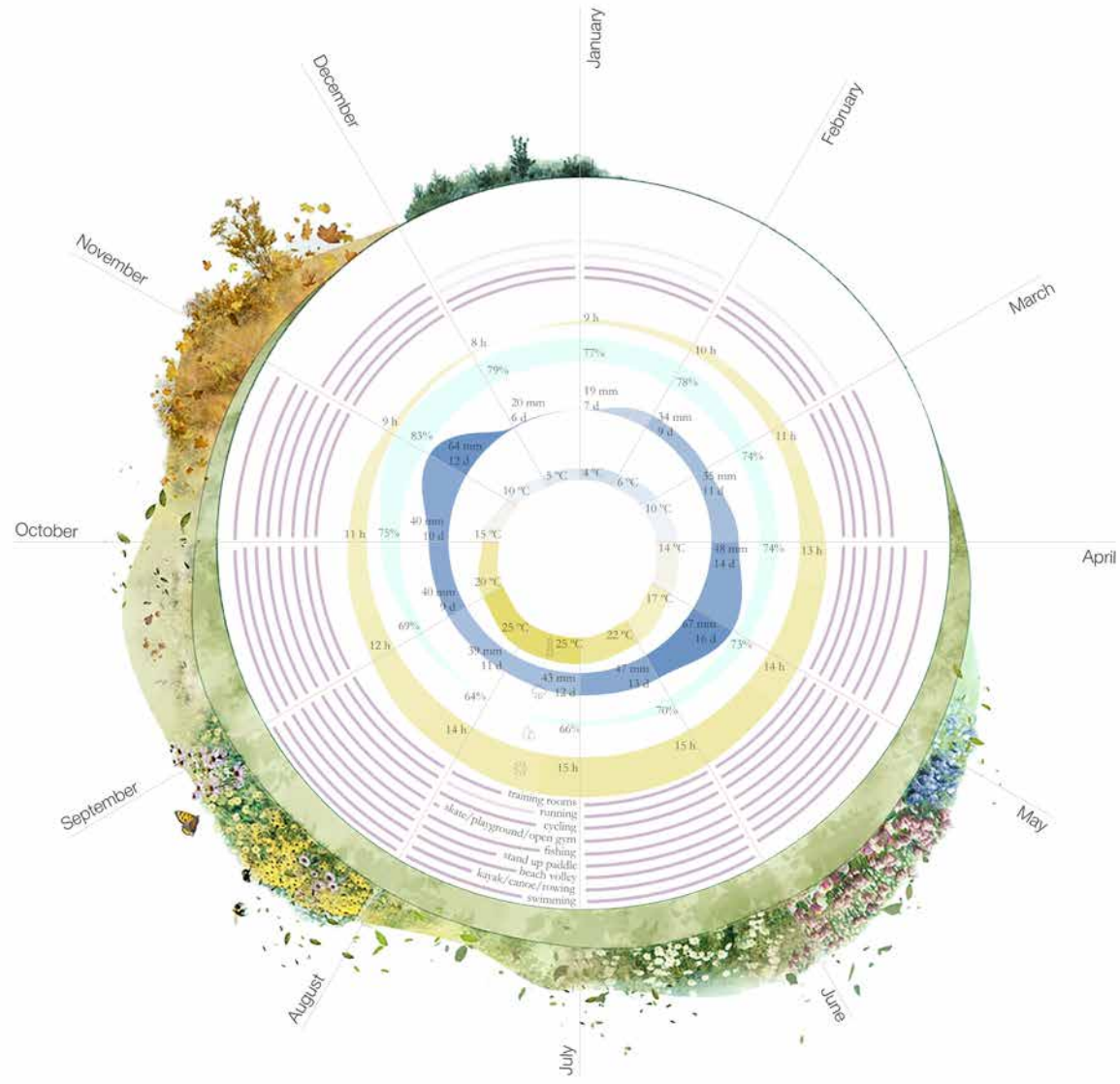
- Low
- Moderate
- High
- Very high

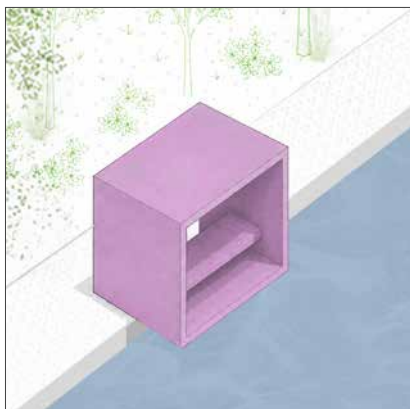
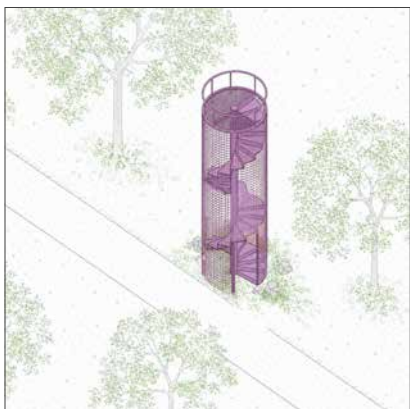
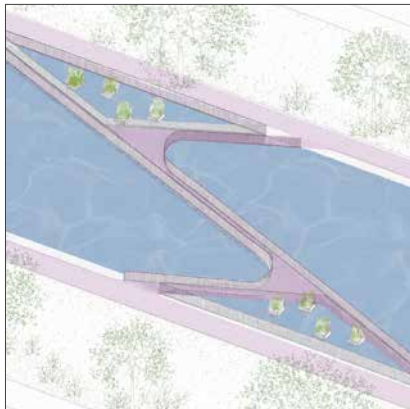
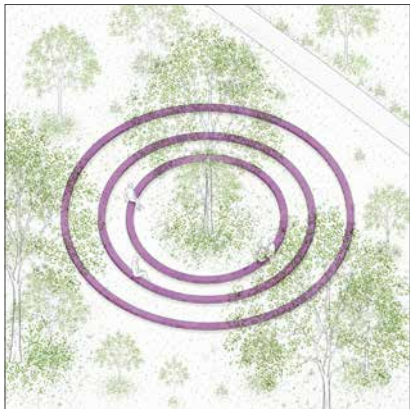
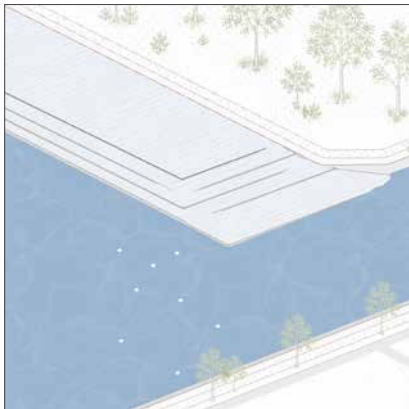
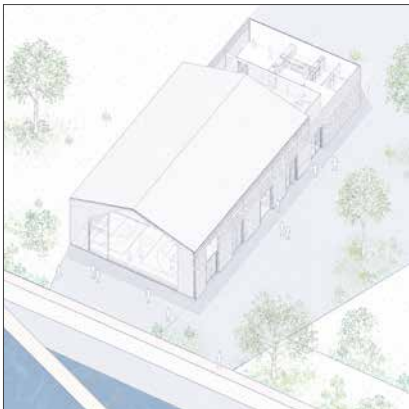
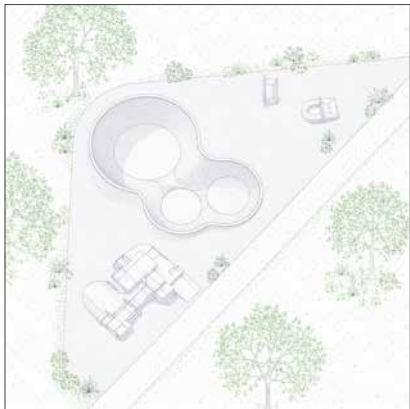
Geological Feasibility

- Not Feasible
- Significant Limitations
- Moderate Limitations
- No Limitations
- Nitrate Vulnerable Zone









VII. REDEFINING LATENT INFRASTRUCTURES

Infrastructural systems exist in diverse forms and are located across different landscape morphologies. Consequently, they carry different implications for the environment. The long lifespan and scale of these structures affect their surroundings for many years, even when left unfinished or abandoned due to the interruption of their use or the emergence of new technologies.

Exploring abandoned infrastructures, from their concept to the remnants of their physical form, revealed that these structures do not disappear when forgotten. This research also revealed that their state of obsolescence does not need to represent their final condition. As they continue to shape territories, their activation or reinterpretation means that their existence or persistence can also provide social and environmental benefits.

Innovation does not mean turning invisible those structures whose technologies have become obsolete. Green strategies focused on urban regeneration and on the well-being of nature, and the communities once served by these infrastructures, are themselves innovations. They resignify spaces that were unseen.

Methodological Framework

The design process developed in this research was designed to be applied gradually across different scales through deep engagement with analytical steps: reading, diagnosis, translation, application, and reflection. Together, they form a methodology for working in post-infrastructural territories that starts with the territorial reading of a site as an active landscape actor, moves to the structural diagnosis of its latent conditions, and translates those conditions into ecological and spatial strategies.

Their latent potential was revealed through the interpretation of typologies (or archetypes) of these infrastructures, and the framework was tested by applying it to the Canale Spinadesco, a linear hydraulic infrastructure of regional scale that had been latent for over a century.

Several design principles gathered from the applied investigation may be applied beyond the case study. Territorial reading was also essential for thinking interventions, as the most effective design decisions highlighted what was already present.

Ecological time, measured in natural succession instead of construction schedules, should be treated as the primary time unity. Moreover, the informal relationships that communities develop with latent infrastructures during their years of abandonment provide valuable information for guiding spatial proposals.

Among the conditions this research was unable to study in depth, the transitional zone is the most urgent theme for further exploration. Of all the landscape contexts analyzed, transitional zones are ambiguous thresholds between urban and rural, productive land and ecological fringe, and are the most complex cases.

They are the landscapes most frequently hosting latent infrastructures, since they occupy the margins and belong to no single morphological typology, and therefore fall outside the existing frameworks designed for them. Further investigation into these vulnerable areas would extend this work, addressing the challenges specific to those “unnamed” territories.

Additionally, even though transforming abandoned infrastructure into a designed landscape inevitably affects the ecological and cultural value that abandonment itself produced, these modifications are beneficial to both dimensions in the long term. Considering the long lifespan of these structures, the focus should be on the gains over time.

Moreover, what this investigation ultimately found was landscapes already in motion, already structuring ecologies, territories, and collective memories. The most significant transformations may not be in building new, but in learning to read, understand, and work with what has already been built and left behind. In this way, the concept of abandonment is redefined as latent. Latency is no longer a synonym for neglect, but for potential. Latent landscapes are, then, landscapes waiting to be reimagined through their obsolete elements.

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