# Embracing the damage

## A Design Principle for Extractive Landscapes

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**Abstract – This essay critically examines the proposition of whether a damaged landscape can serve as a generative starting point for design outcomes. Focusing on extractive landscapes, it explores the evolving narratives across Germany, India, and the United States. These contexts provide contrasting yet interconnected material with their inherent possibilities and narratives. By engaging with these geographies, the essay interrogates dominant conceptions of the "end state" in reclamation practices, questioning whether fixed, predetermined outcomes are adequate or if responding to temporal and ecological variability offers a more meaningful principle for engaging with extractive landscapes. The discussion ultimately highlights the critical role of artists and designers, not as mere problem-solvers, but as mediators capable of navigating between ecological processes, social associations, and future imaginaries. In doing so, it underscores the potential of design as a transformative process rooted in the reality of damage and not in ideal, speculative conditions. In this way, the damage is redefined as a transformative creative principle, something to be embraced and not avoided.**

## Attempts at Deception


**Figure 1:** *Photo by author of a presentation slide from the RWE team during Klausurtagung on October 12, 2024. The slide shows a three-dimensional rendering by RWE illustrating the planned lakefront development along the perimeter of a future artificial lake, presently the Hambach lignite mine in Germany.*

There is something disturbingly serene about this image. A former lignite mine is reimagined as an idyllic landscape: linear pathways curve gently through green meadows, flanked by curated forests and sculptural water features. Birds glide above in cinematic grace. From afar, it could pass for a utopia. But beneath its aesthetic polish lies an unsettling question: what is being hidden, and why?

This is the visual grammar of deception, an attempt to erase the violence of extraction through the language of design. The trauma of mining is not absent; it is actively overwritten. The scarred landscape, disrupted ecosystems, and the ruptured lifeworlds of both human and nonhuman actors - a consequence of decades of lignite extraction are notably effaced. In its place, we are offered a vision of "renewal" sanitised to suit the palate of development agencies and future investors. In places like Hambach, where up to 270 million cubic meters of water will be annually redirected from the Rhine to fill the void and make it an artificial lake, nature is not returning - it is being staged. Donna Haraway's call to "stay with the trouble" urges us to resist the temptation of such clean resolutions. These engineered ecosystems run on borrowed time and borrowed flows (Haraway, 2018). They do not repair damage so much as rearrange its visibility. What appears natural is, in fact, a carefully choreographed performance of renewal.

In this model, weeds are unwelcome; spontaneity is dangerous. The messy work of succession such as fungi reclaiming dead wood or insects thriving in spoil heaps is replaced by monocultural green spaces and techno-ecologies timed to state-led closure schedules. Yes, of course, pollution and toxicity in these terrains must be addressed, but not at the expense of erasing or concealing the trauma of extraction. Anna Tsing's work urges us to consider what might grow in the ruins-unregulated, unexpected, and non-normative (Tsing, 2015). But here, even ruination is gentrified. The actual landscape with the toxic soil, the unstable slopes, and the fractured hydrology remain out of frame. Through visualisation tools and landscape renderings, post-mining lands are repositioned as "future-ready," strategically de-linked from their histories of violence and exploitation.

This tendency to sanitise and aestheticise extractive landscapes reflects a deeper discomfort with the ambiguity and hybridity of ruined terrains. Between the impulse to green and the imperative to forget lies a political enactment - one that deliberately

curates memory, selectively preserving certain narratives while concealing the enduring impacts of extraction. Yet, these landscapes refuse to be so easily contained. They are not blank slates for techno-fixes or visual spectacles but complex ecologies where contamination and regeneration unfold side by side. The very act of covering over tailings with turf or planting monoculture trees on spoil heaps can mask the material and emotional residues of extraction. In resisting these flattening narratives, we must ask: what forms of life, and what histories are being rendered illegible in the pursuit of visual closure? This question becomes especially urgent when viewed across transnational contexts, where differing governance models and cultural imaginaries chase their narratives of recovery.

## Chasing Narratives, drawing from cases in Germany, India, and the United States

In numerous examples across extractive landscapes globally, industrial and natural systems have become so intertwined, they can no longer be teased apart. Just as the coal dust can't be removed from a miner's lungs, trees and plants overgrow the unnaturally regular shapes of slag heaps, transforming what was barren ground into what looks like a lush forest. As human and nonhuman bodies have grown enmeshed, anthropocentrism becomes less dominant as a perspective - it becomes increasingly clear that human and non-human bodies are utterly intertwined. Ironically perhaps, it is through the hybrid "monster" (a disturbed ecosystem, a polluted watershed) that the interconnectedness of all lifeforms becomes visible. These hybrids point the way toward a nonhierarchical and ultimately more inclusive way of understanding and interacting with the multiple entities that comprise extractive landscapes.

This entwining of human and nonhuman agencies has given rise to what ecologists and designers refer to as novel ecosystems - ecological assemblages that emerge in response to human disturbance but are no longer entirely governed, or even fully understood, by human intention (Doley & Audet, 2013). These are not restorations of some imagined ecological past, but rather emergent systems shaped by the residues of industry, climate change, invasive species, and spontaneous regeneration.

While there are no recorded papers specifically on this, site visits in India reveal that emergent landscapes that are increasingly taking shape in former mining regions, where life reasserts itself in the aftermath of extraction. Unlike deliberate acts of ecological restoration, many of these ecosystems arise unintentionally, often on "discontinued" mines - sites left in administrative limbo, neither active nor formally closed but are likely to be worked again (GoI, 2025, p. 4). With no structured rehabilitation in place, these neglected terrains gradually transform into landscapes that are profoundly scarred by vast open pits, often filled with acidic water, yet on the edges of these very lakes, novel ecosystems begin to emerge, where life reasserts itself amidst the barren, eroded overburden hills, reflecting a complex and often disrupted ecological and visual transformation. (See Fig.2).

What renders these sites particularly charged is their location on *Adivasi* (Indigenous) lands, where forest clearances for mining operations historically displaced communities and dismantled traditional livelihoods (Imam & Carter, 2005; Sharma, 2021; Talukdar, 2023). Today, as India confronts questions around a Just Transition, these communities increasingly demand that these spaces be recognised not merely as regrowth zones, but as living grounds for new forms of subsistence, care, and dignity. In this vision, the novel ecosystem becomes more than a biological phenomenon; it has the potential to be a political and ethical query, where questions of justice, memory, and future-making converge.

**Figure 2:** *View of the mining landscape in the North Karanpura Coalfield, India, where novel ecosystems have begun to emerge. Collected rainwater and spontaneous vegetation growth illustrate the early stages of ecological transformation in a formerly active extraction site, March 2023 (Source: Author)*

The site in India exemplifies the ecological trajectories that unfold in the absence of formal intervention - where the landscape is left to regenerate autonomously. In contrast, an alternative possibility lies in an approach shaped through the active intervention of an artist and designer, in the case of the AMD (Acid Mine Drainage) & Art Project in Vintondale, Pennsylvania. However, before delving into the specifics of this project, it is important to first consider the artistic perspective through which such landscapes may be interpreted and reimagined.

If one considers the landscape as an ecological drawing - a co-creation between actor and surface - then how might it be undrawn or redrawn, to include the points of view of multiple participants? If excavators are seen as pencils, may they also draw differently, or re-draw what has already been marked? The time scale of landscapes is long-term and the spatial scale is vast, complex, and layered. The competing realities and needs of owners, residents, and all the non-human creatures that make up the whole of a landscape belong to its narrative, though often the diversity of points of view is snowed under by an imbalance in power relations, where only certain voices are heard, and some are completely ignored.

Especially when it comes to open-pit mining, it is clear that the marks made in the landscape (though extractive) act on the surface guided by purely economic demands. This action of extractive marking is of course responding to the site's inherent character, as engineers chart an extraction route based on the presence of the seam. In a very literal sense, the earth determines the path that is drawn on the surface of the landscape. This can never be called a collaboration, however, as the marks made dominate according to singular economic imperatives that favour efficiency, intensification, and speed. When the mining is done, in current best practice, companies are required to restore the land to its former state. This is already fundamentally impossible, as something huge is missing from under the ground. In the case of coal extraction meant for energy use, the emissions from its burning contribute to climate warming, and this situation is also not redressed by filling in holes and planting trees, however advisable that may be.

Given that the damage has taken place, how to co-exist with it? Can another form of drawing be activated here, one that acknowledges and makes visible the earlier, damaging mark-making? As a model, Rachel Bacon's drawing practice might suggest an alternative. Drawing on damaged paper, the drawing is formed through a "reverse excavation", a return of raw material to the surface. The graphite builds up around

the damaged creases in the paper so that empty paper starts to form what looks like veins of ore. In this scenario, the undrawn, empty paper is the ore and can be seen as a space of potential and new energy. In terms of working within a damaged landscape, this approach may also apply - an intervention works together with the damage so that it remains visible. This can be seen as a co-creation between damage and the designer, allowing the perspective of the landscape and the marks made on it to remain intact (Bacon, 2024). On the spectrum between restoration and doing nothing, this opens a middle way, one in which damage and mark-making co-create a surface (in the drawing) or in a landscape (through creating space for time and natural processes to work interdependently with the marks already present). An intervention in the landscape consists not of covering the past trauma but of making it visible.

**Figure 3:** *Rachel Bacon, Disynclination, 2022, graphite on paper on foil, detail (Source: Author)*

The AMD & Art Project in Vintondale, Pennsylvania is a long-term, passive work of landscape art and design initiated by historian T. Allan Comp in collaboration with landscape architect Julie Bargmann, hydrogeologist Robert Deason, and artist Stacy Levy. In Pennsylvania, a century and a half of underground anthracite coal mining has hollowed out the landscape. What a century ago were bleak empty hillsides are now verdant, lush woodlands. Underneath this tree cover, however, are the remnants of huge slag heaps and an underground full of abandoned tunnels, boreholes, air tunnels, and fissures from subsidence. As Bill Conlogue writes in his work on the anthracite coal fields in Pennsylvania, not only is the porous underground a sign of the area's economic instability, it is also a metaphor for "the instability of all things" (Conlogue, 2013, p. 165). Into this porous layer flows fresh water from higher elevations that subsequently comes into contact with coal and rock before emerging polluted into the valley's rivers and streams. The acid mine drainage (AMD) is filled with iron oxide and other minerals, colouring the water a dramatic reddish-orange and acidifying the water. The water is dangerous to human and animal health - and the streams polluted with AMD are dead to life. AMD pollutes hundreds of miles of streams in Pennsylvania (Mendinsky & Dempsey, 2004).

The AMD & Art Project in Vintondale is designed in the bend in the stream. Through a series of descending basins, the polluted river is cleansed of iron oxide through a passive system of sedimentation. As the water flows through each successive basin, it becomes clearer in the process, creating in the meantime not just a practical improvement, but using the pigment in a painterly process. Nothing is hidden here, but the process of cleansing the water is the design itself. The surrounding plantings

were coordinated with the site, so the colours of the vegetation mirror the successive change in colour of the water. The Vintonville project addresses the specific need for intervention to improve the social climate, repair environmental degradation, and increase the liveability and attractiveness of the area. But it also shows how uncovering something that is normally hidden can be a design principle in its own right. The damage to a great extent determined the design of the site (Studio, n.d.).

**Figure 4:** *AMD & Art Project in Vintondale, PA. Collaboration with Julie Bargmann, Landscape Architect. Robert Deason, Hydrogeologist and T. Allan Comp Historian (Source: Stacy Levy used with permission of https://creativecommons.org/licenses/by-sa/3.0/deed.en)*

In Germany, near the Hambach mine, artist Silke Schatz has a documentary practice that focuses on the emergence of ruderal vegetation in one of the abandoned mining towns. Derived from the Latin *rudus* (meaning rubble), these ecosystems are made up of plant and animal species that thrive in disturbed soils and fragmented landscapes. Often dismissed as "weeds" or overlooked as wastelands, these ecologies are, in fact, vital indicators of multi-species resilience (Kennedy, 2022). They emerge autonomously, without human intervention or approval, embodying an alternative ecological temporality that resists both the extractive rhythms of industrial development and the state's frameworks for ecological restoration.

Through her "Manheim Calling" walks, which I have attended, Schatz's work can be interpreted as a subtle act of resistance. By engaging participants, she pushes back against the dominant narrative for the site's future: the state-sponsored plan to transform the mine into a recreational lake. Additionally, her work creates a repository of these overlooked ecologies, challenging the sanitised aesthetics of extractive landscapes and reclaiming attention for the life forms that persist in the margins.

This approach is deeply aligned with her own reflection from the Manheim area, a belief that we should "let the nature grow back and as human beings would pull out of the scene." This perspective views nature's capacity to "heal" itself as a political issue - a "revolutionary way to see the world." It suggests that we should learn from nature by "witnessing processes" and working with existing structures, rather than constantly designing new ones. Figure 5, which shows *Conyza canadensis*, a medicinal plant growing in the ruins of Manheim, provides a powerful visual example of this quiet, persistent resilience.

**Figure 5:** *Conyza canadensis, Manheim, September 2021 (Source: https://manheim-calling.org/conyza-canadensis/)*

## Shifting Perspectives: Ecological Co-creation

In the context of extractive landscapes, artists and designers offer a lens distinct from policy or engineering - one attuned to symbolism, memory, ambiguity, and provocation. Their work resists both literal and metaphorical closure, instead opening space for mourning, reflection, and imagining alternative futures. Rather than simply beautifying a damaged terrain, artists often reveal the trauma and complexity embedded within it. They invite viewers to engage not only with the visible surface but with the layered, often invisible histories of extraction, displacement, and resistance. These interventions can expose the tensions between what is seen and unseen, remembered and erased, inviting new modes of attention and care.

Often process-based and open-ended, artistic engagement cultivates a shift in perspective beyond purely practical applications. Working with existing processes and conditions can lead to a questioning of fixed viewpoints. Embracing collaboration and longer-term time spans opens up space for multiple non-human perspectives, not just anthropocentric ones. The existing imbalance in power relations among different human groups in these landscapes (like mining operators, environmental activists, and residents) is already skewed, dominated by short-term economic interests that are detrimental to all communities. Widening the scope beyond human perspectives is a preliminary step toward a mentality that allows space for all involved. In this context, the role of artists and designers is mainly to make visible and mediate among the many points of view present at these sites. They become sensitised to what already exists, allowing space for other perspectives and co-creating with the landscape to interrupt cycles of human-induced destruction.

## Conclusion

Together, the novel ecosystems emerging on discontinued mines in India, the artist- and designer-led interventions in the United States, and the documentation of ruderal vegetation in Germany form distinct yet interconnected narratives. While these approaches vary - from the passive succession of unplanned re-wilding to deliberate acts of making damage visible, they converge on a shared conceptual ground: the practice of embracing disturbance.

As outlined in the introduction, this means turning away from the fantasy of ecological repair as a return to purity or wholeness. Instead, it calls for what Haraway describes as "staying with the trouble," an ethic of attention that lingers with damaged worlds rather than rushing to erase their marks. In these disturbed landscapes, disturbance itself becomes a teacher, forcing us to see how extraction, memory, and survival are entangled in ways that defy linear narratives of loss and redemption.

Here, Tsing's invitation to notice "what grows in the ruins" is not merely descriptive but transformative. From the pigment-stained waters of Vintondale to the stubborn ruderal plants in Manheim and the slow vegetal reclamation of North Karanpura, these sites cultivate new ways of perceiving more-than-human life. They remind us that recovery does not unfold in spite of damage but through it, in the uneven collaborations of plants, soils, waters, and people who inhabit the aftermath of extraction.

By returning to these landscapes not as wounds to be healed but as unfinished terrains of negotiation, we begin to ask different questions: Who defines what repair should look like? Whose histories are remembered, and whose are erased? And how might attention itself become a form of care? In echoing the introduction's insistence on learning from disturbance, this conclusion reframes damaged landscapes as living archives - places where staying with the trouble allows us not to undo damage but to inhabit its consequences differently, making room for unexpected futures to take root.

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# References


## MONOGRAPHY/BOOK

**Conlogue,** B. (2013). *Here and there: Reading Pennsylvania's working landscapes*. Penn State University Press. https://www.psupress.org/books/titles/978-0-271-06080-4.html

**Imam,** B., & Carter, P. (2005). *The forest of the Buddha*. Trafford.

**Talukdar,** R. (2023). *Coal over forests, displacement over community rights?: Lessons for a just climate future from forest-dwelling communities in Hasdeo Aranya*. In *Just Transitions* (pp. 141-162). Routledge.

**Tsing,** A. L. (2015). *The mushroom at the end of the world: On the possibility of life in capitalist ruins*. Princeton, NJ: Princeton University Press.

## JOURNAL ARTICLE

**Bacon,** R. (2024). What's the matter? An exploration of the shared space between drawing and mining. *TRACEY – Drawing and Visualisation Research, 17*(1), 1–14.

**Doley,** D., & Audet, P. (2013). Adopting novel ecosystems as suitable rehabilitation alternatives for former mine sites. *Ecological Processes, 2*. https://doi.org/10.1186/2192-1709-2-22

**Haraway,** D. (2018). Staying with the trouble for multispecies environmental justice. *Dialogues in Human Geography, 8*(1), 102–105.

**Kennedy,** C. (2022). Ruderal resilience: Applying a ruderal lens to advance multispecies urbanism and social-ecological systems theory. *Frontiers in Built Environment, 8,* 769357.

**Mendinsky,** J. J., & Dempsey, B. A. (2004). Effects of AMD pollutant loading on streams in the Hazleton PA area. *Proceedings America Society of Mining and Reclamation,* 1289–1303.

## ONLINE RESOURCES

**D.I.R.T.** Studio. (n.d.). *Vintondale reclamation park*. https://www.dirtstudio.com/work/vintondale-reclamation-park

**Government** of India. (2025). *Office memorandum – Guidelines for preparation of mining plan and mine closure plan for coal and lignite blocks 2025*. Room No. 622-A, Shastri Bhavan, New Delhi. https://coal.nic.in/sites/default/files/2025-01/31-01-2025a-wn.pdf

**Sharma,** T. (2021). *Karanpura coalfield: An overview*. LIFE for Environment. https://thelifeindia.org.in/wp-content/uploads/2021/07/Karanpura-report.pdf