Letter to Visions

Restoration or representation? How culture shapes our vision of nature

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Dear Editors,

Contemporary perceptions of nature and biodiversity are increasingly shaped by cultural narratives rather than scientific understanding. As part of my research funded by the Italian Ministry of Education and allocated through NextGenerationEU funds, I decided to investigate this by drawing on the example of AI-generated representations of natural ecosystems to bring out how both technology and society have a strongly biased perception of ecological reality. As my following analysis aims to show, this romanticized imaginary emphasizes charismatic fauna and arcadian aesthetics while obscuring fundamental ecological principles, such as the predominance of plant biomass, and the central role of human activity in shaping ecosystems. The result is a moralized but superficial environmentalism that venerates biodiversity as a symbolic refuge from modernity, thus reinforcing the separation between humans and nature.

Environment, biodiversity, ecosystems, humans, and the technosystem

Artificial Intelligence (AI) builds its remarkable capabilities on the statistical synthesis of massive datasets (*e.g.* texts, images, code) produced by humans. These materials reflect our ideas, opinions, values, and worldviews, reproducing

the dominant cultural narratives of the societies that created them. In this sense, AI mirrors collective tendencies, language, and perception, albeit in a moderated, "civilized" version guided by principles of safety and responsibility (Banh & Strobel, 2023).

Since 2022, the Italian Constitution, through amendments to Articles 9 and 41, has formally recognized the protection of the environment, biodiversity, and ecosystems as fundamental values. To celebrate this cultural and legal milestone, I asked Chat GPT to visually represent the concept of "*Environment, Biodiversity, and Ecosystems*", imagining it as an allegoric painting for a living room wall.

I chose ChatGPT because, through its integrated image_gen system, it can produce visual representations directly within the same analytical environment that interprets and contextualizes them. Unlike specialized tools, such as Midjourney or other standalone image generators, ChatGPT allows for seamless interaction between conceptual reasoning and image creation. The model not only generates the artwork but also explains, critiques, and reinterprets it. This integration made it the ideal choice for exploring how AI visualizes environmental concepts, revealing the cultural biases and symbolic structures embedded in its training data.

The result (Figure 1) was fascinating and rich in symbolism. At first glance, it may appear evocative and congruent to our collective environmental imagination. Yet to an ecologist's eye, something feels wrong. The image is undoubtedly varied and colourful, full of forms and symbols suggesting biological diversity, but it resembles a fairy tale illustration rather than a faithful depiction of nature.

In fact, the narrative is distorted, particularly from the standpoint of global biomass balance. Roughly 85% of the planet's living matter is plant life: the primary producers that sustain all heterotrophic organisms and release oxygen into the atmosphere (Nisha et al., 2023). Yet, the AI's image was dominated by animals; a perceptual bias revealing our cultural imbalance.

Although the first imbalance I noticed concerned the disproportion between animals and plants, I did not deem it necessary to compel the machine to correct this imbalance by integrating my prompt with terms related to vegetation or primary producers. Adding "plants" or "forests" would have been to mend the veil rather than to look behind it, without addressing the deeper cultural mechanism behind the distortion. The overrepresentation of animals is a well-known bias of Western environmental imagination, adjusting it would have produced a more ecologically accurate but less revealing image.

Figure 1. *"*Environment, Biodiversity and Ecosystems*"*. ChatGPT4.0, OpenAI DALL-E Image Generation Model, 2025.

Far more revealing was the omission of humanity, the very agent who shapes, transforms, and threatens ecosystems. I believe that this absence is symptomatic of our age: we long to behold a nature purified of our own presence, as if *Homo sapiens* was not integral part of any ecosystem, as if redemption lay in forgetting ourselves.

For this reason, I chose to expand the prompt by adding "humans" to the existing search rather than beginning a new one. This continuity allowed the model to show how it integrates the human dimension within the same representational and conceptual frame. My goal was not to refine the ecological accuracy of the image but to expose the cultural imaginary embedded in the machine's representation of "nature" when humanity is explicitly reintroduced.

The outcome (Figure 2), that could be titled "*Environment, Biodiversity, Ecosystems, Humans, and the Technosystem*" was even more revealing. In this second image, the most striking feature is the depiction of humans: isolated, suspended figures, without communication or interaction. It's a profoundly existential image, echoing our age of collective solitude, marked by a painful sense of separation from the natural world (Mijuskovic, 2021).

Figure 2. "Environment, Biodiversity, Ecosystems, Humans and the Technosystem". ChatGPT4.0, OpenAI I DALL-E Image Generation Model, 2025.

Another revealing element is the spatial opposition: on the human side, the scene is structured by Euclidean geometries, symbols of our analytical mind, our need to measure and categorize the world. On the natural side, fractal geometries and spirals dominate, reflecting the organic fluidity and dynamic evolution of natural systems.

Why did the AI produce such an effective visual contrast? Looking to art history, I found a powerful parallel in Hieronymus Bosch's Haywain Triptych (Museo del Prado, Madrid). In the left panel (Paradise), the space is open, alive with trees, meadows, waters, and animals; its forms governed by fractal rhythms. In the right panel (Hell), the space is rigidly geometric: urban walls, buildings, constructions; a world devoured by structure. The only natural element left is a single, withered tree engulfed in flames.

The contrast between the airy Eden and the claustrophobic Hell is striking. Bosch's infernal architecture - rigid, oppressive, devoid of nature - evokes today's urban condition: a system of comfort and dependency that provides essential services but erodes autonomy, inducing anxiety and existential distress (Mcphie, 2019; Malavasi, 2025).

The sense of helplessness within this complex system mirrors, symbolically, the Biblical expulsion from Eden. Modern humanity relives that fall every time it contrasts the "natural" world with the artificial, technological one it inhabits daily. The nostalgia for an "Edenic age" - a time without pollution, market laws, or induced needs - reveals an idealized perception of nature that exists precisely in opposition to our social reality (Guarino & Pignatti, 2010).

Even Bosch's Paradise, though, was not wild nature but a domesticated landscape - meadows, streams, fountains, cultivated lands - what we would now call a rural ecosystem: productive, harmonious, and human-shaped. This same pastoral landscape, celebrated by painters of the Grand Tour, is today largely abandoned; yet that very abandonment now appears beautiful to us, as it restores a sense of freedom to nature.

Our contemporary fascination with biodiversity thus draws upon the myth of a lost paradise, an attempt to preserve what can still be saved. But what "paradise" do we really mean? Certainly not Dante's pristine dark forest or Leopardi's merciless Nature. More likely, we long for the traditional, pre-industrial world: a mosaic of cultural and ecological diversity erased by post-industrial globalization.

Towards a true ecological restoration

We now call this ideal "sustainable development", i.e. a development that respects the natural processes maintaining ecological balance and biodiversity. Yet, the energy demands of industrial civilization and human overpopulation have undermined that sustainability. Wealthier nations, seeking to mitigate their environmental impact, invest in "green" policies and conservation programs: establishing reserves, protected areas, and biodiversity rescue centres (Guarino et al., 2011).

But here lies a moral paradox. Funding green initiatives and conservation projects either reduces profit margins or requires intensified production elsewhere. Since humanity is reluctant to forgo comfort, we end up preserving small patches of nature while exploiting the rest more intensively. The result is a perverse feedback loop: the more we protect isolated "natural" areas, the more we accentuate the division between a polluted, everyday world and an idealized, "pure" one, i.e. an Arcadian fantasy of pre-industrial harmony, unaware of sustainability debates and based on subsistence economy.

Today, biodiversity is widely perceived as a moral sanctuary, a repository for the remnants of a "vanishing cultural landscape" (Amici et al. 2017) where humans once lived in balance with nature. For some, this becomes a moral alibi; for

others, a profession; for most, a consumer product, purchased through "eco-friendly" goods and experiences that often are only superficially natural.

Humans have long been fascinated by life's diversity, not only for artistic inspiration but also for intellectual mastery. Early classification systems were attempts to name and order the living world (Rouhan & Gaudeul, 2014). In doing so, Western culture increasingly cast humanity as spectator rather than participant in nature, an alienation reflected linguistically in the contrast between the "civilized" and the "wild."

The "civilized man," asserting his dominance, learned to treat the world as a reservoir of resources (Pignatti, 2013). This vision persisted until the 1972 energy crisis (Meadows et al., 1972) exposed the finite limits of technological and demographic expansion. The modern concern for biodiversity and ecological restoration is our collective response to that awakening.

In recent decades, the defence of biodiversity and restoration of ecosystems have expanded beyond the realm of ecologists. They are now central global goals, involving engineers, agronomists, landscape architects, urban planners, lawyers, economists, and policymakers. This shift stems from the growing realization that the environmental crisis is also social, economic, and health-related - a systemic challenge requiring systemic solutions (Guarino, 2025).

Europe has responded with ambitious strategies:

- The European Green Deal, which places ecological transition at the heart of development by integrating environmental, social, and technological innovation;

- Natura 2000, the world's largest network of protected areas, ensuring the long-term survival of Europe's most threatened species and habitats;

- The Nature Restoration Law, which establishes binding targets for restoring degraded ecosystems and recognizes that nature must not only be protected but regenerated.

These policies aim not just to conserve what remains, but to rebuild a balanced relationship between humans and nature, promoting nature-based solutions, green infrastructure, and new forms of ecological governance (Catalano et al., 2021). Restoration, therefore, is no longer a specialist's task; it is a collective mission, essential to both present well-being and the future of life on Earth.

Yet contradictions persist. Behind slogans like "plant three billion trees by 2030," restoration risks becoming a rhetorical facade (Guarino et al., 2024). Meanwhile, the very disciplines needed for genuine ecological restoration - natural sciences,

botany, ecology - are in decline. Enrolment and funding for degrees in natural sciences are dropping; biosystematic and floristic research struggles to find support; and few resources are dedicated to training professionals capable of long-term ecosystem monitoring and intervention design (Bonari, 2025).

Here lies a painful paradox: we proclaim the centrality of nature while neglecting those who study it. Specialists - botanists, zoologists, ecologists - are too often excluded from decision-making. Without solid scientific foundations and long-term ecological data, restoration risks becoming mere entertainment: well-intentioned but misguided, like the famous case of the Spanish woman who "restored" Elías García Martínez's *Ecce Homo* into an unintentional parody (Menezes, 2013).

True ecological transition requires not just vision but consistency. It is not enough to "plant trees", we must cultivate knowledge. By "consistency", I mean the alignment between political declarations, public enthusiasm, and the long, patient work that ecological restoration truly demands: sustained funding, stable scientific monitoring, and the humility to follow ecological timescales rather than electoral cycles. And to cultivate knowledge means more than producing new data; it requires reviving the disciplines that have withered - botany, taxonomy, ecology - and restoring their centrality in education, planning, and governance. Without this cultural and institutional grounding, nature restoration risks remaining a symbolic gesture: a momentary act of goodwill rather than a durable transformation of our relationship with the living world.

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