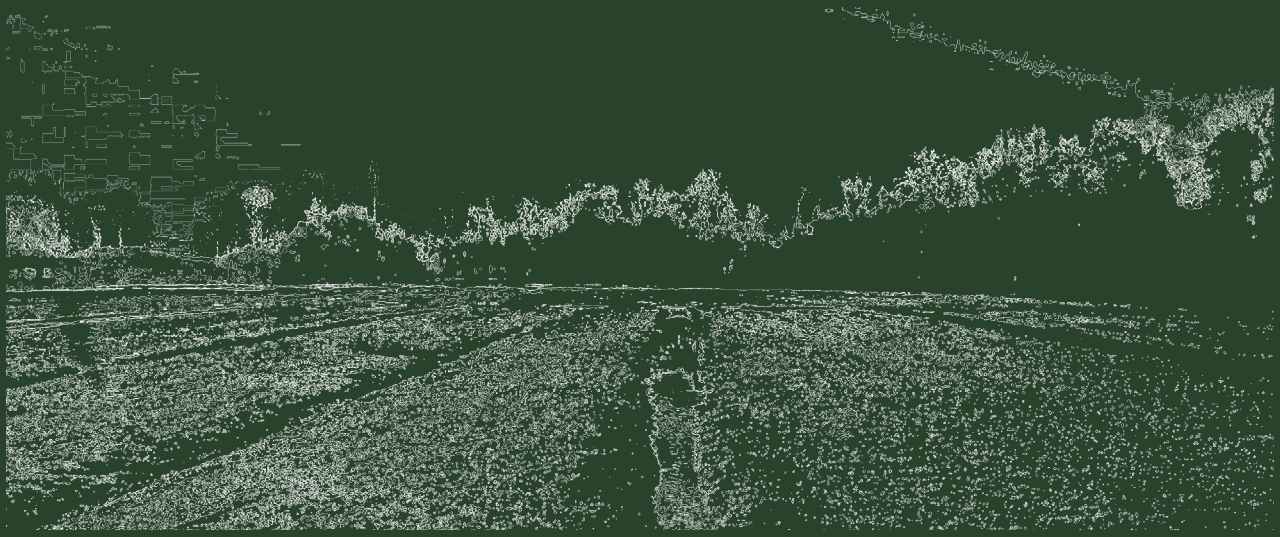

Explore the Marcite in Milan

Marcite-based Tourism System Planning and Design
October 2025

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Master degree in Landscape Architecture. Land Landscape Heritage

Abstract

Marcite represents a significant part of Milan's agricultural heritage. This research investigates four parks containing Marcite—Parco Lambro, Parco Agricolo Ticinello, Parco della Vettabbia, and Parco delle Cave—by exploring the relationship between heritage systems and tourism networks. Considering cycling as the most effective way to discover the city, we propose a redesigned tour route inspired by the existing AbbracciaMi tour. The new cycling route spans approximately 70 km and connects more than 20 parks across Milan. To better understand the water origins of Marcite, the project focuses on northwest Milan, where numerous springs (fontanili) feed into the city's main canals. The landscape design aims to guide visitors toward these water sources and related artifacts. Through low-impact interventions grounded in the principles of conservation, requalification, and enhancement, the project offers tourists a distinctive experience of Milan's cultural landscape and local history.

Keywords

Marcita, Water heritage, Low-impact landscape Intervation, Preservation, Requalification, Enhancement, Tourism system design, Biking system design

Content

Chapter 1
The loss of marcite

1.1 Definition

La marcita is a very old cultural practice that was once common in the plain of south Milan. The cistercian monks of the Abbey di Chiaravalle started controlling the waters as late as the late 1200s, clearing the marshes that covered most of the plain. This is a masterpiece of hydraulic engineering that has made the land rich and fertile where it was once dry.

A dense network of irrigation had already been set up, and the vessels built a few hundred years later finished it.

When the irrigation system got better, this method got even better. By the end of the 18th century, along with the rise of modern agricultural science, ready-made crops were grown that provided fodder for almost the whole year, which meant that more cuts could be made.

Because of this, there was a lot of fodder, which helped cattle farming grow. This led to the building of the Lombardy cascina, which had all the functions of working, socializing, and praying in its usual closed court layout.

(Source: Parco Agricolo Sud Milano. *Le marcite.* Parco Ticinello. http://www.parcoticinello.it/le-marcite.)html)

Image 1. Canals in marcita of parcoticinello (Source: http://www.parcoticinello.it/le-marcite.html)

1.2 Technical core

a. Gravity flow network

The water mills and the renowned irrigation system devised by Leonardo Da Vinci enhanced the Sforza region's soil.

In manuscript H, Vigevano's name is mentioned with greater frequency. Manuscript H includes numerous sketches and designs for hydraulic devices that effectively regulate water flow velocity. Commencing in the 12th century in the Sforza region, Cistercian monks, affiliated with a Roman Catholic monastic order, initiated restoration efforts and established the practice of Marcita farming, utilizing spring water to ensure a consistent supply of isothermal water for the farmed land.

The examination of water scales is meticulously documented in the Leicester text, followed by the Hammer code and then the Gates code. Leonardo elucidates methods to diminish the velocity of water, so reducing the energy of a waterfall.

One-third of the discourse in Da Vinci's manuscript pertains to "water." In the text, Da Vinci contemplated the potential effects of variously shaped items being introduced into water, so examining the dynamics of water flow and its alteration of velocity upon encountering obstructions.

(Source: iCity Art. (X Sylvia.2018.). 7gdm8x0.)

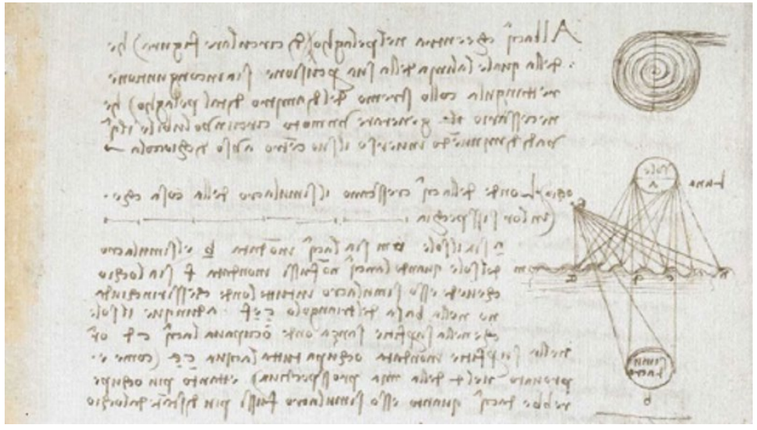


Image 2. An observational study of the Arno River in Italy in Da Vinci's manuscript (Source：https://art.icity.ly/entries/7gdm8x0)

Da Vinci's involvement was essential for enhancing the drainage of the canals, as the terrain was uneven and hence challenging to irrigate. "No channel should be narrower than its universal channel, as this will cause water to accumulate and breach the banks." In the Sforzesca region, Da Vinci's intended artefacts are still observable: "three interlocking" devices that control the water flow from the irrigation canal to the arable land. Da Vinci examined canals and locks, stating, "These gates greatly inspire me."

(Source: Biblioteca Europea di Informazione e Cultura. Le marcite: aspetto storico. In Leonardo e gli studi sulle acque in Lomellina. BEIC Digital Library. https://digital.beic.it/it/content/leonardo-e-gli-studi-sulle-acque-lomellina/le-marcite-aspetto-storico.html)

Image 3. Water channels in the cultivation of water
(Source: MACCHINE PER LA COLTIVAZIONE DELLA MARCITA.2018)

b. Leonardo's Gate Design and Canal Lock

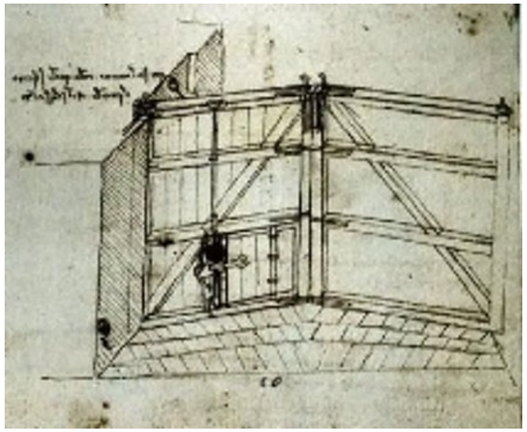


Image 4. Design for a Lock at San Marco. (Source: Leonardo, da Vinci, et al. Il Codice atlantico di Leonardo da Vinci nella Biblioteca ambrosiana di Milano. Plates v. 2, Milano: U. Hoepli, 1894, f. 240 R., DCCC.)

Image 5. Leonardo's Canal Lock. (Source: Zonca, Vittorio. Novo teatro di machine et edificii per varie et sicure operationi. Padova: Pietro Bertelli, 1607, p. 9.)

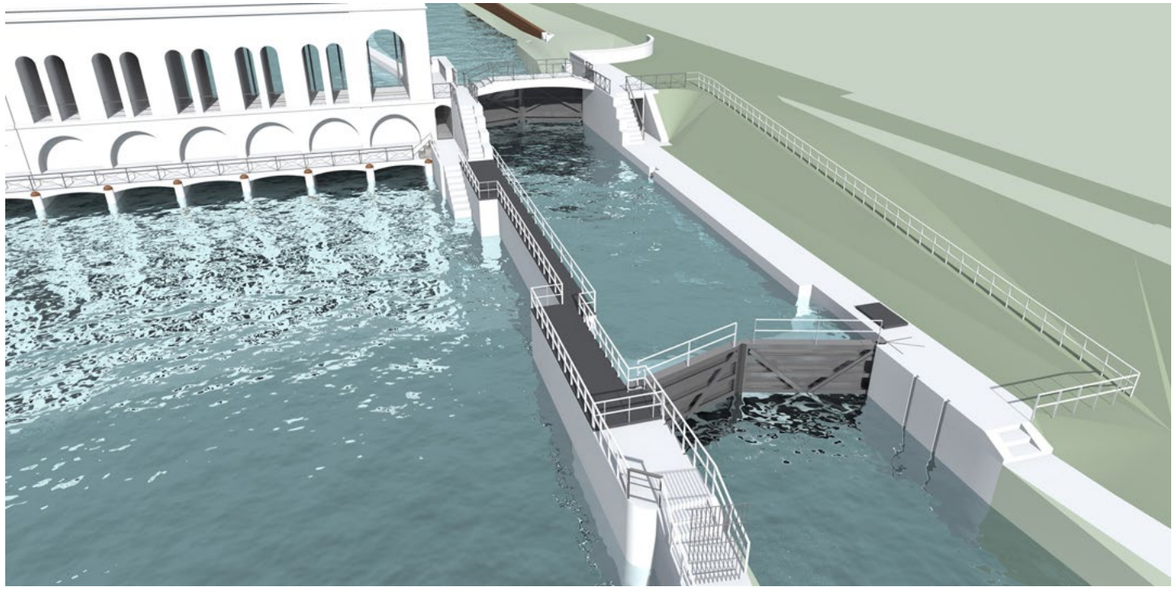


Image 6. Details of the navigation lock of the vessel inlet
(Source: https://www.bininipartners.it/progetti/conca-di-navigazione-canale-villoresi/)

Within the extensive collection of Leonardo's manuscripts in Milan, compiled in the Codex Atlanticus, lies an extraordinary illustration of an innovative canal lock. It is acknowledged as the inaugural demonstration of the optimal design for a water gate, illustrating how an additional gate within the primary gate may regulate water flow. Virtually all contemporary gates adhere to this idea, including

(Source: https://www.lindahall.org/experience/digital-exhibitions/centuries-of-civil-engineering/01-canals/)

c. Cultivation technique

During winter, a thin layer of water consistently flows over the grass. This water film, characteristic of a water meadow nourished by Fontanili, maintains a constant temperature of no less than 11°C. Its continuous flow, facilitated by the gentle topography, prevents the field from freezing and promotes uninterrupted grass growth, yielding up to eight or nine harvests annually, in contrast to the three or four typical of the finest permanent meadows.

The term "marcita" originates from the practice of leaving last winter's clippings on irrigated lawns to decompose as fertilizer. Employing Marset enables farmers to supply their livestock with fresh feed during winter, hence optimizing the quality and quantity of milk and dairy production in Europe. The initial cut occurred at the conclusion of February, while the last cut transpired between late November and mid-December.

（Source：Parco Ticinello. Le marcite. http://www.parcoticinello.it/le-marcite.html)

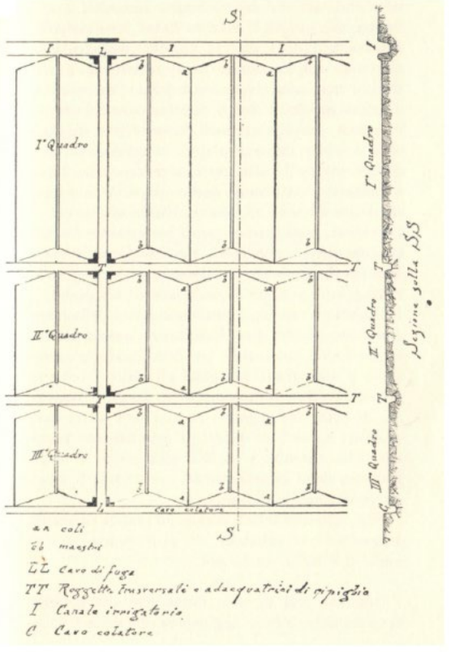


Image 7. Pattern of the steep rot (berra, 1812) Water meadow system
（Source：http://www.parcoticinello.it/le-marcite.html）

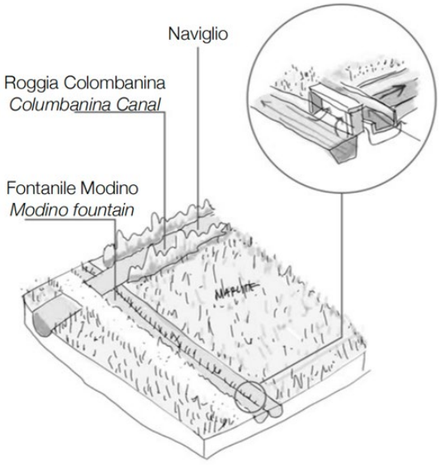


Image 8. Cascina Decima irrigation system
(Source: Pannello Cascina Decima.)

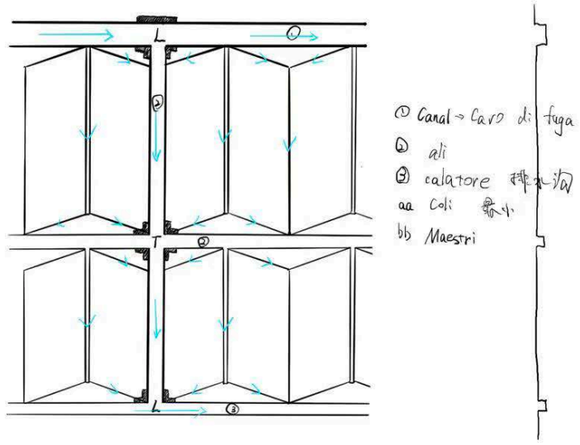


Image 9. Water flow of marcite

The conventional configuration of the terrain, characterized by the posterior slope of the donkey's back, exemplifies the irrigation method through the division of the field into converging inclined strips (wings). At the terminus of the mark, which is perpendicular to the wings, lies the watercourse (or ditch head or principal watercourse), the primary irrigation channel from which main canals extend perpendicularly, with smaller channels situated at the apex of the wings (the upper section where they converge). In the lower section of the wings, parallel to the masters, little channels are excavated known as coli (or colators, or supplementary channels). The water from the supply channel enters the main canals, subsequently flowing over the gently sloped surface of the wings, before collecting in the coli, which is connected to a channel referred to as the seam (or ditch) located at the bottom of the painting. Subsequently, it proceeds to irrigate the adjacent rot (operational pattern of the markings at both ends).

（Source：Parco Ticinello. Le marcite. http://www.parcoticinello.it/le-marcite.html)

1.3 Marcita irrigation design type

1.3.1 Marcita a sguasso o in piano

The most basic type of flat irrigation grassland, with water distributed laterally through the main channel, is suitable for flat terrain.

(Source: (1998). Le marcite: storia, importanza ambientale, prospettive di mantenimento nel territorio del Parco. Parco Ticino.)

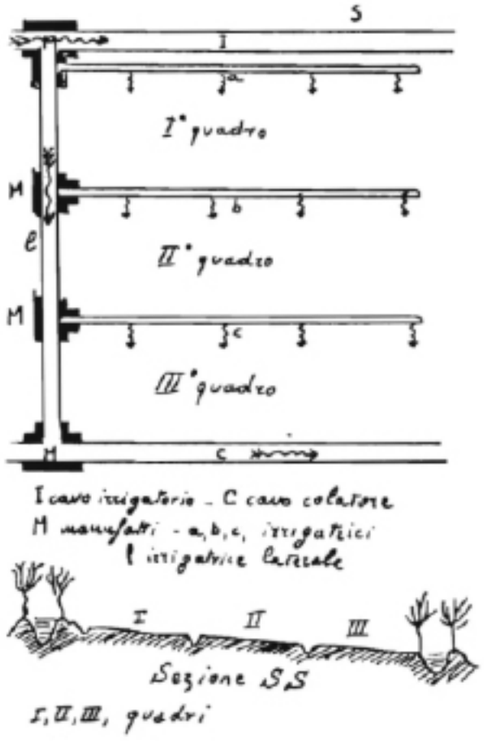


Image 10. Marcita a sguasso o in piano
(Source: Le marcite storia, importanza ambientale, prospettive di mantenimento nel territorio del Parco)

1.3.2 Marcita maschio e femmina

The water distribution system is divided into the main channel (maschio) and the branch channel (femmina), which is convenient for hydraulic control.

(Source: (1998). Le marcite: storia, importanza ambientale, prospettive di mantenimento nel territorio del Parco. Parco Ticino.)

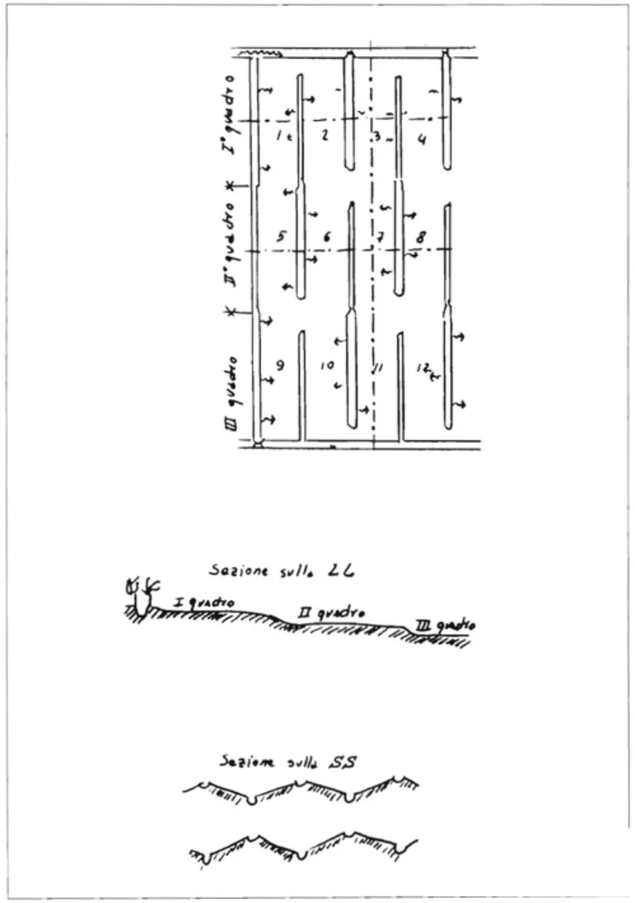


Image 11. Marcita maschio e femmina
(Source: Le marcite storia, importanza ambientale, prospettive di mantenimento nel territorio del Parco)

1.3.3 Marcita a zig-zag

The serrated layout allows water to flow throughout the entire plot through repeated return, increasing the area through which water flows within the limited space. It is suitable for complex or undulating areas.

(Source: (1998). Le marcite: storia, importanza ambientale, prospettive di mantenimento nel territorio del Parco. Parco Ticino.)

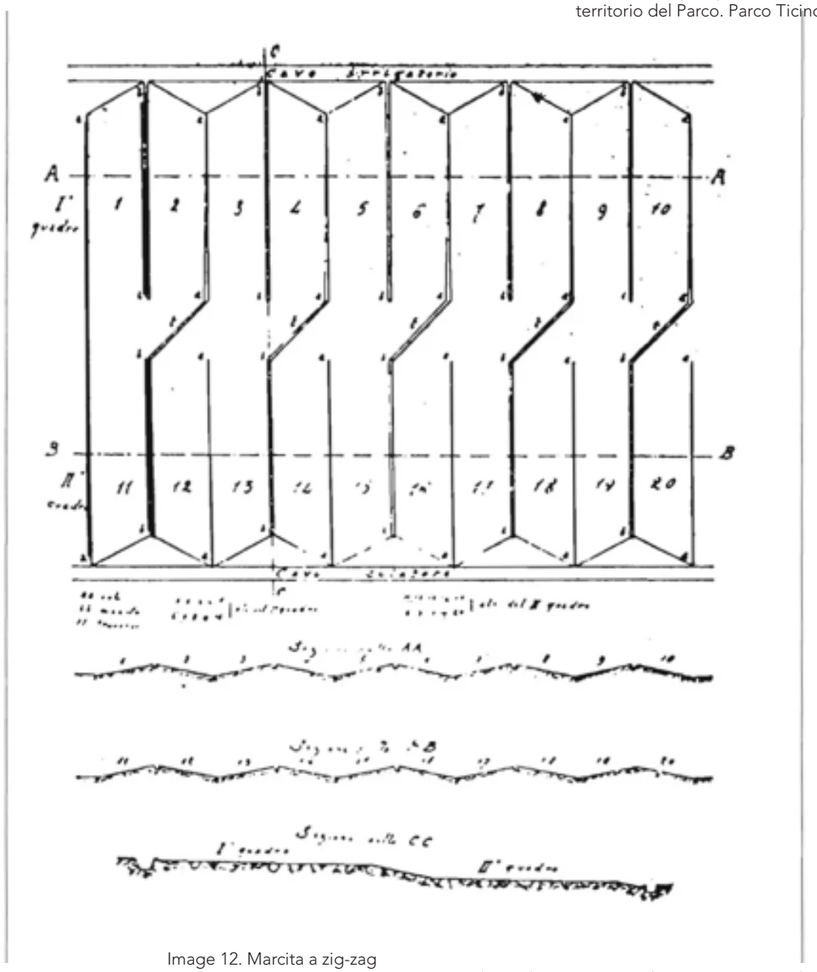


Image 12. Marcita a zig-zag
(source: Le marcite storia, importanza ambientale, prospettive di mantenimento nel territorio del Parco)

1.3.4 Marcita a ripiglio o ad ala doppia

The irrigation scheme is symmetrically allocated on either side. "Adacquatore" refers to the irrigation channel, while "colatore" denotes the drainage channel, both of which are organized in stages. The little arrows in the image indicate the trajectory of water flow. The entire system is dispersed in a "fan shape", which enables the spring water to generate a continually flowing thin water layer on the slope, which is advantageous to plant growth. A tidy and ordered network is suited for large farms.

(Source: (1998). Le marcite: storia, importanza ambientale, prospettive di mantenimento nel territorio del Parco. Parco Ticino.)

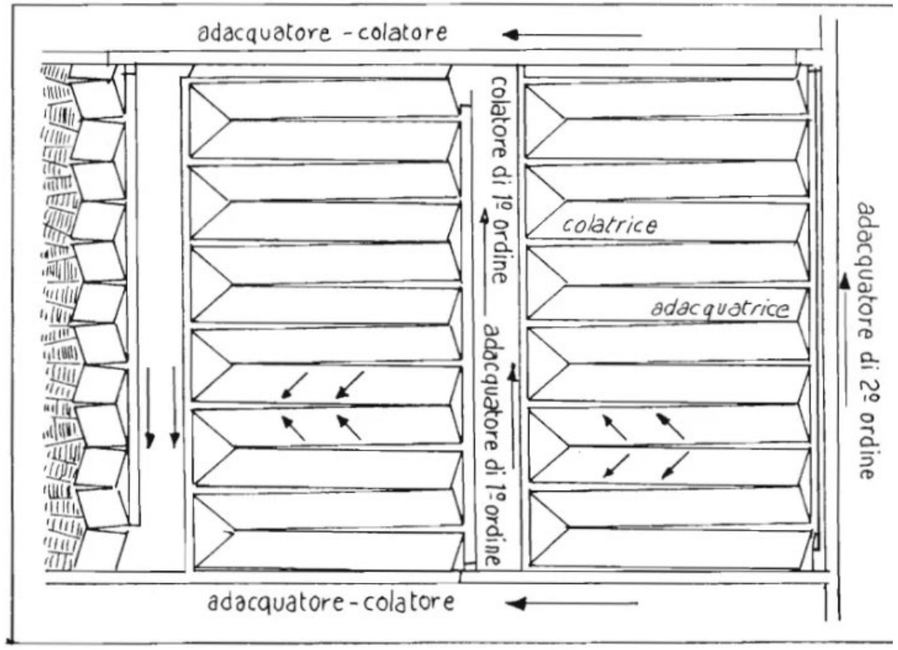


Image 13. Marcita a ripiglio o ad ala doppia
(Source: Le marcite storia, importanza ambientale, prospettive di mantenimento nel territorio del Parco

1.4 Ecological and economic products

1.4.1 Ecological diversity

The marcita has significant floristic diversity and diversification. Numerous bird species have been documented in the meadows during winter, including several that are exceedingly rare in Europe. The water meadow also supports insects and amphibians of European conservation significance, including the Lycaena dispar and the Lataste frog.

(Source: Ente di Gestione del Parco del Ticino e del Lago Maggiore. (2023, marzo). Pannello Mulino del Maglio. https://ente.parcoticino.it/wp-content/uploads/2023/03/Pannello_Mulino-del-Maglio.pdf)

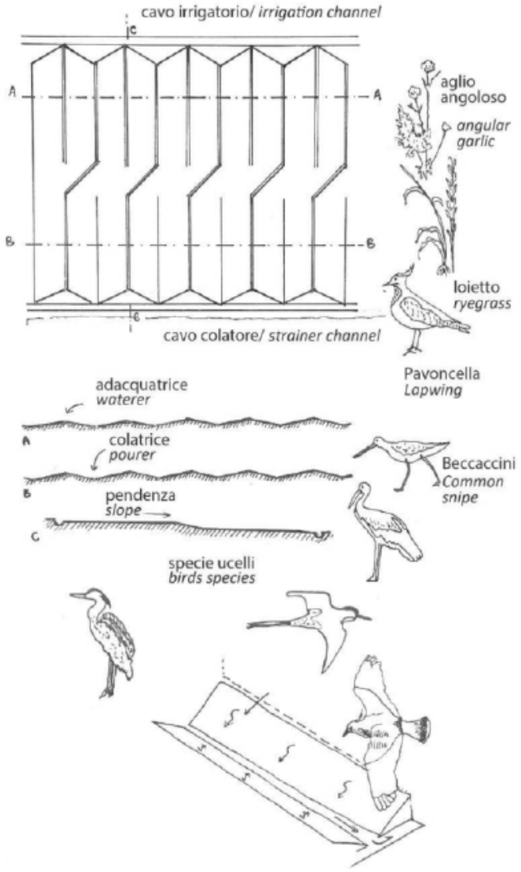


Image 14. section of marcite, high floristic and floristic biodiversity
(Source: Pannello_Cascina-Decima)

1.4.2 Production

Marcite is utilized as both fresh and dried feed and for the breeding of dairy cattle. The milk is subsequently converted into several types of cheese within the plant.
They practice crop rotation on arable land, cultivating summer cereals such as sunflower, corn, and soy, as well as winter cereals like barley, wheat, spelt, oats, rapeseed, and millet.

(Source: Ente di Gestione del Parco del Ticino e del Lago Maggiore. (2023, marzo). Pannello Mulino del Maglio. https://ente.parcoticino.it/wp-content/uploads/2023/03/Pannello_Mulino-del-Maglio.pdf)

Image 15&16. image of production
(Source: Pannello_Cascina-Decima)

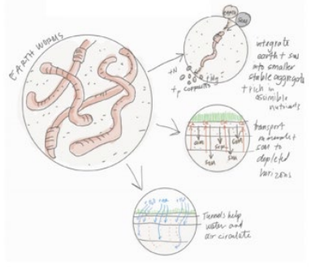
1.4.3 Soil-Biosphere

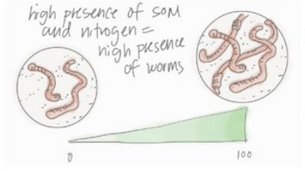
The soil-biological layer of the Marcite system is key to its sustainable agriculture, consistently permeated by thermostatic groundwater to create a distinctive "constructed wetland" configuration. The continuous temperature-controlled capillary recharge of water sustains an anaerobic environment year-round, facilitating the breakdown of organic materials by methanobacteria and sulfate-reducing bacteria, and resulting in the production of stable humic and fulvic acids. The microbial community density is elevated, carbon sequestration much exceeds that of typical meadows, and no fertilizer is required for its sustenance.

(Source: Ente di Gestione del Parco del Ticino e del Lago Maggiore. (2023, marzo). Pannello Mulino del Maglio. https://ente.parcoticino.it/wp-content/uploads/2023/03/Pannello_Mulino-del-Maglio.pdf)

I lombrichi sono bio indicatori di sostanza organica.

Earthworms are indicators of soil organic matter.





Alta presenza vuol dire alta qualità.

High number means high quality.

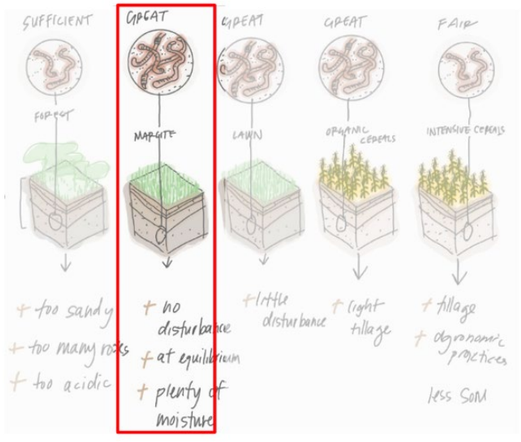


Image 17. Soil-microbial synergy (Source:Pannello_Mulino-del-Maglio)

Chapter 2
Water Meadow in Europe

2.1 Different Types of Meadow in Europe

Mediterranean lowland moist short-grass meadows: Short species-rich swards dominated by graminoids, traditionally sustained by heavy grazing, on clay soils through the Mediterranean region where there is winter waterlogging and distinctive surface cracking in the droughty summer.

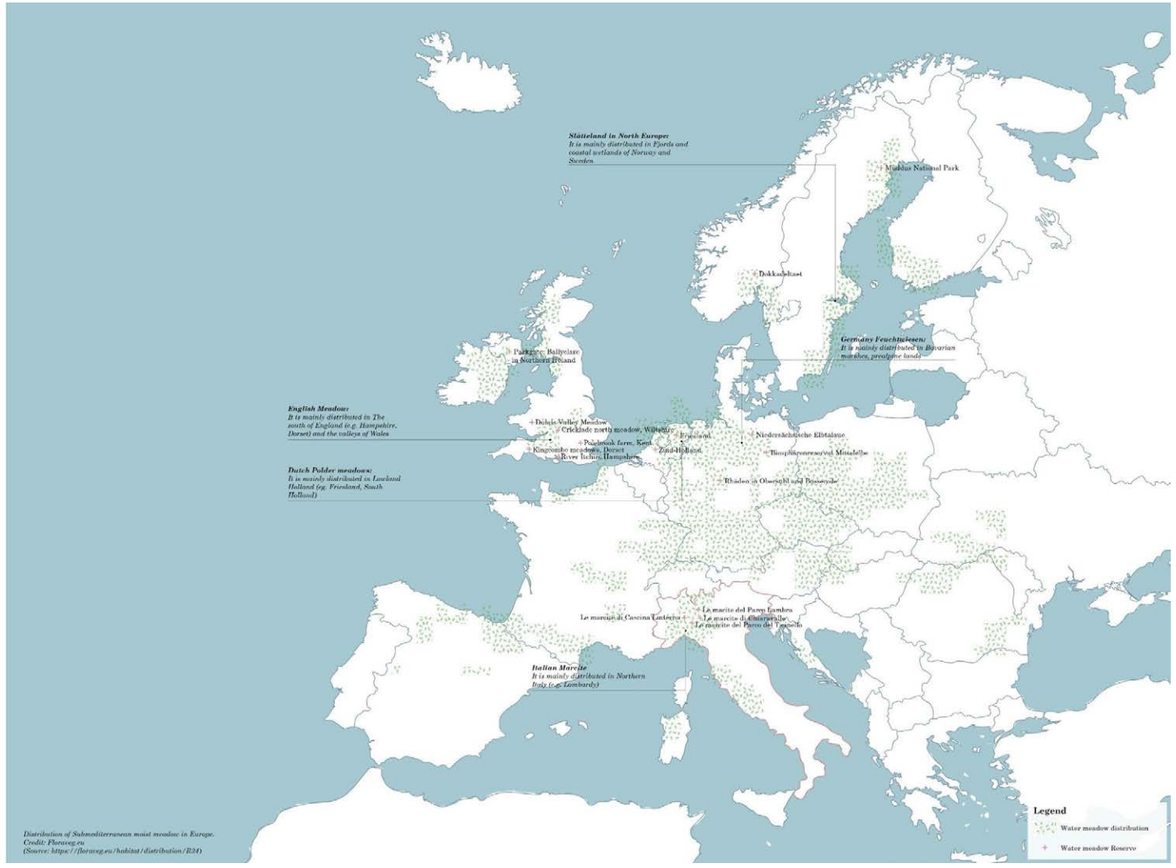


Image 18. Distribution of Mediterranean lowland moist short-grass meadows. Source: floraveg.eu Organized and represented by author

2.2 Different Types of Meadow distribution

a. English meadows

Distribution: The south of England (e.g. Hampshire, Dorset), the valleys of Wales

Irrigation mode Bedwork System: The river water is introduced into the meadow through artificial carrier channels and levees to form floating channels, which divert water in winter for heat preservation and anti-freezing, and drain water in spring to promote grass growth.
Catchwork System: The use of hillside terrain to direct water from high places to lowland meadows, suitable for hilly areas.

Value: Played a significant role in agriculture from the sixteenth to the early nineteenth centuries. it was used to increase pasture yields to support sheep farming (especially the wool industry).

The inclusion of Biodiversity Net Gain in development approvals requires developers to protect or restore natural habitats, including water meadows (**Environmental Law, 2021**).

Farmers are encouraged to maintain traditional irrigation systems through agricultural subsidies, such as paying to maintain a network of ditches and seasonal grazing (**Environmental Stewardship, 2021**).

Image 19. A good example of how water meadows look like when flooded. Source: English Heritage

b. Dutch Polder meadows

Distribution: Lowland Holland (eg. Friesland, South Holland)

Irrigation mode: Windmill drainage: Water levels in the polder are regulated by windmills or modern pumps to keep the meadows wet but not flooded.

Seasonal water level management: water storage in winter to prevent freezing, summer to reduce the water level to facilitate grazing.

Value: It has become a unique "polder wetland", which is the habitat of birds such as the black-tailed godwit and the crested pheasant

Conserve Measures: The Nature Protection Act (2017) lists polder wetlands as core areas of the National Ecological Network (Natura 2000) and prohibits drainage or landfilling.
Farmers sign an agreement to manage water levels and mowing times in the traditional way, and the government provides a subsidy per hectare (about €1,200/ year). Ministry of Agriculture, Nature and Food Quality. (2021). *Natural management in agriculture (ANLb): Agri-environmental scheme guidelines.*

Image 20. Typical Dutch polder landscape with windmill and dutch village. Source: istockphoto

c. Italian Marcite

Distribution: Northern Italy (e.g. Lombardy).
Irrigation mode Continuous irrigation in winter: The use of Alpine spring water to continuously divert water to the meadow during the cold season to prevent soil freezing and promote winter grass growth.
Gravity ditch system: relies on a network of canals built in ancient Rome (such as the Navigli Canal in Milan).

Value: The sustainable farming system developed in the monasteries of the Middle Ages is still in partial use today.
Conservation measures: Marcite in Lombardy is included in the National Register of Rural Landscapes and is prohibited from being converted into industrial land (Agricultural Heritage List, 2012).
Funding the restoration of medieval aqueducts (such as Milan's Navigli Canal) and the promotion of organic grass farming (EU Rural Development Fund [RDP], 2021).

Design measures:
Clear silt of Navigli canal and restore winter water diversion function.
Set up an organic farm in the Marcite meadow, growing traditional grass and medicinal plants.
Develop "Canal Heritage Trail", combining historical interpretation and ecological education.

Results: Meadow area increased by 15%, organic cheese and honey became local specialties

Image 21. The name of the mark derives from the long-standing practice of leaving the last winter cut to "rot" in irrigated grassland Source: wikipedia

d. Germany Feuchtwiesen

Distribution: Bavarian marshes, prealpine lands
Irrigation mode Traditional mowing is combined with grazing: soil is kept moist by limiting drainage and regular mowing prevents shrub invasion.

Shallow channel water diversion system: The use of natural streams or artificial channels to maintain meadow humidity.

Value: It is associated with the traditional hay harvesting (Heumahd) culture of Central Europe and has a high biodiversity.

Conservation measures: Wet meadows are designated as "priority habitats" (code 6410) and member states are required to submit regular conservation reports (EU Habitats Directive, 1992/43/EEC).
The Bavarian Wetland Scheme provides money to rehabilitate peatl ands and limit the decline of the water table, and farmers commit to cutting their grass once a year.

Image 22. "Uckermark Lakes – Between Beech Forests and Orchid Meadows". Source: WWF Deutschland, 2018

e. Slåtteland in North Europe

Distribution: Fjords and coastal wetlands of Norway and Sweden

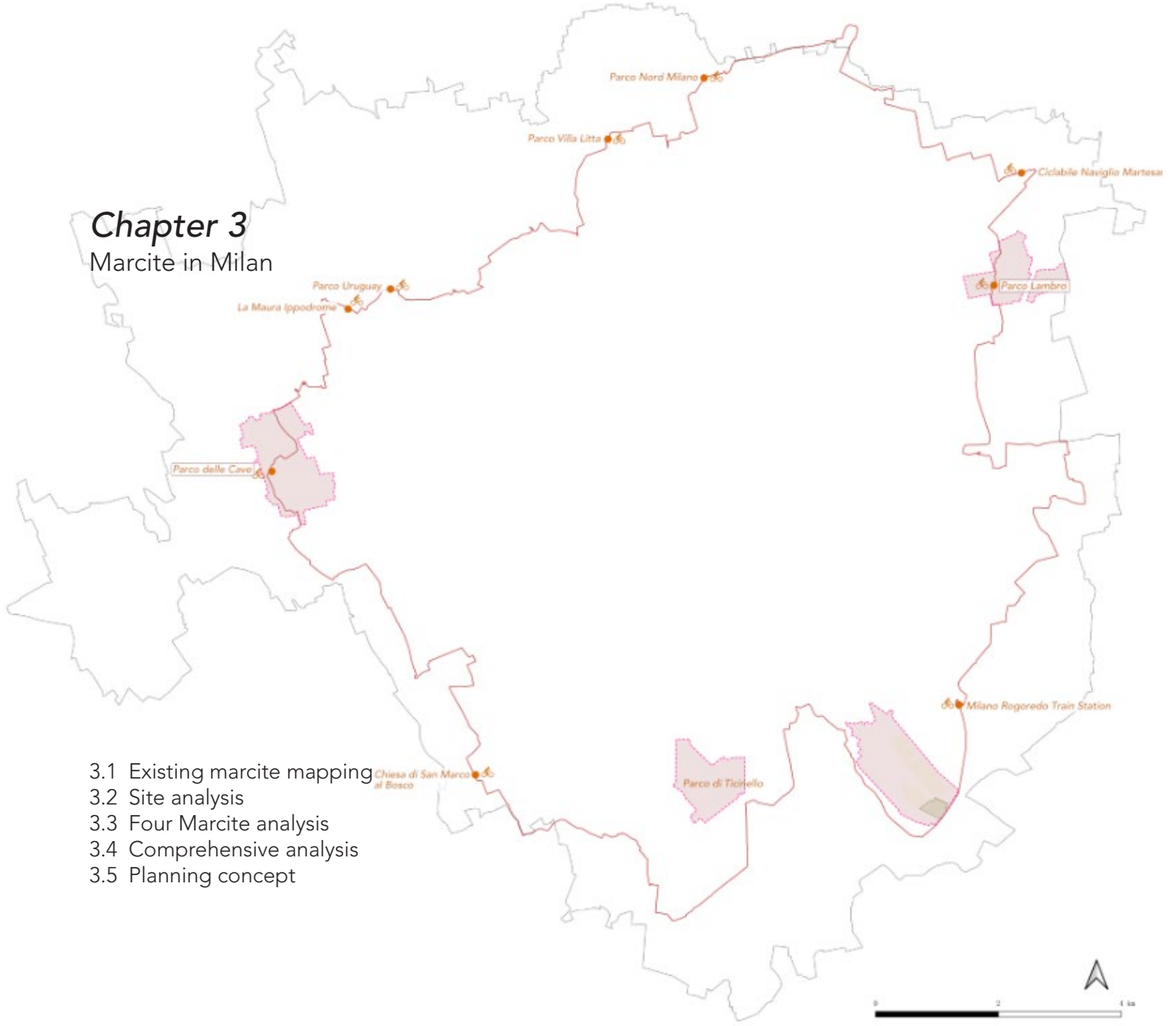
Irrigation mode Natural precipitation dependence: Dependence on high precipitation to maintain a humid environment, supplemented by artificial drainage ditches.
Winter ice protection: Ice covers meadows to prevent soil erosion and promote plant growth after spring melt.

Value:It is traditionally used to harvest forage and medicinal plants (such as Norse moss).

Conservation measures: Norway's Natural Diversity Act (2009) prohibits the draining of marsh meadows and requires payment of ecological-restoration costs (Norwegian Ministry of Climate and Environment, 2009).
Sweden's Green Infrastructure Strategy integrates traditional meadows into the national eco-corridor planning and encourages cities to purchase "ecological service rights" to finance conservation (Swedish Environmental Protection Agency [SEPA], 2018).

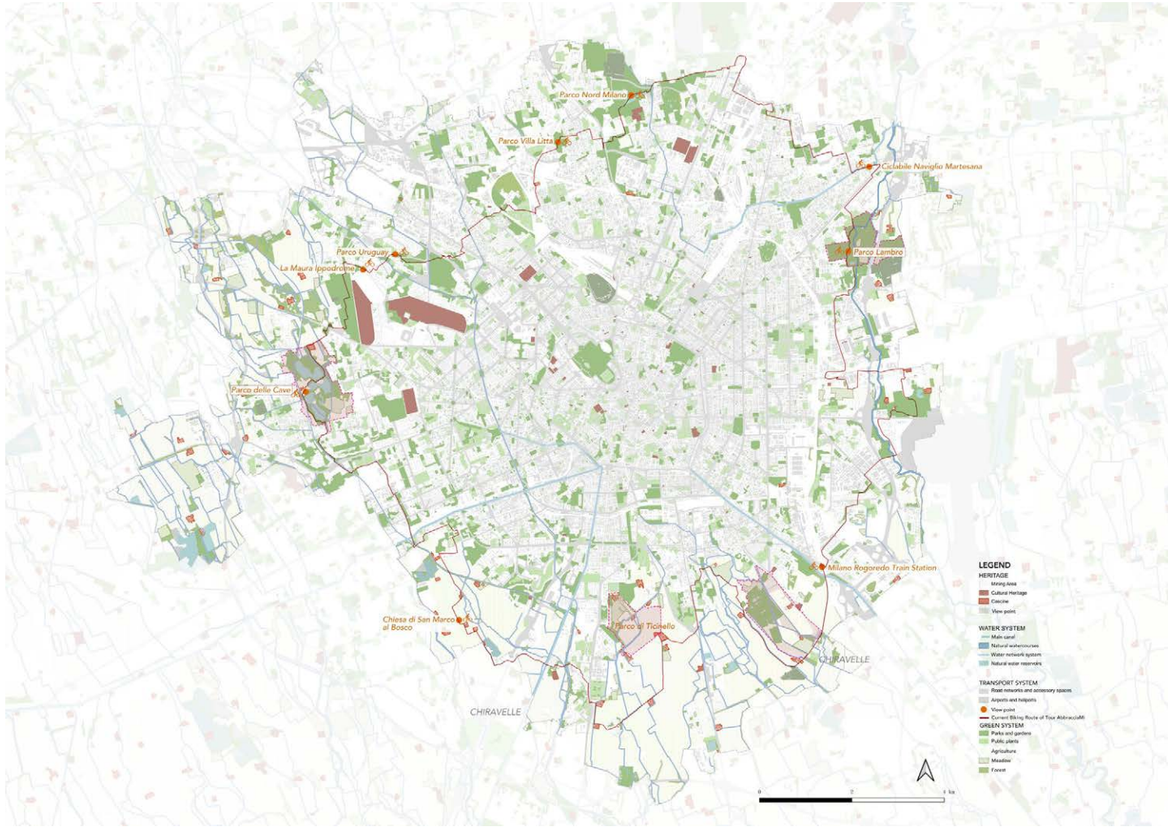
Image 23. A salt marsh outside Stockholm. Photo: Rachel Tiller Source: An 'unknown' ecosystem that is good news for the climate. Norwegian SciTech News.

Chapter 3
Marcite in Milan



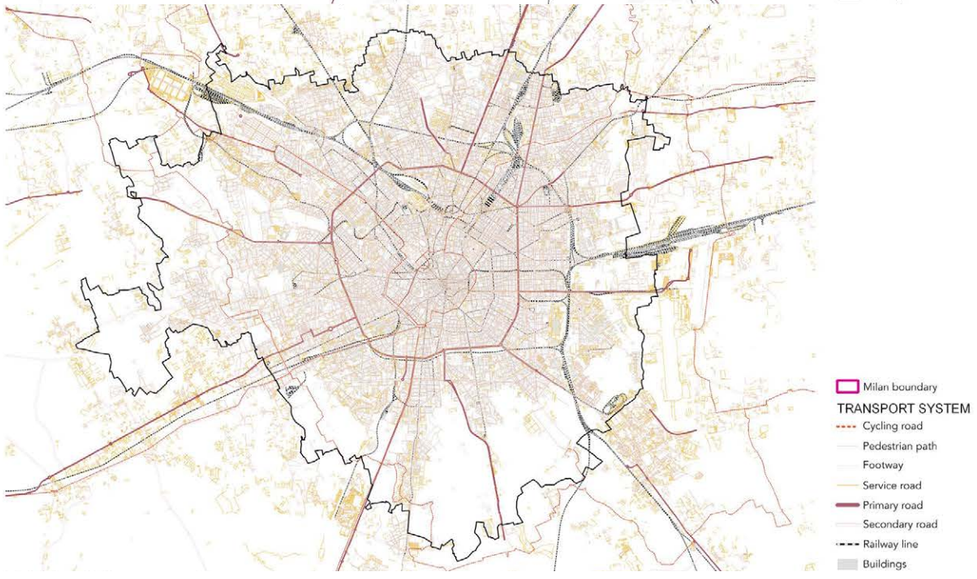
3.1 Existing Marcite Mapping

In the city of Milan, three municipal districts still preserve historical marcite fields:
-The marcite of Parco Lambro (District 3),
-The marcite of Chiaravalle (District 5),
-The marcite of Parco Agricolo Ticinello (District 5), and
-The marcite of Parco delle Cave (District 7)

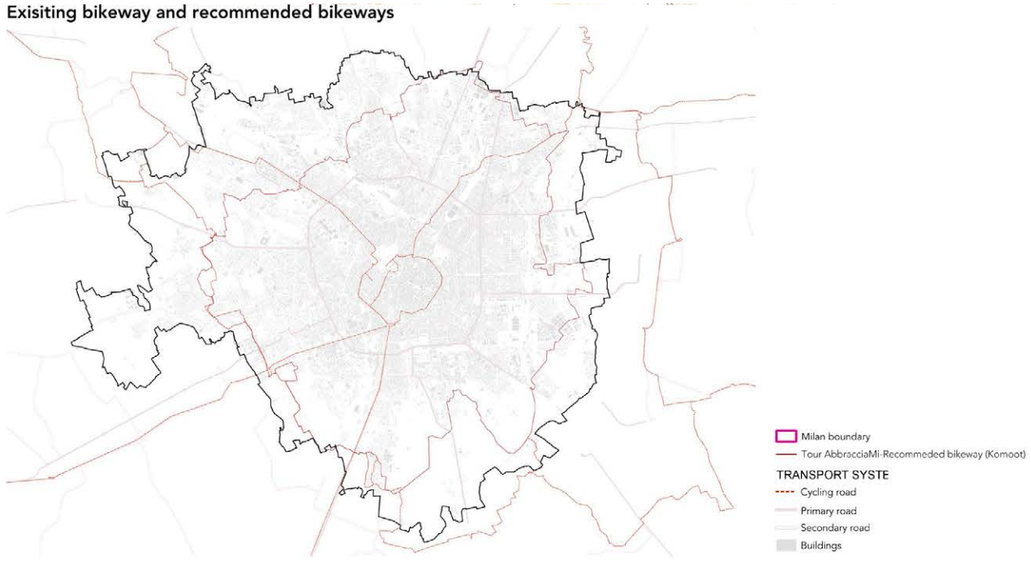


3.2 Site analysis

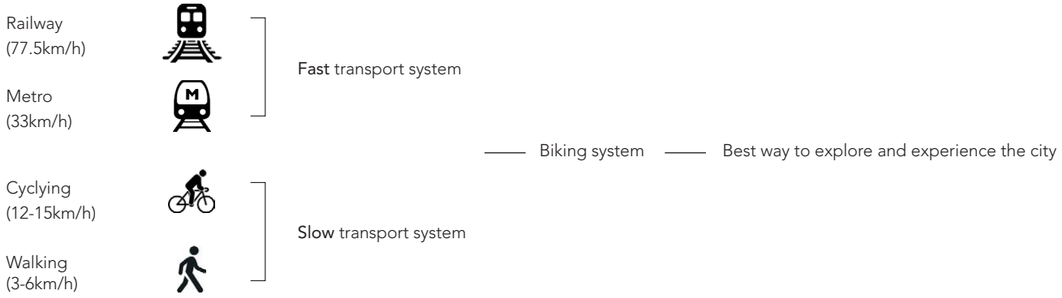
Public transport



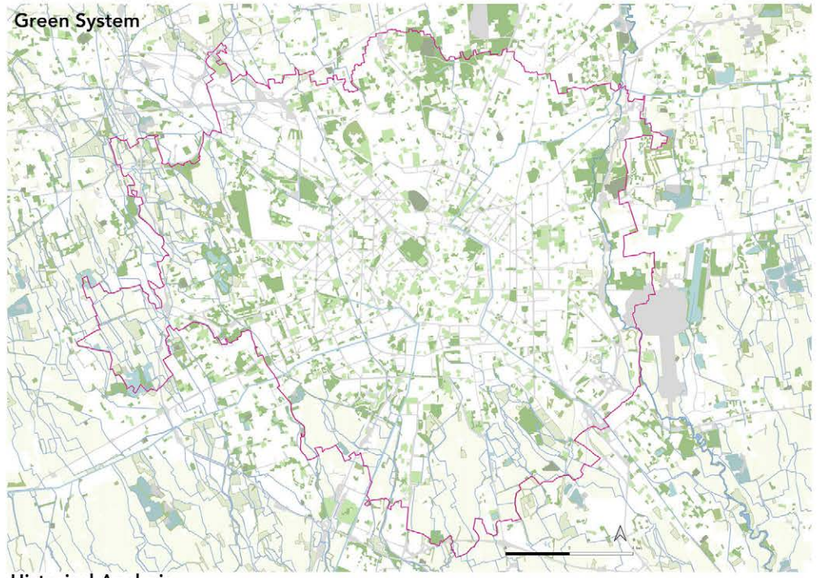
Exisiting bikeway and recommended bikeways



Public transport provides a fast and efficient means of exploring the city, while the bikeway system offers a slower, more experiential mode of movement that enhances the perception of urban landscapes. This study compares the existing bikeway network with the recommended routes proposed by the "AbbracciaMi Tour" and suggestions from KMOOT, highlighting potential improvements for sustainable and accessible urban mobility.



Green System

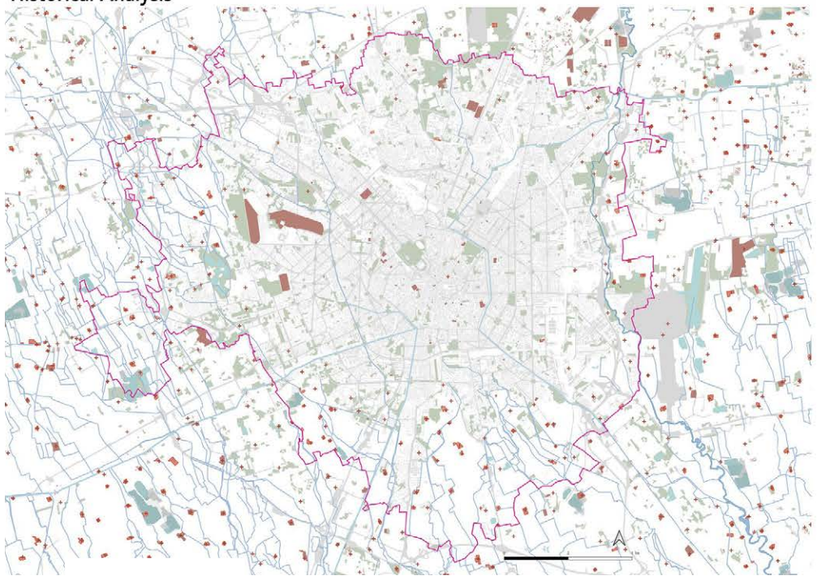


Milan boundary

WATER SYSTEM
- Canal
- Natural watercourse
- Secondary Canal

LANDUSE
- Parks
- Agriculture
- Forest
- Meadows
- Cemeteries
- Road system

Historical Analysis

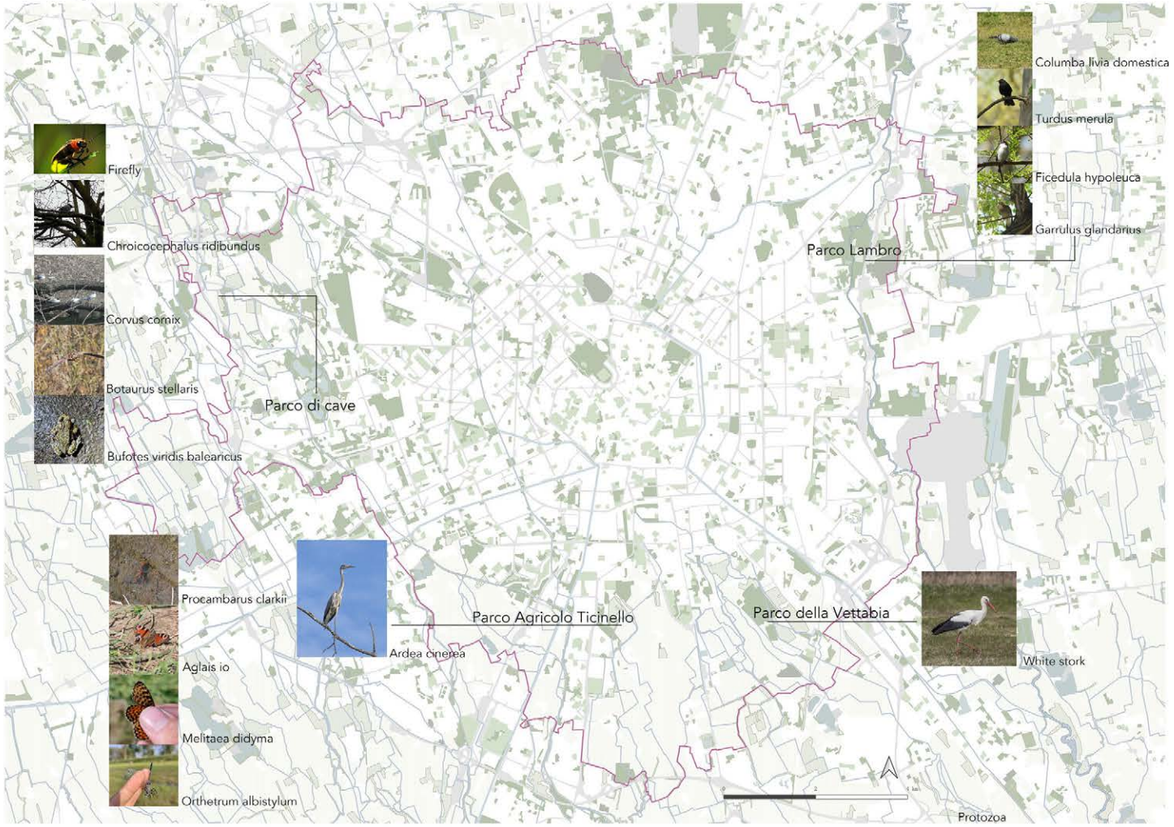


Milan boundary

HERITAGE
- Cascina
- Significant point
- Cultural heritage

BUILDINGS
- Buildings

Ecological Analysis



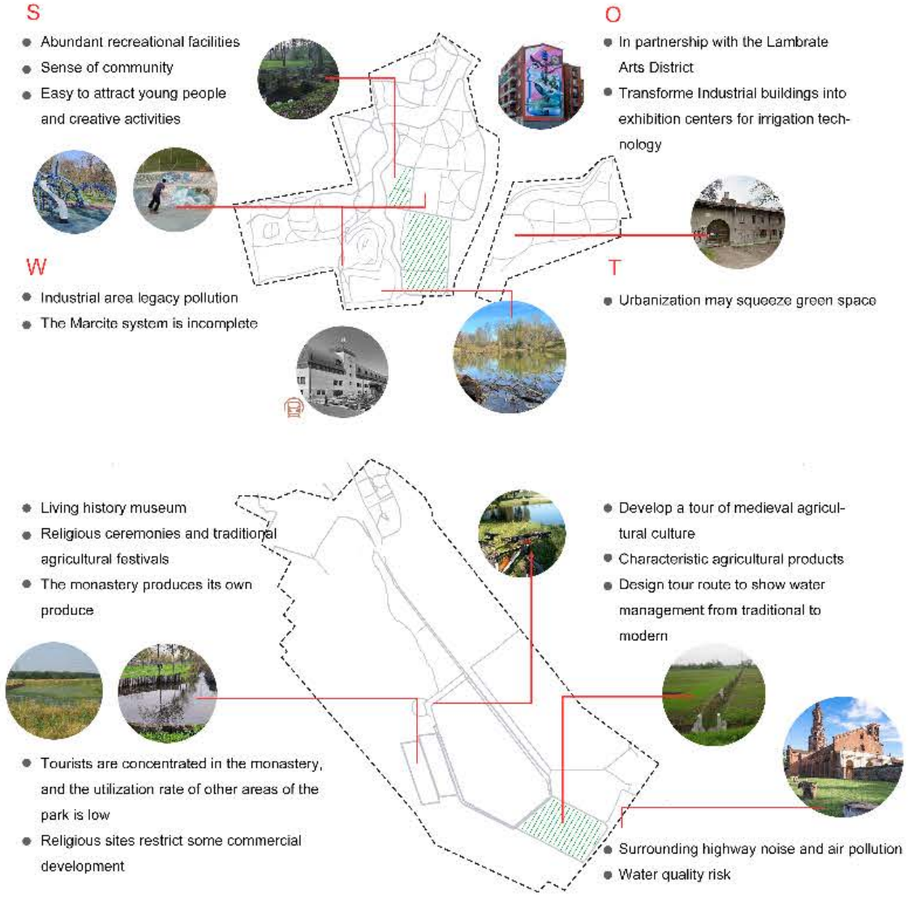
Source: inaturalist

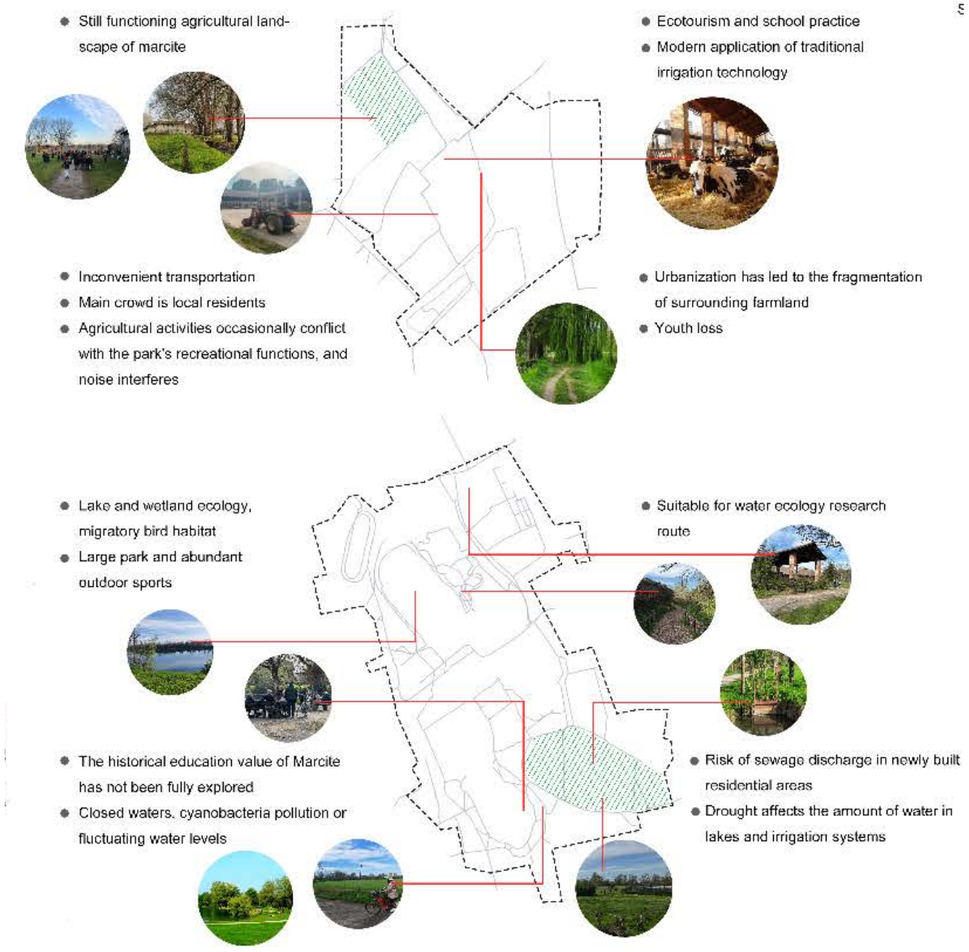
3.4 Comprehensive analysis

The integrated analysis of the green system, historical context, and ecological framework reveals that the marcite plays a crucial role in the urban park, embodying not only a valuable component of historical heritage but also a key contributor to ecological biodiversity.

	Value of Marcita	Summary
Green system	Playing a significant role in the urban park system	Marcite embody multifaceted values: they serve as key components of the urban park system, preserve significant historical heritage, and contribute to the ecological network by sustaining biodiversity and enhancing environmental resilience.
Historical system	Agriculture and water heritage	
Ecological system	Landscape of high biodiversity value	

Swot analysis

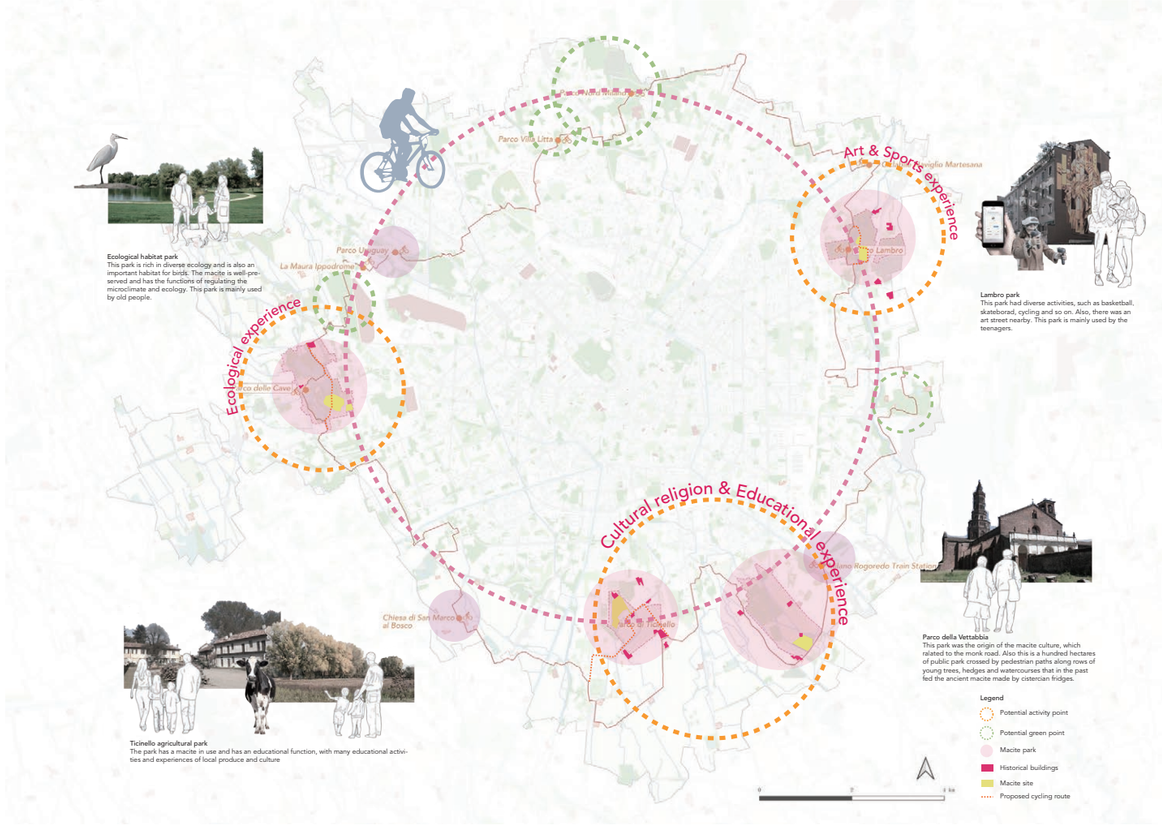




3.5 Planning Concept

- Accessibility improvement. Slow mobility.
- Connect the the green system and enhance the biodiversity .
- Redevelopment of the built heritage

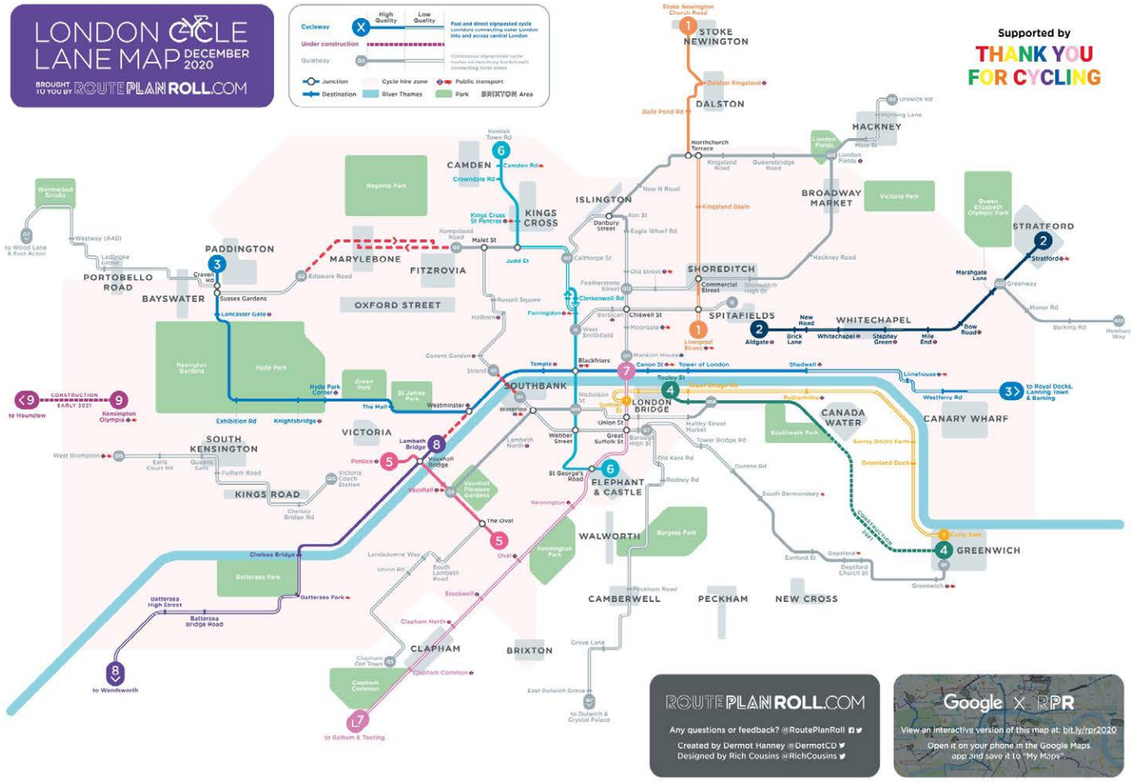
Strategy map



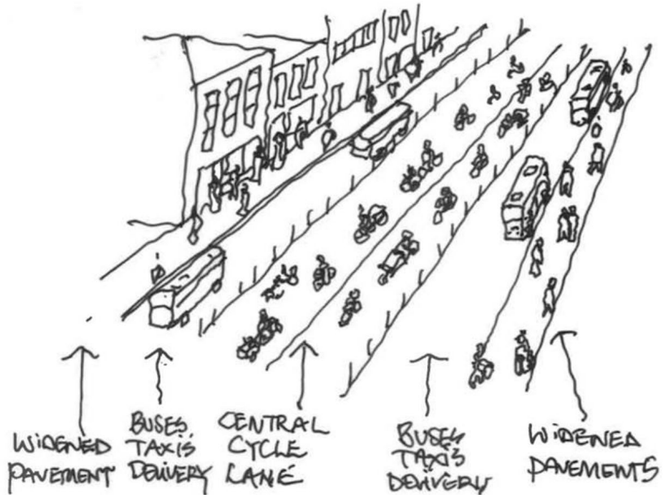
Chapter 4
Marcite-based tourism system planning and design

4.1 Case study

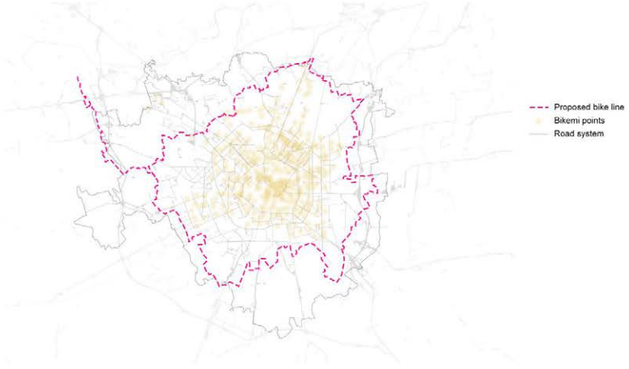
- Cycleway is divided as high quality and low quality.
- Cycleway has level of sound.



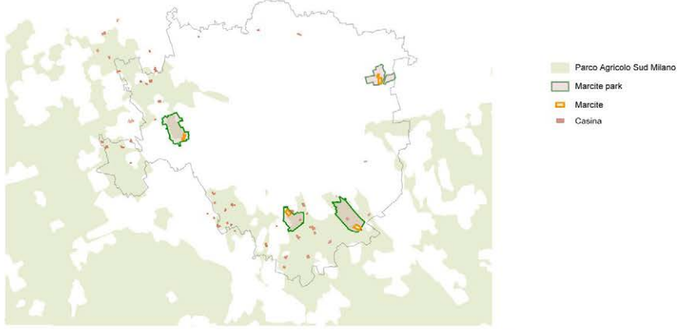
LONDON BIKE LINES
THE ROUTES TO RECOVERY



4.2 Planning strategy



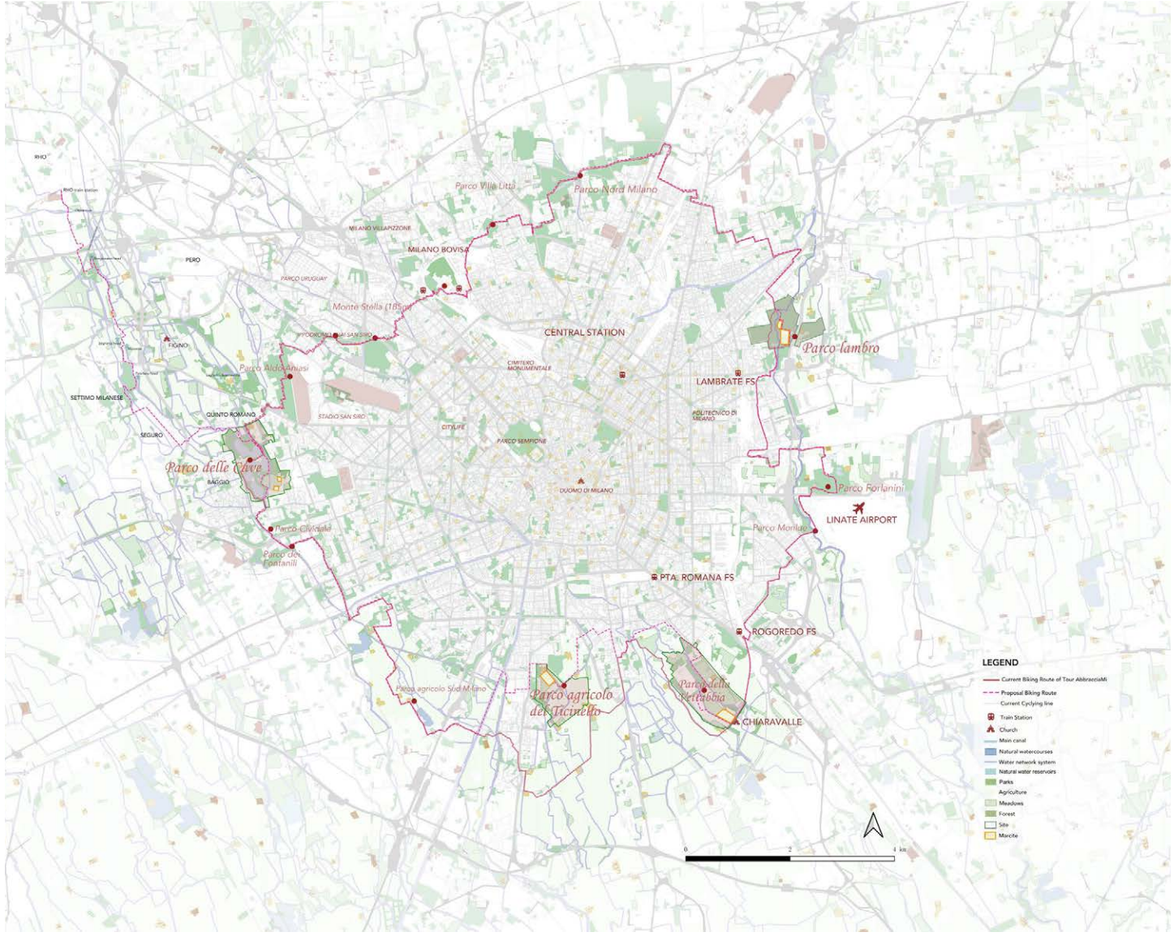
Create new bicycle tour route



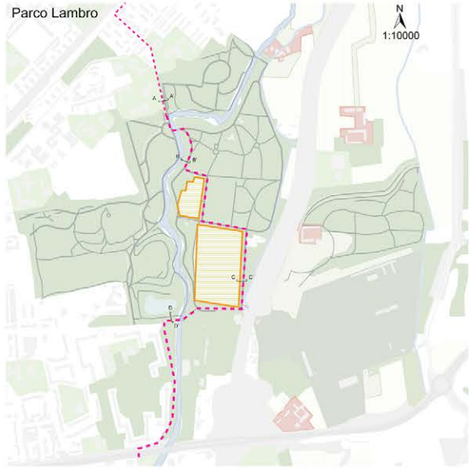
Connect agriculture heritage

Based on the water flow

4.3 Master plan



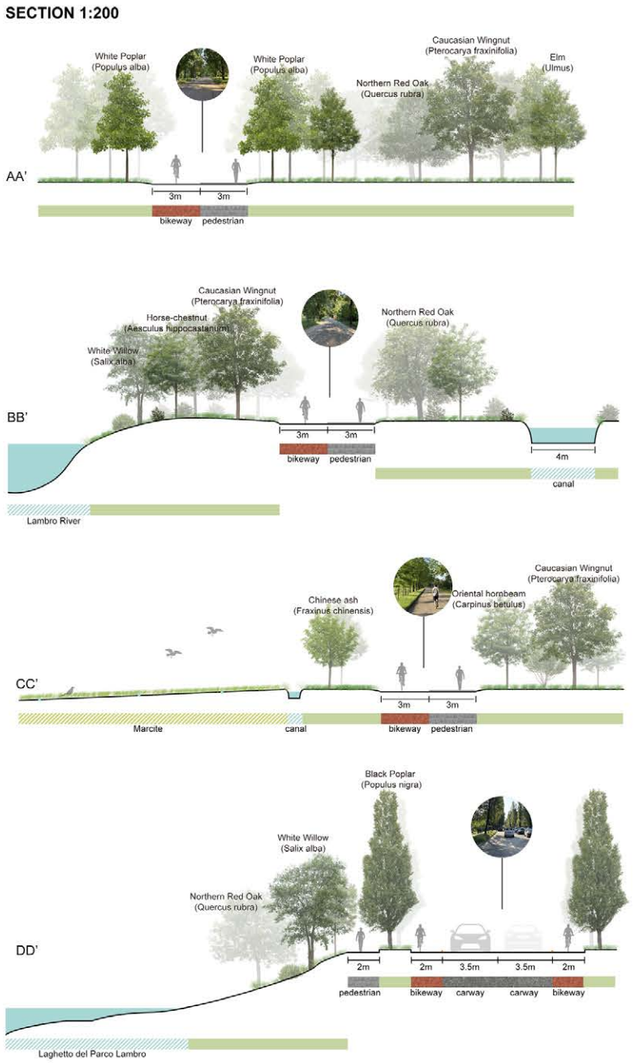
4.4 Transportation design

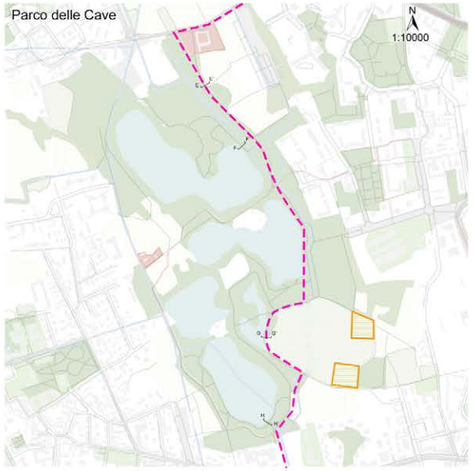


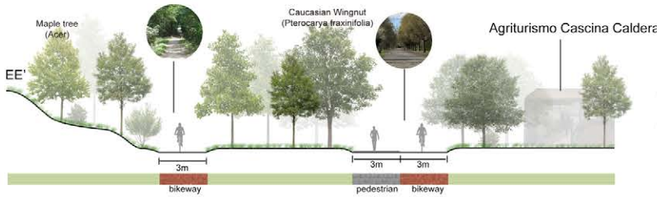
Parco Lambro

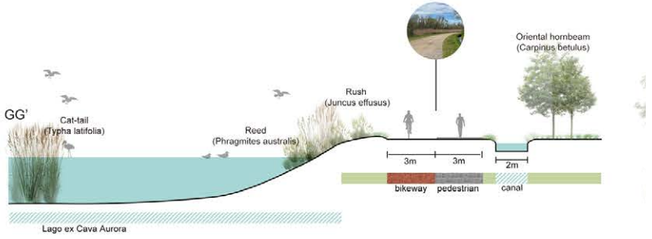
Parco Lambro in eastern Milan is shaped by the Lambro River, featuring meadows, wetlands, and riparian woodlands on gentle floodplain slopes. Historic irrigation traces reflect its agrarian past, while restored habitats support biodiversity and recreation, making it a vital urban green corridor and flood-control park.

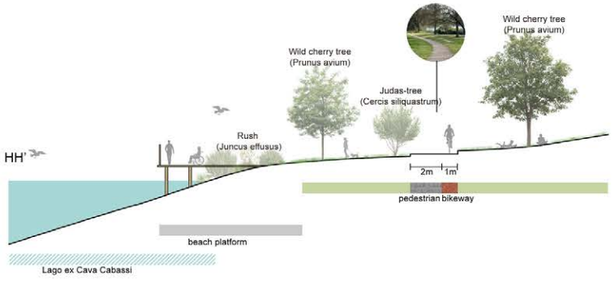
Our route design enhances visitors' experience by guiding them through the park's diverse natural landscapes, separating pedestrian, cycling, and vehicular paths, and making cycling more engaging and enjoyable.



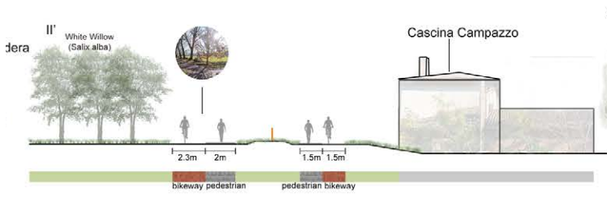


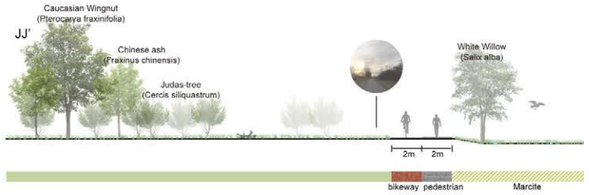




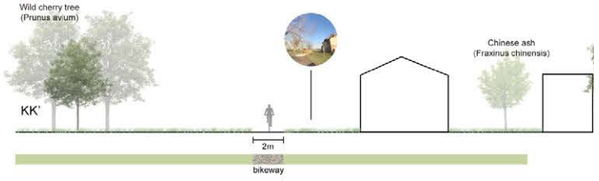


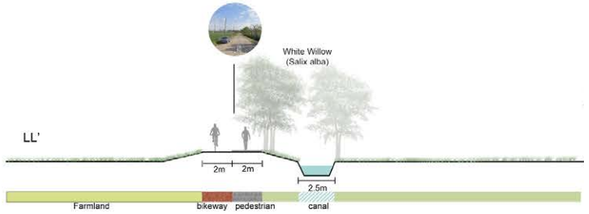
Parco delle Cave
Parco delle Cave in western Milan is a former gravel quarry landscape transformed into a 135-hectare urban park. Its character is defined by lakes from old quarries, surrounding meadows, wetlands, and woodlands, which support diverse birdlife and seasonal wildflowers.
Our cycling route design guides visitors through varied landscape experiences — passing cascine, diverse tree groves, and lakefront paths — while separating pedestrian, cycling, and service routes to ensure safety and enhance the joy of exploration. The park now serves as a major urban nature reserve and recreational green corridor.

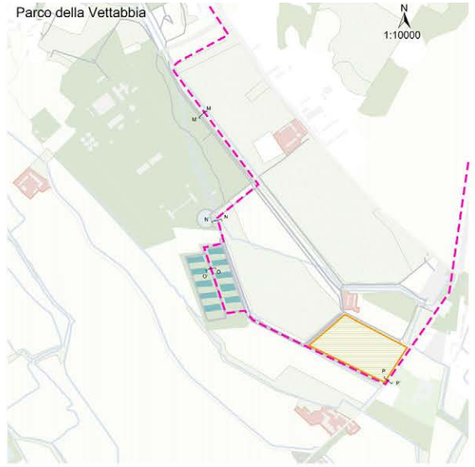


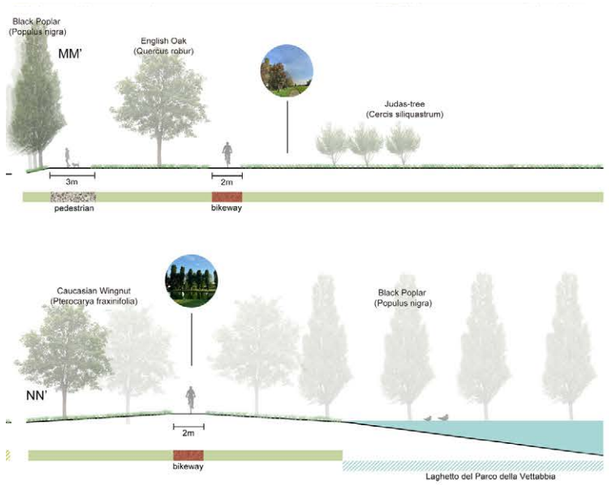


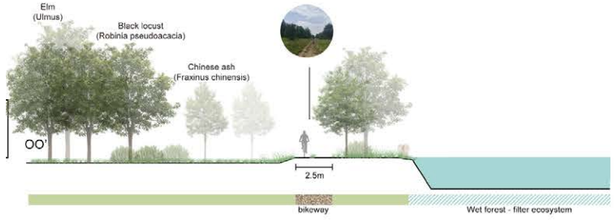
Parco agricolo del Ticinello
Parco Agricolo del Ticinello in southern Milan is a protected agricultural park that preserves the city's historic rural landscape. It features active farmland, ancient irrigation canals, marcite meadows, hedgerows, and riparian woodlands, supporting local biodiversity and traditional farming practices.
Our route design leads visitors across farmland, cascine, canals, and seasonal wetlands, with separated pedestrian, cycling, and service paths to provide safe access and immersive experiences of this unique agricultural-cultural landscape.

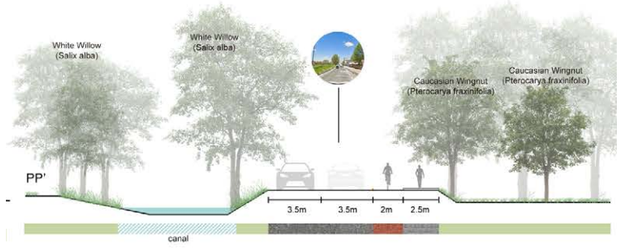








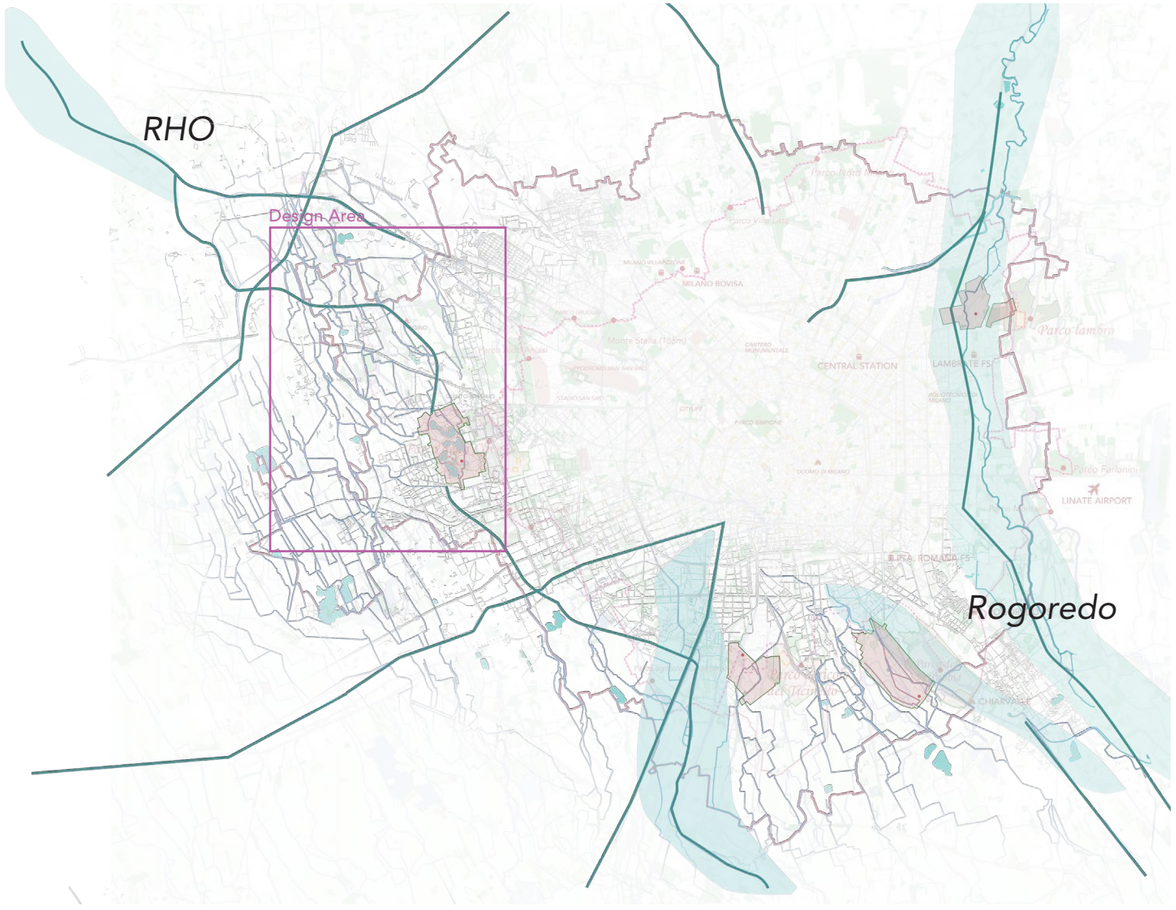




Parco delle Cave
Parco della Vettabbia in southern Milan is a linear agricultural and ecological park shaped by the Vettabbia canal and surrounding farmland, wetlands, and riparian vegetation. It connects the city to the Chiaravalle Abbey and preserves traces of historic irrigation systems.
Our route design guides visitors through canal-side paths, farmland mosaics, cascine, and wetland habitats, with separate lanes for pedestrians, cyclists, and service vehicles, offering a safe and engaging way to experience the park's rich cultural and natural landscapes.

Chapter 5
Water origin of Marcite

5.1 Water origin of Marcite



According to the map on the left, the northwestern area represents the water source of Milan's entire irrigation system, holding significant heritage value that has now become largely invisible. Our objective is to reveal the hidden water history through low-impact landscape interventions, enabling visitors to experience and interpret this historically significant network.

5.2 Historical analysis

According to this comparisons, we can see the canals changed a lot in different periods.

Source: https://archiviodigitale-icar.cultura.gov.it The survey and research for the project Water Heritage for a Resilient City – Re(dis)covering Milan's Irrigation Landscape System: from Rho to Rogoredo was carried out by the project team members, including Dou Wang, Wong Nga Kin, Qian Chen

5.3 Conservation analysis

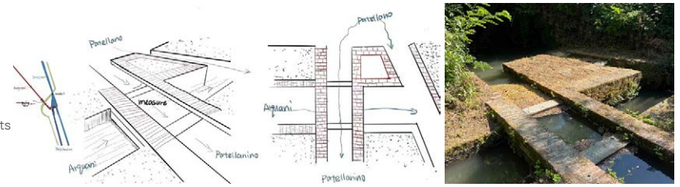
Trii-Baselloni

Material	Location	Estimated Degradatio	Degree of Conservation	Condition Description	Intervention Suggestions
Brick	Wall structures (arches and flow guide walls)	25%	Good	Partial weathering and erosion; vegetation growing in joints; overall structure still stable	Localized repair of damaged bricks and repointing
Stone	Corners and foundation bases	15%	Excellent	Stones are intact with minor moss; no structural damage	Surface moss cleaning only; no structural intervention needed
Concrete	Channel edges, bridge platform, and retaining areas	20%	Excellent	Surface weathering, minor edge spalling, signs of moss and moisture	Surface cleaning, crack filling, and waterproof reinforcement
Metal	Gate rails, mechanical systems, and metal joints	30%	Good	Significant rusting, some deformation, potential functional issues	Rust removal or replacement; check mechanical function
Mortar	Joints between bricks and stones	40%	Good	Widespread loss, expanded gaps, risk of structural loosening	Complete repointing to restore wall integrity
Vegetation	Throughout site: walls, canal bed, slopes, arch area	30%	Good	Vegetation (including vines) attached to and invading structures; risk of long-term damage	Remove roots and climbing plants; vegetation control
Wood	End of canal – wooden posts and water flow structures	20%	Good	Structurally sound; slight surface aging and decay; no functional issues	Apply protective treatment; routine inspections

Critearia of the Degree of Conservation: Excellent(0~25%), Good(25%~50%), Fair(50~75%), Poor(75~100%)

Overall Description

The Trii-Baselloni structure remains generally stable, with partial weathering of bricks and concrete surfaces. Moss and vegetation are spreading in joints, and localized mortar loss is evident. Metal elements show rusting, and wooden parts are aging but still functional.



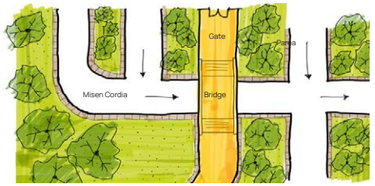
Node_02

Material	Location	Estimated Degradation (%)	Degree of Conservation	Condition Description	Intervention Suggestions
Brick	Channel walls, flow guides	30%	**Good**	Weathering, moss in joints, still stable	Local repairs, repointing, reinforce if needed
Stone	Foundations, side supports	20%	**Excellent**	Intact, slight moss, no damage	Clean moss only
Concrete	Channel edges, retaining walls	35%	**Good**	Surface weathering, edge spalling, moisture	Clean, fill cracks, waterproof coat
Metal	Rails, reinforcements (bridge)	45%	**Good**	Rust, possible functional issues	Inspect, remove rust, replace if needed
Mortar	Joints between bricks/stones	60%	**Fair**	Major loss, widened gaps, partial loosening	Full repointing
Vegetation	Along walls, slopes	40%	**Good**	Roots and vines invading structures	Remove plants, control growth
Wood	Water flow elements (not visible)	25%	**Good**	Slight aging, minor decay if present	Protective treatment, routine checks

Critearia of the Degree of Conservation: Excellent(0~25%), Good(25%~50%), Fair(50~75%), Poor(75~100%)

Overall Description

The site is in fair to good condition but requires targeted repairs, vegetation control, and protective maintenance to prevent further deterioration. The stone structures show moderate weathering, moss growth, and vegetation intrusion. Mortar joints are significantly degraded, while bricks, stones, and wood remain mostly stable. The metal elements present the highest risk due to rust and corrosion.



Source: The survey and research for the project Water Heritage for a Resilient City – Re(dis)covering Milan's Irrigation Landscape System: from Rho to Rogoredo was carried out by the project team members, including He Daiqi， Rawash Lujain

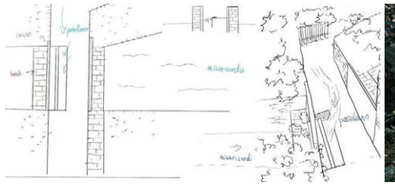
Node_01

Material	Location	Estimated Degradation (%)	Degree of Conservation	Condition Description	Intervention Suggestions
Brick	Channel walls and flow guide structures	**30%**	**Good**	Partial weathering and erosion; some moss and plants growing in joints; overall structure remains stable	Localized repair of damaged bricks and repointing; reinforcement if necessary
Stone	Foundation bases and side supports	**20%**	**Excellent**	Stones are mostly intact with slight moss growth; no structural damage	Surface moss cleaning only; no structural intervention needed
Concrete	Channel edges and retaining walls	**35%**	**Good**	Noticeable surface weathering, slight edge spalling, with moss and moisture present	Surface cleaning, crack filling, and waterproof reinforcement
Metal	Possible gate rails or reinforcement (not visible here)	**45%**	**Good**	Due to the humid environment, potential corrosion is expected; possible partial functional issues if metal parts exist	Inspect all metal components, remove rust or replace parts
Mortar	Joints between bricks and stones	**60%**	**Fair**	Significant mortar loss; widened gaps between joints; risk of partial structural loosening	Complete repointing to restore wall integrity
Vegetation	Along channel walls and surrounding slopes	**40%**	**Good**	Vegetation (including vines) is attached to and invading brick and stone structures, posing long-term damage risks	Remove roots and climbing plants; establish vegetation control
Wood	Wooden elements in water flow structures (not visible here)	**25%**	**Good**	If present, wooden structures are assumed stable with slight surface aging and decay	Apply protective treatment and conduct routine inspections

Critearia of the Degree of Conservation: Excellent(0~25%), Good(25%~50%), Fair(50~75%), Poor(75~100%)

Overall Description

The structure is in fair to good condition, though vegetation and moss cover large portions of the walls. Bricks show some joint loss, while mortar degradation is more advanced. Metal parts are corroded and may compromise function if not addressed. Concrete edges exhibit surface weathering but remain structurally sound.



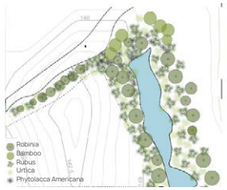
Head of Mosseta

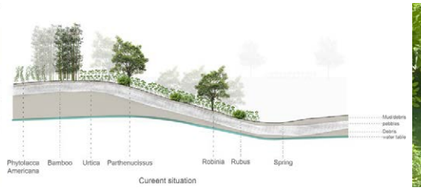
Material / Vegetation	Location	Estimated Degradation	Degree of Conservation	Condition Description	Intervention Suggestions
Vegetation – Bamboo	Slopes, spring head surroundings	75% (impact)	**Considerable Coverage**	Thick stands, spreading rhizomes, retain moisture, block access	Selective removal, root barrier installation, seasonal cutting
Vegetation – Robinia pseudoacacia	Isolated individuals on slope	30% (impact)	**Limited Coverage**	Young to medium trees, risk of root intrusion near spring head	Remove saplings, monitor regrowth, replace with low-impact vegetation

Critearia of the Degree of Vegetation Coverage: Minimal(0~25%), Limited(25%~50%), Considerable(50~75%), Full(75~100%)

Overall Description

The Monseta spring head is stable but obscured by dense bamboo and black locust growth. The spring is dry and not working. The priority is vegetation removal and control, especially bamboo roots near the structure. Once cleared, the masonry can be inspected, and regular monitoring should be established to prevent regrowth and ensure accessibility.





Source: The survey and research for the project Water Heritage for a Resilient City – Re(dis)covering Milan's Irrigation Landscape System: from Rho to Rogoredo was carried out by the project team members, including He Daiqi， Rawash Lujain

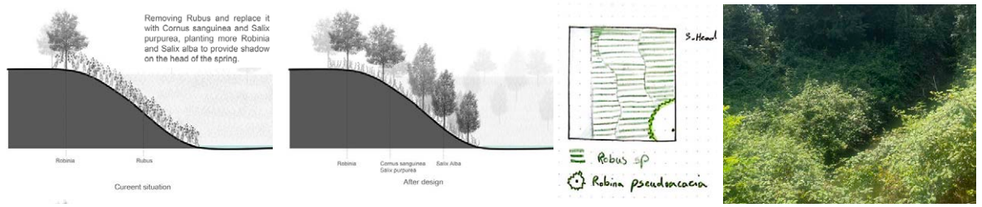
Head of Patellano

Material / Vegetation	Location	Estimated Degradation	Degree of Conservation	Condition Description	Intervention Suggestions
Concrete / Masonry (not visible)	Presumed at spring head	—	—	Covered by vegetation, condition unknown	Clear vegetation to enable inspection; reassess after cleaning
Vegetation – Rubus sp.	Entire slope, canal edge	70% (impact)	**Considerable Coverage**	Dense cover, fast growth, blocks access, may trap moisture	Regular cutting and pruning; seasonal monitoring
Vegetation – Robinia pseudoacacia	Isolated individuals near slope	30% (impact)	**Limited Coverage**	Young trees, risk of root intrusion in future	Remove saplings; prevent regrowth

Critearia of the Degree of Vegetation Coverage: Minimal(0~25%), Limited(25%~50%), Considerable(50~75%), Full(75~100%)

Overall Description

The Patellano spring head is mostly covered by brambles (Rubus sp.) and some black locust (Robinia pseudoacacia). The structure is hidden but seems less damaged than overgrown. The main risk is root intrusion and blocked access, so regular clearing of invasive plants is needed to keep it stable and accessible.



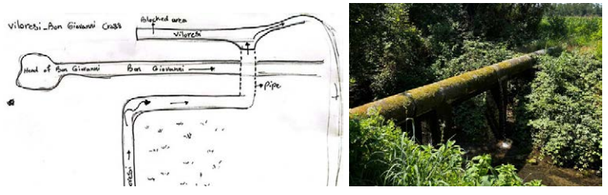
Bongiovanni-Viloresi Cross

Material	Location	Estimated Degradation (%)	Degree of Conservation	Condition Description	Intervention Suggestions
Concrete	Pipe bridge structure, supports	40%	**Fair**	Moss and vegetation growth, surface weathering, cracks possible	Clean surface, remove vegetation, repair cracks, apply waterproof coating
Metal	Pipe clamps, reinforcement parts	50%	**Fair**	Likely corrosion due to humidity, reduced stability	Inspect all metal joints, derust or replace where needed
Vegetation	Surrounding canal and bridge	45%	**Fair**	Dense growth covering structure, risk of long-term damage	Remove excessive vegetation, establish maintenance plan
Stone/Brick	base supports	25%	**Good**	Mostly intact, slight moss growth, no structural damage seen	Basic moss cleaning only
Mortar	Joints (if present at supports)	35%	**Fair**	Minor joint loss and gaps forming	Repoint joints where needed

Critearia of the Degree of Conservation: Excellent(0~25%), Good(25%~50%), Fair(50~75%), Poor(75~100%)

Overall Description

The Bongiovanni–Vioresi Cross is a concrete pipe bridge with supporting pillars. The main issues are surface weathering, moss, corrosion of metal parts, and dense vegetation. While the base remains mostly intact, regular cleaning, vegetation control, and minor repairs are needed to maintain stability and function.



Source: The survey and research for the project Water Heritage for a Resilient City – Re(dis)covering Milan's Irrigation Landscape System: from Rho to Rogoredo was carried out by the project team members, including He Daiqi，Rawash Lujain

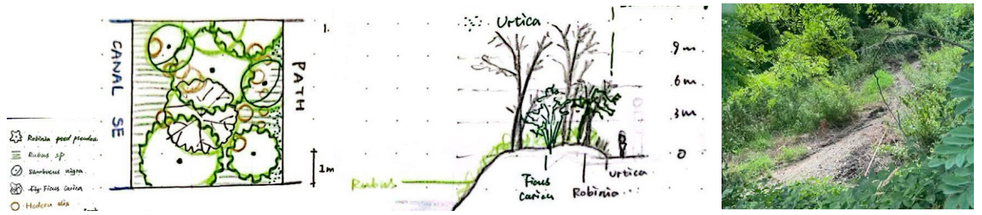
Head of Signarca

Material / Vegetation	Location	Estimated coverage (%)	Degree of coverage	Condition Description	Intervention Suggestions
Vegetation (*Robinia, Rubus, Sambucus, Ficus, Hedera, Urtica*)	Walls, slopes, canal edge	70% (impact)	**considerable coverage**	Dense cover, climbing ivy, saplings near structure	Remove/trim invasive plants, root barriers, seasonal control

Critearia of the Degree of Vegetation Coverage: Minimal(0~25%), Limited(25%~50%), Considerable(50~75%), Full(75~100%)

Overall Description

The head of the spring is relatively clean and structurally sound. The main issues come from dense vegetation (Robinia pseudoacacia, Rubus sp., Sambucus nigra, Ficus carica, Hedera helix, Urtica), which covers walls and slopes, with roots starting to affect joints. Surface moss, minor cracks, and some rust on metal parts are visible. Regular vegetation control, joint repair, and anti-corrosion treatment will help maintain good condition.



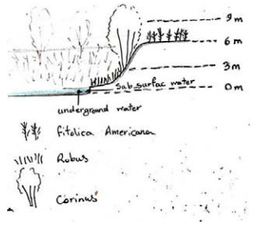
Head of Bongiovani

Material	Location	Estimated Degradation (%)	Degree of Conservation	Condition Description	Intervention Suggestions
Stone	Channel banks and supports	25%	**Good**	Mostly intact, some moss growth	Surface cleaning only
Vegetation	Along banks and in channel	50%	**Fair**	Dense growth (Robus, Cornus, *Fitolice Americana*); risk of clogging and root intrusion	Remove invasive plants, control vegetation regularly
Soil / Slopes	Channel surroundings	35%	**Fair**	Slope instability risk with vegetation pressure	Reinforce slopes if needed, control plant roots
Metal	Underground spring inlet	30%	**Good**	Entrance visible but partly obstructed by vegetation and debris	Clear inlet regularly, monitor water flow stability

Critearia of the Degree of Conservation: Excellent(0~25%), Good(25%~50%), Fair(50~75%), Poor(75~100%)

Overall Description

The Bongiovani head is stable but affected by moss on stone banks, dense invasive vegetation, slope pressure, and a partly blocked inlet. Regular vegetation control and cleaning are needed to maintain function.



Source: The survey and research for the project Water Heritage for a Resilient City – Re(dis)covering Milan's Irrigation Landscape System: from Rho to Rogoredo was carried out by the project team members, including He Daiqi，Rawash Lujain

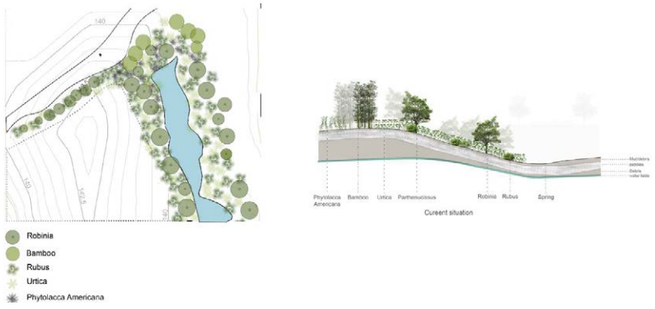
5.4 Vegetation analysis

Node_01

controlling rubus and Hedera Helix and (in-vasive species).
Palification and removing pebbles to provideeasier flow.

Head of Mosseta

Remove and control rubus tand Phytolaca Americana and bam-boo(invasive species)and replace with cornus sanguina. Palification and removing pebblesto provide easier flow.



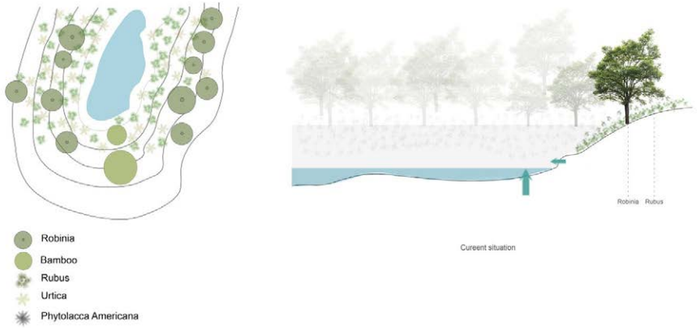
Source: The survey and research for the project Water Heritage for a Resilient City – Re(dis)covering Milan's Irrigation Landscape System: from Rho to Rogoredo was carried out by the project team members, including Teimuri Seyed

Node_01_02

Removing pebbles and vegetation fromdried canals and reuse them if it could bepossible.

Head of Bongiovani

Remove and control rubus and Hedera (invasive species)and replace. Palification and removing pebbles(especial-ly the slope at the beggining of the head)toprovide easier flow

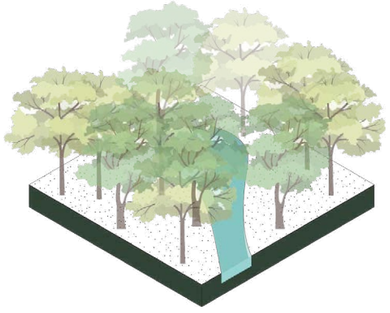


Source: The survey and research for the project Water Heritage for a Resilient City – Re(dis)covering Milan's Irrigation Landscape System: from Rho to Rogoredo was carried out by the project team members, including Teimuri Seyed

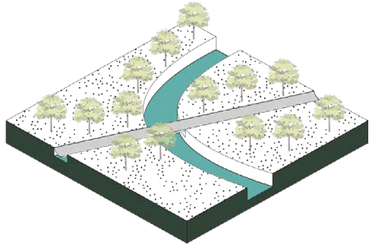
5.5 Design Principle

1. Preservation

- Document and protect local myths, names, rituals, or spiritual uses tied to the spring.
-Protect the Natural Hydrological System



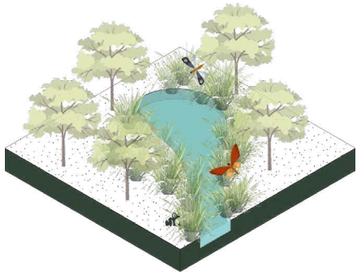
Conserve the existing trees



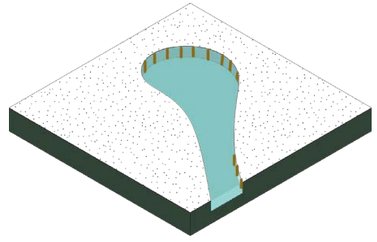
Preserve the existing artifacts

2. Requalification

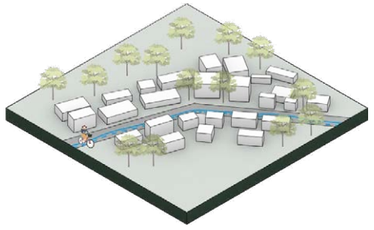
- Connect different kinds of heritages (water heritage, built heritage, agricultural heritage) by proposed cycling route.
- Define some water heritage park, marcita park, ecological education park in this area.
-Conserve the Ecological Environment, establish ecological buffer zones
-Use discreet fences or natural barriers to guide visitors while protecting the spring.



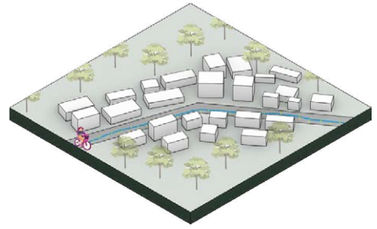
Establish ecological buffer zones



Use discreet fences or natural barriers



Change the pavement

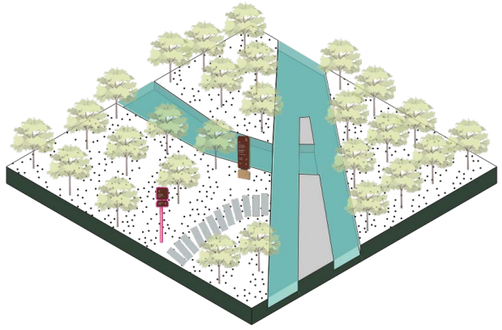


Add the lighting

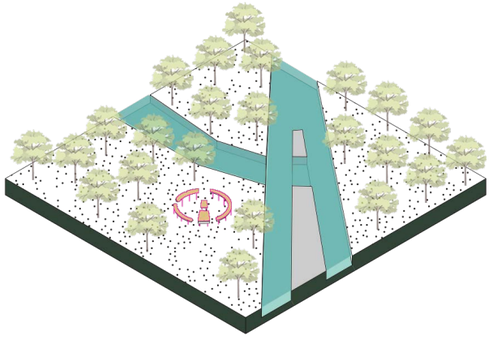
3. Enhancement

- Represent the old canal under the ground by landscape design such as pavement design or guide system.
- Use the lighting design to let people realize the unknown water and relative heritages.
-Set up the guide system in the park from entrance to the artifacts and some point such as the sign and tour map.

Represent the water tracing



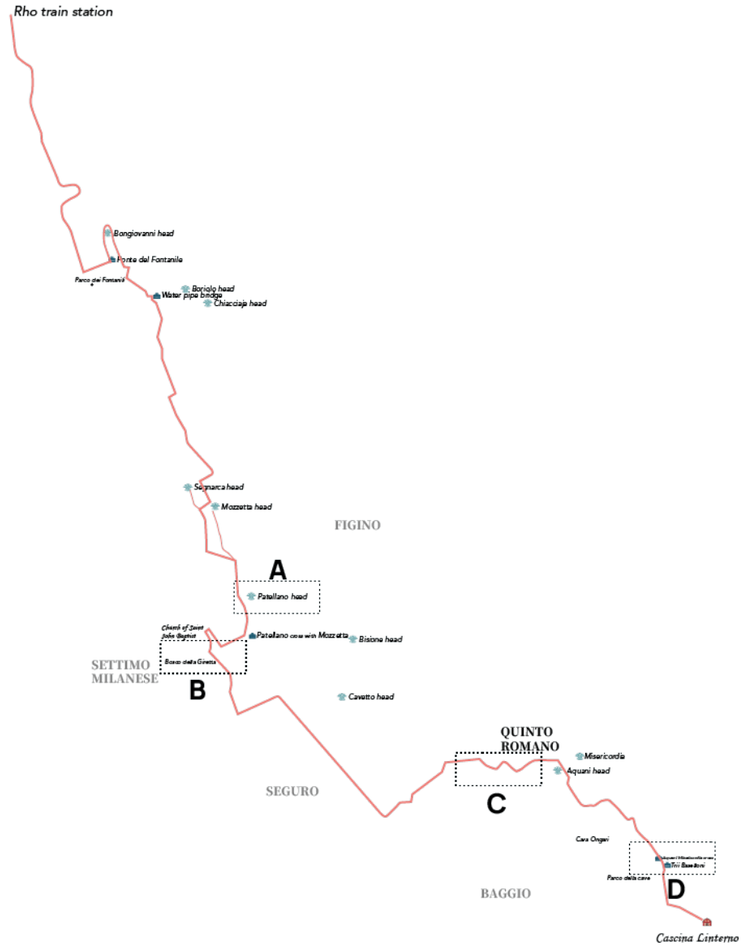
Add guide system



Add interaction structure

5.6 Proposed landscape plan

Detail design site selection



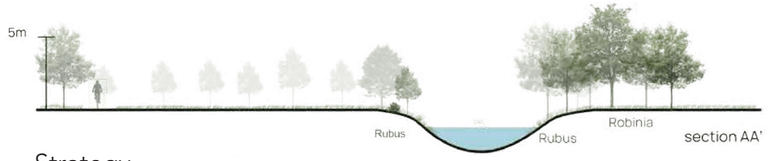
5.7 Detail design plan

Where Water is Born

Node A - Patellano head

The Patellano spring head is mostly covered by brambles(Rubus sp.) and some black locust (Robinia Pseudoacacia). The structure is hidden but seems less damaged than overgrown. The main risk is root intrusion and blocked access, so regular clearing of invasive plants is needed to keep it stable and accessible.

Before Plan Scale 1:400

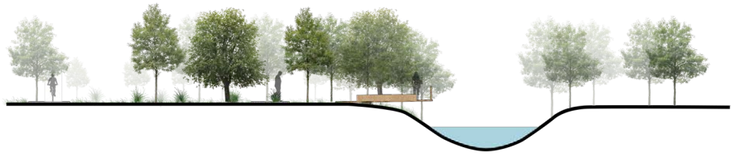


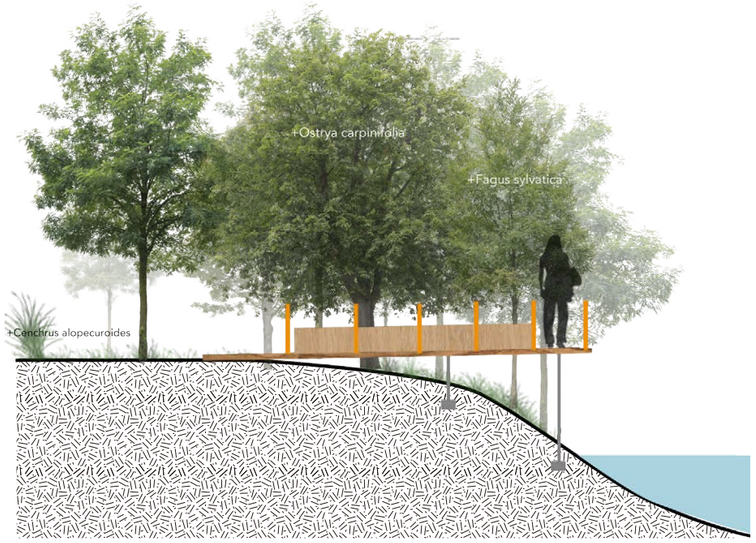
Strategy

After design Plan

Scale 1:400

In our design, we will preserve the exisiting trees and add some low-impact intervations, such as wood deck, guiding path and guiding plants to walk to the spring.





Pause with the Past

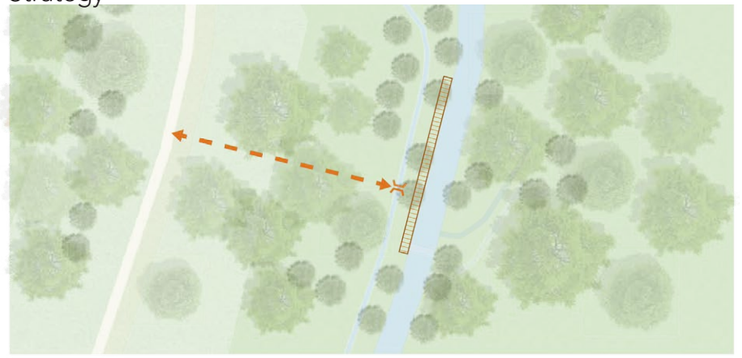
Node B - Intersection (Canal Villoresi)

This place is the intersection of two main canal, Patellano and Mossetta.

Before Plan Scale 1:400

section BB'

Strategy



Waterside Seating

Guiding path

Vertical Info

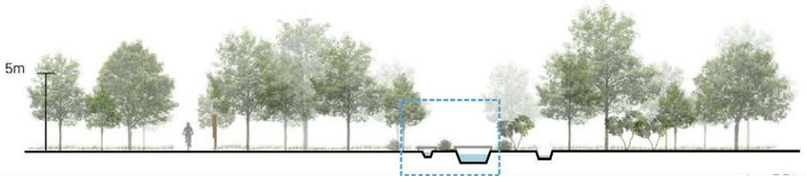
Bridge

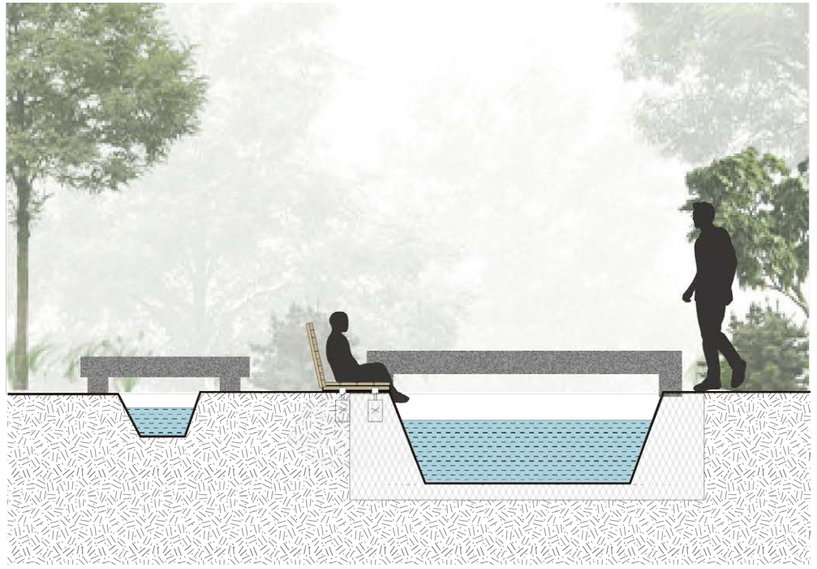
Remo

After design Plan

Scale 1:400

In our proposal, we created a guiding pathway that leads visitors through the forest to the riverfront, where they can sit and experience the space as a place for contemplation and meditation.



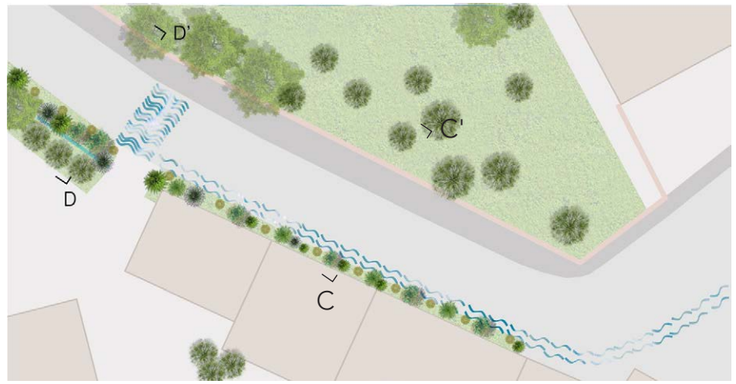


Revealing Canal History

Node C - Undergroundwater street

This street was once traversed by a watercourse that has now become invisible, buried beneath the concrete roadway.

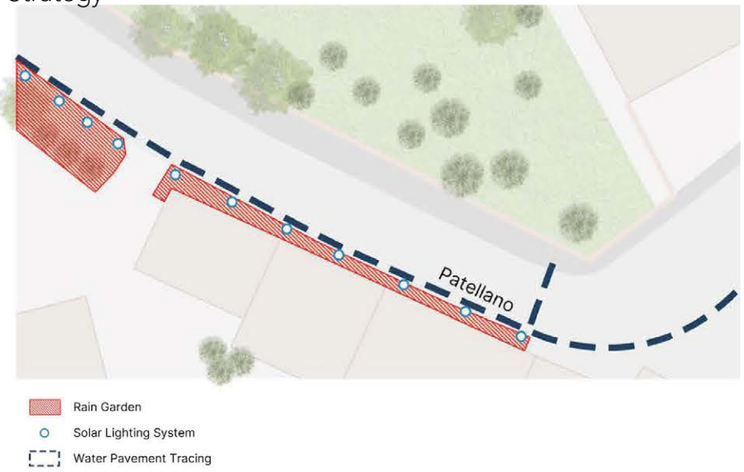
Before Plan Scale 1:400



section CC'

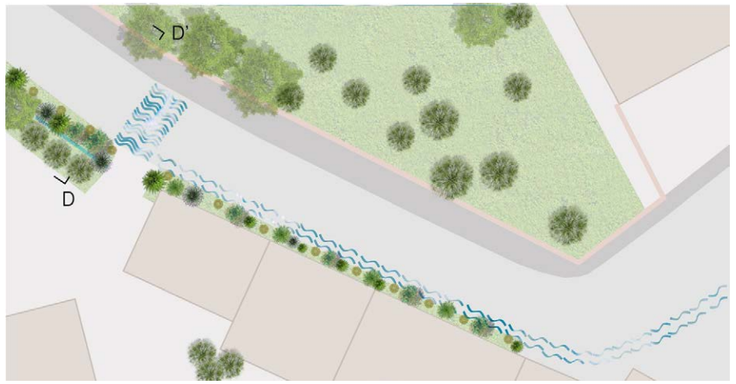
section DD'

Strategy

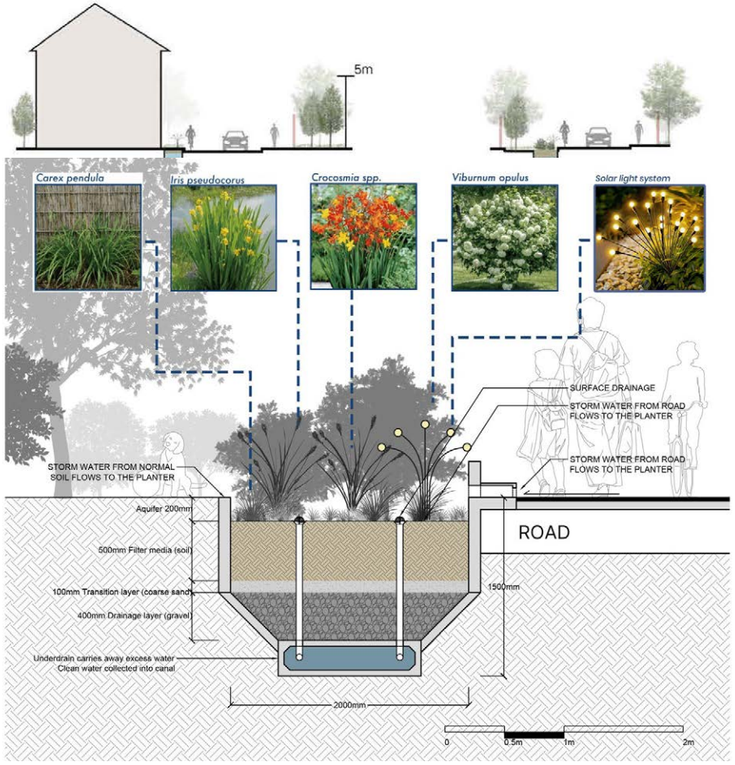


After design Plan

Scale 1:400



To reveal the invisible water history, we propose a series of low-impact landscape interventions—such as rain gardens, modified paving and crossing lanes, and a solar-powered lighting system—to evoke the presence of the former watercourse.

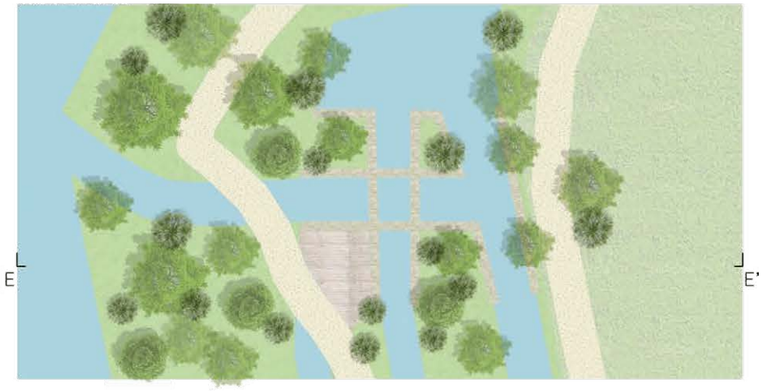


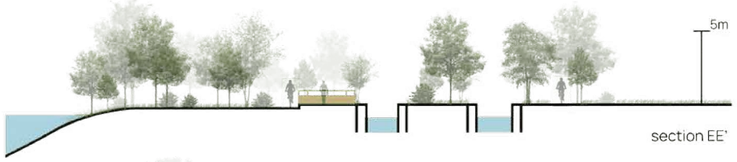
Unveiling the Canal's Story

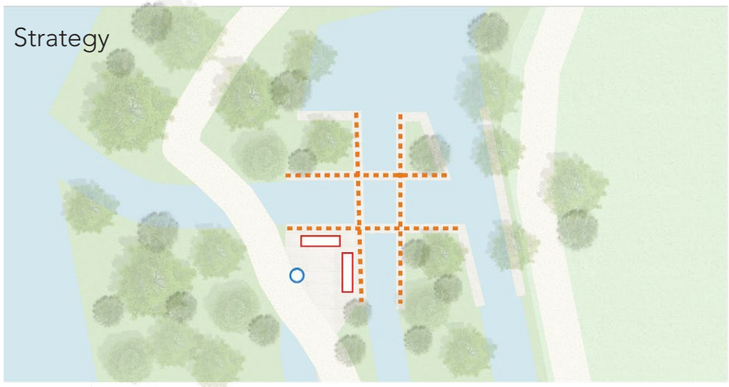
Node D - Trii-Baselloni

The Trii-Baselloni structure remains generally stable, with partial weathering of bricks and concrete surfaces. Moss and vegetation are spreading in joints, and localized mortar loss is evident. Metal elements show rusting, and wooden parts are aging but still functional.

Before Plan Scale 1:400



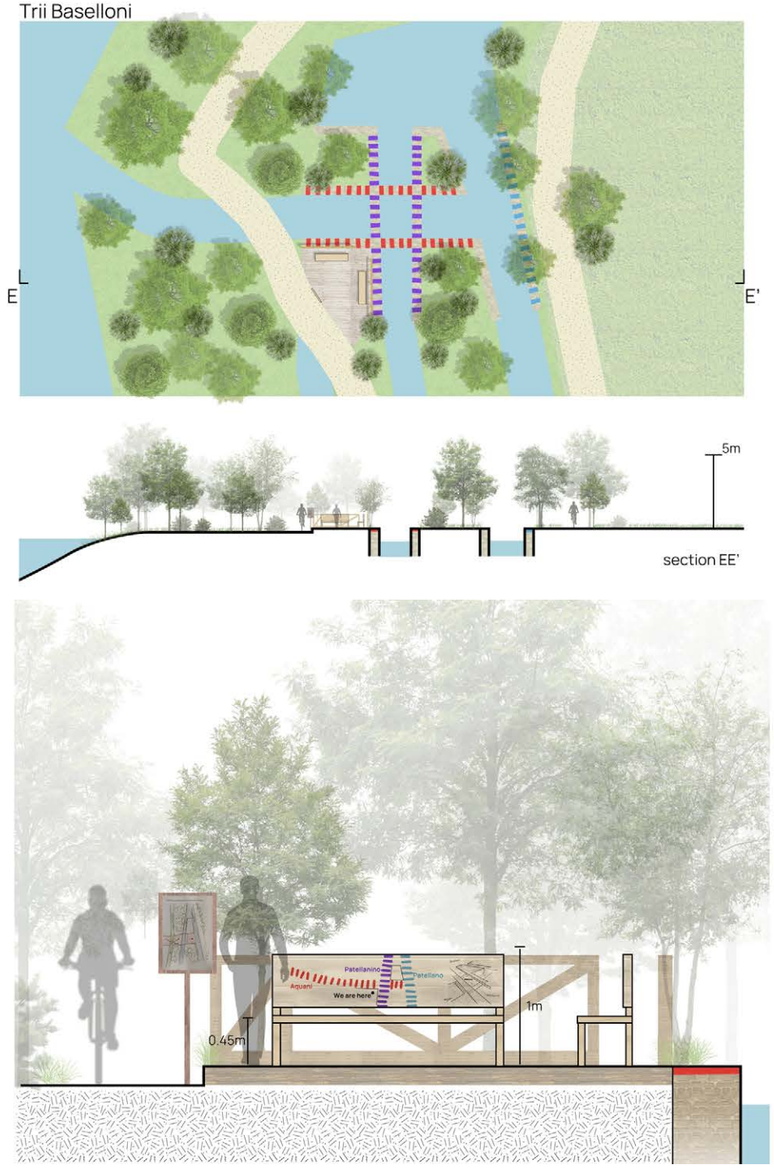




After design Plan

Scale 1:400

By applying distinct colors to selected artifacts and printing interpretive information on the seating elements, visitors can both relax in the space and learn about its historical events.



5.8 Perspective

Where Water is Born

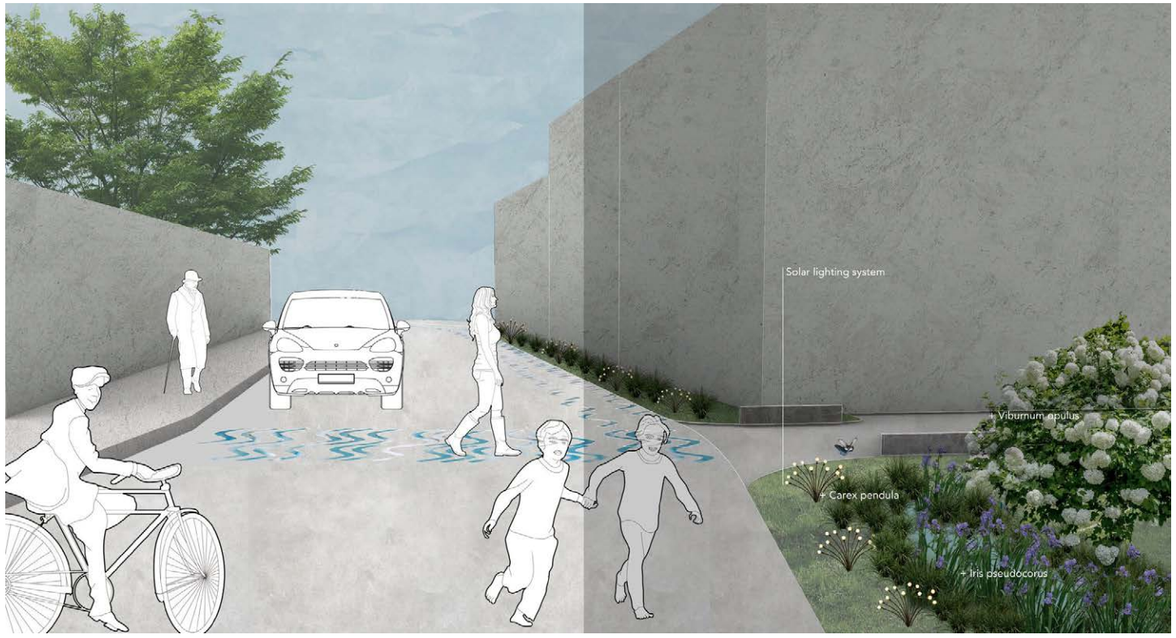
Node A - Patellano head

Pause with the Past

Node B - Intersection (Canal Villoresi)

Revealing Canal History

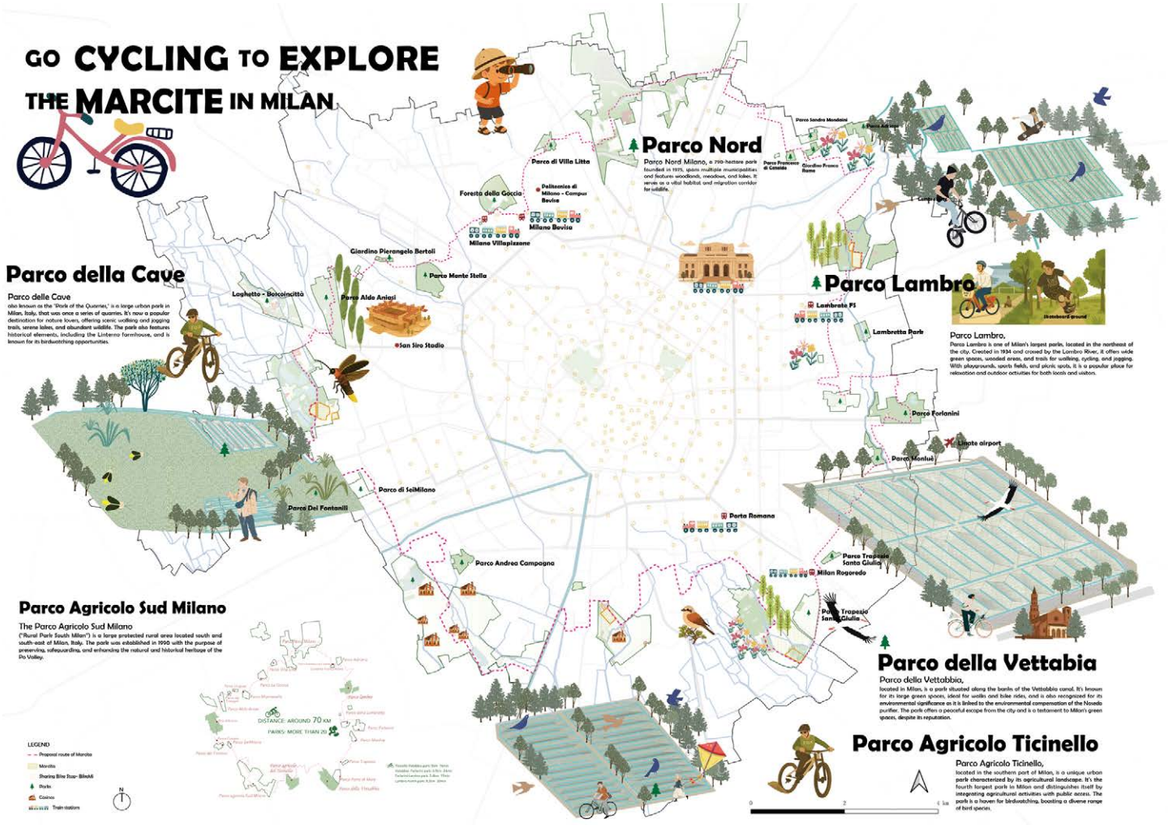
Node C - Undergroundwater street

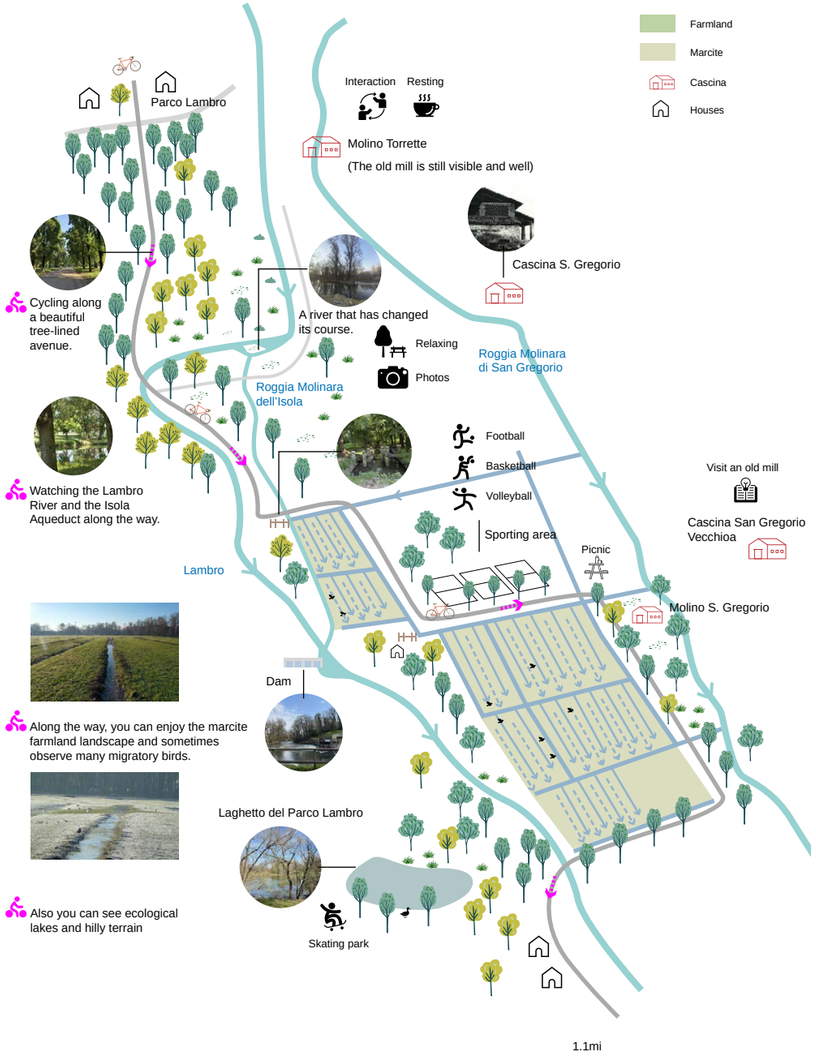


Unveiling the Canal's Story

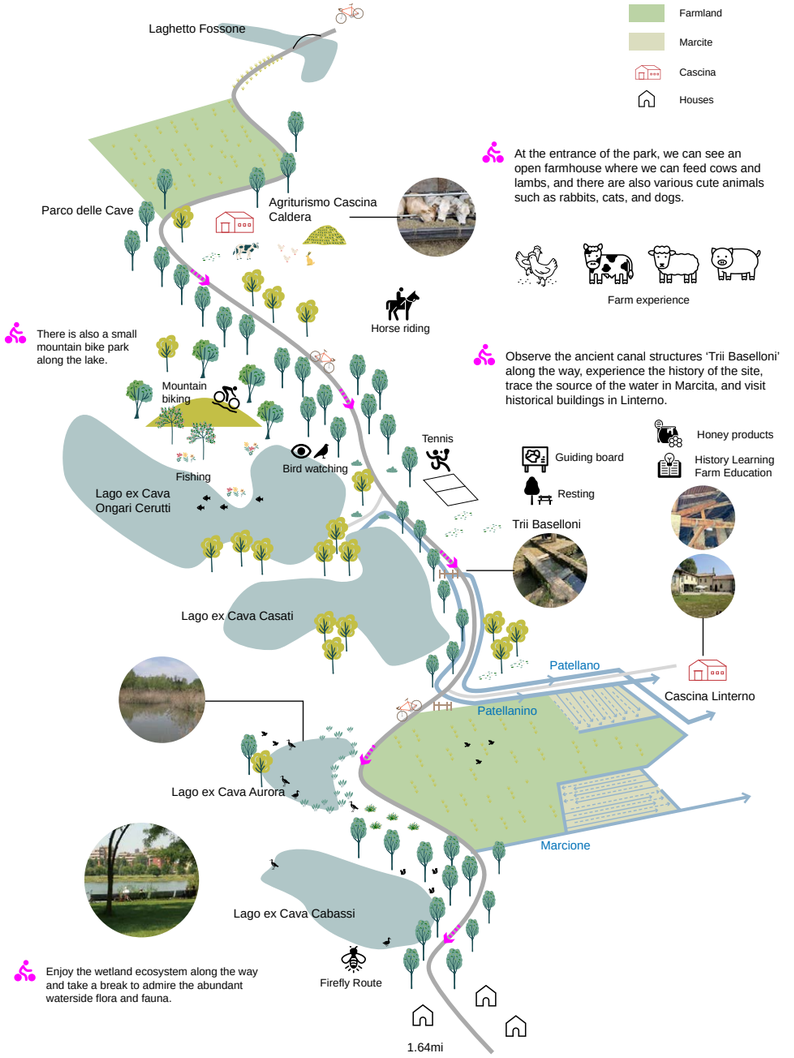
Node D - Trii-Baselloni

5.9 Tourist map





Parco Lambro



Parco delle Cave

Getting fresh milk

Feeding cows

Holding seminars

Parco Ticinello

Cascina Campazzo

Farmland

Marcite

Casina

Houses

Cycling past the still-working Marcite, where you can experience agricultural activities up close and personal.

Flying kite

In spring, the Kite Festival fills the park's sky with color, people can also make the kite by themselves; at the end of May, the Association's annual festival features traditional games (penolaccia, sack races, treasure hunts) and a variety of activities that change every year.

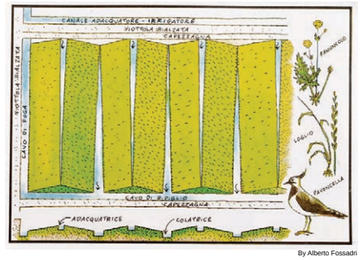
Cascina Campazzino

Every year the Ticinello Park Committee celebrates two evocative traditional village festivals: the Feast of San Martino (November 11) and the Bonfire of Sant'Antonio (January 16).

Organic fruit

Honey products

Organic vegetables



By Alberto Fossadri

The marcita (or marsèntâ in dialect) was a particular technique of permanent irrigated meadows, widespread in the Po Valley and arranged in such a way as to allow grass to grow even during the winter months. It developed especially in lower western Lombardy, where it was already widespread by the 13th century, and in the western Brescia area it really flourished during the 18th century, along the lines of resurgence springs.

1.47mi

Parco agricolo del Ticinello

Scuderia Cascina Grande

Horse riding

Farmland

Marcite

Cascina

Houses

Parco della Vettabbia

Cypress road with gravel, open view and fresh air.

Bird watching

Resting

Laghetto del Parco della Vettabbia

Eco education

"Bosco umido - Ecosistema filtro"

Ride past an ecological pond where you can rest and watch the birds by the pond.

Cycling through this section, you can enjoy the magnificent marcite farmland landscape and clearly see the canal.

Bird watching

Dam

2.09mi

Chiaravalle is on an ancient monk's route.

Special beers

Traditional cheese (Caseu Vetus)

Dining room

Cultural communication

History Learning

Honey products

Cultural product store

Flower garden

Parco della Vettabbia

Chapter 6
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