

THE MORA WATER CRISIS

In yet another blow to people who have lived through fire and flood, in November 2025, the New Mexico Department of Health (NMDOH) advised private well owners in and around the Hermit's Peak-Calf Canyon Fire burn area in Mora County to avoid using their water for things such as drinking, cooking, washing dishes, brushing teeth, or as drinking water for pets due to elevated levels of 11 metals discovered in the area's groundwater. Three (antimony, arsenic and uranium) tested at levels above EPA drinking water standards. One metal, manganese, tested above an EPA lifetime health advisory.

The DOH advised that residents can continue to use the water for household uses—including bathing and washing clothes, “as current levels do not affect normal skin contact,” but to use bottled water for drinking.

At higher concentrations or with long-term exposure, heavy metals can damage the kidneys, skin, cardiovascular system and nervous system. Arsenic and manganese can affect brain development and lead to long-term health effects. The NMDOH has created a fact sheet on health factors and water safety, which is available on its website, or by calling 1-833-796-8773.

The New Mexico Environment Department (NMED) recommended that all private well owners in the community get their water tested at a certified lab, and also recommended the installation of whole-house reverse osmosis systems. Boiling the water does not make it safe and can increase metal contamination.

How did the heavy metals get there? Antimony in 93 percent of the wells leads to a hypothesis of fire retardant as the source. Surprisingly little research exists on the chemical content of fire retardant products that have been used to douse watersheds and communities. Some have suggested that the cause may be the igniting of fire rather than the fire-fighting. U.S. Forest Service workers ignite prescribed burns with potassium permanganate, a neurotoxin that turns into manganese dioxide, which can leach into waterways.

MORA COUNTY Private Well Owners

Avoid using your water for the following:



Making tea/coffee



Drinking



Pet drinking water



Cooking



Making ice



Washing Dishes



Washing Produce



Brushing Teeth

Water may still be used for other household needs, including showering and bathing.

*Boiling water does not make it safe and can increase metal concentration.



Charting a Pathway Toward Long-term Fire Recovery

Why Our Institutions Are Failing, and What to Do About It

BY CHARLES G. CURTIN

Nearly four years have passed since the catastrophic Hermit's Peak-Calf Canyon wildfires, but for the people who live in the region, the wounds are still fresh. Sure, a few roads and bridges have been patched or replaced, some burned trees harvested, and significant payments have gone out to individuals and contractors. But the reality is hard to ignore: Fire threats still loom, floods keep coming, and the land and its people are struggling more than ever—despite billions poured into recovery. The sense of frustration and despair is palpable.



Citizens in Mora debate the role of federal agencies in fire mitigation and recovery.

What's happening in the Hermit's Peak-Calf Canyon burn area isn't just a local tragedy—it's a wake-up call because most of the forests in New Mexico and across the West are predicted to burn in coming decades. This story reveals not only the struggles of people and landscapes caught in the aftermath but also exposes just how unprepared our institutions are to meet the challenges of a radically changing world.

The answer to the riddle of why we've not made more progress in post-fire recovery is that existing institutions and the systems they embody aren't working because they're not designed to work in the face of rapid, repeated and dramatic change. Here are a few examples of intersecting factors leading to poor outcomes.

FEDERAL RESPONSE—A SYSTEM OUT OF SYNC

The FEMA recovery process tasked with disaster recovery isn't designed for long-term recovery. The process lacks the core elements needed to adapt to a changing world, including accountability, long-term design-based thinking and a focus on collective rather than individual benefit. Congressional rules ensure failure by stipulating that replaced infrastructure, such as bridges and culverts, cannot (except in exceptional circumstances) improve on pre-existing infrastructure, so even though a valley post-fire may have many times the run-off it did previously, mandating the same size bridge or culvert results in repeated

replacements rather than right-sizing for the current situation. There is little to no effective oversight to make sure the funding spent results in better outcomes.

FEMA's insurance-style recovery scheme exacerbates existing inequalities by giving large landowners and contractors millions while the rest get comparatively little or nothing. This institutionalized inequity tears at the fabric of communities, compensating landowners while providing no incentive to apply the money to landscape or community recovery. The rational response to such a system is to cash out and leave... which is often what is happening and what has occurred in many rural communities across the West post-fire.

At the same time, inflated federal wages undermine local employers' ability to find reliable, long-term workers, putting additional pressure on already-struggling local economies. While some local contractors have earned substantial incomes, most of the money never percolates down to the local community because, for the most part, large national contractors that feed off the FEMA system don't hire locally and bring in most of their own resources.

In short, we're got a political quick fix to a problem that demands long-term, thoughtful solutions. Our institutions are stuck in the past, treating disasters as rare accidents—when, in this era of climate upheaval, wildfires, floods and intense storms are nearly as inevitable as death and taxes. Based on these shortcomings and many others, the process results in outcomes that unravel communities and push both people and nature into decline.

PRIVATE SECTOR RESPONSE — MISSED OPPORTUNITIES

Though FEMA's response has been disappointing, local philanthropic and economic development responses are at times equally problematic.



Flood Impacts - Massive floods continue unabated and will likely persist for several more years, while fire is a relatively short-term event. The flooding and water contamination are the gift that keeps giving.

Carbon and biomass markets are too often just another form of resource extraction.

Here again, there is little attention to long-term solutions. Yes, short-term assistance, along with other near-term emergency aid, are essential for helping people get through a crisis. Yet, years later, there have been few coherent attempts to get to the heart of the problem: how to finance long-term, ecologically and socially responsible recovery. It's like continually applying Band-Aids and OxyContin to someone with a chronic heart condition. Yes, we're doing stuff, but mostly it's a surface-level response to systemic challenges. There is little or no long-term strategy because there are few incentives and many barriers to long-term thinking.

In my own work, we've meticulously documented place-based solutions to fire-recovery challenges through extensive community engagement and research, all grounded in insights from numerous nationally recognized experts. I've even penned a book that has been vetted by leading figures in conservation and societal change. Yet, despite ample evidence supporting an alternative, more holistic path forward, it seems that the more information we gather, the less support we receive. The lack of support for long-term solutions isn't personal, nor due to insufficient documentation. It's systemic: The grant guidelines and review process for agencies, foundations and economic development organizations, for the most part, don't prioritize systemic solutions to systemic problems. In the words of conservation pioneer Aldo Leopold, "We have the sad spectacle of one obsolete idea chasing another around a closing circle, while opportunity goes begging." And there are opportunities if we recognize the challenge's dimensions and evolve responses to match the scale and scope of the situation.

TOWARD LONG-TERM SOLUTIONS

Most support is an incremental approach to a transformational problem—base hits when we need home runs. Consider pro baseball. Less than 13 percent of hits result in home runs, and those who hit the long balls strike out more than those who seek base hits. In Babe Ruth's legendary 1927 season, he hit 60 balls out of the park in 540 at-bats, averaging a home run every nine at-bats while striking out every six at-bats. So, he lost more than he won. Yet it was the home runs, not the strikeouts or base hits, that made the difference! Current strategies of simple, incremental solutions to overwhelming social and environmental change in prioritizing base hits over home runs are like bringing a knife to a gunfight. The scope and scale of the challenges outmatch current strategies. One must swing for the fences or be assured of facing resounding defeat, which means learning to embrace risk and uncertainty.



Biochar plant - Biochar (a charcoal-like substance that can be used for water retention in soils and myriad other uses) technology, as in this plant in production in Arizona, is approaching reliability, as are the associated markets, but there's still a lot of trial and error involved in the process.

And too often, an honest expression of uncertainty is mistaken for weakness or lack of expertise, when in truth, it's the only reasonable response to the tangled crises we face. Real solutions demand flexibility, experimentation and the courage to try new approaches. We need to strip issues down to their core principles, ask tough

At all scales, there are ways to enhance rather than extract from local communities.

Fire threats still loom, floods keep coming, and the land and its people are struggling more than ever.

questions, and be ready to learn as we go. In short, in the face of massive socio-ecological change and uncertainty, we need to move from narrow problem framing to embracing a series of overarching principles. If we were to devise a few principles to guide a path toward adaptation and recovery, what might they look like? Here are a few suggestions.

PROCESSES NEED TO BE SELF-SUSTAINING, ADAPTIVE AND REGENERATIVE

For approaches to work over the long haul, they need to align rather than run counter to social, ecological and economic forces. Yet as noted, most public and private sector strategies are maladapted to addressing messy, multifaceted challenges. As in Hermit's Peak—Calf Canyon fire responses, they're also just too slow and clunky to respond at the pace of solutions that need to be delivered, and they're too prone to being co-opted by existing political or institutional forces. Agencies and foundations can contribute most effectively by providing start-up funds to support the less monetizable parts of the process, which are community engagement and prototyping and testing alternative strategies. But once a viable approach is devised, the speed of action needed to enact innovation and the need for long-term sustainable incomes requires private investment, supported by alternative valuation methods that incentivize social and ecological renewal.

AVOID SIMPLIFICATION FOR THE SAKE OF COMMODIFICATION

In recent years, a range of verified compensation schemes has emerged to provide investors with returns on environmental benefits. The most widely known of these are carbon credits, in which projects that provide additional benefits over baselines can sell credits to investors. This provides an invaluable income stream for conservation actions. However, the commodification of a public good such as climate change mitigation or ecosystem services too often results in the simplification of a complex, interconnected system in which carbon or other benefits are the most monetizable but often least valuable part. For example, the value of fire prevention or mitigation is typically many times the value of biomass or carbon extracted from a landscape—but you need to design for regenerative outcomes to optimize overall societal benefits.

Carbon sequestration
Biochar, carbon markets, and offtake agreements.

Drought mitigation
Biochar increases water efficiency and can clean ag run-off and groundwater.

Electricity
Created through turbines powered by waste gases.

Greenhouse gas abatement
Prescribed or pile burns are offset by biochar production, wildfires reduced or prevented by converting woody biomass to carbon.

Green energy production
Carbon from biochar is used in rapid anaerobic digestion to produce green fuels, energy, and hydrogen.

Improved soil health
Biochar applied to droughty soils to retain water and can be used in mine reclamation to sequester heavy metals and other pollutants.

Rural economic & socio-ecological renewal
Creating markets for non-merchantable timber supports a return to fire-adapted landscapes, improved ecological function, and traditional land uses.

Thermal energy
Heat is used to dry lumber or to warm greenhouses and other buildings.

Wildfire mitigation
Creation of fuel breaks and removal of non-merchantable timber.

Stacking benefits like stacking pancakes—Biochar and carbon markets are just one of a diversity of potential income streams, which like a stack of pancakes, provide multiple valuation streams; the most valuable are often the least readily monetizable.

REDUCE LEAKAGE BY MONETIZING ECOLOGICAL FUNCTION

Leakage is a term in carbon and other markets for reducing impacts in one place only for them to “leak” elsewhere. So, one needs to be attentive to the whole system. For example, an approach that acquires carbon from burned trees but uses damaging logging practices that undermine overall

ecological function may create a negative outcome from a potentially positive process. Remote monitoring technologies and understandings of environmental function, as well as ecosystem service markets, have reached a point where we can incentivize landowners to restore and sustain their lands by monetizing the maintenance of ecological function, and public landholders can also use these techniques. This includes creating mosaics of fire-adapted habitats that enhance rather than damage environmental function.

For example, grazing can reduce fine fuels to retard wildfire spread while enhancing nutrient cycling and vegetation patch dynamics to enhance biodiversity. Studies in Europe suggest one horse can generate over 10,000 Euros in annual fire suppression benefits if managed in a sustainable way. New tech, such as

Our institutions are unprepared to meet the challenges of a radically changing world.

fenceless livestock management, enhances landowners' ability to do this. But we need vibrant rural communities to sustain this strategy, and this approach strengthens rural communities by boosting landowner incomes and creating well-paying rural jobs. Such approaches aren't unfounded speculation—we're piloting this strategy right now in the burn scar areas of Mora and San Miguel counties and will have preliminary results in early 2026.

INTEGRATED DESIGN FOR THE LONG HAUL.

Too often, policies and philanthropy operate as if the present is eternal, when there is overwhelming evidence that the world is changing radically. For example, in many places, due to a warming and drying climate, burned or logged areas no longer naturally regenerate into forests. So simply removing burned trees is not a solution, because they are replaced by other biomass,



Landscape and Oak Colonization - Image of the upper Gallinas Valley with Hermit's Peak and the location of wildfire ignition points in the background. In the foreground is a recently burned hill slope with oaks coming in; the barren hills in the background (also covered with oaks) are likely old fire scars. Once oaks colonize, they are hard to remove. Small stands can be beneficial, but the thousands of acres coming in following recent fires represent a wholesale landscape conversion that threatens local ecology and culture. Yet oak impacts and the need for regional restoration are rarely considered in recovery plans.

Most of the forests in New Mexico and across the West are predicted to burn in coming decades.

typically with less commercial or ecological value and often equally or more fire-prone (such as dense stands of shrub oaks). Replanting trees can help, but it also creates more fuel and returns conditions to those that led to the wildfires in the first place, unless one designs and implements a fire-adapted landscape stewardship strategy to complement tree replanting and other ecological recovery actions. This requires integrated attention to the overarching social, ecological and economic facets of recovery design.

CLOSE THE LOOP, RENEW NEW MEXICO FIRST

Carbon and biomass markets are too often just another form of resource extraction, where natural resources taken from areas of low value in disadvantaged communities are refined and exported to areas of higher value, often with out-of-state investors getting the lion's share of the benefits. But it does not need to be that way. At all scales, there are ways to enhance



Diffuse Strategies - Regenerative strategies need to be measurable, replicable and marketable, with a range of benefits ranging from soil health to water quality improvements and adaptive grazing strategies.

rather than extract from local communities, and as already noted, the social and ecological returns in a well-designed system can be many times those to investors. Investors still receive a reasonable and competitive economic return. Many of these I have already alluded to, including payments for ecosystem services to landowners, restoring historic fire-adapted landscapes and rural lifeways, and enhanced water flows which support farming, acequia systems and other forms of agricultural land use.

The preceding discussion is just one example of the value of reconceiving solutions to move from incrementalization to integration using a principled approach. The crucial point is that new outcomes require new thinking that, from first principles, considers the overall decision space in which we operate, seeks to avoid the pathologies of the existing system and generates new vision, ideas and outcomes. In the words of architect, social activist and polymath Buckminster Fuller, "You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete." ■

Ecologist and conservationist Dr. Charles G. Curtin has worked for three decades in New Mexico and across the globe on collaborative conservation programs and large-scale research projects. His recent work has focused on regenerative conservation design and the process of using carbon and other alternative markets to sustain communities and the ecosystems they rely on. charlescurtin.com

BOOK PROFILE

**PLACE-BASED SOLUTIONS:
THE POWER OF REGENERATIVE
THINKING IN THE FACE OF CRISIS**

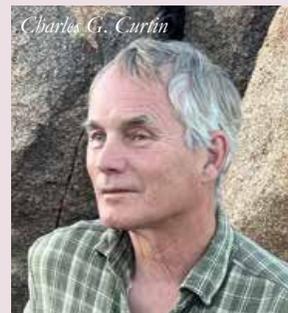
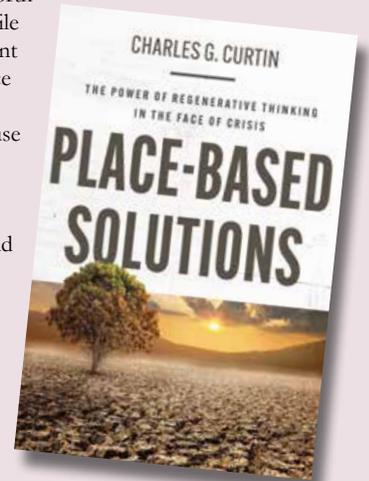
BY CHARLES CURTIN

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In 2019, Charles Curtin left a three-decade career in international conservation science and landscape ecology. Despite having led or contributed to some of the most significant collaborative projects around the world and co-founding programs and teaching at institutions like MIT, he no longer believed that conventional approaches were adequate or relevant in the face of increasing socio-ecological change.

To gain a fresh perspective on how to attain more conscientious and socially relevant environmental action, he moved to the remote mountain town of Mora, located high in the Sangre de Cristo Mountains of northern New Mexico. There, he sought to reconcile conservation efforts with immersion in ancient Hispanic-Indigenous cultures. This experience led to a reconception of conservation and social action principles that emphasized the use of biochar and a carbon and ecosystem-services economy. The goal was to develop a model for reviving disadvantaged rural communities facing massive wildfires, flooding and the related impacts of climate change.

This book chronicles Curtin's three-decade journey in place-based action across vast landscapes and seascapes, supported by a deep dive into the supporting literature. The insights gained along the way illustrate how to harmonize the needs of communities, economies and ecosystems for mutual benefit and



show how, by rethinking social action, we can craft economically and ecologically viable solutions to societal challenges. Jonathan Cobb, who has edited for eminent ecologists and conservationists ranging from Paul Erlich to David Western, has described this as one the most important books of its time.

The book can be acquired from local book sellers in Santa Fe and Taos, from Amazon, or directly from the publisher (<https://www.press.jhu.edu/books/title/53924/place-based-solutions>).



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