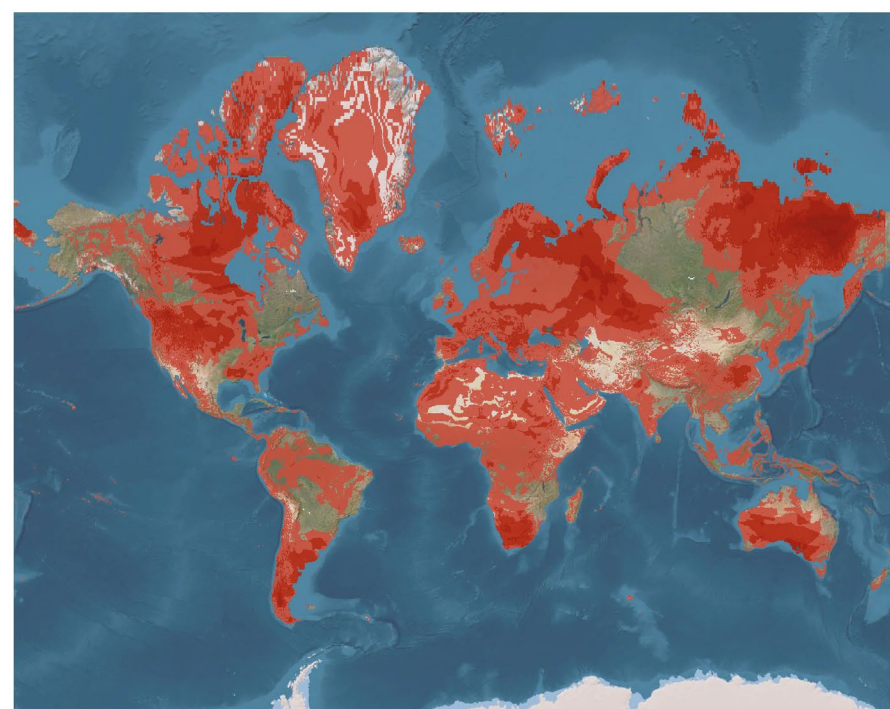
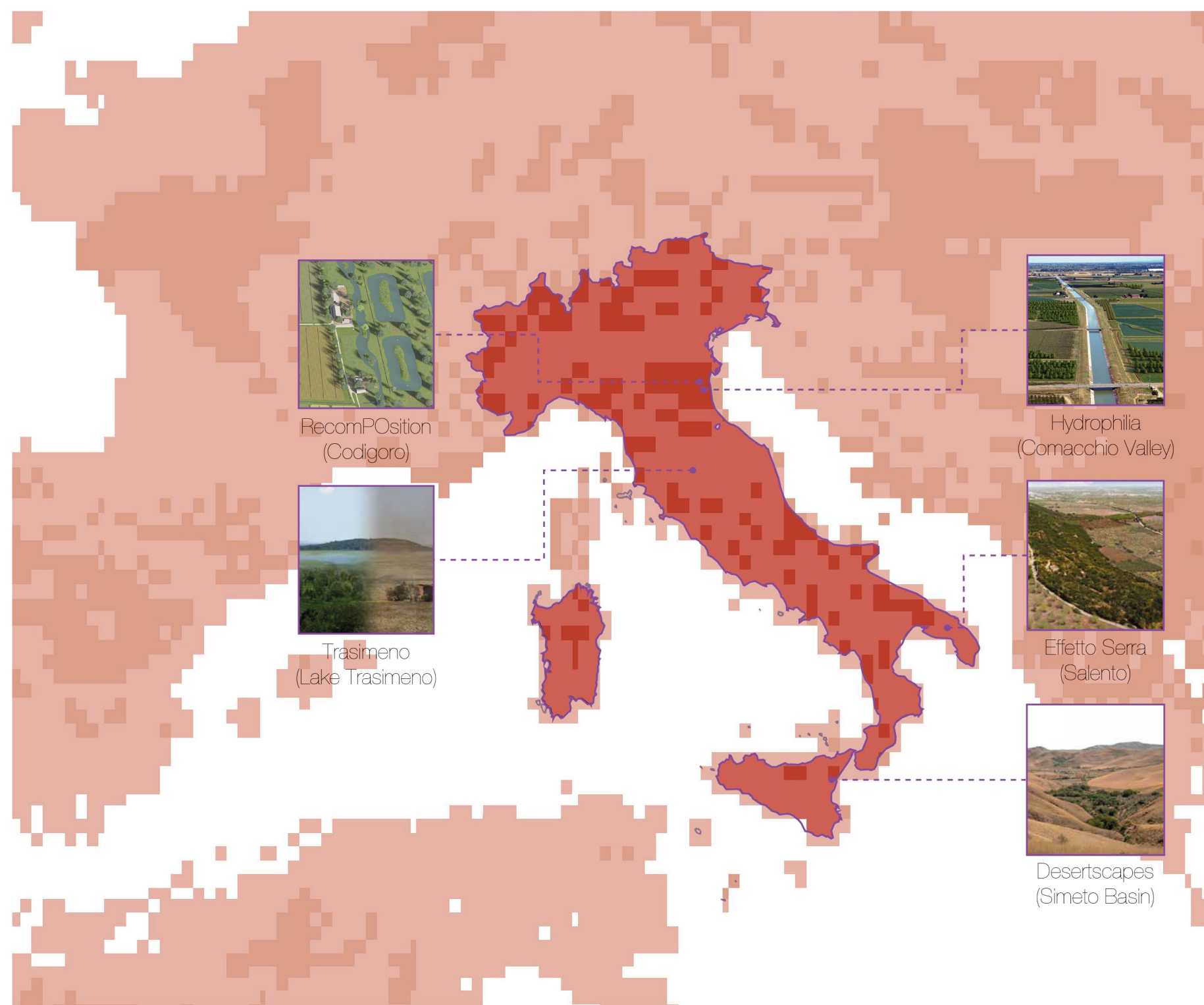
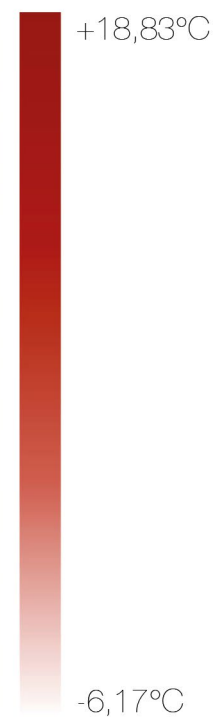


World temperatures in August 2100 (NASA/GDDP-CMIP6 dataset)



Temperature differences of global isotherms from 2025 to 2100
(computed from NASA/GDDP-CMIP6 dataset)



Temperature differences of Italian Isotherms from 2025 to 2100
(computed from NASA/GDDP-CMIP6 dataset)

The following theses represent a selection of projects developed within the Graduation Laboratory of Landscape Architecture (LsE), in collaboration with the Sealine Research Center at the Department of Architecture, University of Ferrara. In particular, the presented works focus on the development of future scenarios in response to global challenges.

CANNIZZOLA DESERT 2025



CANNIZZOLA DESERT 2050



Country/City	Italy, Ferrara
University / School	University of Ferrara
Academic year	2023/2024
Title of the project	DESERTSCAPES. From inhospitality to daily life: evolution of the Simeto basin. Nausica
Authors	D'Andrea, Federico Placuzzi



Title of the project	DESERTSCAPES. From inhospitality to daily life: evolution of the Simeto basin.....
Authors	Nausica D'Andrea, Federico Placuzzi.....
Title of the course	Master Thesis Laboratory in Landscape Architecture and Infrastructures.....
Academic year	2023/2024.....
Teaching Staff	Gianni Lobosco, Elena Dorato, Lorenzo Tinti, Francesco Axel Pio Romio.....
Department / Section / Program of belonging	Department of Architecture, Sealine Research Centre.....
University / School University of Ferrara/ Department of Architecture / Sealine Research Centre.....



Written statement, short description of the project in English, no more than 250 words

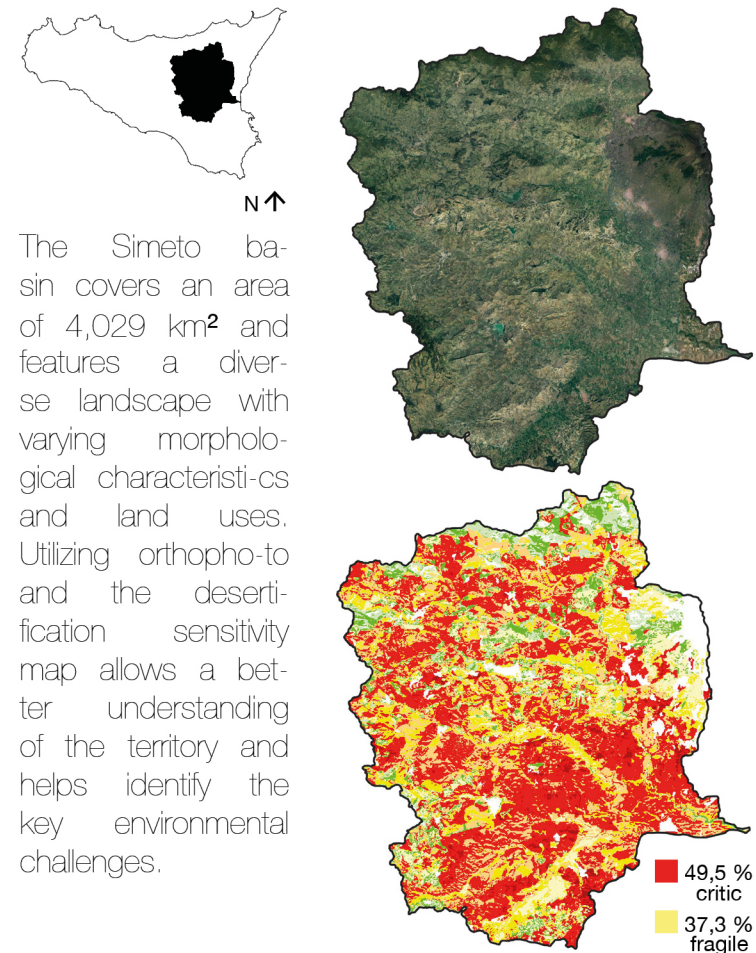
The Region of Sicily is among the Mediterranean areas most severely affected by desertification, a process intensified by both climate change and human activity. The Desertscares thesis project proposes a mitigation strategy for this phenomenon in the Simeto Basin, using projected climate scenarios for 2050. The project focuses on an agriculture-based landscape, introducing adaptive strategies to counteract land abandonment, biodiversity loss, and soil degradation. Its main goal is to define an operational model that preserves the landscape while enhancing ecological resilience. A preliminary environmental analysis identified three macro-areas based on shared features: the Next Desert Area, the Agricultural Area, and the Oasis Area. This classification informed targeted interventions to prevent desertification. Each macro-area was designed with specific adaptation strategies to support ecological processes, improve farming practices, and generate new local opportunities. The integrated scenario for 2050 envisions a "Landscape of Resistance", a resilient land management model. Desertscares offers a site-specific and replicable approach for landscapes threatened by desertification.

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OVERLAY MAPS OF THE SIMETO BASIN



SIMILAR INTERVENTIONS AREAS

Desert area 47%



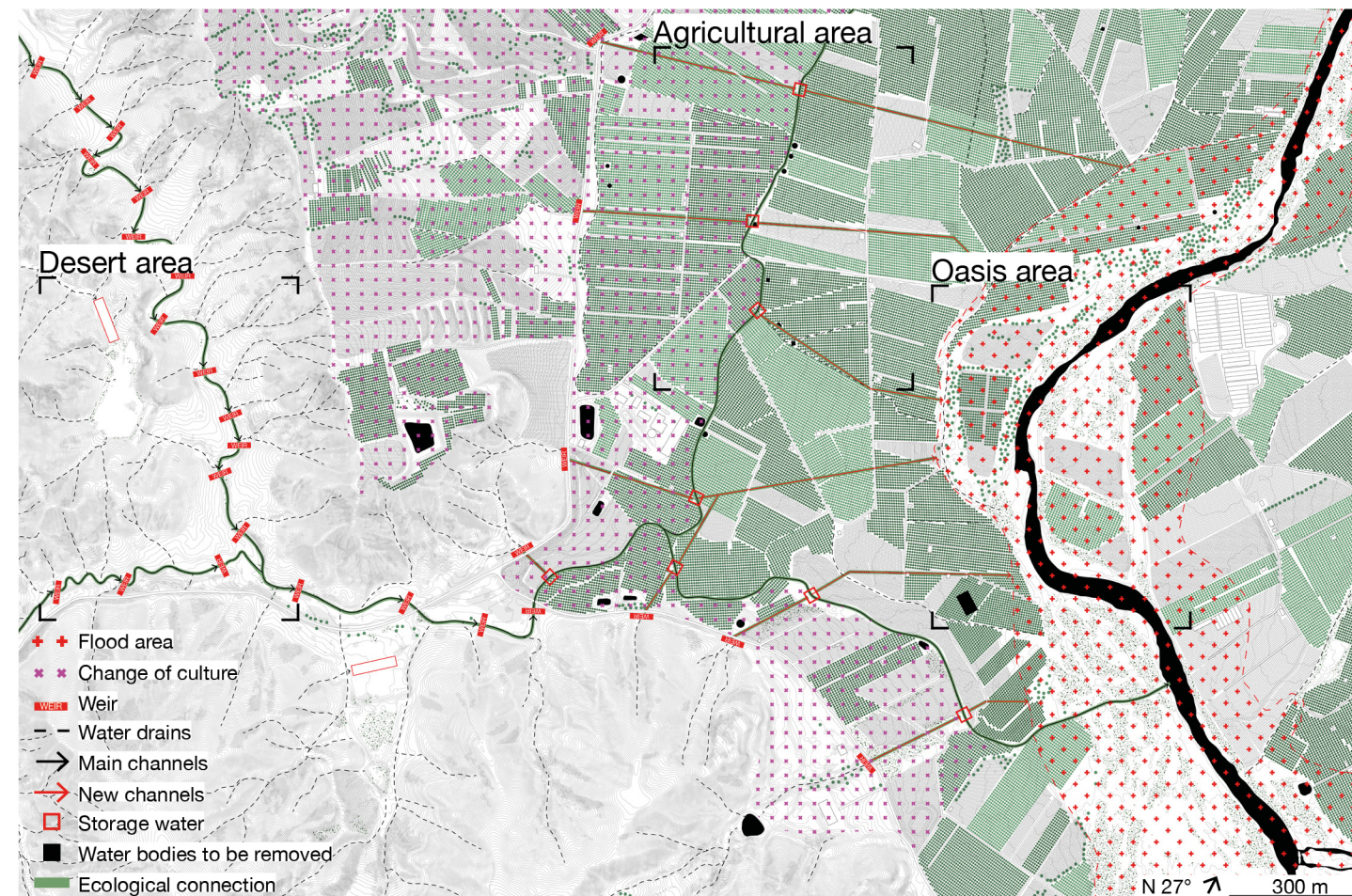
Agriculture area 29%



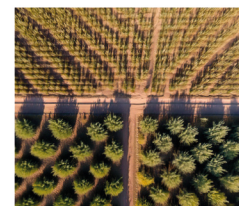
Oasis area 4%



POSSIBILITIES OF INTERVENTIONS IN THE CANIZZOLA DESERT



Increasing the cover crops and connection.



Favouring spontaneous wetlands.



Hotspots of adaptive agriculture.



Underground rainwater storage systems.



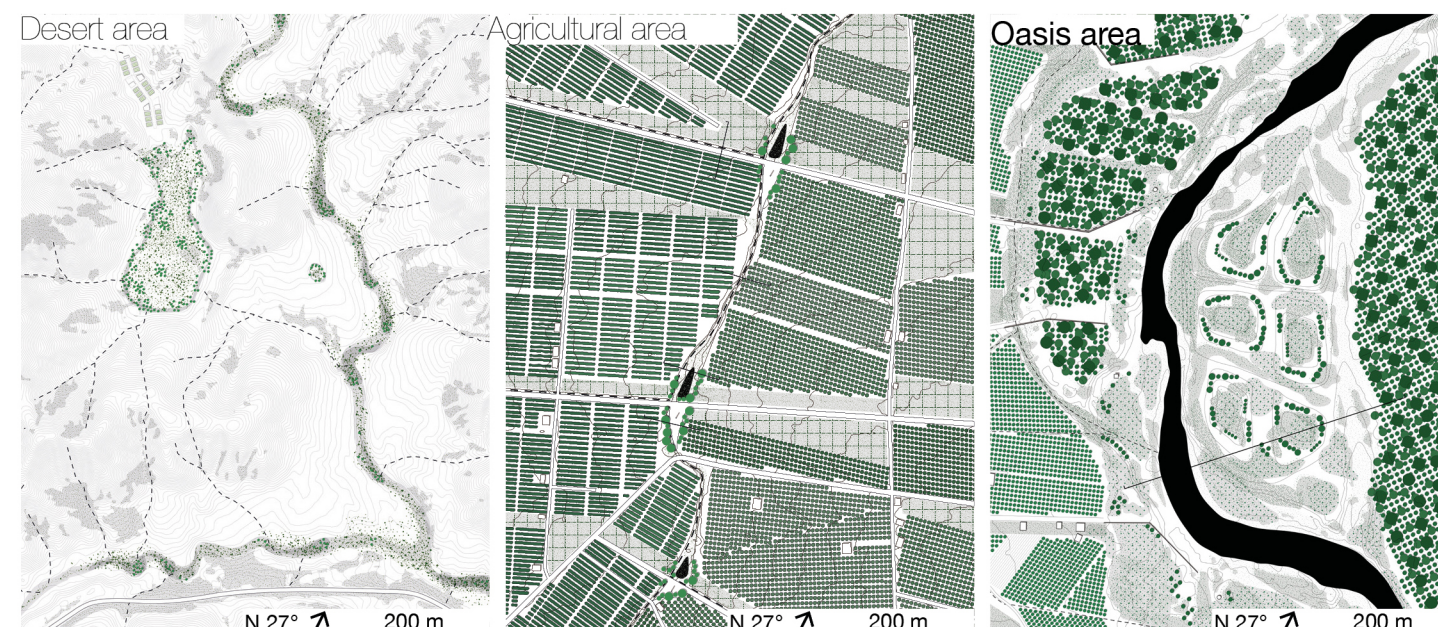
Increasing less water demanding crops.



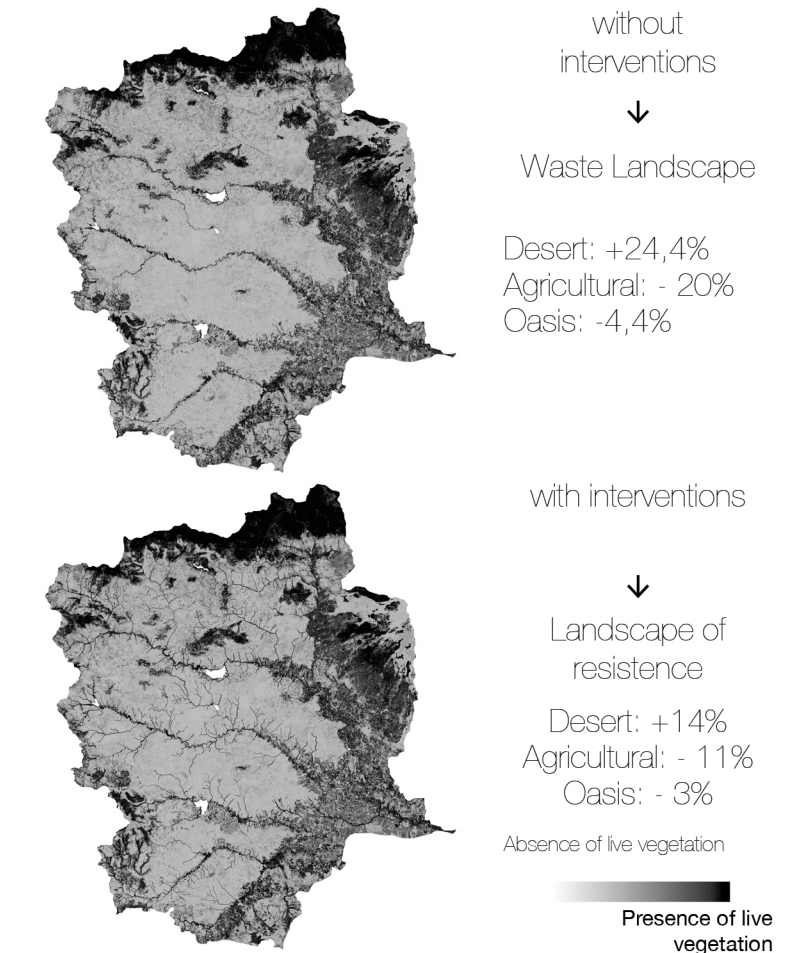
Enhancing the riparian zone.



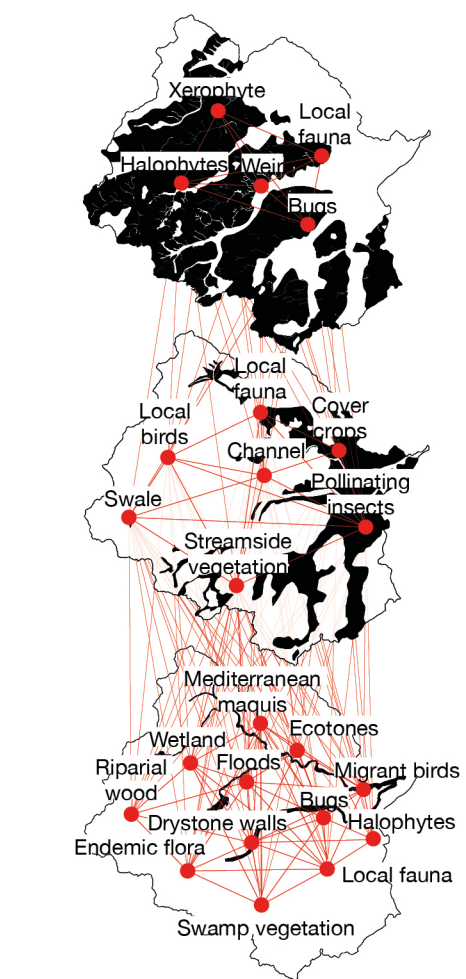
HOW THE CANIZZOLA DESERT COULD CHANGE IN 2050?



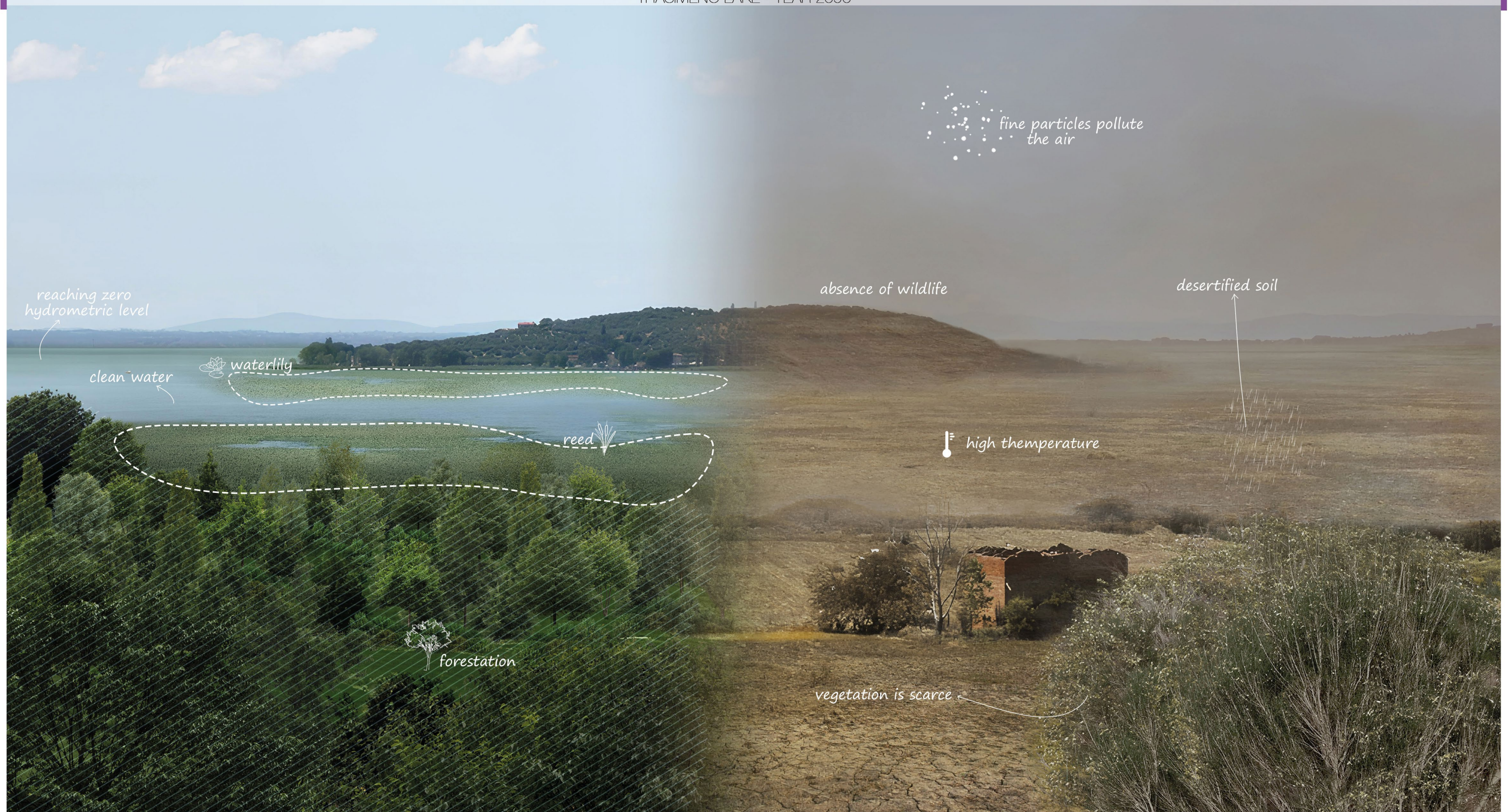
2050 SCENARIOS FOR THE SIMETO BASIN



CONNECTIONS TROUGH LANDSCAPES



The "landscape of resistance" is configured as an active system due to the density of ecological connections. The response to the adaptation strategy manifests itself in a new configuration of the landscape, which can evolve in response to changing environmental conditions.



Country/City

Italy, Ferrara

University / School

University of Ferrara

Academic year

2023/2024

Title of the project

Trasimeno Lake: project for a dynamic landscape

Authors

Beatrice Musa, Laura Iori, Martina Natalizi

Title of the project	Trasimeno Lake: project for a dynamic landscape
Authors	Beatrice Musa, Laura Iori, Martina Natalizi
Title of the course	Master Thesis Laboratory in Landscape Architecture and Infrastructures
Academic year	2023/2024
Teaching Staff	Gianni Lobosco, Elena Dorato, Carmela Vaccaro, Stefano Casadei
Department / Section / Program of belonging	Department of Architecture, Sealine Reserch Center
University / School	University of Ferrara/ Architecture Department/ Sealine Reserch Center



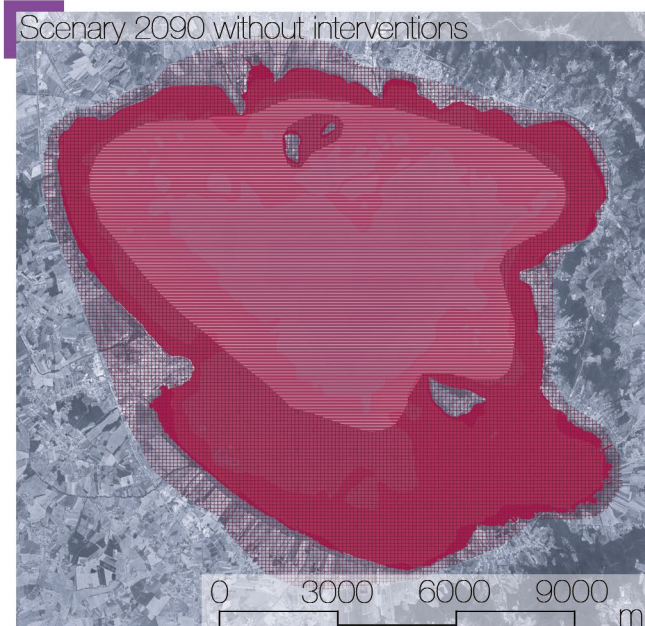
Written statement, short description of the project in English, no more than 250 words

Lake Trasimeno is a closed basin and has always been a characteristic dynamism, with water levels fluctuating seasonally. However, climate change marked by rising temperatures and declining precipitation is intensifying these variations, degrading shorelines and threatening biodiversity. This condition leads to the retreat of reed beds and the warming of lake waters. The reed die-back worsens eutrophication, fueled by nutrient runoff from surrounding fields, accelerating habitat loss. Simultaneously, elevated temperatures increase water surface evaporation. It's been outlines four future scenarios projected for 2030, 2050, 2070, and 2090 both with and without intervention. Recognizing the urgency to act, the study begins with a hydraulic project underway, aimed at stabilizing water levels through a new inflow system. The project envisions a resilient landscape through: expanding wetlands, reinforcing reed beds, and reintroducing the native white water lily. These actions aim to enhance biodiversity and adapt the ecosystem to climatic shifts. Three case studies — Oasi La Valle, the Anguillara canal, and Polvese Island — serve as test sites for architectural interventions: a lakeside promenade, a park, and natural pools.

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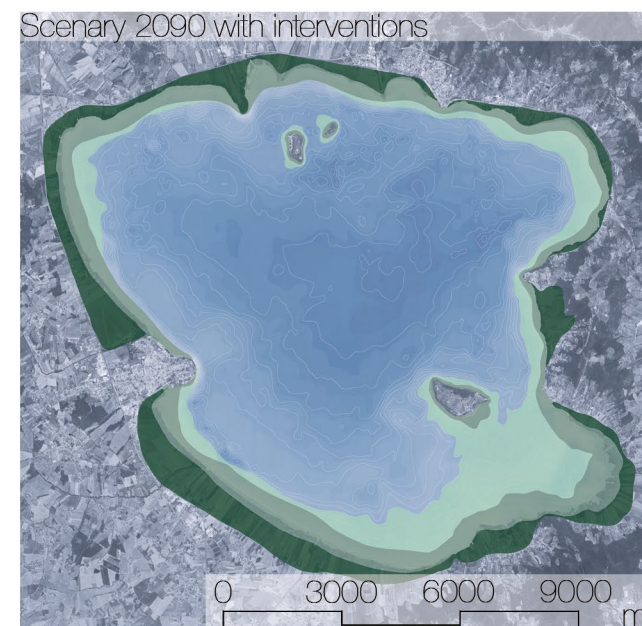


Average annual temperature: 17,2°C

Annual rainfall: 590 mm

Water level: completely drained lake

■ water surface
deserted land
— dry and arid grasslands

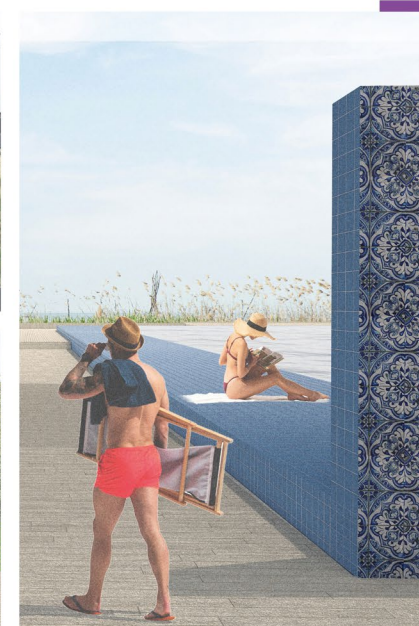


Average annual temperature: 17,2°C

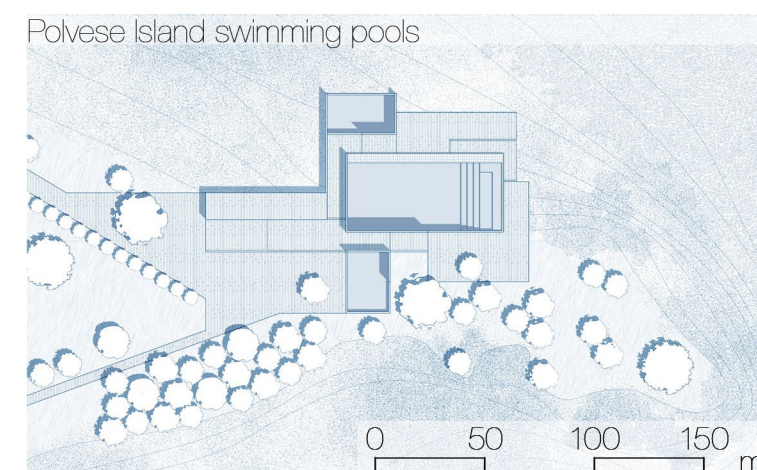
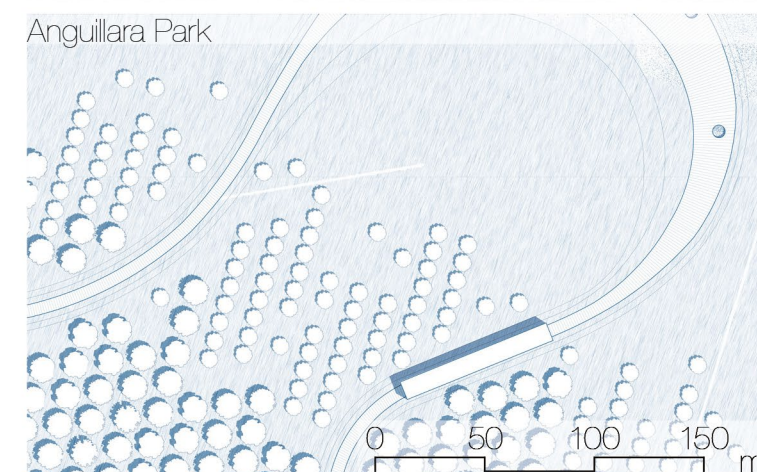
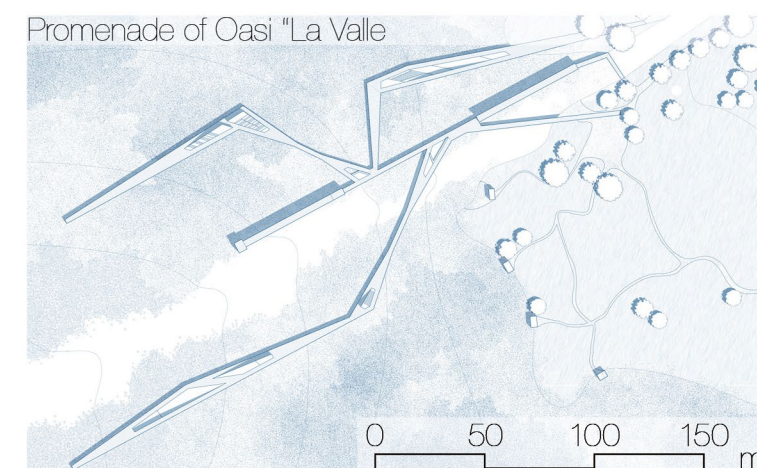
Annual rainfall: 590 mm

Water level: maintenance of the hydrometric zero

■ wet belt restored
■ development of the reedbed
■ reduction of the water lily



Intervention strategy - project for a dynamic landscape



The projects enhances Oasi La Valle, Island Polvese and Anguillara Coast through sustainable interventions promoting biodiversity and lake access. First one it includes a 300-meter walkway over reeds and water lilies; second one a two-level park showcasing vegetation zones; and the third are lakeside pools designed for eco-friendly swimming. All elements aim to integrate respectfully with the natural landscape, strengthening local identity and environmental awareness.



Country/City

Italy, Ferrara

University / School

University of Ferrara

Academic year

2021/2022

Title of the project

Effetto Serra, Serre Salentine as a tool for post Xylella regeneration.

Authors

Lorenzo Alessio; Irene Bolzan; Valerio Zulli

TECHNICAL DOSSIER	
Title of the project	Effetto Serra, Serre Salentine as a tool for post Xylella regeneration.
Authors	Lorenzo Alessio; Irene Bolzan; Valerio Zuli
Title of the course	Landscape architecture and infrastructure
Academic year	2021/2022
Teaching Staff	Gianni Lobosco; Luca Emanuelli; Fabio Ippolito
Department / Section / Program of belonging	Department of Architecture, Sealine Research Center
University / School	University of Ferrara/ Department of Architecture / Sealine Research Centre



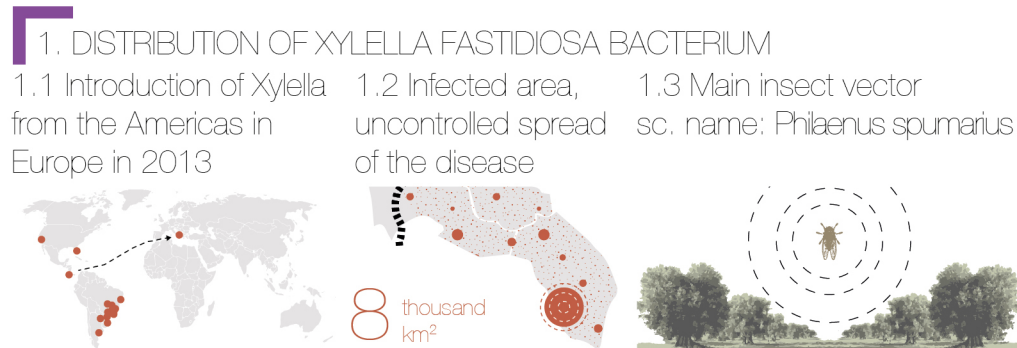
Written statement, short description of the project in English, no more than 250 words

In less than a decade, the southernmost part of the Apulia region in Italy has witnessed the transformation of its olive trees into wooden skeletons of death. How should we respond to the presence of a bacterium that irreversibly alters the identity of a landscape? This project addresses the urgent need to regenerate an area devastated by Olive Quick Decline Syndrome, caused by the bacterium Xylella Fastidiosa. The disease has triggered a severe phytosanitary crisis, leading to the progressive degradation and abandonment of the territory. Currently, the region faces a fragile rural ecosystem undergoing desertification, worsened by monoculture practices and increasing drought. It urgently requires a green infrastructure capable of activating new agroforestry processes aimed at restoring soil richness and ecological balance. The project's goal is to establish a new, more resilient and sustainable landscape model. By enhancing biodiversity, it seeks to reactivate the Salento's countryside and improve the management of available natural resources. The strategy involves introducing an ecological framework that branches throughout the agricultural landscape. This framework will consist of native vegetation and crops resistant to Xylella, helping to break the dominance of monoculture and promoting the spread of biodiversity's benefits. A key element of the intervention is improved water management, essential to support reforestation and new agricultural practices.

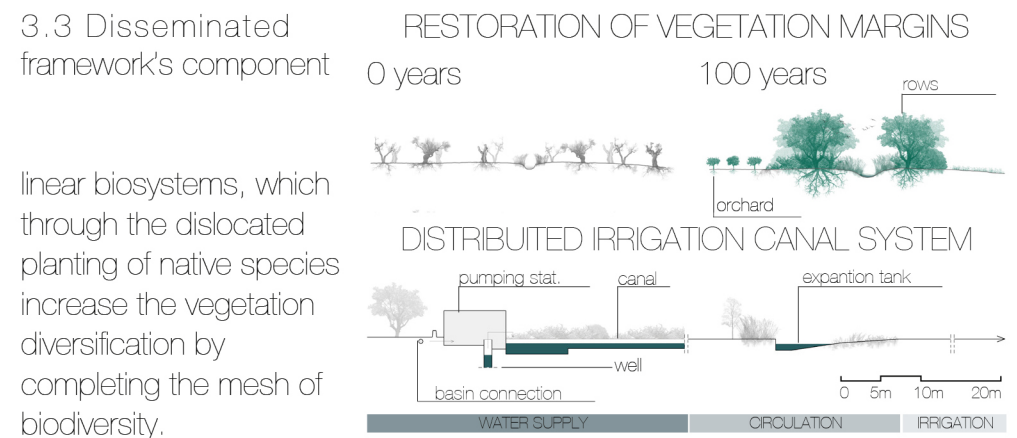
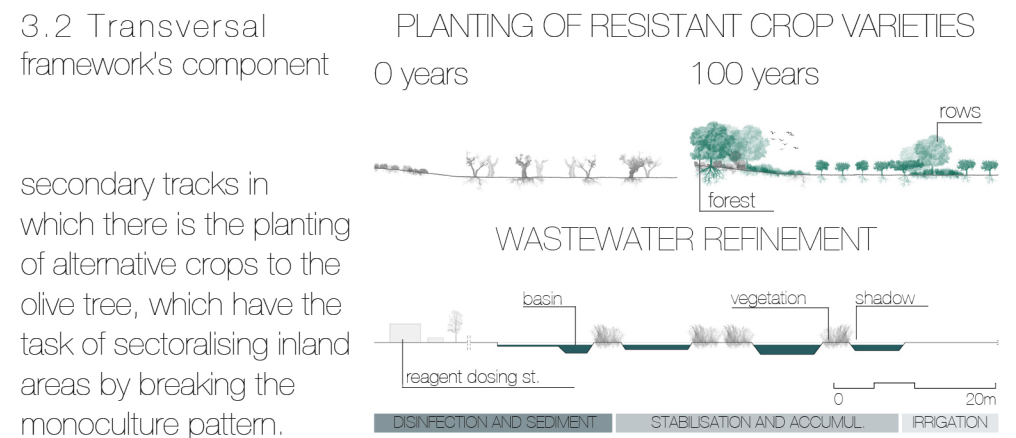
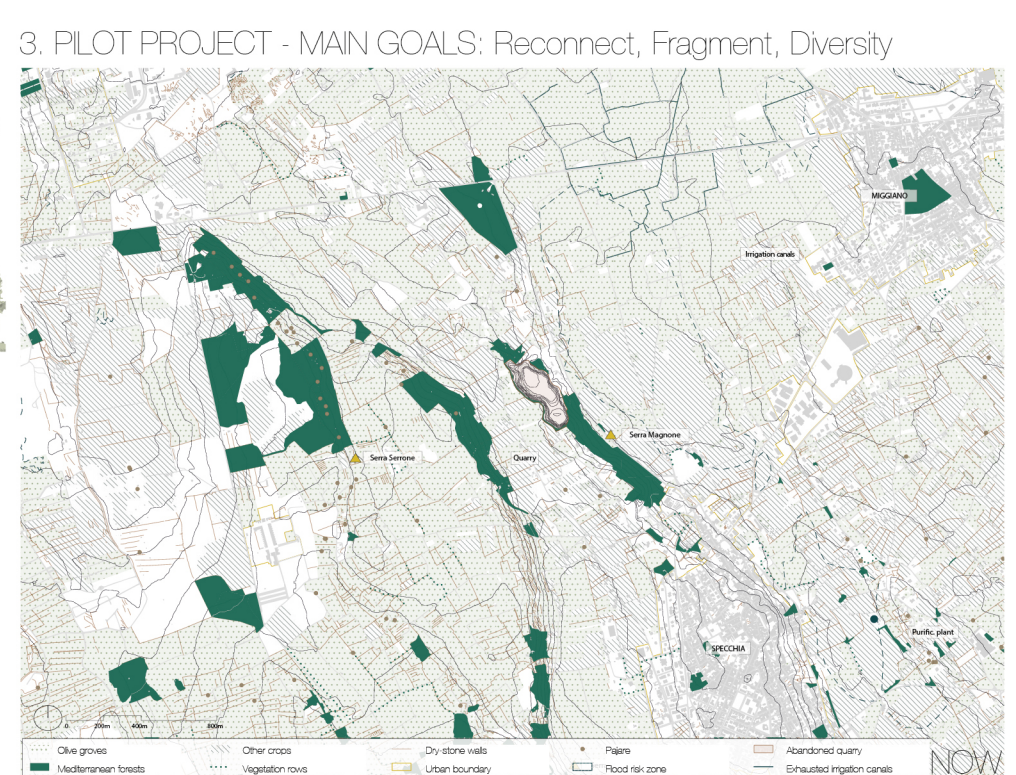
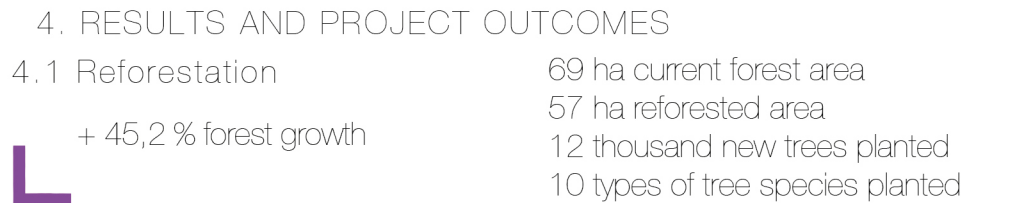
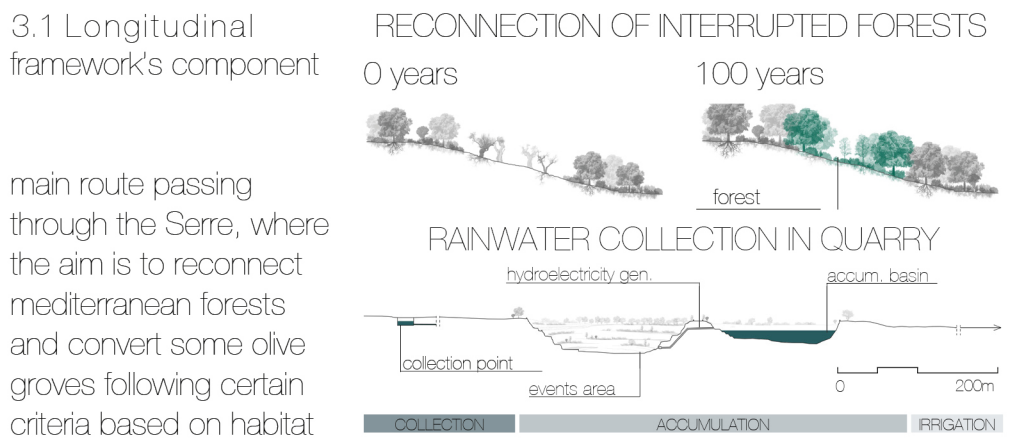
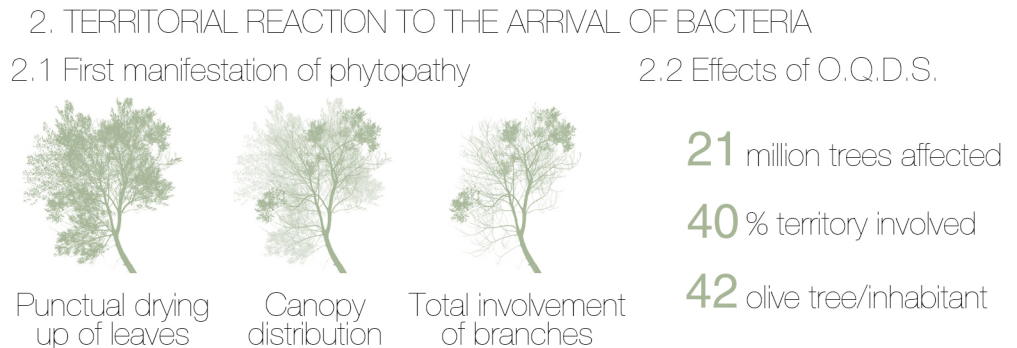
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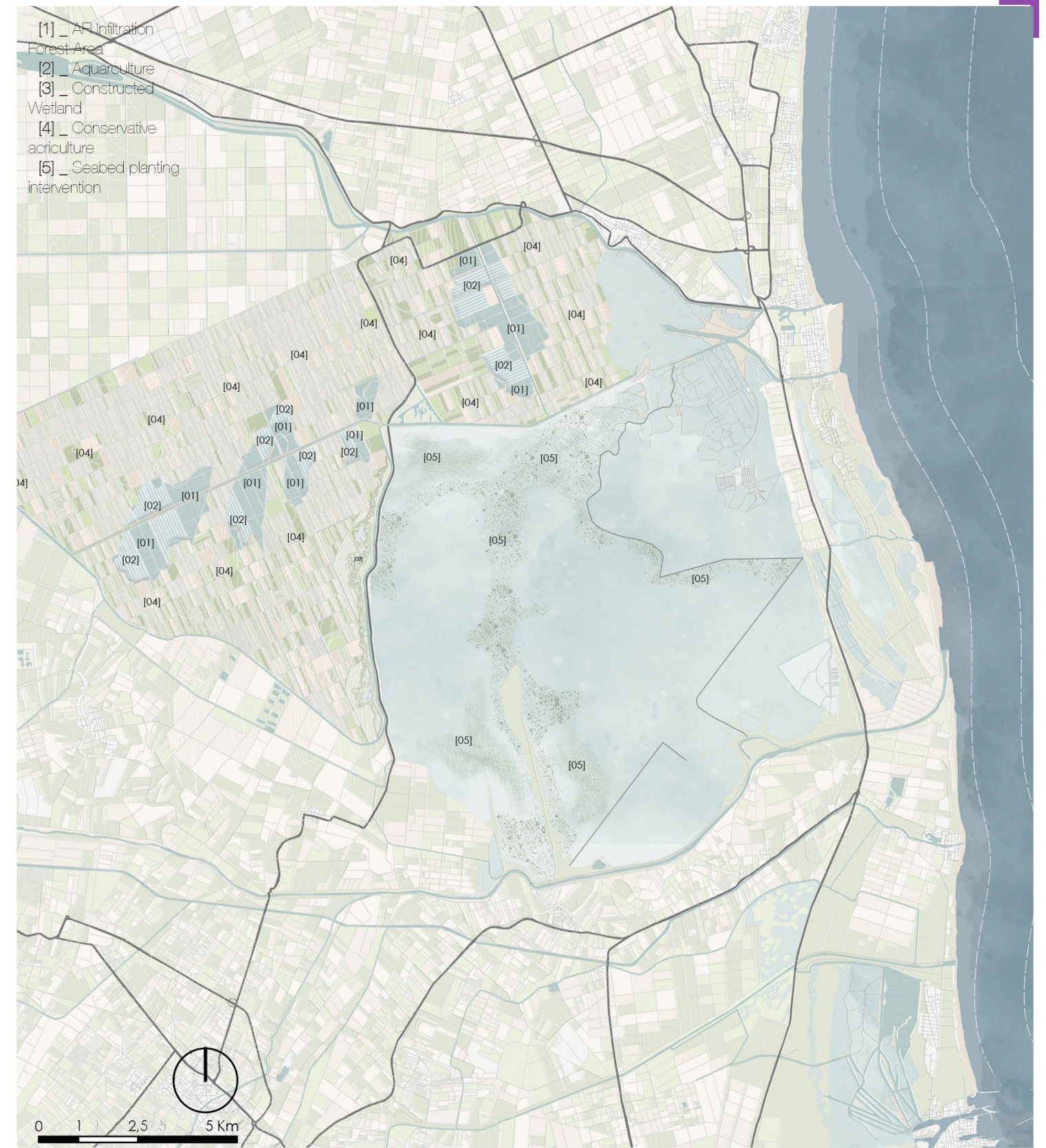
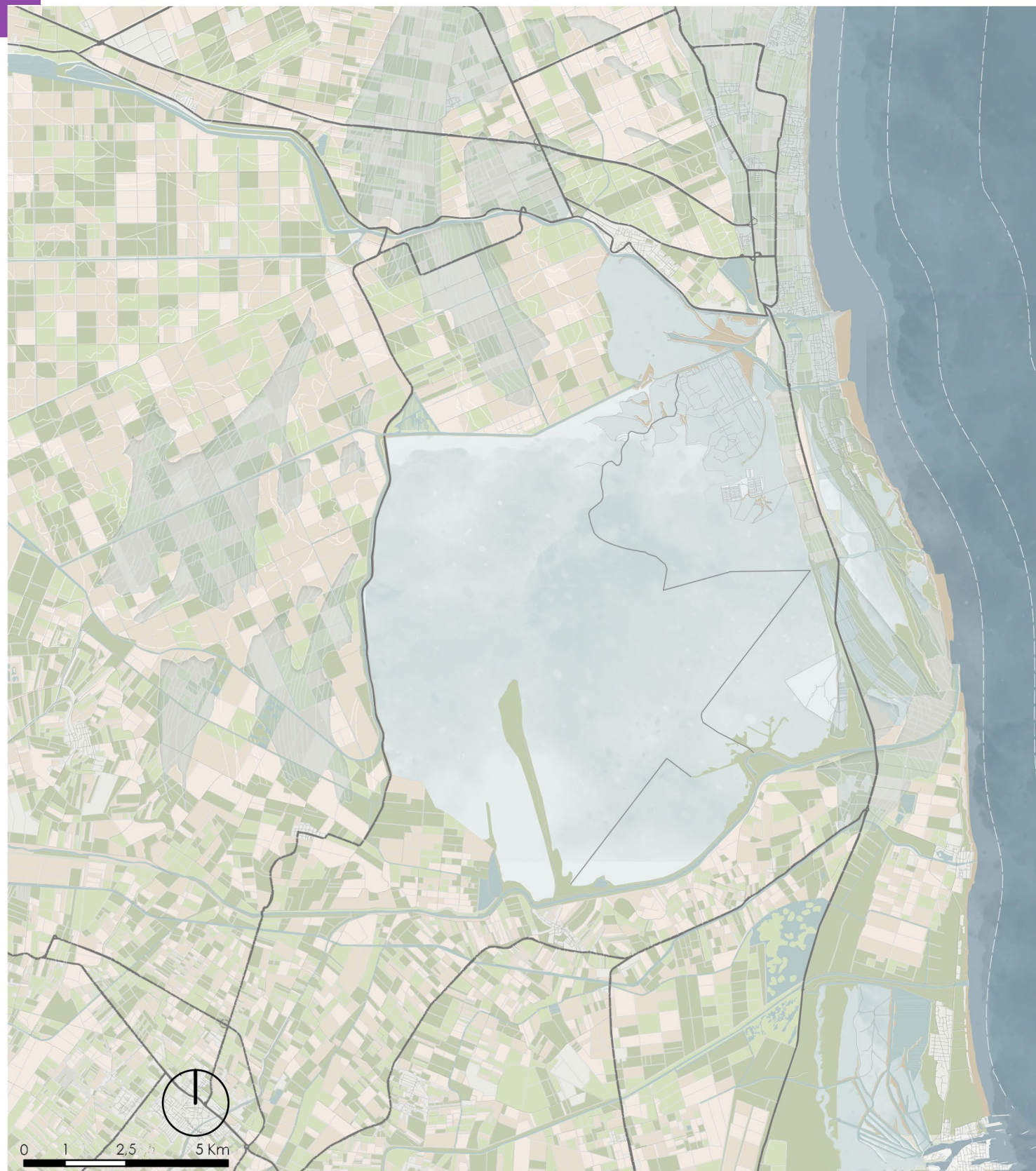
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In 2022 the provinces of Lecce, Brindisi, Taranto, and Bari were totally affected





Country/City	Italy, Ferrara
University / School	University of Ferrara
Academic year	2020/2021
Title of the project	Hydrophilia : the future of the agricultural landscape for the water resources management and the environmental protection of the Comacchio Valli and the Mezzano lands
Authors	Margherita Bonifazi

TECHNICAL DOSSIER

Title of the project

Authors

Title of the course

Academic year

Teaching Staff

Department / Section / Program of belonging

University / School

Hydrophilia : the future of the agricultural landscape for the water resources management and the environmental protection of the Comacchio Valli and the Mezzano lands.

Margherita Bonifazzi

Master Thesis Laboratory in Landscape Architecture and Infrastructure

2020/2021

Luca Emanuelli, Gianni Lobosco, Massimo Tondello

Department of Architecture, Sealine Research Centre

University of Ferrara/ Department of Architecture / Sealine Research Centre

13

An aerial photograph of a rural landscape. A light blue river or canal flows from the top center towards the bottom right. To the left of the river, there is a large, rectangular area of green trees, possibly a forest or a planted grove. The surrounding land is divided into various agricultural fields, some of which are green and others are brown. There are a few small buildings and houses scattered throughout the landscape.

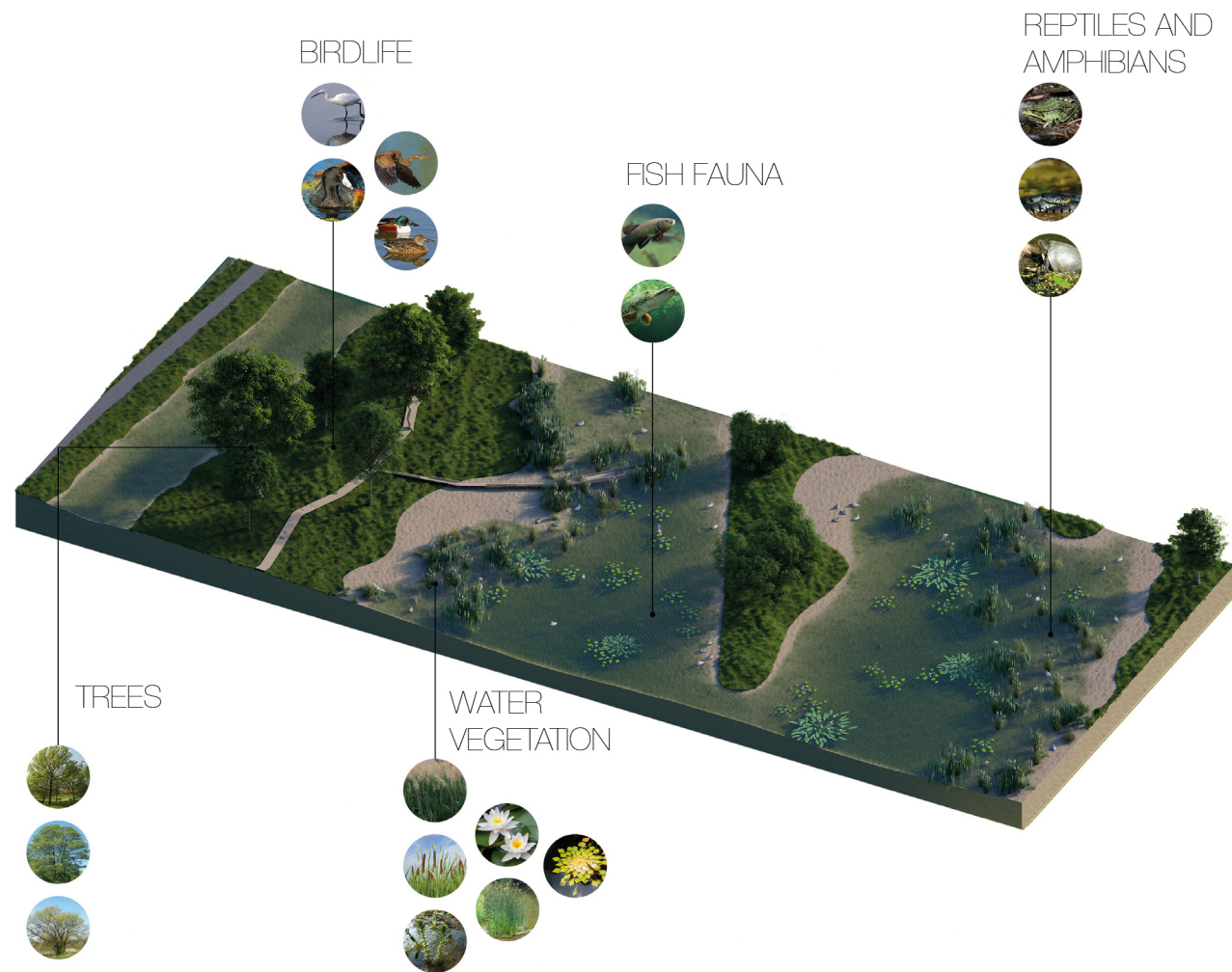
Written statement, short description of the project in English, no more than 250 words

According to future scenarios, climate change and the continuous rise in sea levels will increasingly threaten agricultural activities and habitats in coastal areas. To date, these critical issues have been addressed only marginally and with a conservative approach, mainly due to restrictions paradoxically linked to biodiversity protection regulations within the Po Delta Park. For this reason, the thesis addresses the problem by proposing a solution aimed at making these territories more resilient to saltwater intrusion. The study focuses on the Valli di Comacchio, an area historically characterized by the coexistence of land and water. The proposal envisions a shift toward conservative agricultural practices, combined with the introduction of AFIs (Infiltration Forest Areas) and wetlands. These landscape-environmental devices serve as a freshwater barrier to protect cultivated lands from brackish water intrusion and help mitigate eutrophication processes affecting the Valli di Comacchio. While the implementation of these systems reduces the surface area available for cultivation, it enhances productivity and resilience by functioning as a water reserve and as a habitat for plant and animal species vital to the ecological balance of this transitional zone between land and sea.

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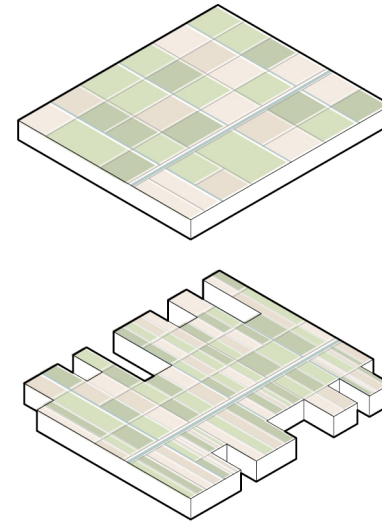
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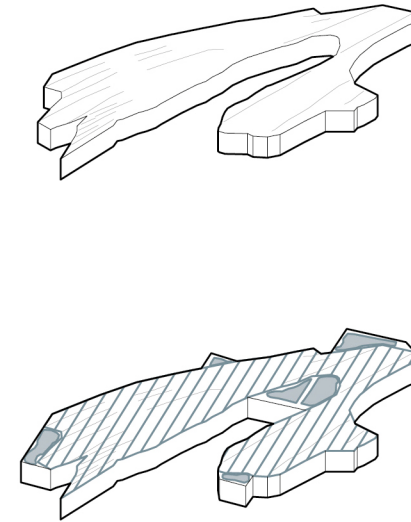
In a land characterized by significant ecosystem potential, it becomes necessary to adopt a strategy that reintegrates water, the key element of this ecosystem.

To achieve these goals, the strategy adopted involves the following actions:

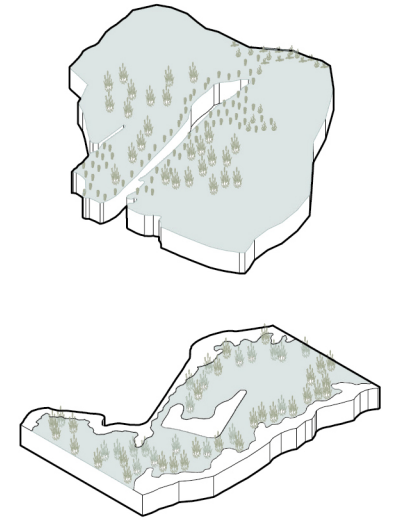
- Agricultural transition from intensive agriculture to conservation agriculture;
- Groundwater recharge through paleodunal systems;
- Improvement of water quality through planting and phytoremediation efforts



The transition from an agricultural fabric based on very large scale fields to one composed of micro-plots defined by homogeneous characteristics allows for targeted actions and reduces the need for human inputs by creating favorable conditions for the proliferation of pollinators.

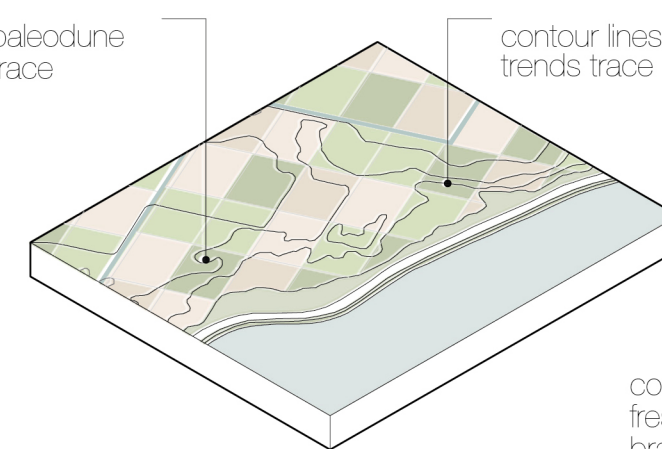
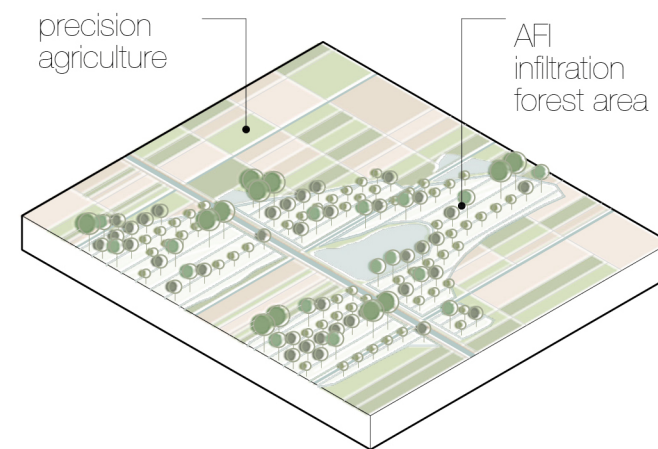
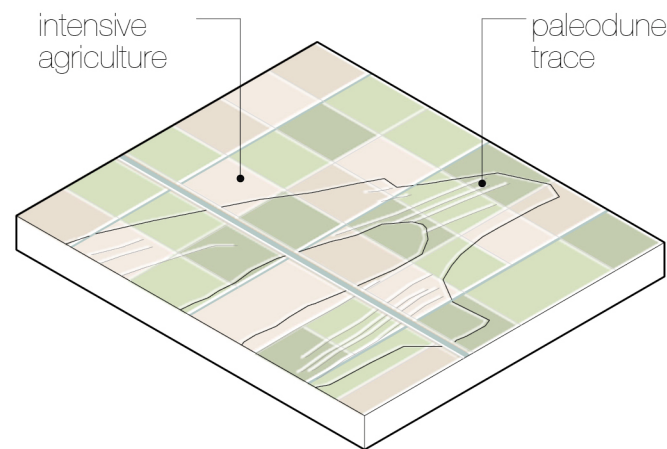


The forest infiltration systems follow the organic shapes of the paleodunes. This allows for the integration of the agricultural and forest fabrics, creating continuity between the two habitats and activating the ecosystem services generated by the interaction of different species.

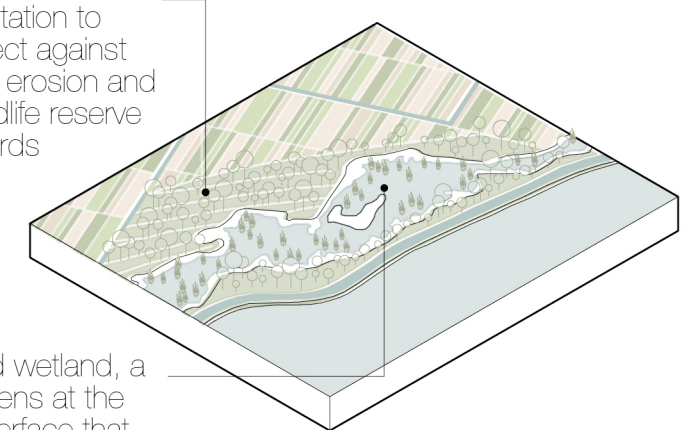


The inclusion of reed beds and marine phanerogams improves the conservation status of the Valli ecosystem, as they re-oxygenate the water column and initiate phytoremediation processes. Furthermore, the presence of these plant species supports the establishment of bird populations.

LANDSCAPE TRANSITION



forestation to protect against wind erosion and a wildlife reserve for birds



constructed wetland, a freshwater lens at the brackish interface that helps to contrast sea water intrusion

AFI INFILTRATION FOREST AREA TARGET:

- Contrast the impact of intensive agriculture on the valley ecosystem;
- Contrast the sea water intrusion;

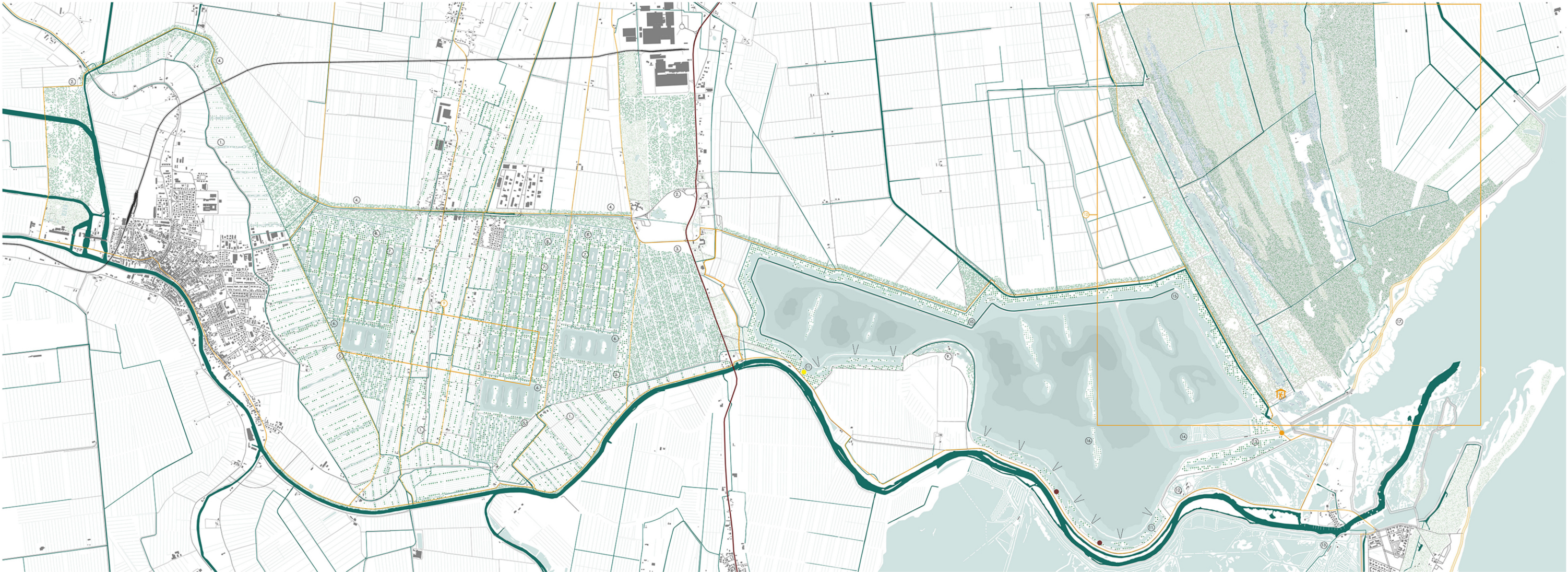
An adaptation strategy to counter the growing impact of seawater intrusion is to establish infiltration forest areas in correspondence with the palaeodunal deposits. According to this strategy, during the non-irrigation season, water is diverted from the irrigation channels into the infiltration forest areas. In this way, the presence of fresh water is maintained throughout the year. Moreover, the root systems of the trees enhance the recharge capacity of the dune.

CONSTRUCTED WETLAND TARGET:

- Contrast the sea water intrusion;
- Promote biodiversity;

The presence of wetlands is essential for the survival of the Valli ecosystems. The inclusion of a constructed wetland within the Valle del Mezzano not only helps restore the ecological balance supported by biodiversity and the presence of water, but also makes it possible to purify the water coming from cultivated areas before it is introduced into the Valli, in order to prevent episodes of hypersalinity. This action is especially important during episodes of intense rainfall, when runoff is more significant.

Productive lanscape recomposition along Codigoro-Pomposa axis



Heritage lanscape enhancment along Pomposa-Volano axis

Country/City	Italy, Ferrara
University / School	University of Ferrara
Academic year	2023/2024
Title of the project	recomPOsition: project for the adaptation of the productive agricultural landscape along the Codigoro–Volano axis
Authors	Lorenzo Nicolini

Title of the project	recomPOsition: project for the adaptation of the productive agricultural landscape along the Codigoro–Volano axis
Authors	Lorenzo Nicolini
Title of the course	Laboratorio di Sintesi Finale E
Academic year	2023/2024
Teaching Staff	Gianni Lobosco, Romeo Farinella, Alessandra Marin, Beatrice Magagnoli, Francesco Axel Pio Romio
Department / Section / Program of belonging	Department of Architecture, Sealine Reasearch Centre
University / School	University of Ferrara



Written statement, short description of the project in English, no more than 250 words

The aim of the project is to adapt the productive landscape to 2100 and enhance the heritage network of the Codigoro-Volano axis in the Province of Ferrara: an extremely fragile delta area. Today, the territory is characterised by a dual nature of strong agricultural production and great environmental richness. The project analyses this dual nature of the landscape, willing to understand its most critical issues, such as hydraulic fragility, saltwater intrusion, pollution and the inefficiency of the agricultural production system. The ultimate goal is to define a new interface between productive and heritage landscapes, with operations to enhance wooded areas, protect the territory from sea flooding, create coastal ecosystems and water and valley farming systems, seeking to understand what and how many possibilities could be useful for composing a resilient landscape. The project develops two case studies. The first one concerns a typical agricultural area, for which efficiency and climate adaptation measures are proposed; the second one considers the Bosco della Mesola lowland forest, for which development, enhancement and protection measures are planned. These interventions profoundly transform the territory, but this change is dictated by the awareness that the greater the challenges posed by current and future critical issues, the greater the intensity of landscape adaptation interventions must be.

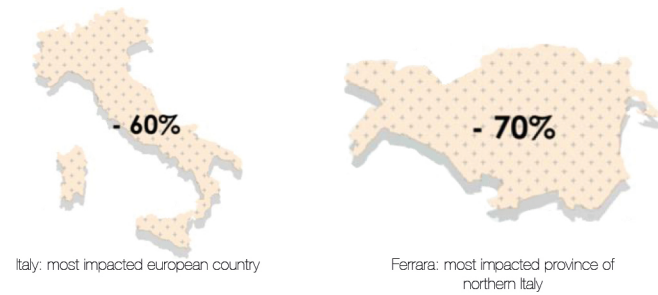
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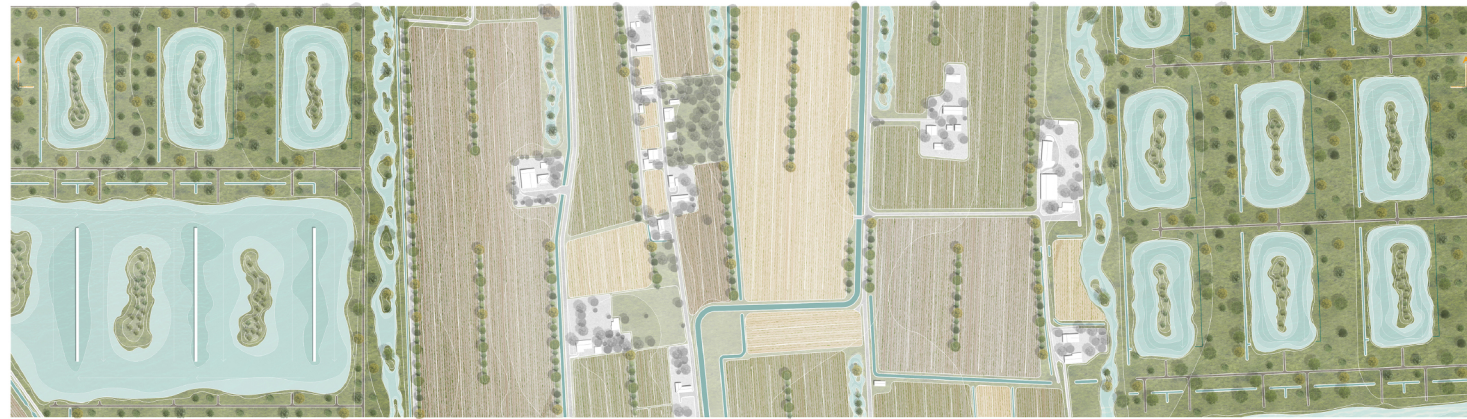
Productive landscape: recomposition of agricultural land for climate changes impact

Agricultural land value loss by 2100

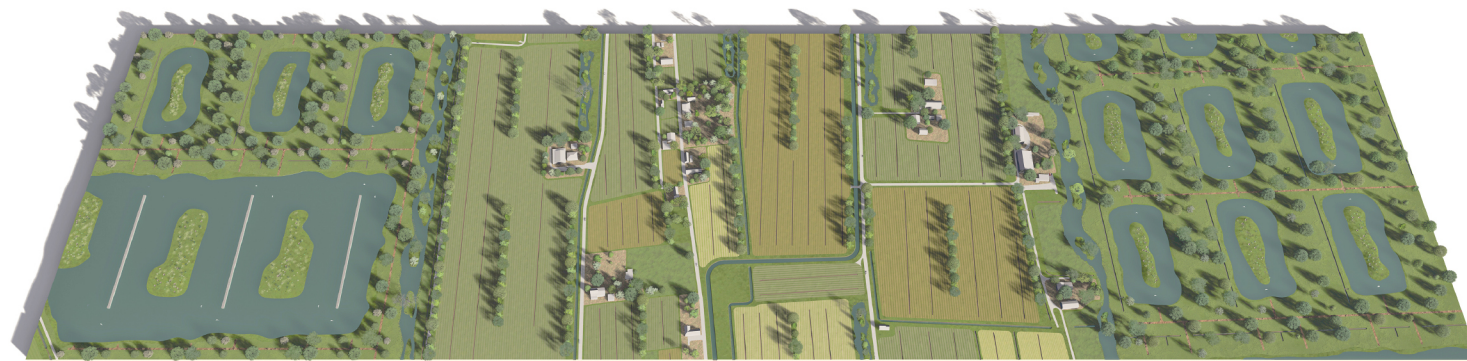


The agriculture-focused interventions propose planting rows of trees in between the fields and converting a portion of them into constructed wetland in order to increase soil productivity and clean the dirty water resulting from intensive agricultural activity; less productive agricultural lands, on the other hand, will be converted into aquaculture systems with cleaning and recycling water systems.

Productive landscape Masterplan



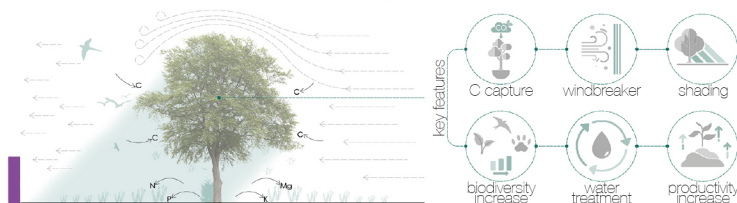
To-be state view



Current state view



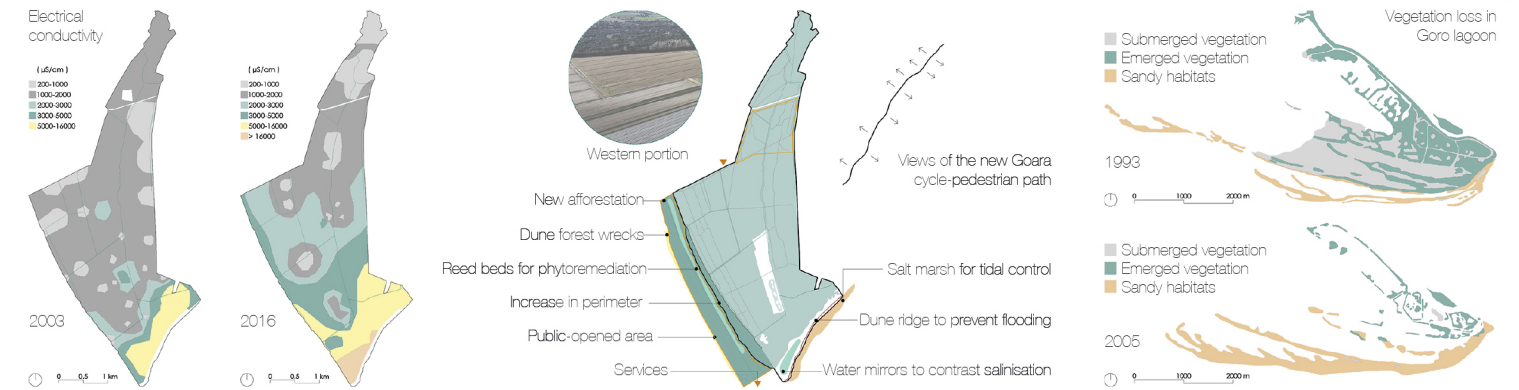
Tree-lined rows benefits to agriculture



Tree-lined rows details



Heritage landscape: Mesola's Forest issues and concept project for 2100



Heritage landscape Masterplan

The Mesola Forest is heavily threatened by salt intrusion in the southern sector, due to the proximity of the Goro lagoon. The project aims to compensate for the loss of trees with a strip of afforestation to the west, characterised by different environments, to create a new interface with the lagoon by planting freshwater ponds to mitigate saltwater intrusion, and building a dune cordon-salt marsh system to improve flooding defence, also designed to enhance wetland habitats.

