Rewilding in the Age of Machines

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FORE 6351 Futures research project

This submission presents a completed futures research project exploring how rewilding may evolve as cities navigate technological dominance, ecological pressure, and shifting cultural values.

Project Summary

I chose this domain as a few years ago I moved from a lifetime in New York City to outer Cape Cod. This is my first time ever living in the rural seaside, and in nature, deep in the woods. While still working in tech there has been a bit of cognitive dissonance so I have been trying to make sense of the two by paying close attention to living systems, what is happening in tech, and the new people I have met through this experience.

KEY ISSUES(S) OR QUESTION(S) *Phrase your topic as a SINGLE question. You might want to fill out "domain definition" below first.*	How might we unpack the concept and domain of rewilding, particularly as it relates to reconnecting with our natural selves and innate human behaviors by integrating aspects of the natural world into modern life?		
TYPE *Highlight one* *Hint: Exploratory is general, Strategic is when you have a specific issue to address*	**Exploratory** — or — **Strategic**	**CLIENT**	Local or regional government

DOMAIN DEFINITION *Title of your project and two paragraph high-level summary of the topic. Include why you picked this topic/why it's worth exploring*	*Title:* Reciprocity with Nature: Rewilding in the Age of Technological Dominance *Two paragraph high-level summary:* Rewilding is a way of returning to ourselves and interrogating how we have come to live so far removed from the living systems that sustain us. Like the ecological repairs that occurred during the COVID-19 pandemic and the exodus of people from urban spaces, we should examine and challenge the structural systems that might enable ecosystems and species to reestablish their own balance. It's a shift in both mindset and method, one that values reciprocity and resilience over extraction and efficiency. At a broader scale, rewilding pushes us to confront narratives around dominance, progress, and who gets to decide what the future looks like. It offers an alternative vision that honors plural perspectives and collective care, where human thriving is inextricably tied to the health of the more-than-human world. Both environmental *and* cultural, imagining systems that support mutualism for sustainability and regeneration.
GEOGRAPHIC SCOPE *Hint: in most cases "global" will be too big.*	I would first focus on smaller urban environments and their outer edges additionally the areas where people go to "escape" from those places to understand what those environments offer and why
TIME HORIZON *Insert **a range of years** for each horizon.* *Note: this project is thru the end of horizon two, meaning H2 should end at the desired timeframe and H3 is the end of H2+*	**H1** 3-5 years **H2** 5-10 yrs **H3** 10+

Current Conditions and Context

Link to full doc

Current Assessment

Fill out the right column according to the instructions in the left column.

FUTURE OF *Add title of your project*	**Reciprocity with Nature in an Age of Machines**
CURRENT CONDITIONS *Identify 5-10 current "hot topics" in your domain.* ***Including a link to a source.*** (Hint: consider your domain map categories)	+ Urban disconnection from nature – Many city dwellers lack daily access to biodiversity, raising demand for rewilded green spaces. + Climate crisis and biodiversity loss – Ongoing extinction pressures are sparking rewilding as a regenerative response. + Health and wellbeing framing – Integrative and whole body health is moving to the forefront in the interest of public-health (MAHA) posing great public health risks but some benefits. + Cultural shifts toward reciprocity – Growing narratives emphasize mutualism with the more-than-human world instead of extraction. + Design as ecological practice – Innovative labs are reframing architecture and products as *living systems*, not inert objects (e.g. Material Ecology).
STAKEHOLDERS *Identify at least 5-6 external stakeholder groups and describe why they are important to the domain in a phrase or short sentence.* *E.g., State legislature – as a new technology is released, the state legislature needs to verify its safety for general use.*	+ **Local/regional governments** – Control land use, zoning, and park investments, who and how to work with them. + **Environmental NGOs** – Groups focused on restoring habitats and mobilizing communities as they understand the socio-political landscape. + **Indigenous and community groups** – Hold ecological knowledge and stewardship practices central to culturally grounded hyper local *evidence-based* practices. + **Health systems & practitioners** – Increasingly leveraging "integrative" and natural interventions to support the increasing demand and are responding to (and anticipating) public health crises. + **Architecture & Design Innovation Labs** – Material ecology groups use living materials like microbes, textiles, and algae to bring rewilding into architecture, treating buildings as active parts of ecosystems shifting design from extraction to reciprocity. + **Corporate & philanthropic funders** – Invest in rewilding as ESG strategy and reputation-building, pulse on what's currently on trend.

FUTURE OF *Add title of your project*	**Reciprocity with Nature in an Age of Machines**
RECENT HISTORY *Identify 2-3 important events (include the historical date to your best estimate, e.g., July 19, 2022) in your domain in the last 10 years.* ***Include a link to a source.*** *Hint: put list in chronological order, dates first. Where it's not an obvious connection to your domain, make sure it connects with your added description*	+ (2009) Rise of Rewilding Europe – Large-scale projects demonstrated successful keystone species reintroduction and biodiversity revival. + (2014–): European Bison Reintroductions– Since 2014, Rewilding Europe and WWF Romania have reintroduced European bison to the Southern Carpathians. A model-based study found these bison helped sequester CO_2 equivalent to removing ~43,000 cars per year. + (2020) COVID-19 "Anthropause" – The global slowdown from COVID-19 restrictions offered a real-time glimpse of how wildlife and ecosystems respond when human activity decreases—revealing opportunities for more nature-inclusive policies and urban planning.

Scanning and Emerging Signals

What became clear through the scanning was that rewilding is no longer being treated as a single intervention or environmental fix. Instead, it's showing up as a distributed shift, one that moves through material systems, everyday practices, questions of equity, and the slow reworking of urban life itself. In many sources, rewilding emerged as a way cities are beginning to rethink how they are built, maintained, and allowed to change. This includes a growing interest in materials and design approaches that behave more like living systems, responding to local conditions rather than a one-size fits all model.

Practices like foraging and informal stewardship are resurfacing across both rural and urban contexts as practical responses to food access, health, and a renewed desire for more direct, accountable relationships with place.

Technology can be used as an amplifier. Digital mapping, AI-assisted planning, and ecological monitoring make it easier to visualize and coordinate rewilding at scale. At the same time, there is a persistent tension between efficiency-driven, technology-led models and approaches grounded in reciprocity, care, and shared responsibility. What's unresolved is not whether technology belongs here, but what kinds of relationships it ultimately supports and who is responsible for the oversight.

Scanning Form

TITLE	Living Building Material Captures CO_2 Through Cyanobacteria	**AUTHOR**	ETH Zurich Research Team
BRIEF SOURCE	ETH Zurich News / *Nature Communications*	**DATE**	June 2025
KEYWORDS	material ecology, biodesign, living materials, regenerative design		
URL	https://ethz.ch/en/news-and-events/eth-news/news/2025/06/a-building-material-that-lives-and-stores-carbon.html		

BRIEF DESCRIPTION **(What is the CHANGE!)**	Scientists have created a new building material that's mixed with tiny, living microbes (cyanobacteria). These microbes act like plants. They breathe in carbon dioxide from the air, so walls or bricks made from this material could help clean the atmosphere instead of adding to pollution.						
POTENTIAL IMPLICATIONS FOR…	**… Stakeholder name:**	Architecture & Construction Industry – especially innovative design labs and sustainable materials firms					
	Architecture and construction – may start using carbon-negative materials, changing the way buildings are made and managed. **Local governments and city planners** – could adjust zoning and building rules to allow for living, regenerative structures. **Public health and communities** – would benefit from cleaner air and healthier, more nature-rich urban spaces. **Environmental groups and funders** – gain new chances to support climate goals through projects that show measurable impact in the built environment. industry, particularly resource extractors						
HORIZON	**H1 confirming** *baseline scenario*	**H2 resolving** *transition*	**H3 creating** *transformation*	**IMPACT** *0 to 5*	4	**PLAUSIBILITY** *0 to 5*	4
				NOVELTY *0 to 5*	5	**CREDIBILITY** *0 to 5*	4
SCANNER	Alison Rand			**DATE SUBMITTED**	09/09/2025		

Scanning Form

TITLE	Climate Change and Gendered Vulnerability: A Systematic Review	**AUTHOR**	Gulnaz Anjum, Mudassar Aziz
BRIEF SOURCE	Journal of Global Health (via PMC)	**DATE**	March 12, 2025
KEYWORDS	Public health policy, women's health, climate equity, rewilding concepts 2035		
URL	https://pmc.ncbi.nlm.nih.gov/articles/PMC11905046/		
BRIEF DESCRIPTION (What is the CHANGE!)	Women, particularly in marginalized communities, face higher health risks from climate change. This includes heat stress, food and water insecurity, and caregiving burdens. Gender-sensitive strategies in adaptation and health planning can put in place support infrastructure for adaptation and resilience, promoting communal and societal health and well-being.		
POTENTIAL IMPLICATION FOR YOUR CLIENT If this change happens, what would it mean for your client (one or two paragraphs)	**… Stakeholder name:** Local Governments & Urban Planners This systems-driven approach means examining planning, zoning, and health systems and acknowledging that climate stress is not evenly distributed. Women often bear a greater share of the responsibility. To respond, policies would need to treat rewilding measures as core components of public health. Framing rewilding as a pathway to women's health resilience can provide access to new funding, build trust within communities, and address health inequities. In this sense, rewilding becomes a tool for promoting sustainable communities, equity, prevention, and resilience simultaneously and can have a broad reach and impact.		

HORIZON	**H1 confirming** *baseline scenario*	**H2 resolving** *transition*	**H3 creating** *transformation*	**IMPACT** *0 to 5*	4	**PLAUSIBILITY** *0 to 5*	4
				NOVELTY *0 to 5*	3	**CREDIBILITY** *0 to 5*	4
SCANNER	Alison Rand			**DATE SUBMITTED**	9/16/2025		

Scanning Form

TITLE	Urban Rewilding in the Built Environment	**AUTHOR**	Future Today Strategy Group
BRIEF SOURCE	FTSG 2025 Trends Report – Built Environment Section	**DATE**	2025
KEYWORDS	Rewilding, urban planning, biodiversity, AI, climate resilience, community engagement, green infrastructure		
URL	N/A (report excerpt)		
BRIEF DESCRIPTION (What is the CHANGE!)	Cities are increasingly integrating rewilding projects—such as large-scale tree planting, mangrove restoration, and pollinator gardens—into their urban infrastructure. These initiatives blend ecological restoration with AI-enabled planning and citizen engagement platforms, reframing “green space” as a critical element of urban resilience, health, and climate adaptation.		

POTENTIAL IMPLICATION FOR YOUR CLIENT If this change happens, what would it mean for you client (one or two paragraphs)	Urban rewilding is moving from experiment to expectation. For local governments, this shift carries both promise and obligation. When woven into infrastructure, rewilding reduces heat islands, cleans the air and water, and creates more livable neighborhoods—benefits residents increasingly view as markers of climate stability and quality of life. To capture these gains, however, rewilding cannot remain a showcase project for select districts. It will demand new governance frameworks, creative funding, and equity-driven design so that every community shares in the resilience dividend. By positioning rewilding as public health infrastructure, we can lead the transition, open new funding streams across climate and health, and strengthen community trust in the company's long-term vision.

HORIZON	**H1 confirming** *baseline scenario*	**H2 resolving** *transition*	**H3 creating** *transformation*	**IMPACT** *0 to 5*	5	**PLAUSIBILITY** *0 to 5*	3
				NOVELTY *0 to 5*	4	**CREDIBILITY** *0 to 5*	5
SCANNER	Alison Rand			**DATE SUBMITTED**	09.23.2025		

Scanning Form

TITLE	Foraging as Resilience and Cultural Practice	**AUTHOR**	Sardeshpande, M. & Mabhaudhi, T.
BRIEF SOURCE	*Ambio* (SpringerLink), 2025 — systematic review of 353 studies	**DATE**	August 14, 2025
KEYWORDS	Foraging, cultural resilience, rewilding, reciprocity, climate adaptation, equity		
URL	https://link.springer.com/article/10.1007/s13280-025-02222-9		

BRIEF DESCRIPTION (What is the CHANGE!)	Foraging, once treated as a survival strategy or hobby, is re-emerging worldwide as a way of living with the land. This review of over 350 studies demonstrates that foraging influences health, culture, and the way people care for ecosystems. The shift is that foraging is being recognized as part of resilience planning, rather than something that happens at the margins.
POTENTIAL IMPLICATION FOR YOUR CLIENT If this change happens, what would it mean for you client (one or two paragraphs)	For a local government, the resurgence of foraging raises a choice: keep it informal or integrate it into resilience and wellbeing infrastructure. Supporting edible landscapes and equitable access could strengthen reciprocity, trust, and food security during climate stress. Ignoring it risks commercialization or exclusion that leaves vulnerable communities behind.

HORIZON	**H1 confirming** *baseline scenario*	**H2 resolving** *transition*	**H3 creating** *transformation*	**IMPACT** *0 to 5*	4	**PLAUSIBILITY** *0 to 5*	3
				NOVELTY *0 to 5*	3	**CREDIBILITY** *0 to 5*	4
SCANNER	Alison Rand			**DATE SUBMITTED**	09/30/2025		

Scanning Form

TITLE	Human–Nature Reciprocity as a Framework for Transformative Sustainability	**AUTHOR**	Irene Teixidor-Toneu, Álvaro Fernández-Llamazares, et al
BRIEF SOURCE	*People and Nature* (Guest Editorial, British Ecological Society), Vol. 7, Issue 5, May 2025	**DATE**	May 19, 2025

KEYWORDS	Reciprocity, Indigenous Knowledge, Biocultural Conservation, Relational Ethics, Climate Justice, Transformative Change, Policy Innovation					
URL	https://besjournals.onlinelibrary.wiley.com/doi/10.1002/pan3.70036					
BRIEF DESCRIPTION **(What is the CHANGE!)**	Reciprocity—long practiced within Indigenous and local knowledge systems—is emerging as a guiding principle for sustainability and conservation. It reframes human–nature relations from extraction and "ecosystem services" toward mutual responsibility, care, and co-production of ecological well-being. The shift challenges Western management models and embeds ethical, relational, and spiritual dimensions into environmental governance and science.					
POTENTIAL IMPLICATION FOR YOUR CLIENT If this change happens, what would it mean for you client (one or two paragraphs)	If this shift toward reciprocity continues, organizations operating in conservation, sustainability, or urban resilience will need to redesign programs, partnerships, and funding models around *mutual benefit* rather than service extraction. For a client focused in urban sustainability or ecological innovation partners, this means integrating Indigenous and local stewardship frameworks into planning, metrics, and engagement. Reciprocity offers not only ecological benefits but legitimacy, inclusion, and long-term resilience. Ignoring this trend could marginalize organizations seen as "colonial" or extractive in approach which is likely a non-negotiable.					
HORIZON	**H1 confirming** *baseline scenario*	**H2 resolving** *transition*	**H3 creating** *transformation*	**IMPACT** *0 to 5*	4	**PLAUSIBILITY** *0 to 5* 4
				NOVELTY *0 to 5*	4	**CREDIBILITY** *0 to 5* 5
SCANNER	Alison Rand			**DATE SUBMITTED**		

Key Drivers of Change

Six Key Drivers

FUTURE OF *Add title of your project*	Rewilding in the Age of Machines	
DRIVER NAME *HINT: Make this unique to your domain. E.g. "Climate Change challenges for Public Health" vs. "Climate Change"*	**DESCRIPTION** *one to two sentences* *HINT: Should clearly connect to your domain. Don't write it as "in the future we will be…", write it highlighting its current state.*	**SUPPORTING RESEARCH** *three to five bullets (just a key phrase … not the whole item)* *NOTE: These come from either current assessment, scanning, or TIPPOs … the work you already did. You may have to fill in a few bullets with new information, this should be brief.*
1 Cultural Narratives of Reciprocity and Wellbeing	A global cultural turn toward reciprocity with the more-than-human world reframes rewilding as equity, public health, and wellbeing infrastructure.	· Material ecology and reciprocity-based design reframing how humans live with ecological systems · Narratives reframing rewilding as equity and wellbeing practice · Stakeholder mapping highlights community demand for equity-driven adaptation

2	Climate and Biodiversity Pressures	Accelerating climate change and biodiversity loss drive cities to embed ecological resilience into infrastructure.	· Ecological trend – accelerating biodiversity loss spurring rewilding responses · Large-scale rewilding projects like mangroves and pollinator corridors already underway (Dubai, EU) · Bison reintroduction in Europe shows measurable carbon capture potential · Identified climate stress as central challenge for long-term planning
3	Shifts in Capital and Material Innovation	ESG and climate finance increasingly fund regenerative infrastructure, while material ecology (living systems, energy-storing concrete) redefines buildings as active agents.	· Economic & Resources trend – ESG and philanthropic funding flowing toward rewilding · Material ecology and living building systems that actively sequester carbon · “Living materials” and adaptive reuse framed as drivers of regenerative design · Stakeholders anticipate funding pivots to climate + health blended initiatives

4	Governance and Equity in Urban Policy	Policy frameworks struggle to equitably distribute rewilding benefits, balancing state-defined standards with community-led and gender-sensitive approaches.	· Rewilding reframed as infrastructure in urban planning · Gender-sensitive adaptation approaches positioning rewilding as women's health resilience · Governance frameworks vs. community inclusion in rewilding standards · Urban rewilding must move beyond showcase projects to equitable public health infrastructure
5	Digital Transformation of Planning	New digital tools like artificial intelligence, mapping software, and automation are changing how we design cities. Making it easier to picture future projects and involve residents directly in shaping their neighborhoods and communities.	· AI-enabled visualization and GIS tools accelerating rewilding site selection · Automated BIM generation forecast reducing costs and standardizing workflows · Digital citizen participation platforms used in pollinator planting projects

6	Resilience and Resource Constraints	Cities under pressure from infrastructure limits, resource scarcity, and funding gaps must adopt rewilding and adaptive systems as survival strategies.	· Existing infrastructure and density make scaling rewilding difficult · Dubai Green Spine and Mangroves framed as resilience infrastructure (heat reduction, erosion prevention) · Cost pressures and uneven resource allocation already visible in stakeholder strategies

Driver Outcomes Across Futures

Driver Outcomes in Baseline

FUTURE OF *Add title of your project (including year). E.g., Future of Public Health in 2035*		Future of Rewilding in the Age of Machines 2040
YOUR DRIVERS		**OUTCOMES IN BASELINE FUTURE** *one to two sentences*
1	Cultural Narratives of Reciprocity and Wellbeing	Reciprocity remains aspirational, a niche ethic among activists, but mainstream culture still values growth and convenience.
2	Climate and Biodiversity Pressures	Biodiversity loss continues at current rates; rewilding appears as small showcase projects rather than systemic repair.
3	Shifts in Capital and Material Innovation	ESG and climate finance grow but remain tied to branding; innovative materials emerge, but adoption is slow and uneven.
4	Governance and Equity in Urban Policy	Policies support rewilding as amenities, not infrastructure; equity concerns are noted but rarely prioritized.
5	Digital Transformation of Planning	AI and GIS accelerate project planning, but use is largely technical, with limited community participation.
6	Resilience and Resource Constraints	Cities adapt piecemeal; resilience strategies address acute shocks but don't shift underlying vulnerabilities.

Driver Outcomes in Transformation

List your six key drivers of change in the left column. In the right column, describe in 1-2 sentences what that driver looks like in a Transformation world.

FUTURE OF *Add title of your project (including year). E.g., Future of Public Health in 2035*		Future of Rewilding in the Age of Machines (2040)
YOUR DRIVERS		**OUTCOMES IN TRANSFORMATION FUTURES** *one to two sentences*
1	Cultural Narratives of Reciprocity & Wellbeing	Reciprocity becomes the cultural baseline; wellbeing is measured by ecological balance, not economic growth.
2	Climate & Biodiversity Pressures	Aggressive rewilding restores ecosystems; biodiversity corridors are embedded into cities as critical infrastructure.
3	Shifts in Capital & Material Innovation	Finance shifts to regenerative outcomes; living materials and circular economies dominate construction and urban design.
4	Governance & Equity in Urban Policy	Equity is central; rewilding policies are co-created with communities, with gender- and justice-sensitive adaptation built in.
5	Digital Transformation of Planning	AI and digital platforms become participatory commons, empowering residents to co-design ecological futures.
6	Resilience & Resource Constraints	Resilience is proactive and systemic — cities design with nature, making food, water, and climate systems self-sustaining.

Baseline Scenario: *The Designed Wild*

In the baseline future, rewilding is contained. Nature is designed, monitored, and optimized, with technology doing much of the work of keeping things in line. Responsibility feels abstracted. The system implies that someone else is in charge.

Summarize Baseline Future

FUTURE OF *Add title of your project (including year). E.g., Future of Public Health in 2035*	Rewilding in the Age of Technological Dominance, 2035
SCENARIO TITLE *Fun/memorable name of your scenario*	The Designed Wild
THIS IS A WORLD IN WHICH… *3-4 sentences that highlight the key elements of the scenario* *HINT: This should be more than just a restating of the driver outcomes - what does the world look like when these drivers interact?*	Urban nature is curated through data and design. Green corridors, carbon dashboards, and AI-optimized ecosystems restore some balance, but within tightly controlled parameters. Cities "rewild" by proxy—sensors monitor soil health, drones reseed forests, and human interaction with the wild becomes largely mediated. People feel closer to nature but still buffered from it, experiencing connection through simulation more than direct encounter.
WHALE *Can you identify the "whale" of the system that runs this scenario?* *Hint: The Whale is the biggest influence on the system. Your world needs this ___ for the rest to happen*	**Digital Tools** – the coordinating system that enables and limits how rewilding unfolds.

CLIENT PERSPECTIVE *What's your immediate feeling on how your client will react to this scenario?*	Local governments feel confident: measurable progress, visible green metrics, public approval. But a quiet unease remains about reciprocity, dependence on automation, and who ultimately steers ecological renewal.

Transformation Scenario: *Reciprocity Rising*

In the transformation future, the collective leads the way. Rewilding becomes shared and local, shaped by forms of stewardship that live within communities. Technology is less visible and supportive instead of directive. The shift is from trying to control nature to being in relationship with it, and from managing risk on behalf of others to taking responsibility together.

Summarize Transformation Future

FUTURE OF *Add title of your project (including year). E.g., Future of Public Health in 2035*	Rewilding in the Age of Technological Dominance, 2035
SCENARIO TITLE *Fun/memorable name of your scenario*	Reciprocity Rising
THIS IS A WORLD IN WHICH… *3-4 sentences that highlight the key elements of the scenario* *HINT: This should be more than just a restating of the driver outcomes - what does the world look like when these drivers interact?*	Technology has become a facilitator of mutualism rather than control. Communities use open-source tools to map species recovery, track shared resources, and co-design regenerative zones. Ecological stewardship becomes a cultural practice. Less about optimization, more about relationship. Governance adapts, equity is centered, and digital systems recede into the background as living systems reclaim presence.
WHALE *Can you identify the "whale" of the system that runs this scenario?* *Hint: The Whale is the biggest influence on the system. Your world needs this ___ for the rest to happen*	**Cultural Narratives of Reciprocity** – the moral and imaginative shift that redefines progress.

CLIENT PERSPECTIVE *What's your immediate feeling on how your client will react to this scenario?*	Municipal leaders are cautiously hopeful. The approach demands trust, decentralization, and long-term thinking, but it delivers a more resilient, participatory form of regeneration that reconnects people and policy to place.

Implications of the Transformation Future

Implications

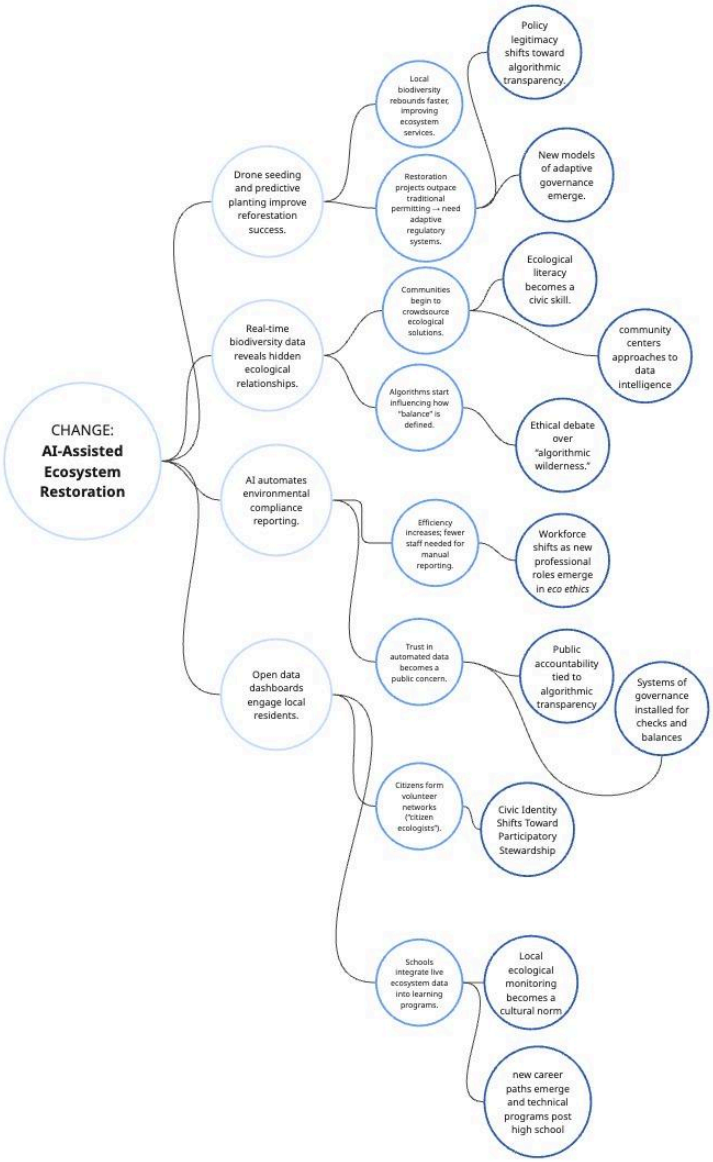
SCENARIO *Pick either Baseline or Transformation*	Transformation:* The Future of Rewilding in the Age of Technological Dominance 2045 — Reciprocity Rising In this transformational future, technology is no longer the dominant force acting upon nature but an active partner. Communities use open-source tools to map species recovery, share data, and co-design regenerative zones that blend civic planning with ecological renewal. Governance shifts toward collaboration and transparency. Living systems reclaim presence as cities begin to plan, budget, and build for resilience rather than expansion. The organizing principle is reciprocity: a balance between digital intelligence and the intelligence of life itself.
CATEGORY *Pick a category to focus the implications on (refer back to client and what would be most useful to them; you can also refer to your domain map categories)*	**Ecological** *(Focus areas: biodiversity restoration, species reintroduction, climate impacts on habitats, and soil, water, and air health.)* This category centers on how ecological systems evolve once they are treated as living infrastructure. For municipal and regional planners, this perspective reframes nature from something to protect into something to manage with the same precision as roads or power grids. The implications trace how these changes influence governance, economy, culture, and identity.

FUTURES WHEELS *Do **3-5** futures wheels of impacts of **KEY CHANGES** from your scenario for the category/client* *Use Coggle.It (create free account), KUMU, Miro, or graphic program of your choice; take a picture of each of your futures wheels and paste in below*	(See below) **AI-Assisted Ecosystem Restoration** – Predictive systems accelerate restoration, reshaping governance and public trust in ecological decision-making. **Community Bioregeneration Cooperatives** – Local co-ops manage habitats as shared assets, connecting livelihood, identity, and ecology. **Soil, Water, and Air as Infrastructure** – Cities formalize ecological performance as civic infrastructure, transforming how budgets, policy, and accountability function.
MOST IMPORTANT IMPLICATIONS *3-5 Most Important Implications from anywhere on your Futures Wheels*	**Ecology becomes civic infrastructure.** Natural systems—soil, air, and water—are managed as measurable public assets, reshaping how cities plan and allocate resources. **Governance decentralizes through cooperation.** Community co-ops and transparent ecological data bring new forms of shared accountability and public trust. **New professions take shape.** Roles in ecological maintenance, AI ethics, and living-systems management emerge as core civic occupations. **Civic identity reframes around stewardship.** Caring for place becomes a form of participation in local governance rather than a volunteer cause. **Policy becomes adaptive and iterative.** Data-driven monitoring enables governments to update regulation continuously rather than reactively, creating a more responsive planning system.

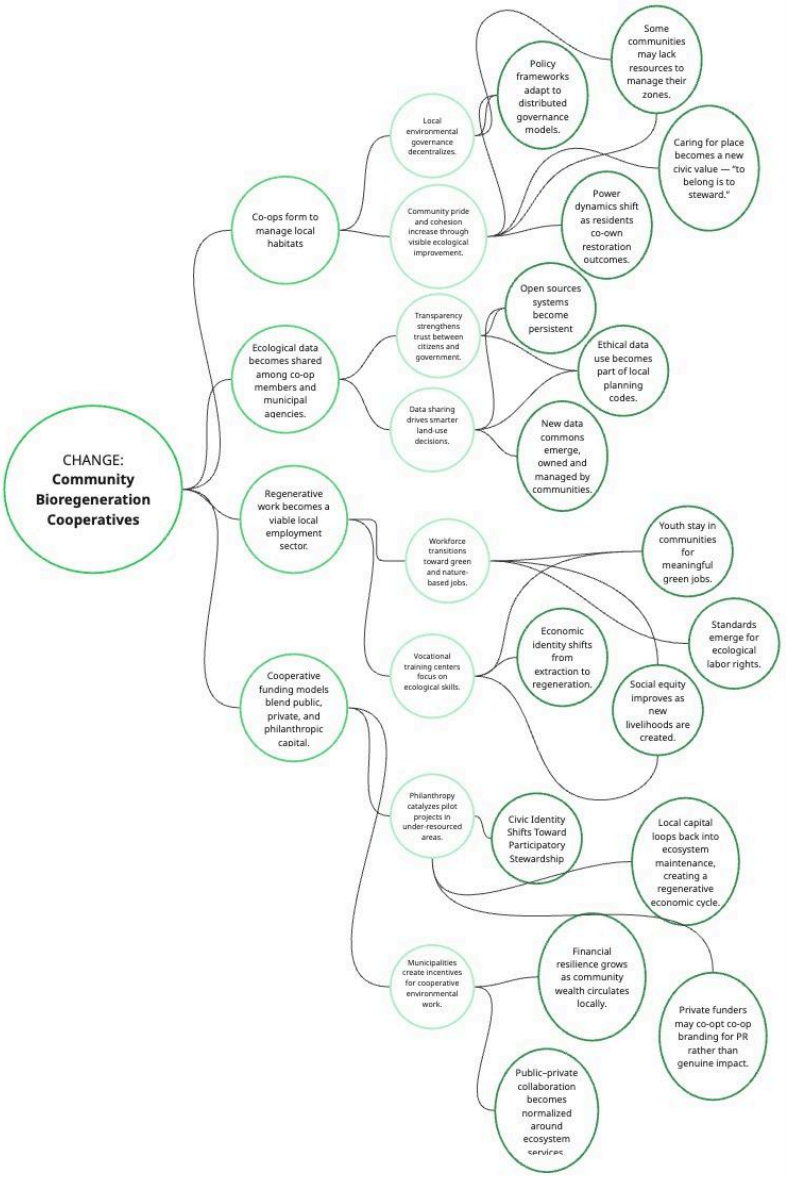
MOST PROVOCATIVE IMPLICATIONS *3-5 Most Provocative Implications from anywhere on your Futures Wheels*	**Algorithmic wilderness.** AI begins to define “natural balance,” forcing societies to question what it means for technology to have a say in nature’s boundaries. **Legal personhood for ecosystems.** Soil, rivers, and air gain legal standing, creating complex intersections between environmental ethics, liability, and property law. **Equity paradoxes.** While regenerative investment strengthens resilience, it may also drive new forms of ecological gentrification if access and ownership aren’t addressed. **Decentralized data power.** Community-owned environmental datasets challenge existing municipal control and create new debates over governance, privacy, and consent.
MOST IMPORTANT STRATEGIC QUESTION *From the Most Important implications, identify a strategic question that you will respond to in the next assignment*	How might cities redesign their infrastructure and planning systems to treat soil, water, and biodiversity as measurable civic assets while ensuring those ecological benefits are shared equitably across communities?
MOST PROVOCATIVE STRATEGIC QUESTION *From the Most Provocative implications, identify a strategic question that you will respond to in the next assignment*	As AI and data systems become co-managers of ecosystems, what frameworks of ethics, governance, and accountability will be needed to preserve the meaning of “wild”?

***AI Used to help with synthesis and first level implications**

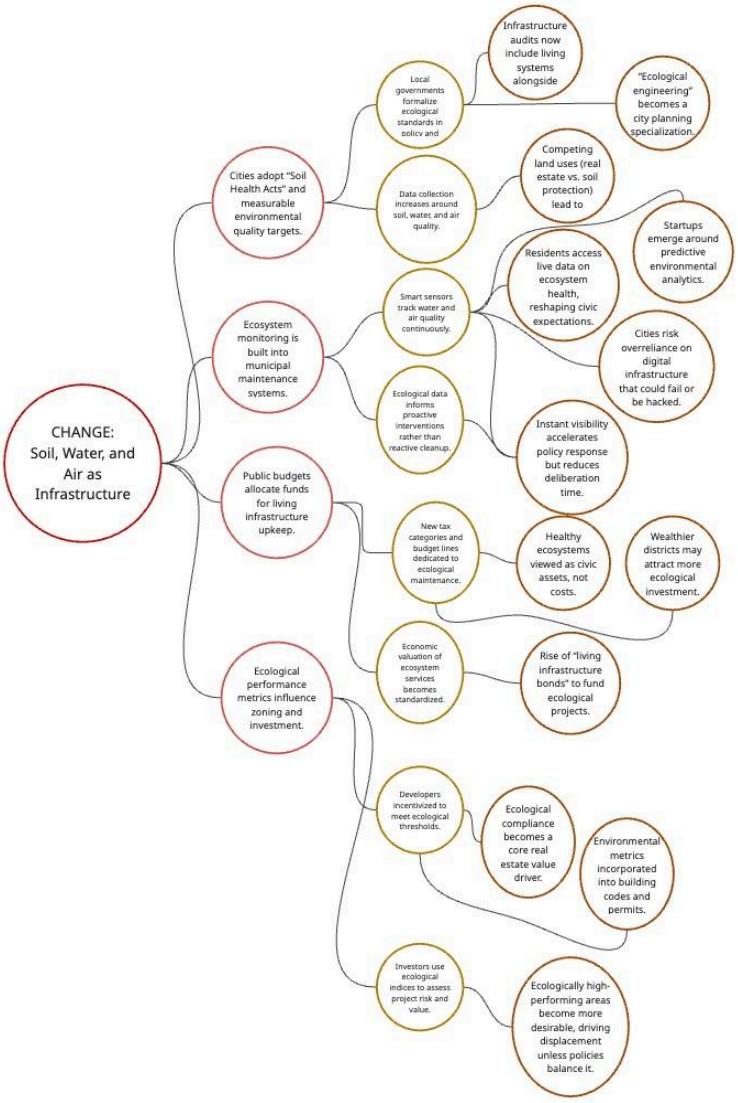
Wheel 1: AI- Assisted Ecosystem Restoration



Wheel 2: Community Bioregeneration Cooperatives



Wheel 3: Soil, Water, and Air as Infrastructure



Strategic Options

The strategic options below are grounded in the futures explored in this work and outline practical ways organizations could respond if the transformation future begins to take shape.

Option Elevator Speech

STRATEGIC QUESTION 1 *What is the issue or opportunity?*	How might cities redesign infrastructure and planning systems to treat soil, water, and biodiversity as measurable civic assets while ensuring those ecological benefits are shared equitably across communities?
OPTION ***Response:** How should client respond Include a memorable name and one-line description*	**Living Infrastructure Initiative** *Designing cities where living systems count.*
WHY IS IT IMPORTANT? ***Rationale:** Describe why the strategic question is worth responding to*	This is an opportunity for cities to lead the transition toward regenerative, measurable resilience. Reframing soil, air, and water as infrastructure transforms how resources are managed and valued. It also brings equity to the center—ensuring that clean air, healthy soil, and access to green space aren't privileges, but shared civic rights. By redefining infrastructure to include living systems, municipalities can build more stable economies and more cohesive communities.

WHAT SHOULD WE DO ABOUT IT? ***Strategic response**: List the key components of your long-term strategy across the timeframe of your project*	PHASE 1 (Startup)	PHASE 2 (The work)	PHASE 3 (Success)
	Create a *Living Infrastructure Task Force* that bridges planning, public works, and sustainability teams. Launch pilot "ecological audits" in two neighborhoods to measure soil, air, and water quality as infrastructure assets. Develop public-facing dashboards to share data and increase transparency.	Integrate ecological metrics into zoning, capital improvement plans, and procurement standards. Expand municipal training programs for living-systems maintenance. Establish community co-ops for localized monitoring and care of shared ecological assets.	City budgets include dedicated funding for soil, water, and air maintenance. Ecological performance becomes part of municipal credit ratings and long-term planning metrics. Residents identify environmental well-being as a defining measure of civic success.
WHO "OWNS" IT? ***Responsibility:** Identify the long-term **internal** champion for the issue and option (person and/or function)*	Office of Sustainability (lead), in partnership with Public Works, Planning, and Community Co-op Networks.		

STRATEGIC QUESTION 2 *What is the issue or opportunity?*	As AI and data systems become co-managers of ecosystems, what frameworks of ethics, governance, and accountability will be needed to preserve the meaning of "wild"?

OPTION ***Response:*** *How should client respond Include a memorable name and one-line description*	**Algorithmic Stewardship Framework (ASF)** *Keeping intelligence, human and digital, in balance with nature.*
WHY IS IT IMPORTANT? ***Rationale:*** *Describe why the strategic question is worth responding to*	This issue sits at the intersection of innovation and ethics. AI already monitors soil health, predicts migration patterns, and automates restoration—but it also introduces new risks: bias, opacity, and the potential to quietly redefine what “natural” means. Developing an Algorithmic Stewardship Framework helps ensure that technology strengthens, rather than replaces, ecological intelligence. It’s about keeping the human relationship to nature visible and accountable as automation scales.

WHAT SHOULD WE DO ABOUT IT? ***Strategic response**: List the key components of your long-term strategy across the timeframe of your project* *Hint: Phases may be the same as your Horizon years*	**PHASE 1**	**PHASE 2**	**PHASE 3**
	Convene an *AI and Ecology Ethics Council* including ecologists, data scientists, ethicists, and community leaders. Audit current environmental-AI tools for bias and unintended ecological consequences. Draft guiding principles for algorithmic transparency and human oversight.	Develop a *Responsible Ecological AI* certification, similar to LEED for green buildings. Incorporate ethical standards into procurement and city contracting for environmental tech. Launch public education programs around ecological data literacy and algorithmic ethics.	Ecological AI systems operate under transparent, community-audited frameworks. Public trust in AI-driven stewardship grows because decisions remain explainable and participatory. The city becomes recognized as a model for *ethical automation in environmental governance.*

WHO "OWNS" IT? ***Responsibility:*** *Identify the long-term* ***internal*** *champion for the issue and option (person and/or function)*	Chief Sustainability Officer and Chief Data Officer, co-leading through a new *Office of Ethical Technology and Ecology (OETE)* in collaboration with universities and community partners.

Final Project Delivery