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Against wastelanding: distributed design at the pace of soil in the Conca de Barberà

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ABSTRACT

This paper proposes a methodology for designers to work in the extensive yet marginal landscapes that are produced as part of the process of agricultural intensification. The distributed design approach, which focuses on enriching the existing bioinfrastructure of the soil, emerged out an ongoing research project in the Conca de Barberà, Spain. The project involves managing an interconnected series of currently unproductive on unmaintained fields through the rotational grazing of horses, with the hypothesis that the systematic grazing regime will catalyse soil biological activity. By attending to the soil infrastructure, the project necessarily developed a unique design approach. Management decisions became design problems and design work took on something of the call and response of management. Though it was shaped by the specific constraints and opportunities of the research project, the methodology is applicable to a wide variety of design projects in extensive landscapes with limited resources.

KEYWORDS

Landscape architecture; management; infrastructure; soil; regenerative agriculture; Spain

Introduction

Like much of southern Europe, the Conca de Barberà in northeast Spain spent the beginning of 2023 in the midst of severe drought (Morel, 2023). The effects were most legible in large agricultural landscapes, where extensive monocultures of crops such as wheat were yellowing in early spring, typically a time of fresh new growth fed by the winter rains. With harvests uncertain, the precarity of these landscapes and the systems that support them came into stark relief.

Such landscapes are shaped by patterns of uneven development that produce both simplified ecologies of intensive cultivation (Barua, 2022, p. 2) and their constitutive outsides; the marginal lands which are unproductive under the current agricultural regime. The former are a 'synthesis of field and factory' (Mintz, 1986, 47) that centralise production and create links to global markets. Centralisation is accompanied by a concomitant marginalisation of other landscapes (Schmid, 2012, p. 57). Traci Brynne Voyles (2015) describes this as *wastelanding*; the process whereby spaces are discursively produced as empty and devoid of relations, enabling practices of waste disposal and extraction that, in turn, serve as markers of their degraded status. Not only does wastelanding enable extraction in the present, but it also anticipates and legitimates future appropriation (Wolford, 2021, p. 1630). For example, Nitin Bathla (2023) shows how

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certain landscapes in the Aravalli region of India were classified as wasteland, enabling the extraction of value through enclosures and development projects. Such marginalised spaces, characterised by abandonment and legacies of extraction, have spread around the world alongside the 'modular simplifications' of capitalist agriculture (Tsing, Mathews, & Bubandt, 2019, p. 189).

Due to a combination of neglect and intermittent disturbance, these landscapes often host early successional, opportunistic plant communities. In the Conca de Barberà, pine trees and low shrubs proliferate in abandoned fields, and old structures are overgrown with vegetation. Such scenes can elicit hopeful visions of a redemptive Nature reclaiming and repairing anthropogenic damage (Millington, 2013, p. 287). Though seductive, this romantic notion establishes an artificial distance between ecological dynamics and human influence (Cronon, 1996), supporting the conclusion that it is best to allow these spaces to regenerate autonomously.

In contrast, this paper argues that it is precisely this distance that enables the exploitation of marginal landscapes. Instead of abandoning such spaces to ecological self-regulation, it is imperative to develop alternative forms of relation. Accordingly, the paper describes a design approach that was developed as part of a research project located near the town of Senan in Conca de Barberà province in Catalonia, Spain (Figure 1). The 10-year research project, which started in 2020, investigates the effects of the rotational grazing of horses on soil biological activity in a series of marginal sites. This 'wild experiment'[1] was enabled by a close collaboration between landscape architects at the Chair of Being Alive at the ETH Zurich and Marc Sánchez and Henar Gomez of Innova Horse Care, who co-designed the project and continue to care for the horses. As part of this larger transdisciplinary action research project, I conducted a series of semi-structured walk-along interviews with team members, residents, soil scientists, and ecologists over the span of five field visits from 2020 to 2023. Along with my colleagues, I

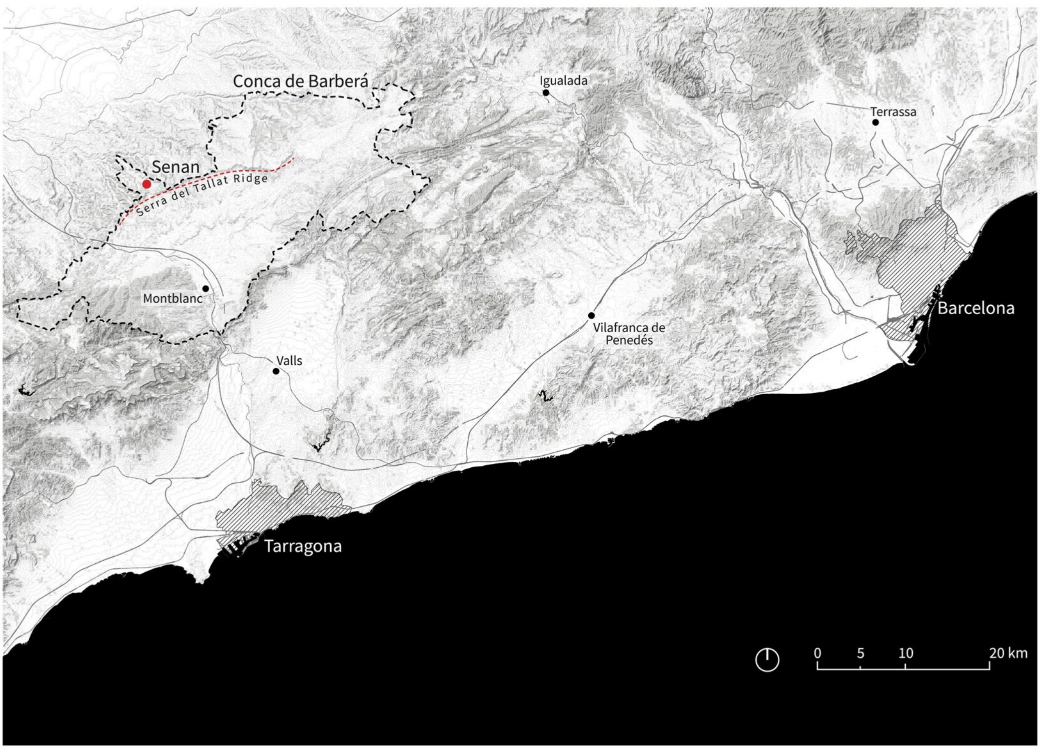

Figure 1. Territorial map situating the project site in Senan in the Conca de Barberà. Geodata from Institut Cartogràfic i Geològic de Catalunya.

conducted soil samples and vegetation surveys. Additionally, I reviewed geospatial data, archival documents, and reports, which inform my analysis of the region's transformations.

The paper begins by describing how the entwined dynamics of intensification and wastelanding transformed the agricultural system in the Conca de Barberà. It then introduces the research project; first articulating the soil infrastructure as the locus of intervention, and then illustrating the rotational grazing strategy at the centre of the project through a case study of one of the fields, Pla del Mut. This provides a concrete example of how the project team integrated management and design practices. This theme is further developed in the next section describing the distributed design approach, which aims to enhance the existing 'bioinfrastructure' of the soil (Puig de la Bellacasa, 2014) through iterative management. The conclusion argues that new design methodologies and project structures are necessary to affect change in these extensive and overlooked landscapes.

Tracing intensification and wastelanding in the so-called-forest

Coming to the region as an outsider for the first time in 2020, the landscape appeared fixed. Located in the north of the Coca de Barberà, the territory contains a series of parallel dry valleys that run perpendicular to the Serra del Tallat ridgeline. The valley floors feature the most fertile soil, and these gently sloping areas are terraced with dry-stone walls that support the cultivation of cereals. The steeper side slopes are also terraced, with the walls running perpendicular to those in the valley bottom. These terraces, narrowing as the slope becomes steeper further up the hillside, support olive trees, almond trees, and vineyards. Further up, the terraces are increasingly uncommon, and pine trees dominate. The relationship between this agricultural logic and the topography is visible in Figure 2. Organised around the availability of water, this pattern responds to the region's Hot Summer Mediterranean (*Csa*) climate with its three-month summer drought, as well as the geological condition featuring layers of predominantly calcic sedimented material. It was easy to imagine the agricultural logic had persisted unchanged for centuries. In fact, it soon became clear that this was a territory in flux. To attend to these patchy more-than-human dynamics (Tsing et al., 2019), I describe the extent and effects of the region's transformations through a tour of one of the woodlands that occupy the ridges around Senan.

What appears to be a homogenous forest from the outside is, upon closer reading, a mosaic of plant communities shaped by divergent histories of management and neglect. It is, perhaps, not even a forest at all.[2] Upon entering the woodland, it is possible to determine the dominant species; the Aleppo Pine (*Pinus halepensis*). It soon becomes clear that many of the trees are showing signs of decline. Some are tilting to the side; others are covered with mistletoe (*Viscum album*), a hemi-parasite that weakens its host over time (Lázaro-González et al., 2021). The fact that the trees are all the same age and *Pinus halepensis* seeds require full sun to germinate (Ne'eman, Goubitz, & Nathan, 2004) suggests that are early successional pioneers which grew together in an open field.

If one continues walking upslope through the pines, eventually they will pass dry stacked stone walls; the same walls that support the terraced fields below. These walls record the high-water mark of agricultural production in the region. They likely originate from an economic boom in the second half of the nineteenth century, when the arrival of the phylloxera insect decimated French vineyards, causing a spike in grape production in Catalonia and the subsequent cultivation of marginal areas through the construction of new terraces (Badia-Miró, Tello, Valls, & Garrabou, 2010). This boom was short-lived. Phylloxera arrived in the Conca de Barberà in 1893, precipitating an economic crisis and the abandonment of many of the newly constructed fields (Llobet i Portella & Bach i Riu, 1983, p. 293).

The late nineteenth century was not the only moment of change. Many fields were abandoned following the industrialisation of agriculture, which in this part of Catalonia proceeded slowly until 1950, and rapidly thereafter (Cartanyà Martí, 2010, p. 18). Before this transformation,

Figure 2. The existing agricultural system responds to the topography, with cereal crops in terraces along the valley bottoms; almonds, olives, and grapes in smaller side terraces; and pine trees along the ridge tops. Credit: Shen He, Chair of Being Alive, ETH Zurich.

the agricultural system relied on animals for both power and nutrients. Raising animals and growing crops were complementary activities, with the waste from one supplying the needs of the other (Cartanyà Martí, 2010, p. 131). An integrated system of livestock and crop management supported a heterogeneity of land uses with minor changes from the 1860s through the 1950s (Tello, Garrabou, Cussó, & Olarieta, 2008, p. 116). This reciprocal system disintegrated as the region became increasingly linked to global markets, which supplied fertilisers and absorbed surpluses (Cartanyà Martí, 2010). Simultaneously, farm machines replaced draft animals. These machines centralised and intensified production (Tello et al., 2008, p. 105). Not only were certain steep or narrow fields no longer accessible, but it also became increasingly efficient to farm larger parcels of flat land, making the marginal land no longer worthwhile to cultivate (Foster, 2016). The high costs and associated risks of buying the machines incentivised farmers to ensure predictable and productive harvests. This meant sowing new varieties of high-yielding seeds, which in turn demanded new fertilisers and phytosanitary treatments to protect the plants from diseases (Museo de la Vida Rural, 2020). Generally, this transformation led to a reduction of spatial complexity and biodiversity (Tello et al., 2008, p. 114). The changes can be seen in in Figure 3, where a comparison of satellite photos from 1946 and 2020 attests to the widespread abandonment of marginal fields and intensification of production in the valley bottoms. These former fields are now forested, corresponding to the uppermost portion of Figure 2.

Comparing the two satellite photos also reveals that some areas have been covered with trees for more than three quarters of a century. Although seemingly unchanged from an aerial perspective, these spaces have also undergone a dramatic transformation. Returning to the forest, if one walks long enough, at some point they will find a stand of multi-trunked Holm Oaks (*Quercus ilex*). These are overgrown coppices, once cut every 20–40 years but likely abandoned since the 1950s (Unrau et al., 2018, p. 333). They attest to the metabolic relationships that linked the forest to the agricultural system. The harvested wood provided energy for cooking and heating. It was also burned in small structures called *formiguers* and the resulting charcoal was spread on the fields as fertiliser (Olarieta et al., 2011). Many of these stands of coppiced oaks were managed as commons (Guadilla-Sáez, Pardo-de-Santayana, & Reyes-García, 2020). Now privately owned, management patterns have changed. Instead of slow-growing oaks, landowners favour the straight wood and fast growth of the pines, often clearing young oak trees that grow in the pines' shade (Folch i Guillén, 1986, p. 99). Hasty logging operations left

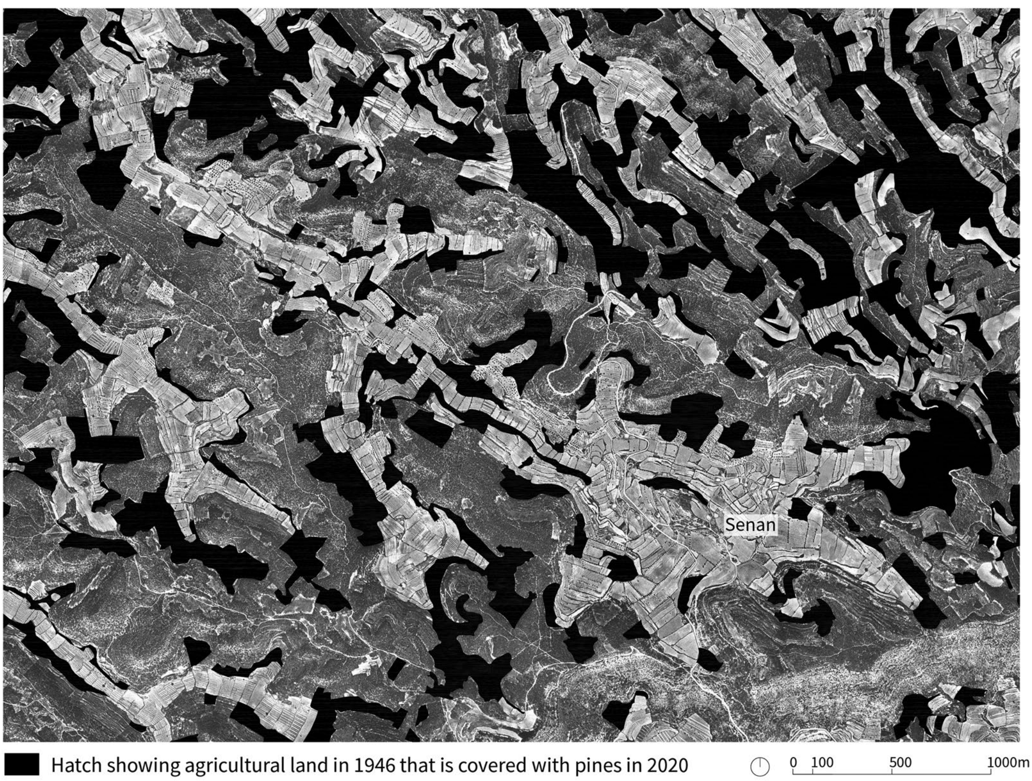

Figure 3. Map of fields abandoned between 1946 and 2020. Orthophotos from Institut Cartogràfic i Geològic de Catalunya. Credit: Chair of Being Alive, ETH Zurich.

behind slash piles of unwanted wood, exacerbating the existing fire danger (Ne'eman et al., 2004). Elsewhere, a patch of forest near Senan was recently cleared for a manure pond supporting nearby industrial pig farming operations. This analysis of the forest shows how the entwined dynamics of intensification and wastelanding have shaped the landscape around Senan. Former fields are now covered in declining pines, at risk of fire and further exploitation. Rather than a romantic narrative of previously agricultural land returning to so-called nature, the disinvestment in these spaces opens opportunities for new forms of extraction that proliferate in marginal areas.

Building a soil infrastructure through rotational grazing

While the vegetation provides the most visible evidence of the transformation of the region, the relatively ephemeral plant communities express the condition of the soil.[3] Formed by the region's history, the soil is the connective tissue linking the disparate elements, establishing the site's limitations and potentials (Krzywoszynska & Marchesi, 2020). While there is no detailed soil map of the project area, through interpolation, it is possible to define three main soil types: the deep *Comapregona soil* located in the valley bottoms; the *Emprius soil* running along the mid-slopes; and the *Morull soil,* which is the shallowest and is found on the tops of ridges (Mapa de sòls, 2018). The three typological soils provide a basic framework within which a wide range of alternatives are possible. The classification defines the key parameters of these soils, such as weak development, a high pH, a texture ranging from loam to silty clay loam, and soil depth decreasing higher up the slope (Mapa de sòls, 2018). While it reveals the weak soil development shaped by the climate and the high pH due to the calcareous parent material, the classification provides little information about the biological activity, which is increasingly recognised as a key factor in the soil's ecological performance (Gobat, Aragno, & Matthey, 2004). Biological activity, encompassing the metabolism of soil inhabitants, varies dramatically over relatively short temporal and spatial scales, and it is significantly affected by vegetation cover and management practices (Nannipieri, Greco, & Ceccanti, 1990). The role of anthropogenic dynamics in soil formation reveals soil to be a profoundly social entity; shaped by agricultural techniques and production systems, both a product and archive of the region's history (Engel-Di Mauro, 2016).

Maria Puig de la Bellacasa's conception of soil as a 'bioinfrastructure' helps to define the project's locus of intervention. She builds on Susan Leigh Star's description of infrastructure as 'invisible, part of the background for other kinds of work' (1999, p. 380) to argue that soil functions as the 'dismissed infrastructure of the *bios*' (Puig de la Bellacasa, 2014, p. 2). Like landscapes, infrastructures are not only composed of things, but also the relations between them (Larkin, 2013, p. 329; Olwig, 2003, p. 875). There is much attention to how landscapes can function as infrastructure (Bélanger, 2017; Milligan, 2015), but this is marked by a focus on 'built things.' That is, infrastructure as composed of technical objects (Davis, Holmes, & Milligan, 2015). By instead emphasising the relational qualities of these landscape infrastructures, it becomes possible to design with the more-than-human relations that 'generate ambient environments of everyday life' (Barua, 2021, p. 1,468).

To counter the ongoing marginalisation of the abandoned fields in Senan, the research project attempts to enrich this living infrastructure. Since a soil infrastructure is composed of continuously reproduced relationships, it necessarily develops over time. Accordingly, the research project adopted an incremental approach. In 2020, designers from the ETH Zurich partnered with local landowners and landscape managers. Together, the team developed a strategy to manage an interconnected series of marginal fields through the rotational grazing of horses. The majority of the horses arrived from the shelters operated by Asociación Defensa de los Équidos, which supports animals that have been mistreated or abandoned. The parameters of the rotational grazing system became key variables in the design process, allowing the project to incrementally affect the soil condition in an extensive manner. The following section describes this approach using the example of Pla del Mut, one of the project sites.

Rotational grazing at Pla del Mut

Like the other project sites, Pla de Mut is characterised by histories of intensive cultivation. Prior to our involvement, the area was hastily logged, leaving behind crooked, unsaleable pines and piles of wood. In November 2023, the project team visited the site, which is one of the 8 fields distributed throughout the valley that constitute the research project (Figure 4). At the time of the visit, the project's fences, which divide the field into 23 paddocks approximately 1,000m2 in size, had already been installed. One of the paddocks was occupied by 8 horses[4] intently grazing the mixture of grasses and low shrubs. The horses remained there for a single day, grazing intensively before moving onto another paddock, which was chosen based on where the plants were in the best condition to receive them (Figure 5).

As with any rotational grazing strategy, the precise timing and intensity of these simple actions are crucial. Rotational grazing is a system for dividing a given field into smaller paddocks and moving animals between them, allowing the remaining paddocks time to regenerate (Mann & Sherren, 2018). The approach used in this project builds on the Pastoreo Racional Voisin (PRV) method first developed by Andre Voisin in the 1950s (Voisin, 1959/2021). Typically used in extensive cattle farming, PRV is a method for 'managing the soil–plant–animal complex through direct grazing and well-planned pasture rotation' (Pinheiro Machado Filho et al., 2021, p. 3) that has been modified to the needs of many ruminants, including horses (Undersander, Albert, Cosgrove, Johnson, & Peterson, 2014). In comparison to other forms of rotational grazing, such as mob grazing and the Savory system, PRV typically features intensive management, since the

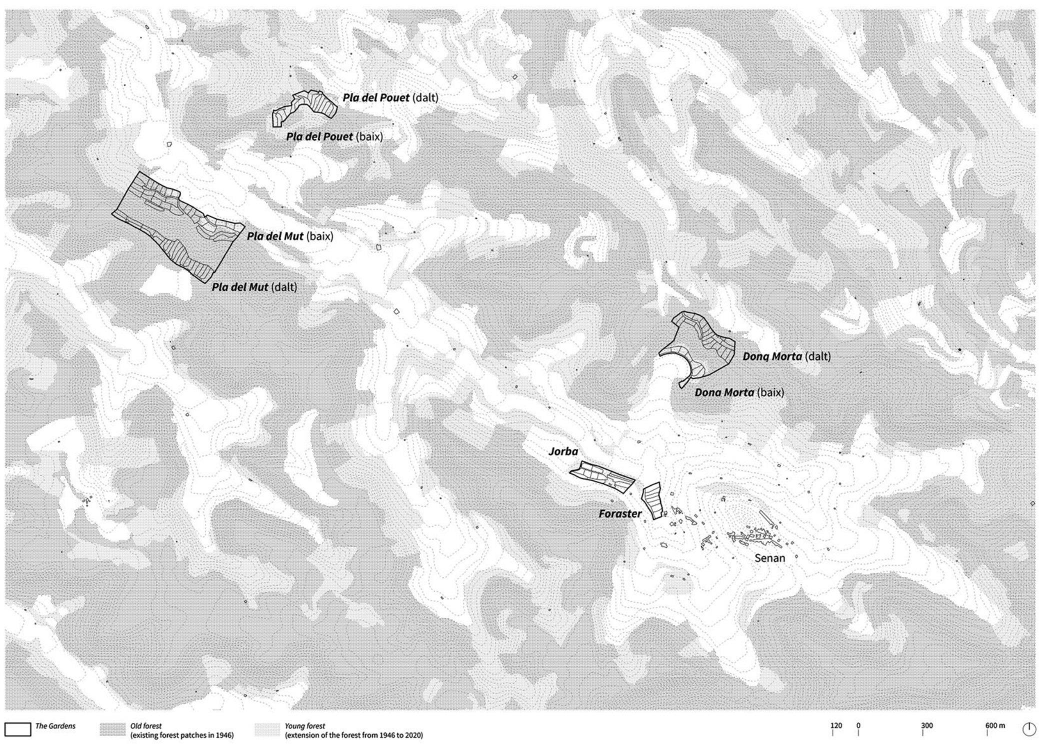

Figure 4. Project sites distributed in valley in the region of Senan divided into paddocks. Credit: Chair of Being Alive, ETH Zurich.

Figure 5. Horses grazing at Pla del Mut. Credit: Chair of Being Alive, ETH Zurich.

animals move to a new paddock each day, lower stocking densities, and rest periods determined by the regrowth of the vegetation.

This project deployed PRV as a land management strategy. Two variables are particularly important: the intensity of grazing and the duration of rest between visits.[5] The fences that divide the fields into paddocks serve to modulate these two variables. First, the fences define the area that will be grazed each day, thus determining the intensity of grazing. In PRV, the paddock should be small enough that it is grazed uniformly but large enough that plants are not grazed twice, which translates into short occupation times with stocking densities higher than found in continuous grazing (Voisin, 1959/2021). This intensive grazing concentrates the horses' manure and urine in a small area, which promotes the decomposition of the organic matter and its incorporation into the soil, thus fuelling the plants' regrowth (Pinheiro Machado

Filho et al., 2021, p. 5). Along with controlling the intensity of grazing, the fence system determines the duration of the rest period between visits. In the PRV system, grazing should occur after the plants' Optimum Recovery Period (ORP), which means immediately before the plant redirects its energy from vegetative to reproductive growth (Pinheiro Machado Filho et al., 2021, p. 4). Following the initial grazing, the plants use their energy reserves to grow new aerial shoots. When the plants have accumulated sufficient energy in their root system for vigorous regrowth, but before flowering, the plants have completed their ORP, and the foliage contains maximum nutrients for the grazing animals (Voisin, 1959/2021). Grazing at this moment catalyses a chain of biological reactions that contribute to the mineralisation organic matter and the formation of soil aggregates (Gobat et al., 2004, p. 77). By delaying the reproductive phase, carefully timed grazing intensifies these exchanges with the soil ecosystem as the plants work to regrow and replenish reserves. The land manager watches the vegetation, deciding when the target species in each plot have completed their ORP and are ready to be grazed again.

After closely observing how the plants responded to grazing, Sánchez determined that the grasses at Pla del Mut, such as *Brachypodium retusum* and *Avenula pubescens,* were not regenerating as quickly as anticipated, likely a result of the unseasonable drought. After discussing the options, the team decided to adjust the fence layout so the paddocks could expand, reducing the total number of paddocks in the project, but allowing the horses a larger area to graze each day. This capacity for adaptation was built into the initial design, which combined a robust perimeter fence incorporating salvaged wood with mobile interior fencing. While it reduced the total number of paddocks, increasing the average size provided additional forage for the horses and decreased grazing pressure on the grasses, reducing the chance of overgrazing and allowing the plants to recover fully before the horses return.

Distributed design approach

After several years, a specific way of working emerged out of the project's unique goals and constraints, particularly from the aim of modifying the web of living relations that compose the sites' soil infrastructure. As a shorthand, this methodology can be called a distributed design approach. The design process is both distributed over time, expanding to include what is normally considered the maintenance phase of the project, and also distributed among multiple actors, granting design agency to those who manage the project. It is inspired by adaptive management, a widely accepted but unevenly applied technique in the natural sciences for managing dynamic ecosystems (Allan & Stankey, 2009). Adaptive management has been slow to hybridise with design methodologies in landscape architecture (Kato & Ahern, 2008, p. 543). Instead, landscape projects typically follow the phases of an architectural project (Davis & Oles, 2014), with limited overlap between design and maintenance phases (Hopper, 2006, p. 26). This is beginning to change as designers and researchers recognise the limitations of this model (Geffel, 2021; Raxworthy, 2018). Instead of a sequence of indefinitely repeated actions, maintenance can become an interdisciplinary locus of ongoing design exploration, providing opportunities for participatory decision-making (Chambelland, 2021), sharing design agency (Waterman, 2017; Terremoto, 2023), and contesting the division of labour that underlies the reproduction of landscapes (Franco, 2022; Jacobs & Wiens, 2023).

The distributed design methodology builds on this work. It relies on (a) a systematic design approach; (b) open-ended and minimal design interventions; and (c) mechanisms for feedback that are built in from the beginning. Initially, the design is articulated as a series of parameters. This process then guides the development of a minimal design proposal, which makes efficient use of resources and allows space for ongoing design engagement. For example, early on, the project team installed low-cost fences. These simple fences have since been modified through an iterative and still-ongoing design process. Certain public-facing fences are evolving into hedgerows with edible fruits and berries that benefit from the enhanced soil infrastructure.

Other fences are strengthened with branches left over from previous logging operations, shaped into intricate installations by local woodworkers. Leaving the design open-ended and dispersing design resources over a longer period distributes design agency among a wider group. From the beginning, mechanisms for feedback were built into the project. This allowed management insights and design thinking to mutually influence each other. In this project, the mechanisms that supported ongoing feedback were what Teresa Galí-Izard calls dynamic diagrams (Mouritz & Gali-Izard, 2018) and collective fieldwork. A description of each will further illustrate this method.

The project team developed dynamic diagrams using Grasshopper, a parametric plugin for the Rhinoceros 3D modelling program (Galí-Izard, Harris, Turett, & Walker, 2022; Ma & Gali-Izard, 2022). The diagrams represented key project components, in this case the system of fencing and the sequence of grazing. The drawings can be quickly modified to account for new information, such as a change in the number of horses or the paddock layout. Crucially, the diagrams could depict change over time, showing the projected regeneration time of each plot and the anticipated movement of the horses. Figure 6 shows the estimated regeneration time for the paddocks in one of the fields at two different moments in the year. The drought in the summer results in a significantly longer regeneration period than when the same paddock is grazed in April. Though they are not predictive models, these drawings facilitated collaboration between disciplines by enabling team members to visualise and plan for multiple scenarios (Holmes, 2020). The drawings allowed landowners, managers, and designers to collaborate during the early phases of the project. Thus, the particularities of the rotational grazing method and preferences of the horses, such as their dislike of tight corners, were incorporated into the diagrams and, in turn, into the design intervention. After observing changes, the diagrams were modified, facilitating communication among team members about key project relationships and assumptions.

The process of collective fieldwork provided further opportunities to productively entangle design and management practices. At the beginning of the project, the team conducted a series of open-ended walks with botanists, soil scientists, and local inhabitants, building a common store of knowledge about the site and its history. These visits integrated multiple modes of apprehending the landscape, combining mushroom hunting and berry picking with more typical surveys and assessments. For example, the search for the ideal place for a picnic on a hot day revealed much about one site's soil conditions, sun exposure, and canopy cover; information which later informed the layout of the fencing. These group excursions served to attune participants to a shared sensibility.

Fieldwork has evolved as the project has taken shape. Regular monitoring to assess how the management regime affects the soil and plant communities now complements the unstructured site visits. This testing provides further mechanisms for attunement to site dynamics (Lutsky & Burkholder, 2017). Wherever possible, monitoring is conducted collectively since the conversation and exchange provides important insights. This proved the case even if the participants were not previously familiar with the project or site. For example, in 2022, a group of architecture students from the ETH Zurich visited for a week and provided a fresh perspective on the project, contributing to its development through design workshops and critical engagement. Continuing site visits have become a way to sensitise the designers to the call and response which characterises landscape management (Argent, 2009, p. 13). This ongoing fieldwork involves monitoring changes, evaluating observed conditions against expectations, and collectively generating responses.

Dynamic diagrams and collective fieldwork provided mechanisms to link the iterative design tools of landscape architecture with the work of caring for landscapes. Affecting meaningful change in these dynamic conditions requires a sustained rhythm of incremental interventions calibrated by regular observation and adjustment. By attending to the soil infrastructure, the project necessarily developed a unique design approach. Management decisions became design problems and design work took on something of the call and response of management.

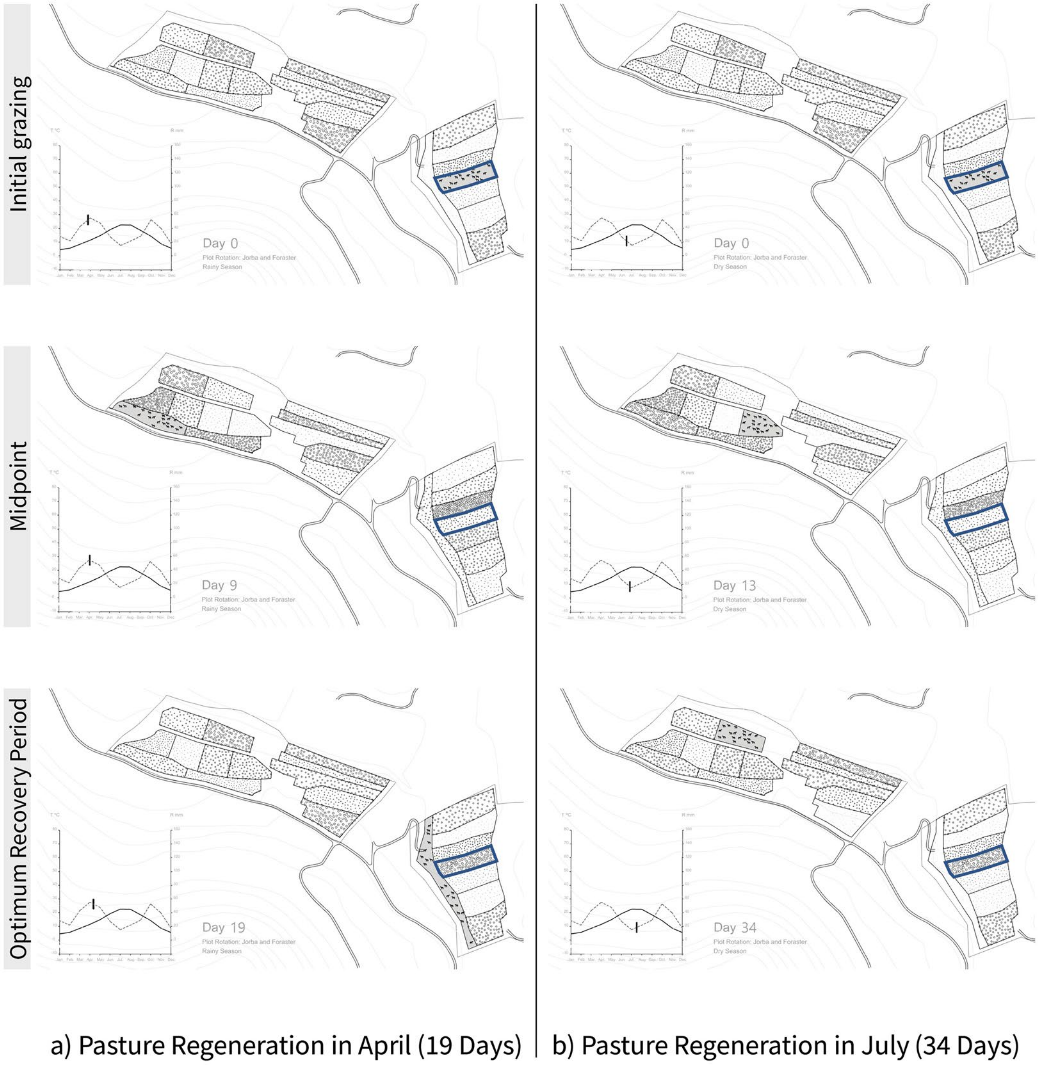

Figure 6. Dynamic diagram showing the estimated regeneration times of the same paddock grazed at two different moments. Credit: Chair of Being Alive, ETH Zurich.

Discussion: adaptive practices in marginal landscapes

Recognising that the dynamics of intensification and wastelanding will continue apace, it is important to ask how designers can intervene in the spaces these processes produce. Driven by the pressure to generate increasing profits, intensification leads to the adoption of ever-more intensive farming techniques, even as industrial agriculture embraces the label of 'regenerative' (Cronin, 2022). Concurrently, wastelanding leads to spaces strategically made empty of relations and marked by a limited access to resources (Voyles, 2015, p. 7). Yet these marginalised landscapes can provide a site for the emergence of alternatives. One key insight from scholars of plantations is that the relatively infertile, marginal land outside the fields of the plantation proper were 'provision grounds' (Wynter, 1971, p. 99), serving as a means of sustenance (Carney, 2021), and enabling reproduction and resistance (Mitman & Allewaert, 2019). While I am hesitant to romanticise the marginal (Harvey, 1996, p. 105) and ruderal (Stoetzer, 2022, p. 10) as well-springs of nebulously defined resistance, these sites offer opportunities for more open experimentation and collective action.

The region's history provides another source of possible alternative configurations. As described above, many of the forests were at one point managed in common. In her study of wastelands in Britain, Vittoria Di Palma (2014) shows how common land came to be understood as waste. This discursive shift contributed to the widespread enclosure of the commons, which was justified in terms of the improvement it would bring (Di Palma, 2014, p. 28). Bathla (2023) proposes 'restorative commoning' to resist both the processes of wastelanding that render certain landscapes disposable and the connected desire to improve such spaces through normative forms of greening, which typically serve elite interests. The latent communal practices in the Conca de Barberà can serve as inspiration for alternative ways of managing landscapes.

If designers have a role to play in these spaces, there is a need for innovative ways of working that combine the fresh perspective afforded by distance with local land management practices. These novel methodologies could aim to enrich relational infrastructures, which are shaped by humans and nonhumans (Cho, 2021; Jacobs, 2019). Such infrastructures, which necessarily develop slowly over time, frame the potential futures of these marginalised sites. To develop such relational infrastructures, design practice must adapt to the incremental temporalities of living systems through observation and response, necessitating new methodologies and project structures. Landscape architects can learn much from the fields of regenerative agriculture (Giller, Hijbeek, Andersson, & Sumberg, 2021) and ecosystem management (Allan & Stankey, 2009; Allen & Garmestani, 2015), to develop approaches which bring the unique capacities of design thinking to bear on the issues faced by marginal landscapes. But crucially, these novel approaches cannot just be ecologically informed techno-fixes to narrowly defined problems. Instead, they must critically respond to the political dynamics that reproduce uneven landscapes, recognising the unique possibilities and limitations of design projects to affect socioecological change. The results may lack the markers of a typical landscape architectural project, instead fading into the background, discernible only if one is looking for them. And yet they reveal the potential of the discipline to adapt to the ongoing crises of our time.

Notes

1. Bruce Braun defines wild experiments as '…experiments in procedure in a situation of ecological and political uncertainty, able to incorporate new and unexpected human and nonhuman actors, and making room for different ways of knowing by farmers, hunters, amateur naturalists and local residents' (2015, p. 109). The research project uses a network of test sites and controls to assess soil and vegetation responses to the new management regime with preliminary results forthcoming.
2. Botanists classify these areas as *brolla arbrada*, which indicates a shrubland community featuring trees of minor ecological significance (Folch i Guillén, 1986, p. 25).
3. Plants that appear spontaneously in fields can reveal much about soil conditions (Pankhurst, Doube, & Gupta, 1997). Farmers can interpret these weeds, otherwise known as bioindicators, as signals of the level of compaction, nutrient availability, and water holding capacity of the soil (Ducerf, 2020).
4. The number of horses in a group has varied over the course of the project in response to their social dynamics and the growth rate of the vegetation.
5. These correspond to the first two of the four rules of PRV codified by Voisin (1959/2021).

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Disclosure statement

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Research ethics and consent

All participants consented to participate in the research project. In most cases, consent was written but in some cases it was verbal. Anyone named in the article or otherwise identifiable has given consent to publish and has been shown the article in its current form.

Notes on contributor

Luke Harris is a landscape architect and doctoral candidate based at the Institute of Landscape and Urban Studies at the ETH Zurich. His current research investigates the metabolism of designed urban substrates. He is a founding member of the collective Office of Living Things, a research collective developing community-based design strategies for fostering dynamic living systems. He currently lectures on landscape-related topics as a part of the Chair of Being Alive at the ETH Zurich. Previously, he practiced at Michael Van Valkenburgh Associates in New York City.

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