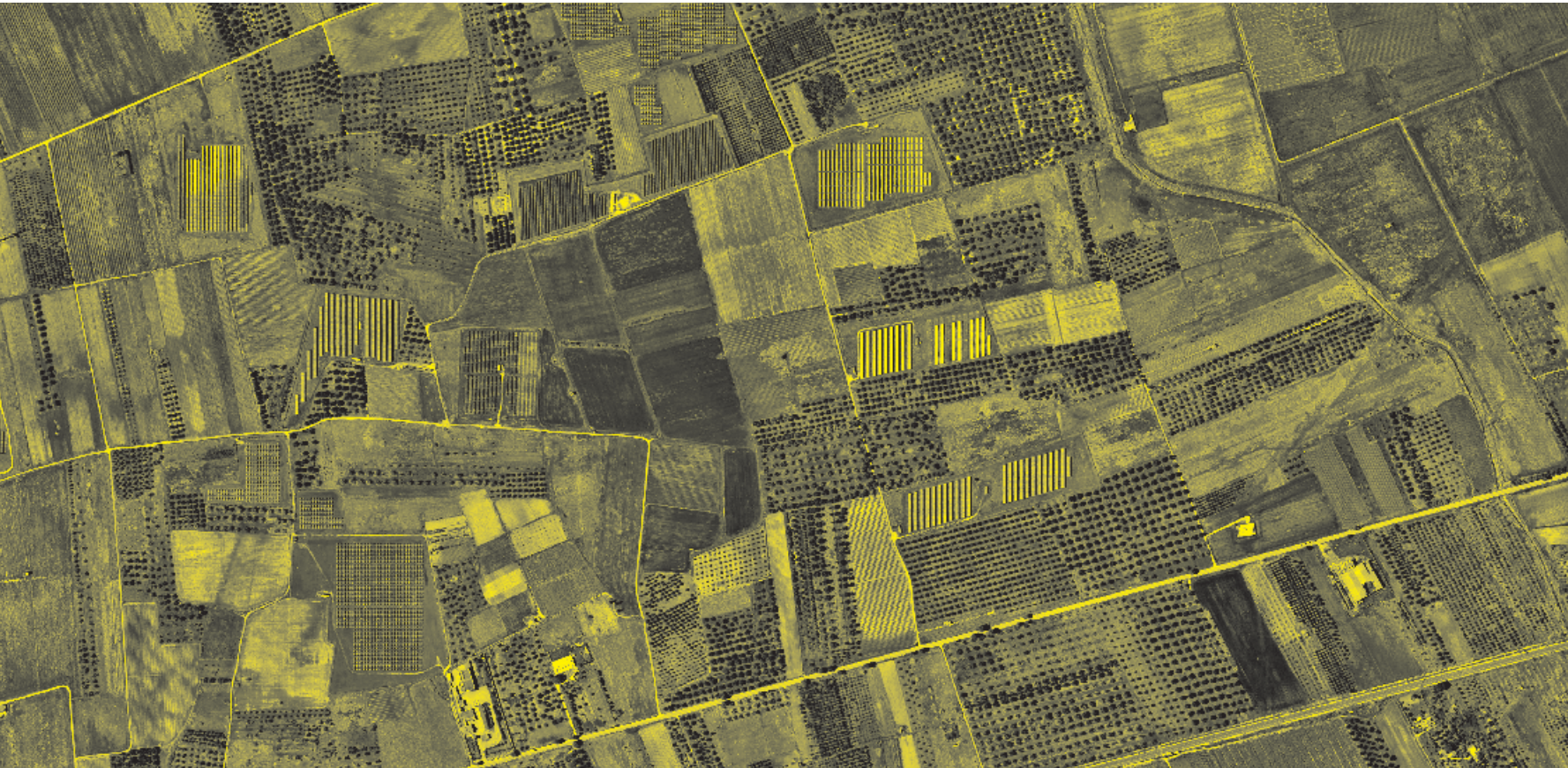
DESIGNING FORMS FOR FUTURE SOLARSCAPES

A VISION FOR THE ITALIAN PALIMPSEST

EDITED BY
ELENA VIGLIOCCO



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NEW PERSPECTIVES

INSIGHT

Renaturation as radical design

GIULIA CAZZANIGA

The objective of the intervention is to convert a necessary infrastructural dismantling – the decommissioning of the Single-Axis Tracking (SAT) photovoltaic power plant located within the Stura di Demonte river floodplain – into a proactive, design-oriented, ecological, and educational asset. The end-of-life stage of a photovoltaic plant is viewed as an autonomous and independent design phase itself, not merely as a endpoint, but as a process that guides and follows a strategic and architectural plan. It focuses on spatial relationships to develop a riverine landscape natural park capable of evolving over time. Dismantling encompasses technical procedures such as extracting cables and infrastructure, recycling panels, de-compacting soil, and removing paved surfaces. Conventionally, projects stop at these steps; however, we propose advancing this phase by conceptualizing it not as reverse construction[1], as our current regulation requires, but as an opportunity for innovative layout and design.

Shifting from restoration to rewildening

The project aligns with the morphological reorganization proposed by the Politecnico di Torino research unit and must consider decommissioning selected photovoltaic fields at the end of their lifecycle and operational efficiency, within a framework of reshaping the productive landscape. Based on our research and analysis, our role was to interpret in the most sensitive way the tendencies of this landscape, proposing the most adherent and forward-looking scenario of change possible.

For the Fossano case study, the strategic vision is to fully decommission the SAT photovoltaic power plant, ending its productive use and creating large-scale ecological change. This approach is based on a contemporary understanding of river landscapes[2], which sees rivers not as fixed channels but as dynamic, interconnected systems that include the active channel, floodplains, and riparian corridors. Critically, we oppose the notion of ecological restoration, the attempt to revert a site to a specific,

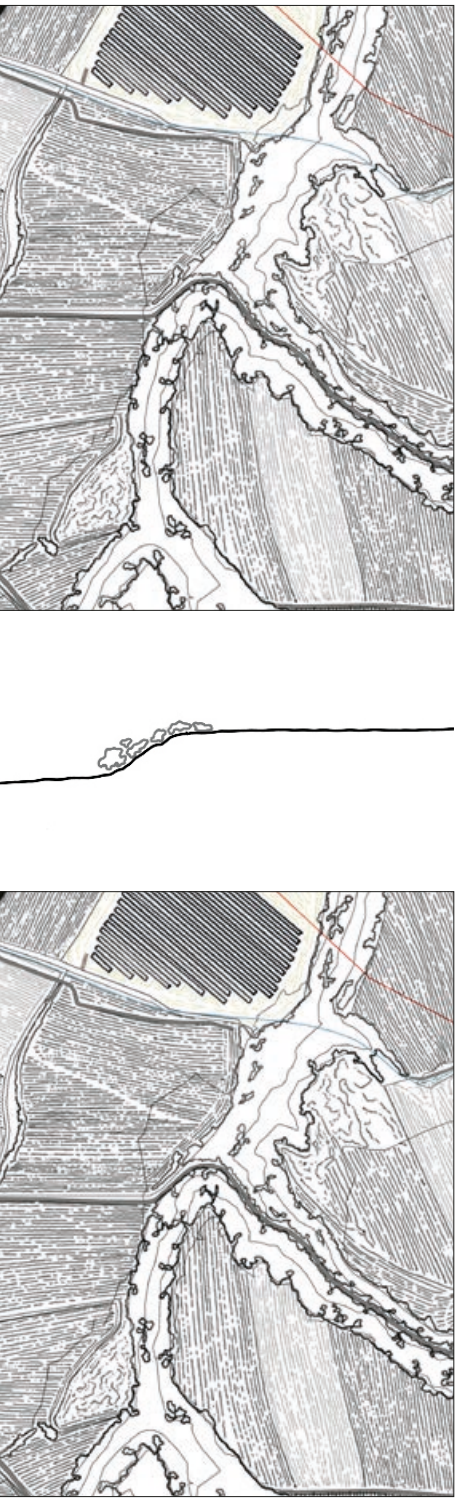
1 D.Lgs n. 199/2021, and Direttiva RED II UE 2018/200; D.Lgs. n. 190/2024.

2 Many studies are focusing on fluvial landscape, in particular I refer to Anuradha, Mathur, Dilip da Cunha, *Mississippi Floods: Designing a Shifting Landscape*, New Haven, Yale University Press, 2001.

idealized historical state, as both philosophically flawed and practically unfeasible.
As James Corner argues in *Terra Fluxus*[3], – which advocates for landscape as a dynamic process rather than a fixed form – the very concept of restoring a past condition is impossible; it imposes an arbitrary choice of a point in time to which the landscape must return, be it agricultural, post-reclamation, or primeval wilderness, and fundamentally ignores the irreversible, continuous co-evolution of land, atmosphere, and life. Therefore, renaturation advances beyond restoration towards rewilding, encouraging self-sustaining, evolutionary ecological processes.
The landscape architecture project aims to intentionally accept the area's inherent hydrogeological instability – a trait often seen as a liability – and strategically redirect it to support natural succession. This fundamental decision to shift the site's role from power generation to ecological process management through a design intervention is supported by a comprehensive assessment. Our research indicates that reasons for fully decommissioning and renaturing the site fall into two main categories: addressing issues like pollution vulnerabilities and site-specific risks, and seizing opportunities to enhance the site's history and redefine the narrative of the productive landscape. The site currently hosting SAT photovoltaic power plant poses two primary concerns linked to its presence within the riverbed area. First, the location subject's valuable energy infrastructure to high hydrogeological risk, making its eventual flood-related damage inevitable and economically unsustainable. Relocating solar production to a safer area directly addresses this vulnerability. Second, and more critically, the presence of photovoltaic infrastructure within the flood zone constitutes an ecological hazard. During flood events, the plant's embedded structures, including cables and foundations, risk contamination, leaching toxic substances into the soil and aquifer. Therefore, the complete removal of all technical components is not merely a step in the procedure, but a necessary preemptive measure to secure the environment and prevent long-term contamination of the regional aquifer. Furthermore, the site's environmental constraints make any form of intensive productive land use – be it photovoltaic energy generation, traditional agriculture, or large-scale farming – fundamentally ill-suited for the riverbed area. This is exemplified by existing practices, where current farming activities require strict regulation to manage sewage, a known contributor to regional aquifer pollution.
Given the land's critical hydrogeological function, the conversion to renaturation is the only strategic choice that removes the cumulative pressure of all inappropriate productive activities, prioritizing ecological resilience and environmental safety over short-term economic output.
In contrast to these liabilities, the site presents exceptional characteristics that offer significant design opportunities. First, decommissioning enables the ecological reconnection of the area with the adjacent Gesso and Stura River Park, reinforcing the

3 James Corner, *Terra Fluxus*, in Charles Waldheim, *The Landscape Urbanism Reader*, New York, Princeton Architectural Press, 2006, pp. 21-33.

GIULIA CAZZANIGA



Above. Drawing representing the actual condition of the site, before the dismantelling.

Below. Representation of the Project of rewildening to create the Riverine landscape park, illustrated at the territorial scale.

Hand drawings by Simone Baccaglini, 2025.

functional connectivity of the European Natura 2000 Network. Within this expanded ecological matrix lies the Foresta Fossile[4] (Fossil Forest), a unique palaeobotanical feature in northern Italy. Renaturation allows the park to expand, significantly enhancing its potential to host new educational and open-air museum experiences along the river.
The second deeper opportunity lies in the symbolic meaning conveyed by the site's morphology, which can be enhanced through a design choice that selects a clear narrative rooted in the area's evocative qualities. The strategic vantage point along the riverbank provides a privileged visual connection to the complex layers of human intervention that have shaped the landscape. The design of the new natural environment will highlight, rather than hide, these historical and engineering landmarks: the visible erosion phenomena, the urban dwelling of Fossano, the imposing modern architecture of the A6 bridge, a symbol of major anthropogenic alteration and connectivity, and the historical railway bridge, a monument of engineering merit.
By designing a new, structured natural environment – accessible only in designated areas – the landscape architecture project will transform the space into an active narrative, using these visual references to tell the comprehensive story of the productive landscape, its centuries of reclamation, and its continuous transformation.

Shifting from Procedure to Design

As previously stated, the dismantling phase of a photovoltaic power plant generally follows a systematic procedure involving technical steps to deconstruct the photovoltaic infrastructure and associated services. The decommissioning process is governed by specific legal and regulatory requirements, particularly concerning waste management and site restoration, and may commence after the completion of initial legal examinations and approvals. Furthermore, the decommissioning of the photovoltaic power plant must strictly comply with both national and European waste directives, principally the Waste Electrical and Electronic Equipment (WEEE) regulations.
The subsequent technical phase moves through three clear stages. First, the plant must be fully isolated electrically before all WEEE components – panels, inverters, and transformers – are systematically removed. Second, the mechanical infrastructure, including metallic support structures, is dismantled. Crucially, the final step involves the extraction of all foundations and buried electrical cables. This underground removal is essential for two reasons: mitigating the pollution risk from residual contaminants and preparing the site for new use. Following these extractions, the final mandatory technical action is soil decompaction to restore the ground's permeability and healthy state, especially where heavy machinery has caused disturbance[5].
In our vision, the mandatory removal and soil decompaction are transformed into the core design innovation, as we leverage

4 It is a type of archeo-botanical site where the remains of an ancient forest have been preserved in situ (in their original place of growth) through the process of fossilization.

5 D.Lgs. 387/2003 for renewables) explicitly includes the decommissioning obligations, timelines, and acceptable level of site restoration.

operational tools to sculpt new microtopography and deliberately shape the natural park's layout. These excavations reveal the hidden network of buried infrastructure that keeps the system active and connected within the site and to the wider network. From a design perspective, this can be seen as a purposeful grid made by these carvings, which creates precise spatial opportunities to shape and manage the future landscape.
Applying the renaturation to the fluvial landscape, the first consideration in this type of territory is to reflect on the role of water bodies, projecting them into future development and updating management to align with our current awareness of climate change. Instead of performing conventional "backfilling" to restore a uniform, flat grade, the decommissioning process becomes an active geomorphological intervention. The precise pathways of removed cable trenches will be intentionally widened and contoured to create localized micro-depressions and topographical variations. These features serve three strategic ecological and hydraulic functions: they act as temporary lamination tanks during high-water events, promote differential soil moisture and light exposure across the floodplain, and accelerate varied plant successions, thereby effectively controlling and leading the rewilding process. In this way, the operational necessity of hazard removal is precisely translated into a design opportunity, influencing the site's future morphology and hydrological performance. This vision fundamentally challenges the legacy of the historical drainage practices carried out over centuries to improve productivity. We aim to move beyond the philosophy of contemporary reclamation, which artificially limits water flow within systems created solely for exploitation. Instead, our goal is to develop an adaptive hydrological network that allows water to flow freely, serving as an effective flood mitigation measure. In fact, «rivers are not just made of water»[6], but of the water, the floodplain, the groundwater, and the flow of time[7]. This strategy is directly inspired by contemporary precedents, such as the Renaturation of the River Aire in Geneva (Atelier Descombes Rampini, 2002 - ongoing), a project that demonstrated how the controlled widening of the riverbed and the creation of designed wetlands allow the river to design itself[8]. This approach embodies two core principles: interrupting cycles of resource extraction and framing the fluvial elements as dynamic features that actively support the complex coexistence of various living organisms.
In line with this vision, the removal of paved surfaces, such as asphalt streets and de-paving connections, and the use of techniques to prevent earth compaction, become strategies that influence how people perceive and experience the pathway, beyond just restoring ecology, aiming for the maximum porosity across the site by cracking the surface. These measures open opportunities to create diverse spatial conditions by reinterpreting the old infrastructure in a new spatial system: the presence of the original grid is not erased permanently but, leaving the material in place, a trace of the past is incorporated into a slow metabolic

6 Elisa Cozzarini, *Gli intrecci del fiume, Piccole trame in equilibrio variabile*, Udine, Forum Editrice, 2023.

7 JV Ward, *The four-dimensional nature of lotic ecosystems*, in "Journal of the North American Benthological Society", 1989, n. 8 (1), pp. 2-8.

8 Georges Descombes, Julien Descombes, *Aire: The River and Its Double / La riviere et son double / Der Fluss und sein Doppelganger*, Zurich, Park Books, 2018.

process where natural elements, atmospheric events, and design choices concur to create a specific layout condition over time. This temporal strategy impacts both ecological recovery and storytelling: plant recolonization rates will vary depending on the size and gradient of the asphalt removal and, at the same time, the granulometry of the fractures can enable the development of different surfaces within the park suitable for walking, cycling, or exploring. This design intentionality, which prioritizes the evolution of the pathway over its fixed form, is exemplified by Wagon Landscaping practice. Their work treats depaving not just as a procedural method, but as a critical tool for defining architectural space, intentionally incorporating the ludic and experiential dimensions that are essential to the life of successful public landscapes[9].

Simultaneously, this approach extend to the plantation: in fact, rewilding doesn't mean inaction rather it requires design choices that establish a flexible, geometric framework guiding the process over time. This framework should be open-ended to accommodate natural developments and successions – a foundational structure that can evolve. This methodology is central to Michel Desvigne's philosophy of *Intermediate Natures*[10], wherein the designer acts not as a static creator but as a director of existing systems. As Desvigne states, the pleasure of this practice consists of combining, domesticating, and directing living systems, necessitating rigor and patience. The initial stage, therefore, involves rigorous mapping of the already-present vegetation on the site, using these spontaneous ecologies as the primary structural elements to be reinforced by new, context-appropriate planting. This principle directly relates to designing with existing vegetation and managing its evolution over time, as seen in the Bordeaux Rive Droite project[11], where the goal is not to create a permanent fixed form but to establish a pattern or impression that leaves a lasting trace in future natural developments.

Shifting from Design upon to Design within Landscape

This research presents a project hypothesis, a "vision" intended to trigger radical thinking about landscape transformation. Renaturation is not a passive withdrawal but a deliberate project and design choice that demands deep, interdisciplinary collaboration among ecologists, hydraulic engineers, and landscape architects. The success of this vision relies on establishing a shared framework that simultaneously resolves complex technical and hydraulic issues while imbuing the site with a renewed, proper landscape meaning. The proposed initiative is thus driven by the principle that ecological restoration must be actively guided by design, drawing foundational inspiration from Ian McHarg's environmental approach, *Design with Nature*[12]. This demands viewing the project as a dynamic process that operates across three interconnected conceptual pillars. First, the intervention requires Multi-Scale Design, working at the Territorial Level to position the renatured area as a vital link

9 Wagon Landscaping's depaving projects exemplify a philosophy of minimal transformation, in-situ recycling, and embracing living dynamics. See the landscape projects by Wagon Landscaping, *Jardin des Joyeux* and *Asphalt Jungle* in Paris. https://www.wagon-landscaping.fr/tous-les-projets [last access October 2025].

10 Michel Desvigne, Alexandra Gille, *Intermediate Natures: The Landscapes of Michel Desvigne*, Berlin, Birkhäuser Architecture, 2011.

11 Parc aux Angéliques, Right Bank (Rive Droite) of the Garonne River, Bordeaux, France. Extends from the Pont Saint-Jean to the Pont Jacques Chaban-Delmas, Michel Desvigne Paysagiste (MDP) 2012-2018.

12 Ian L. McHarg, *Design with Nature. Garden City*, New York, The Natural History Press, 1969.

13 Andrè Corboz, *The Land as Palimpsest*, in "Diogenes", n. 31(121), 1983, pp. 12-34.

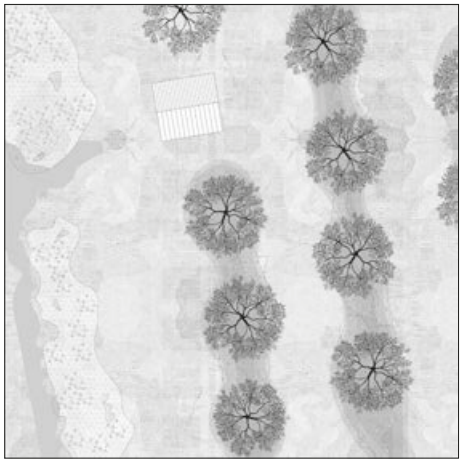
Schemes to illustrate the boundaries, technical structures, and biodiversity in their evolution, adaptation, and changes on site.

Diagrams by Marco Agosti, 2025.

1. Boundaries. The renaturation process blurs the boundaries between river beds and PV power plant surfaces. The margin becomes a threshold where a future of coexistence among various environments and species is possible.

2. Structures. The removal of infrastructures, cables, and foundations to create a new micro-topografy allows for a colonization of pioneer vegetation and the programmed plantation of new trees. The biodiversity will be enhanced by benefiting from varied soil composition, water availability, and sunlight exposure.

3. Biodiversity. The increase in biodiversity is also achieved through depaving. Over time, soil porosity will improve as asphalt is gradually removed and pioneer, as well as planted, species colonize the area.



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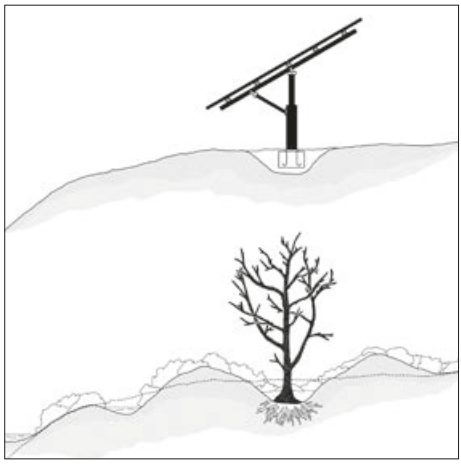

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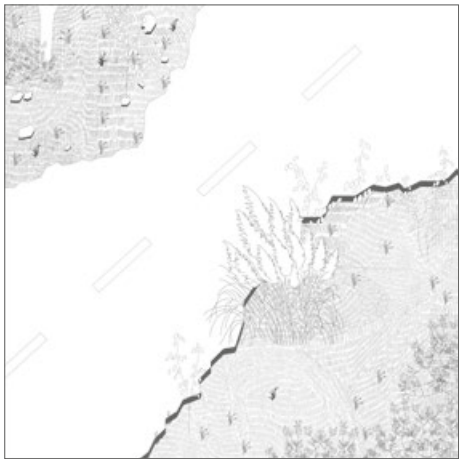

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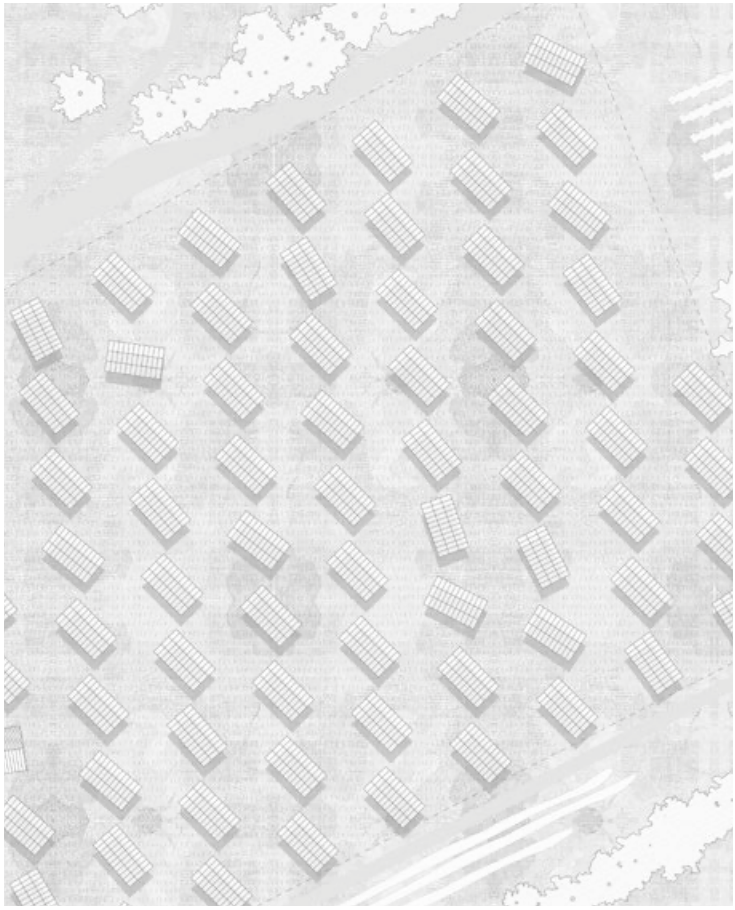
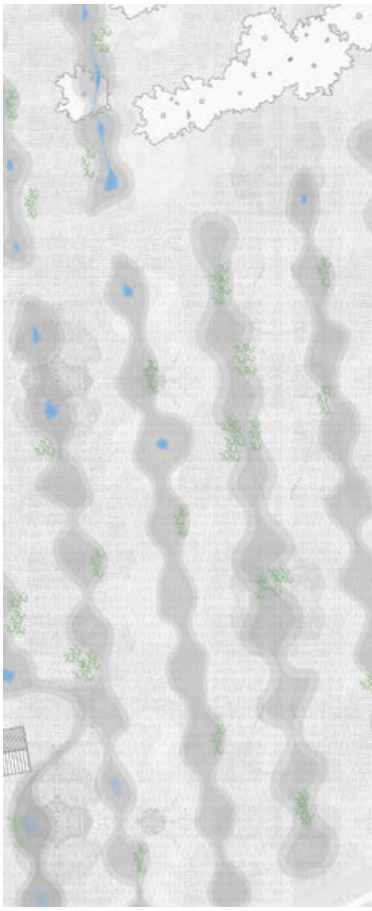
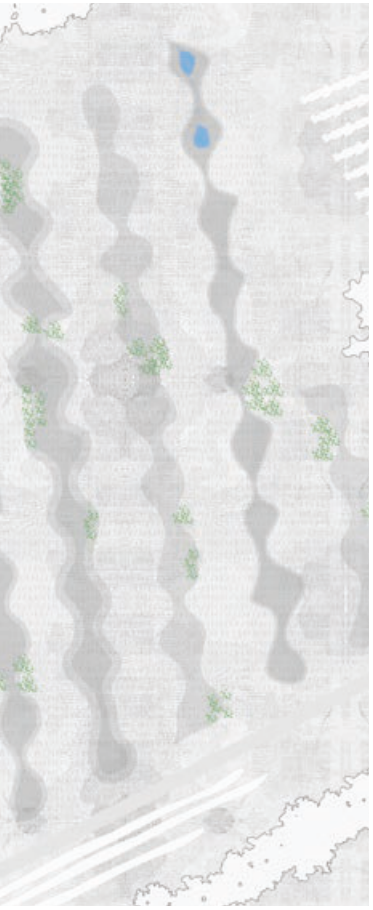


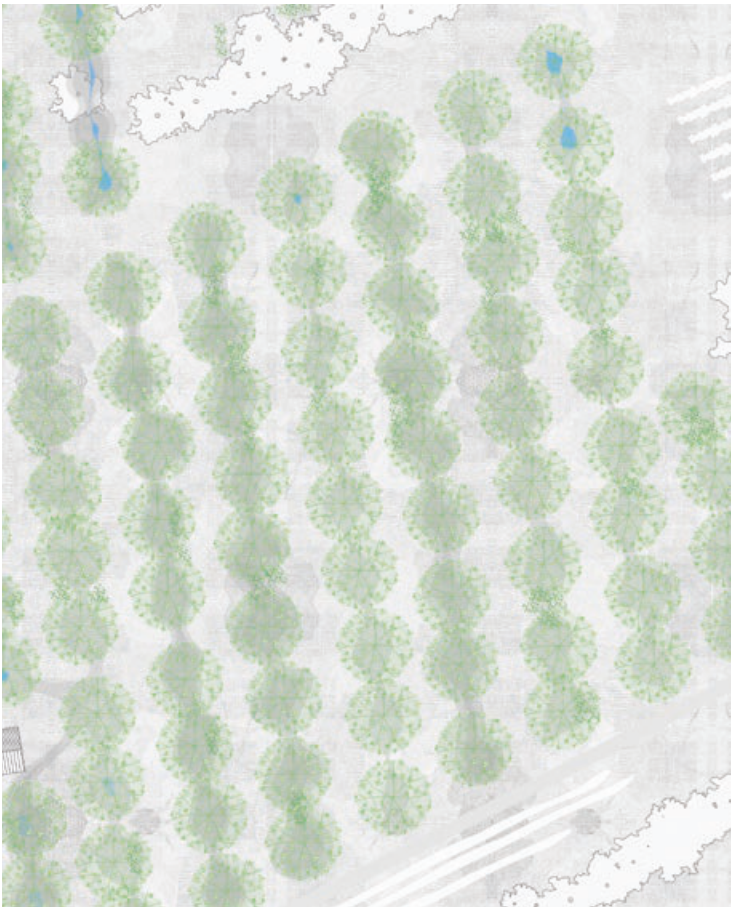


Drawings illustrating riverbed evolution through erosion and sedimentation on a design layout that will be erased.

Hand drawings by Simone Baccaglini, 2025.

within larger ecological corridors that enhance regional green infrastructure and biodiversity flow, and at the Local Level to facilitate ecological succession through the strategic use of pioneer species and geomorphological modifications. Second, the design adopts Corboz's theory of the Palimpsest[13]: the renaturation does not require erasing all traces of the photovoltaic field, but rather integrates them. The necessary civil engineering works – specifically the carving and trenching required to remove cables and foundations – become intentional linear disruptions designed as micro-depressions for water retention and topographical variations that promote diverse plant successions. Third, the project requires Intentional Design to specify the precise parameters for rewilding, including the management of early vegetation growth and the design of interfaces for public access and the Foresta Fossile's educational pathways. This

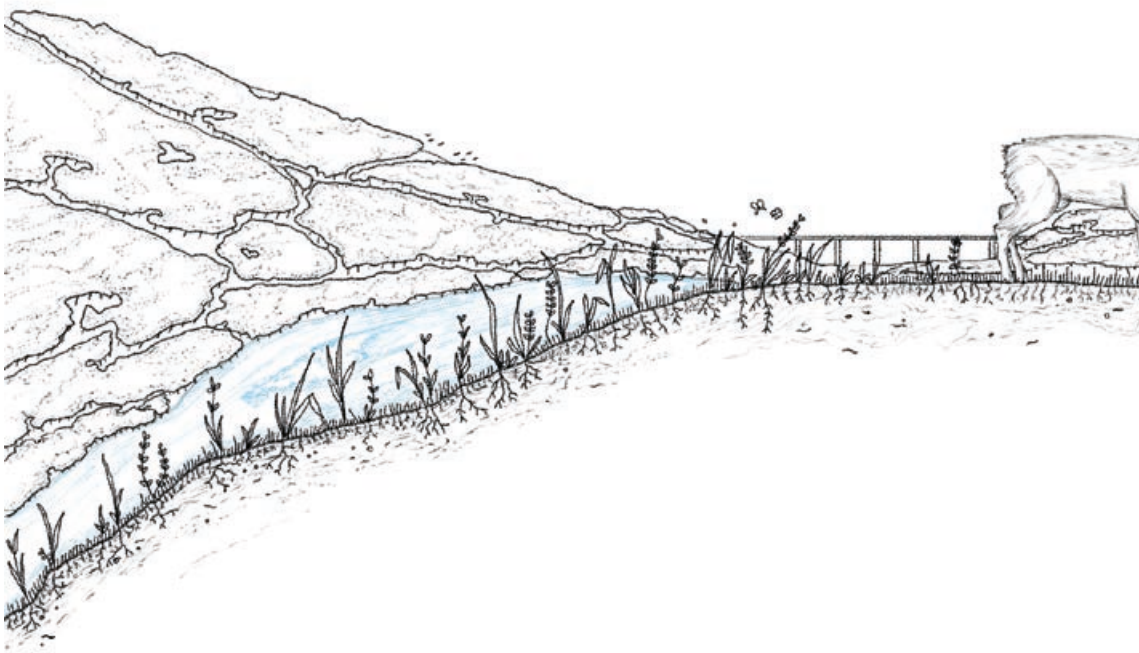


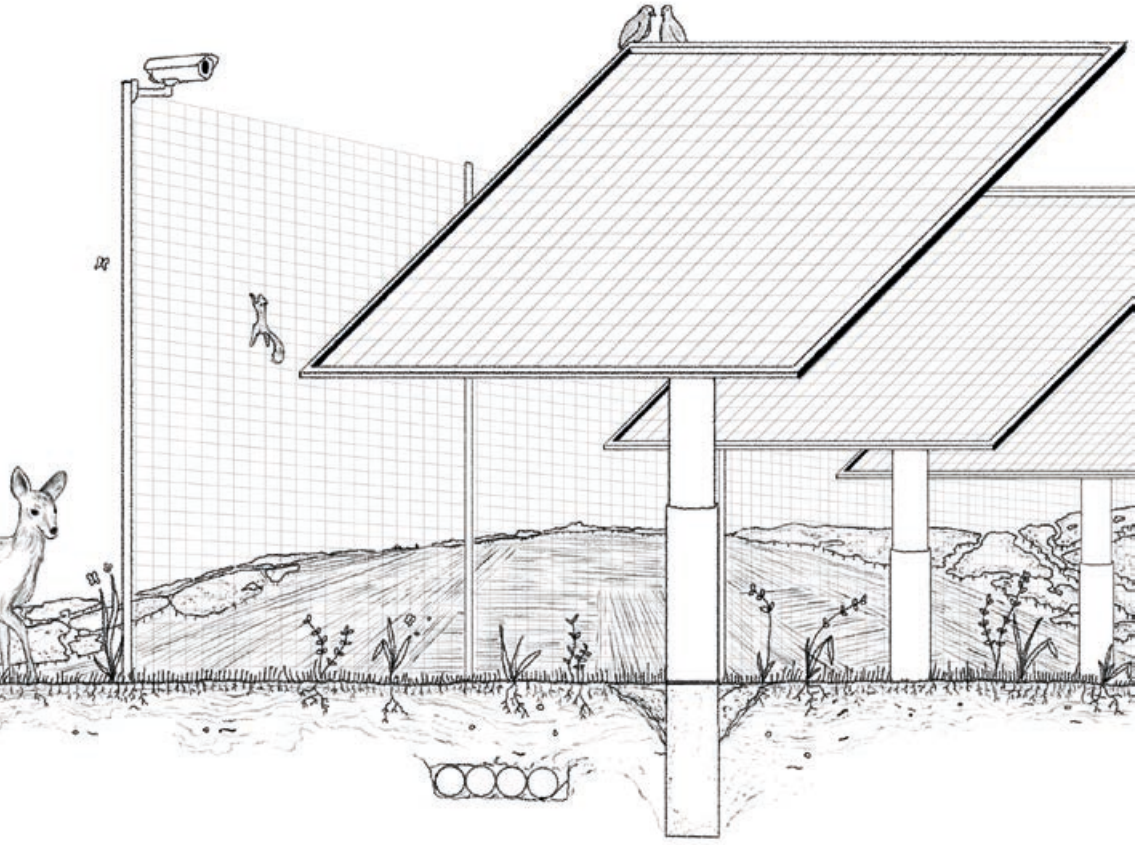


coherent strategy ensures the landscape is ecologically robust, structurally sound for mitigating hydrogeological risk, while narratively engaging for the new museum experience. Ultimately, by transforming the operational necessity of decommissioning into a deliberate, multi-scalar, and micro-topographic design act, this project proposes a definitive break from the extractive use-consume-restore logic. Renaturation, in this radical sense, is an active commitment to the landscape's dynamic processes, embracing the uncertainty of its future evolution and establishing a new paradigm of care, coexistence, and perpetual transformation.

Section on Fossano former SAT PV Power Plant, before its decommissioning.

Hand drawing by Simone Baccaglini, 2025.





Section on Fossano after the decommissioning envisioning the Riverine Landscape Natural Park.

Hand drawing by Simone Baccaglini, 2025.