RI•VISTA
01
2024
SECONDA SERIE

# Slow Restoration, Rewilding, and Design

**Laura J. Martin**
Center for Environmental Studies, Williams College, USA
ljm4@williams.edu

## Abstract

*This position paper distinguishes restoration from rewilding and argues for the establishment of a slow restoration movement. Repair takes time. Restoration is an active and ongoing process that unites insights and methods from ecology and landscape architecture and design. Slow restoration acknowledges that repair is a never-ending process, one in which people care for other beings and attempt to undo the harms caused by centuries of colonialism, consumption, and death.*

Questo contributo distingue il restauro ecologico dal 'rewilding' e sostiene la creazione di un movimento per il restauro lento. Il ripristino richiede tempo. Il restauro è un processo attivo e continuo che unisce le intuizioni e i metodi dell'ecologia, dell'architettura del paesaggio e più in generale delle scienze progettuali. Il restauro lento riconosce che il ripristino è un processo senza fine, in cui le persone si prendono cura degli altri esseri e cercano di rimediare ai danni causati da secoli di colonialismo, consumo e morte.

## Keywords

*Restoration, Rewilding, Biodiversity, Timescale.*
Restauro, Rewilding, Biodiversità, Scala temporale.

Received: *February 2024* / Accepted: *June 2024* |  DOI: 10.36253/rv-15801

Repair takes time, because repair takes growth, and growth takes time. There is no unified timeline of biological growth, and seasons of life and death vary tremendously across species. Coral reef pygmy gobies (*Eviota sigillata*), for instance, can complete their entire life cycle in eight weeks, whereas a yew tree can live thousands of years. We name trees older than 4,000 years: Methuselah (*Pinus logaeva*) of the White Mountains of California, The Cypress of Abarkuh (*Cupressus sempervirens*) in Iran, the Llangernyw Yew (*Taxus baccata*) in Wales. This is to say nothing of bacteria, ephemeral at the cellular level and immortal at the level of the population, or the clonal colony of the shrub *Lomatia tasmanica* in Tasmania that is estimated to be at least 43,600 years old. Meanwhile, landscape features like peat bogs, at once biotic and geologic, take millennia to develop. They can be undone overnight.

But time is not a feature of recent national and international restoration commitments, which aim to restore nature in a matter of a few years. Embracing Silicon Valley's language of innovation and disruption, these commitments imagine that funding and good intentions are all that is needed to repair relationships between Western societies and nature that are fundamentally broken. A key goal of the Kunming-Montreal Global Biodiversity Framework, adopted at the United Nations Biodiversity Conference in 2022, is that "The integrity, connectivity and resilience of all ecosystems are maintained, enhanced, or restored, substantially increasing the area of natural ecosystems by 2050"[1]. The Bonn Challenge, launched in 2011 by the German government and the International Union for Conservation of Nature (IUCN), aims to restore 350 million hectares of deforested landscapes by 2030 (a recent study, Parr et al., 2024, found that, in its haste, this program has planted vast areas of ancient grasslands across Africa with ecologically inappropriate tree species). In 2020, Prince William launched the Earthshot Prize to restore damaged ecosystems by 2030. And for the myriad restoration and reforestation efforts aiming to maximize carbon sequestration, a tree's value is only in how rapidly it can grow.

But what if time is exactly what restoration requires? What if the ecological damage wrought by powerful individuals, companies, and societies over hundreds of years cannot be reversed so quickly? What would slow restoration look like?

'Slow' is anathema to policymakers, who work under pressure to demonstrate the results of their policies immediately, or at least before the next election cycle. But restoration – even intensive restoration – is a process that takes decades, if not centuries, to unfold. Restoration is a process, not an event. In Europe, river restoration measures are implement-

**Fig. 1 -** Peat bogs of Valle Carbajal, Argentina (photo: Andrew Shiva).

ed and assessed within 6-year cycles, but as Chazdon et al. (2021) note, improvements in water quality and ecological communities develop slowly, and they cannot be captured in a six-year snapshot. Generations of ecological scientists have remarked upon the temporal mismatch between restoration and policy. Writing of the American West, ecologist David Costello remarked in 1957: "We need to curb our ecological impatience. We took 150 years to tear down our range and grasslands. Why expect to rebuild them in 5 years?" (p. 51). Nevertheless, like policymakers, ecologists work on short timescales because their research is funded on 1- to 5-year cycles; because academic tenure depends upon demonstrable results; and because the pace of scientific publishing is rapid. What if, instead of designing restoration experiments to yield rapid results, we designed them with the year 2200 in mind, or 2500, or the mysterious world our children will inherit?

In parallel with ecologists, landscape architects are also thinking about how to restore landscapes, ecological communities, and species, though more often in the name of climate resilience and adaptation than biodiversity restoration. Like policymakers and ecologists, architects and designers are under pressure to work on short timescales, that of the regulatory regime and the client. In most countries, the profession is bound to the 'capital project', with design services financed at the outset. After construction, the architect is no longer involved and does not have a role in maintaining the landscape. As Rob Holmes observes, almost nobody is funding landscape architects to work with vacant urban spaces or to manage forests or construct wetlands (Holmes, 2020). Further, the professional networks of landscape architects rarely overlap with scientists, engineers, planners, and regulators in public agencies and environmental NGOs. All of these trends are barriers to the fuller inclusion of designers and design principles in biodiversity restoration.

**Fig. 2 -** Workers cut down an old tree in the Siskiyou National Forest, Oregon, USA, 1936 (photo: U.S. Forest Service).

**Fig. 3 -** A U.S. Forest Service scientist measures Engelmann spruce (*Picea engelmannii*) seedlings at Savenac Nursery, Montana, USA, in 1932 (photo: U.S. Forest Service).

Biodiversity restoration is a practice of care and time. It encompasses both climate mitigation (e.g. forest-based carbon sequestration) and climate adaptation (e.g. planting trees to buffer coastal communities from rising sea levels). It aims to prevent both local and global species extinctions. It aims to reverse the harms of resource extraction and overconsumption, and hopefully, it aims to support Indigenous reconciliation and land-back movements. The Society of Ecological Restoration (SER) defines restoration as "the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed"[2]. The UN Decade on Ecosystem Restoration defines it as "the process of halting and reversing degradation, resulting in improved ecosystem services and recovered biodiversity"[3]. In *Wild by Design*, I argue that ecological restoration is a design practice, a collaboration with non-human species, at once intimate and distanced, and that landscape architects have deeply shaped the ideas and aesthetics of restoration practice (Martin, 2022).

Restoration, in other words, is a deliberate process,

| | |
|---|---|
| A "science-based methodology for conservation" that "emphasizes the restoration and protection of big wilderness and wide-ranging, large animals – particularly carnivores". | Soulé, Noss, 1998, p. 19. |
| "Passive management of ecological succession with the goal of restoring natural ecosystem processes and reducing human control of landscapes". | Navarro, Pereira, 2012, p. 904. |
| "The reorganisation of biota and ecosystem processes to set an identified social-ecological system on a preferred trajectory, leading to the self-sustaining provision of ecosystem services with minimal ongoing management". | Pettorelli et al., 2018, p. 1114. |
| The restoration of "trophic complexity, stochastic disturbances, and dispersal as three critical components of natural ecosystem dynamics" in order to "lead to increased self-sustainability of ecosystems". | Perino et al., 2019, p. 364. |

**Tab. 1 -** Definitions of 'Rewilding'.

and with their interventions restorationists seek to respect the autonomy and world-making of other species, reconciling wildness and design (Martin, 2022). This importantly distinguishes restoration from rewilding, another 're-' word emerging in policy circles and among environmental NGOs. Definitions of re-wilding vary (tab. 1), but they share an emphasis on passive management: an unaided process of regeneration, allowing an ecosystem to 'sustain itself', or go feral. Rewilding, also known as passive restoration, unassisted restoration, spontaneous recovery, and natural restoration, is a recovery that occurs without intentional human intervention. The politics of rewilding are entirely different from the politics of restoration.

Worldwide, passive restoration accounts for much more habitat recovery than active restoration (Wright, Muller-Landau, 2006). Compared to active restoration, passive restoration is typically considered inexpensive or even free, and easy to implement, as it requires no technical expertise (Rey Benayas et al., 2008; Holl, Aide, 2011; Crouzeilles et al., 2017). Restoration, in contrast, requires both scientific and design expertise. It takes time and money to collect seeds, establish plants, to protect seedlings from herbivores, to execute controlled burns, to recontour the land, to remove dams, to remove unwanted vegetation or animals, and to signal to visitors that the restored place is a cared-for place.

But as Zahawi et al. (2014) observe, rewilding of ecosystems may be slow or even impossible if extant populations of desired species are small or limited in their dispersal. They go on to identify three hidden costs of passive restoration. First, landowners and policymakers can perceive slow recovery as a failed effort. Second, passively restored sites appear 'messier' than active ones, perhaps containing thickets of impenetrable vegetation, and developers and settlers can claim these are available unused lands. Third, unmanaged sites are unprotected from disturbances like vandalism.

Here is where landscape architects and designers could work productively with restoration ecologists and conservation biologists to create biodiverse landscapes and ecosystems, ones that reveal themselves over many decades. Landscape architects and restoration ecologists are similarly committed to active restoration, and active restoration takes time. Research suggests the longer a site is allowed to recover, the more likely it is to provide quality habitat for biodiversity and benefits for people; carbon storage, endangered species habitat, wild edible plants, and species diversity all tend to increase over time in restoration landscapes (Rey Benayas et al., 2009; Moreno-Mateos et al., 2012; Bayraktarov et al., 2016; Crouzeilles et al., 2016).

At present most landscape architects and ecologists are working in parallel, not collaboratively. Landscape architecture and urban planning incorporate ecological theory, but focus on vegetation, with little fo-

**Fig. 4 -** The yellow box tree (*Eucalyptus melliodora*) being removed from a neighborhood in Canberra (photo: Australian Capital Territory Environment, Planning and Sustainable Development Directorate).

cus on wildlife, with the exception of bird-friendly design (Kay et al., 2022). Many view plants as design materials rather than living beings. There is also the fact that plant restoration ecologists and animal restoration ecologists rarely collaborate with one another (McAlpine et al., 2016). Once more, urban planners and architects often view incorporating species habitat into new development as expensive and timely (Calkins, 2005; Naidoo et al., 2006; Polak et al., 2014). Landscape architects need ecologists' expertise and ability to observe, care for, and keep alive other beings.

Ecologists, in turn, need designers. Design is necessary to ensure that communities value restored landscapes and that restored landscapes endure. As Nassauer (1995) notes, landscape designs that improve ecological quality will not be appreciated or maintained if a feature that communicates the human intention to care for the landscape is not part of the design. These 'cues to care' will differ among communities and societies. Nassauer notes that in the midwestern United States, designers can signal that ecological designs are cared-for landscapes by including a high proportion of flowering plants and trees, creating human paths, including structures like bird houses and fences, and using bold and visible patterns like terracing, in line with cultural expectations and human pleasure. This work will look different elsewhere.

But isn't time running out? If we do not act to counter rapacious consumption of fossil fuels and other beings, won't nature die? Aren't restorationists the emergency room doctors working frantically and heroically to stanch the blood pouring out of the wounded world? It is understandable to want to match the rapidity of environmental destruction with an equal rapidity of repair. But restoration is a political act, and in politics, urgency has a dangerous side. In *Why Setting a Climate Deadline is Dangerous*, Shinichiro Asayama and colleagues (2019) argue that the rhetoric of a 2030 deadline for climate action invites policymakers to declare emergency rule and call for emergency actions and authoritarian governance. As I explore elsewhere, already much of environmental governance proceeds through 'stopgap measures' that are proposed to 'buy time' for more durable solutions, even though those more durable solutions never

**Fig. 5 -** *Life Support* drawing, Joyce Hwang, 2019 (drawing: Joyce Hwang).

**Fig. 6 -** *Life Support*, Joyce Hwang, 2019 (photo: Mitchell Whitelaw).

come (Buck et al., 2020). I worry that by promising the quick fix, restorationists are losing sight of the work: to stop wounding the world. Restoration will never be able to keep up with the current pace of environmental damage. The race is not even close. We need to call off the race.
Slow restoration acknowledges that powerful actors have committed ongoing environmental violence, colonization, and degradation for centuries, and that restoration must work to change these practices in addition to rebuilding habitats, landscapes, and relationships among people and other beings.
Slow restoration may be slow, but it is active. Slow restoration is an intervention and an acknowledgement of responsibility for undoing harm. It is not rewilding.
Slow restoration is passed down from generation to generation. It is a process beyond the scope of anyone's life.
Slow restoration recognizes that generations and ageing matter for other beings, too. Animals are social. Multiple indigenous restoration projects protect individual animals, including elder animals, which in migratory species often help the group find its way home (Langston, 2021).
Consider the 2019 sculpture *Life Support* by architect Joyce Hwang (figg. 4-6), which refashions a 400-year-old dead tree into visual interest for humans and functional habitat for birds, bats, and reptiles. The work centers the individual organism. This yellow box tree (*Eucalyptus melliodora*) had been removed from a residential neighborhood in Canber-

ra. In another landscape, the tree fall would support a host of insects, fungi, and bacteria as it decayed over hundreds of years. But in a suburban landscape, the tree would have ended up in a landfill, or being chipped into mulch.

Instead, the 20 tons of tree were refashioned by Hwang into a 50-foot-tall sculpture that is designed to attract species to rest and nest. Monitoring cameras hooked up to *Life Support* allow ecologists to gather data on how marsupials and bird species like Crimson Rosella (*Platycercus elegans*) are using the structure. Such a project does not replace the need to plant new trees and wait hundreds of years until they become large enough to support desired species. That work is also needed. But it is a medium-term solution, one that compellingly plays with the ideas of life and death, natural and artificial, and time.

How to do more work like this, that bridges ecology and design and that puts our creative energy toward creating opportunities for other species? Can the Kunming-Montreal Global Biodiversity Framework accomplish this? What is most striking about the Framework is the radical mismatch between the timeframe it sets forth and the timescale required to accomplish its ambitions. The Framework envisions a colossal, collective project to usher in the resurgence of nature. Implementation will require all disciplines (the obvious ones, like ecology and fisheries science, but also everything from environmental history to neuroscience), all arts, all industries to contribute. If restoration is to be civic – and to benefit communities rather than harm them – implementation must be bottom-up rather than top-down. It must be publicly funded. And restoration labor, which is difficult, and takes time, must be compensated. In the 1930s, the United States established the Civilian Conservation Corps to employ men to plant trees and create nature parks. Ninety years later, small seedlings are now large trees. Imagine what a Restoration Corps of the 2030s could accomplish.

By 2050, nearly 70% of humanity will live in cities (UN 2018), and human-built indoor space, the 'indoor biome', currently occupies an area larger than France (Martin et al., 2015). Without landscape architects, designers, and planners, conservation biologists will be unable to answer crucial questions. For instance, much existing scholarship asks how law and regulation shape habitat, but what about zoning, code, insurance, and building practices? What about aesthetic trends? The vital work of ecological restoration needs to extend beyond public lands into farms, backyards, urban parks – the places that a previous generation of environmentalists considered too trashed to prioritize. These are exactly the places that require care. Rather than create new national parks and protected areas, we need to invest in coexistence in the places where people live and work.

This will take time.

## Notes

[1] <https://www.cbd.int/gbf/goals> (02/2024).
[2] <https://www.ser.org/news/579490/The-UN-Decade-on-Ecological-Restoration-Ten-Guiding-Principles.htm>(02/2024).
[3] <https://www.decadeonrestoration.org/publications/principles-ecosystem-restoration-guide-united-nations-decade-2021-2030>(02/2024).

## References


Asayama S. et al. 2019, *Why setting a climate deadline is dangerous*, «Nature Climate Change», vol. 9, pp. 570-572.

Bayraktarov E. et al. 2016, *The Cost and Feasibility of Marine Coastal Restoration*, «Ecological Applications», vol. 26, pp. 1055-1074.

Buck H. J. et al. 2020, *Evaluating the efficacy and equity of environmental stopgap measures*, «Nature Sustainability», vol. 3, pp. 499-504.

Calkins M. 2005, *Strategy use and challenges of ecological design in landscape architecture*, «Landscape and Urban Planning», vol 73, pp. 29-48.

Chazdon R. L. et al. 2021, *The intervention continuum in restoration ecology: rethinking the active–passive dichotomy*, «Restoration Ecology», e13535.

Costello D. F. 1957, *Application of ecology to range management*, «Ecology», vol. 38, pp. 49-53.

Crouzeilles R. et al. 2016, *A global meta-analysis on the ecological drivers of forest restoration success*, «Nature Communications», vol. 7, 11666.

Holl K.D., Aide T. M. 2011, *When and where to actively restore ecosystems?* «Forest Ecology and Management», vol. 26, pp. 1558-1563.

Holmes R. 2020, *The problem with solutions*, «Places», <https://placesjournal.org/article/the-problem-with-solutions/> (02/2024).

Kay C. et al. 2022, *Barriers to building wildlife-inclusive cities: insights from the deliberations of urban ecologists, urban planners and landscape designers*, «People and Nature», vol. 4, pp. 62-70.

Langston N. 2021, *Climate Ghosts: Migratory Species in the Anthropocene*, Brandeis University Press, Boston.

Martin L.J. 2022, *Wild by Design: The Rise of Ecological Restoration*, Harvard University Press, Cambridge.

Martin L.J. et al. 2015, *Evolution of the indoor biome*, «Trends in Ecology and Evolution», vol. 30, pp. 223-232.

McAlpine C. et al. 2016, *Integrating plant and animal-based perspectives for more effective restoration of biodiversity*, «Frontiers in Ecology and the Environment», vol. 14, pp. 37-45.

Moreno-Mateos D. et al. 2012, *Structural and functional loss in restored wetland ecosystems*, «PLoS Biology», vol. 10, e1001247.

Naidoo R. et al. 2006, *Integrating economic costs into conservation planning*, «Trends in Ecology & Evolution», vol. 21, pp. 681-687.

Nassauer J. I. 1995, *Messy ecosystems, orderly frames*, «Landscape Journal» vol. 14, n. 2, pp. 161-170.

Navarro L.M., Pereira H.M. 2012, *Rewilding abandoned landscapes in Europe*, «Ecosystems», vol. 15, pp. 900-912.

Parr C.L., te Beest M., Stevens N. 2024, *Conflation of reforestation with restoration is widespread*, «Science», vol. 383, pp. 698-701.

Perino A. et al. 2019, *Rewilding complex ecosystems*, «Science», vol. 364, eaav5570.

Pettorelli N. et al. 2018, *Making rewilding fit for policy*, «Journal of Applied Ecology», vol. 55, pp. 1114-1125.

Polak T. et al. 2014, *Optimal planning for mitigating the impacts of roads on wildlife*, «Journal of Applied Ecology», vol. 51, pp. 726-734.

Rey Benayas J. M. et al. 2009, *Enhancement of biodiversity and ecosystem services by ecological restoration: a meta-analysis*, «Science», vol. 325, pp. 1121-1124.

Rey Benayas J.M., Bullock J.M., Newton A.C. 2008, *Creating woodland islets to reconcile ecological restoration, conservation, and agricultural land use*, «Frontiers in Ecology and Environment», vol. 6, pp. 329-336.

Soulé M., Noss R. 1998, *Rewilding and biodiversity: complementary goals for continental conservation*, «Wild Earth», 8(3), pp. 18-28.

UN 2018, *2018 Revision of World Urbanization Prospects*, < https://esa.un.org/unpd/wup/> (02/2024).

Wright S. J., Muller-Landau H.C. 2006, *The future of tropical forest species*, «Biotropica», vol. 38, pp. 287-301.

Zahawi R.A., Reid J.L., Holl K.D. 2014, *Hidden costs of passive restoration*, «Restoration Ecology», vol. 22, pp. 284-287.