## "Memories of Communities Past": Natural Regeneration in a Larger Strategy Toward Ecological Restoration

Over the past several hundred years of land development in the United States, Indigenous systems of land management have been replaced by agricultural, urban, forestry, and industrial development. Today, 42% of the contiguous United States has been converted to nonnative landscapes through development and other land conversion.<sup>1</sup> NatureServe calculates that "34% of plant species and 40% of animal species in the United States are at risk of extinction and that 41% of ecosystems are at risk of range-wide collapse."<sup>2</sup> These ecosystems are the result of millions of years of adaptation, as well as at least thousands of years of Indigenous cultivation and stewardship.<sup>3</sup>

Biodiversity is strongly linked to the health, productivity, and stability of all life on earth<sup>4</sup> and as it decreases, it represents a serious threat to our collective future. In response to this crisis, ecologists and Indigenous communities around the globe have practiced various forms of land and ecological restoration efforts, attempting to slow biodiversity loss, preserve native plant and animal species, and restore habitat. Many of these efforts have employed cost- and labor-intensive efforts to kill invasive species and replant native species.

However, recently, there is increasing consideration being given to natural regeneration as an additional tool, especially for large scale, landscape level restoration efforts. Studies and projects have indicated that layers of soil preserve seed banks (including seeds, root sprouts, stumps, or coppices)<sup>5</sup> of native plant species for often quite long periods of time. When conditions allow, these seed banks can naturally regenerate. A study of seed banks in Norway argues that "on ecological timescales, seed banks represent local 'biodiversity reservoirs' that can contribute to local population persistence and biodiversity maintenance through temporal storage effect."<sup>6</sup> The study argues that "seed banks can buffer populations against local extinctions following habitat area loss," as they "reflect 'memories of communities past' during secondary succession."<sup>7</sup> These studies suggest that the earth has its own part to play in restoring ecosystems and, that even though biodiversity is lost through human capitalist development, the earth has the ability to regenerate itself and restore itself to health.

However, efforts toward natural regeneration face several major obstacles. First, "spontaneous natural regeneration on farmland is often discouraged and viewed as poor land management."<sup>8</sup> In a neoliberal and capitalist economy, simply allowing farm and forestland to regrow itself is seen as wasting land that could otherwise produce profit. The agricultural and forestry sectors rely on profit generated from land and benefit from monocropped forest plantations and farmland.

These realities will eventually force us to evaluate the dangers that capitalist development and private property pose to ecosystems and human existence on earth. Evo Morales, former president of Bolivia, spoke in 2008 and said, "The capitalist system treats our Mother Earth as raw material, but the earth must not be treated as a commodity. Who could privatize, rent, or lease their own mother?"<sup>9</sup> This larger economic question is outside the scope of a short paper, but our current biodiversity crisis, coupled with climate change, clearly highlights, not only the deficiencies of a system that puts private profit and corporate property ownership before human and ecosystem thriving, but the immediate need to replace such a system before it is too late.

One immediate strategy that has been suggested, especially for smaller scale farmers and landowners, is government subsidies of natural regeneration efforts.<sup>10</sup> In Ireland, that is what Eoghan Daltun recommends, since most of Ireland is not owned by large farmers or wealthy

landowners but is divided into smallholdings owned by small farmers.<sup>11</sup> Ireland has the highest rate of deforestation in Europe. Once sporting about 80% forestation levels, it now has about 1% of its land area in native forests.<sup>12</sup> Daltun has used natural regeneration on his own 73 acres on the Berea Peninsula. He fenced the land to keep away invasive feral goats and manually eradicated invasive rhododendrons—and let nature do the rest, regrowing a small forest of native sessile oak, rowan, downy birch, hawthorn, hazel, holly, and willow, and allowing native insect and animal species to multiply. He suggests that Ireland should replace its heavily sheep grazed pastures and monocropped industrial spruce plantations with native forest, subsidizing small farmers to do it.<sup>13</sup>

Second, natural regeneration is not always considered a valid ecological strategy and is not always eligible for governmental and grant support.<sup>14</sup> Non-Native scientist in particular often overlook the ability of seed banks to regrow after periods of time and tend to develop a strategy that is "one-size-fits-all: Kill the weeds, then plant native seeds."<sup>15</sup>

Indigenous communities are challenging the wider scientific and global economic community to evaluate different, pre-capitalist forms of land use, which allowed humans to live in a more symbiotic relationship to much more diverse ecosystems. Indigenous communities play a disproportionate role in protecting biodiversity, as 80% of worldwide biodiversity is preserved on Indigenous land.<sup>16</sup> Increasingly, Indigenous scientists and communities are exploring natural regeneration, often by creating the conditions that native plants need to grow.

In Washington state, the Stillaguamish River region was largely settled by farmers who drained the land to grow crops. In 2012, the Stillaguamish Tribe obtained 88 acres of farmland restored it as an estuary, by breaching and then rerouting a levee to allow the property to flood again. Within a year, maritime bullrush and sedges that had not grown on the property for 140

years returned and grew over the entire area. The saltwater had killed the introduced crops and the tides had helped bring in the native species.<sup>17</sup> They have purchased additional farmland and hope that restoring these wetlands will help restore a once abundant salmon population now in steep decline.

While some regions need more intensive management, efforts like this suggest that seed banks can buffer populations against local extinctions following habitat area loss and can preserve 'memories of communities past.'<sup>18</sup> Natural regeneration suggests that ecologists can indeed partner the earth and its other-than-human life forms—and can learn from Indigenous communities who have thousands of years of experience doing so. These studies and projects suggest that the soil does at least in some cases contain the memory of the past—and the ability to heal itself.

Natural regeneration holds some other advantages as well. First, it often requires fewer resources.<sup>19</sup> Many land restoration projects require intense management to first remove invasive species and then cultivate and replant native species and continue to manage and monitor growth. Often these cultivated native species are not particularly adapted to the microclimates in which they are replanted, leading to loss of plants. Heavy use of herbicides can also kill native plants still present in the soil.<sup>20</sup>

Natural regeneration can use a variety of interventions. Some projects simply allow spontaneous natural regeneration, most often used for land that has been only recently cleared of forest, simply allowing native species to grow back and the ecosystem to restore itself. This requires very few resources, while assisted natural regeneration can use a variety of tools: fencing, rerouting waterways, the use of fire, or controlling invasive species to allow land to regenerate.<sup>21</sup> The Stillaguamish project required extensive resources to engineer levees at the outset, but limited intervention afterwards.

Second, using natural regeneration when feasible opens the possibility of larger scale habitat and ecosystem restoration. "The potential of natural regeneration for achieving large-scale restoration objectives and climate mitigation targets is often overlooked,"<sup>22</sup> sometimes because most ecological restoration projects are funded on a three-to-five-year budget.<sup>23</sup> Natural regeneration, using both spontaneous and assisted methods, could be used for much larger projects, designating whole landscapes and bioregions for restoration efforts. While some areas might need more intensive management, like removal of levees or dams, or preventing livestock or invasive species, much larger areas could be allowed to regenerate over a much longer time. In northeastern Costa Rica, it was found that land degraded by grazing and logging, left alone for several decades, transformed itself from scruffy shrubs and vines to a lush tropical forest.<sup>24</sup>

Finally, as climate change increases, the natural regeneration of forests particularly holds the promise of holding a greater carbon storage potential than previously thought. A recent study suggests that the default Intergovernmental Panel on Climate Change (IPCC) rates may underestimate young forest aboveground carbon accumulation rates by 32 per cent on average.<sup>25</sup> In other words, the first 30 years of natural forest regrowth has a much greater potential for carbon accumulation than previously thought. Simply letting forests grow back may be a serious strategy for combating climate change. Those "memories of communities past" may just save our future.

## Endnotes

<sup>7</sup> Vandvik, "Seed banks are biodiversity reservoirs,", 225.

<sup>8</sup> Chazdon, "Partnering with nature," 8.

<sup>9</sup> Evo Morales, "10 Commandments to Save the Planet: Message to the Continental Gathering of Solidarity with Bolivia in Guatemala City, Oct 9, 2008," in *The Global Fight for Climate Justice: Anticapitalist Responses to Global Warming and Environmental Destruction*, edited by Ian Angus (Winnipeg, Manitoba: Fernwood Publishing, 2010), 146.

<sup>10</sup> Chazdon, "Partnering with nature," 9.

<sup>11</sup> Rory Carroll, "'The result was amazing': one man's mission to reforest a barren Irish hillside: Eoghan Daltun has spent 14 years rewilding part of Beara peninsula into a showcase of diversity," *The Guardian*, July 4, 2023, <u>https://www.theguardian.com/environment/2023/jul/04/reforest-rewilding-beara-peninsula-ireland-eoghan-daltun</u>.

<sup>12</sup> Mike Waltman, "Can Forest Expansion Balance Climate Change, Economic Growth, and Ecological Health: When it comes to managing woodlands to meet multiple needs, Irish activists underscore the importance of considering the forest as well as the trees," *Ensia*, Dec 19, 2023, <u>https://ensia.com/features/reforestation-climate-change-</u>economic-growth-ecological-health-conservation-biodiversity-ireland/.

<sup>13</sup> Carroll, "The result was amazing."

<sup>14</sup> Chazdon, "Partnering with nature," 10.

<sup>15</sup> Josephine Woolington, "Underground seed banks hold promise for ecological restoration: Indigenous science is using natural regeneration to restore western ecosystems." High Country News, March 1, 2024,

https://www.hcn.org/issues/56-3/underground-seed-banks-hold-promise-for-ecological-restoration.

<sup>16</sup> UN Environment Programme, "Indigenous Peoples: The unsung heroes of conservation," Jan 9, 2017,

https://www.unep.org/news-and-stories/story/indigenous-peoples-unsung-heroes-conservation

<sup>17</sup> Woolington, "Underground seed banks hold promise."

<sup>18</sup> Vandvik, "Seed banks are biodiversity reservoirs,", 225.

<sup>19</sup> Chazdon, "Partnering with nature," 7.

<sup>20</sup> Woolington, "Underground seed banks hold promise."

<sup>21</sup> Chazdon, "Partnering with nature," 6-7.

<sup>22</sup> ibid, 1.

<sup>23</sup> Woolington, "Underground seed banks hold promise."

<sup>24</sup> Kirsten Weir, "Second Nature: A 2020 study suggests letting forests regrow naturally can help boost efforts to fight climate change," The Nature Conservancy, February 28, 2022, <u>https://www.nature.org/en-us/magazine/magazine-articles/second-nature-reforestation/</u>.

<sup>&</sup>lt;sup>1</sup> NatureServe, "Biodiversity in Focus: United States Edition" (NatureServe: Arlington, VA, 2023), 22.

<sup>&</sup>lt;sup>2</sup> NatureServe, 8.

<sup>&</sup>lt;sup>3</sup> "The reality is, indigenous nations on this Turtle Island were highly organized. They densely populated the land and they managed the land extensively. And this has a lot to do with food, because a large motivation to prune the land, to burn the land, to reseed the land, and to sculpt the land, was about feeding our nations. Not only our nations, but other animal nations as well." Lyla June Johnson, "Lyla June on the Forest as Farm

Science reveals that ancient foodscapes were cutting-edge regenerative agriculture." The Esperanza Project, November 15, 2019. <u>https://esperanzaproject.com/2019/native-american-culture/lyla-june-on-the-forest-as-farm/</u>. <sup>4</sup> REA Almond, M Grooten, D Juffe Bignoli, T. Peterson (Eds), "Living Planet Report 2022: Building a nature-positive society" (WWF, Gland Switzerland, 2022), 6.

<sup>&</sup>lt;sup>5</sup> Robin Chazdon, Blaise Bodin, Manuel Guariguata, David Lamb, Bethanie Walder, Unna Chokkalingam, Kenichi Shono. "Partnering with nature: The case for natural regeneration in forest and landscape restoration." FERI Policy Brief (Montreal, Canada: 2017), 5.

<sup>&</sup>lt;sup>6</sup> Vandvik, V., Klanderud, K., Meineri, E., Måren, I.E. and Töpper, J., "Seed banks are biodiversity reservoirs: species– area relationships above versus below ground." Oikos (2016), 218.

<sup>25</sup> S.C. Cook-Patton, Leavitt, S.M., Gibbs, D. et al, "Mapping carbon accumulation potential from global natural forest regrowth," Nature 585, 545–550 (2020). <u>https://doi.org/10.1038/s41586-020-2686-x</u>

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