Let's Cool the Planet Now! An Ecosystem Restoration Manifesto
An Appeal to Humanity, UN Secretary-General, and World Leaders

A companion to
THEREFORE CHOOSE LIFE, AN URGENT CALL TO ACTION .docx

From Biodiversity for a Livable Climate and the EcoRestoration Alliance

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Appeal to Humanity, the Secretary-General of the UN, and Heads of State to solve the climate crisis with new scientific insights around the power of water and vegetation

Summary

The climate crisis can be addressed by utilizing important and often-overlooked insights and solutions about water, plants, and re-coupling water and carbon cycles. Water and vegetation in healthy ecosystems move heat to space, whereas greenhouse gasses capture it. Therefore, restoring degraded ecosystems can enhance planetary cooling and mitigate climate change.

Background

Plants use photosynthesis to convert vast amounts of atmospheric carbon into living biomass, and vast quantities of liquid water into energy-rich water vapor that rapidly draws heat away from Earth’s surface. At high altitudes, these vapors condense around plant-released microparticles causing cloud formation which shades and hydrates the Earth's surface. This complex process balances the planetary energy budget by reflecting sunlight and radiation from condensation out to space.

When healthy ecosystems are degraded, these processes break down. Soils overheat, dehydrate and decarbonize; fires send plumes of smoke (formerly living carbon) into overheated atmospheres; soils become compacted and non-absorbent. The result: warming, storming, fires, floods, and droughts.

Seventy five percent of the earth's land surface is now degraded or desertified, due to deforestation, mismanaged grazing, and waste of precious rain water that should instead be

stored in healthy soils, groundwater, wetlands, aquifers, and living beings[1]. Freshwater reserves are vanishing as excess rainwater escapes to the sea and evaporates. This vicious cycle has been accelerating and exacerbating: ecosystem degradation begets climate degradation and human deprivation, which in turn accelerates ecosystem degradation and loss. This death spiral may soon become irreversible.

A message of hope and urgency

There is still time to turn this around. Countless projects around the world are using the practical science and research of eco-restoration to inform, empower, and engage local communities to regenerate healthy ecosystems. Local lives are improved, food security is increased, climate impacts are reduced, and global prospects are redeemed. We can and must do this at all scales.

The following insights regarding critical and overlooked "levers" inform and empower for expeditiously re-stabilizing and cooling of the climate.

- **Biodiverse healthy and resilient ecosystems are vanishing,** living biomass on Earth has been halved[2], with attendant loss of water and climate regulation.

- **Continents are dehydrating:** Massive amounts of soil have been degraded and dessicated by human activities such as tilling of croplands and poor water management practices. This reduces the ability for plants to bring rain, maintain the soil carbon sponge, and refill aquifers[3].

- **The amount of hot bare ground is increasing.** In the sun, bare ground absorbs and then radiates heat that is captured by greenhouse gasses.

- **Oceans are overheated, polluted, depleted of life and acidified.** Overheated oceans drive extreme weather events; heat, acidification, and toxins kills oceanic life that sequesters vast amounts of carbon, and generates planet-cooling clouds.

Recommended Strategies

Bring back life. Protect and restore healthy ecosystems on land and sea. Rehydrate soils. Stop killing soil microbiomes. Replace extractive agriculture and mariculture with permaculture, regenerative food production, and protected marine sanctuaries.

Restore water cycles. Rebuild ecosystems; rehydrate lands, reforest continents to restore the biotic pump and draw oceanic moisture inland.

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[1] 75% of Earth's Land Areas Are Degraded, IPBES Report Warns (nationalgeographic.com)
[2] Biomass (ecology) - Wikipedia & Harvesting the Biosphere: The Human Impact
[3] Russ Speer Need Michal et al's UN whitepaper reference.

Increase plant life everywhere. Plants use solar energy to integrate water, carbon and other crucial life cycles, cooling through evapotranspiration and returning heat-inducing atmospheric carbon back into life-supporting biomass and sequestered carbon.

Restore keystone animal species. Many ecosystems are organized around apex predators, pollinators, beavers, fungi, whales and other foundational organisms that set the conditions for life.
On land, they pollinate, manage vegetation that could otherwise fuel fires, help turn the soil into a carbon-rich sponge, and slow the flow of water so that it seeps into the earth, nourishing the microbiome. In the oceans they maintain nutrient cycles and de-stratify ocean water temperatures, and physical and chemical gradients.

Restore ecosystems at speed and scale. Healthy ecosystems (native, co-adapted species) interact and cooperate, and support up to 30 times more biodiversity while mitigating heat waves, droughts, fires, violent storms, and floods. New techniques for accelerated rewilding are springing up all over the world. They provide virtually immediate benefits locally, and collectively could be used to reverse climate change.

Specific Actions To Be Undertaken by Almost Everyone Almost Everywhere.

Our understanding of how natural systems maintain livable climates has direct implications for all of us. Each of us in our own locales can save the future by enacting and advocating these actions.

- Preserve natural forests. Stop deforestation now.
- Cover bare ground with plants.
- Slow the flow of water and rebuild the soil microbiome, and support native plants.
- Invest in and empower the good stewardship of Indigenous peoples and other proven stewards of life.
- Create, support, and interconnect habitats that restore biodiversity on land, sea and air.
- Clean and regenerate life in oceans, lakes, and rivers.
- Regreen deserts by capturing water and re-establishing co-adapted plant-animal interactions.
- Restore biomes in soil, wetlands, salt marshes, coastal vegetation, and oceans.
- Replace pesticide-dependent single-species forestry, agriculture and gardening with toxin-free permaculture and synergistic suites of co-adapted species.[4]
- Focus actions on strategic locations where relatively small interventions can have relatively large impacts.
- Reconnect with Nature, to respect and love all life, and start giving back to Nature.
- Promote meaningful lives via livelihoods connected with nature and the joyfulness of life.

[4] see https://en.wikipedia.org/wiki/Ernst_G%C3%B6tsch

- Support laws and policies that establish ecocide as a crime against humanity.

Investment and benefits

Ecosystem restoration is a critical complement to emissions reductions for climate stabilization.

The effects are virtually immediate and the costs (compared to energy transition and disaster relief efforts) are relatively low: perhaps 1% of global GDP.

By combining decarbonization of the atmosphere with recarbonization of the biosphere, we can impact most Sustainable Development Goals, slow migration to the Global North, and save the future.

This is life's last best hope; we must all act now!

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