The Working Wilderness:
A Call for a Land Health Movement

BY COURTNEY WHITE

I have asked Courtney White to lend his essay, "The Working Wilderness," to this collection for three reasons:

First, I think it is a good essay.

Second, it tells of a serious and continuing effort on the part of some ranchers and conservationists to develop local knowledge sufficient to support a locally adapted land economy. This is an effort that is needed simply because it is necessary. If humans don't learn to adapt their land economies to the nature of their places, that will be a disaster, first for their places and then for the humans.

Third, it is an essay about cooperation between people and nature, between people and their places, and between ranchers and conservationists. This, again, is necessary. The only possible result of the human effort to "conquer" nature and one another is human defeat. The longstanding conflict between ranchers and conservationists is not only hopeless and ruinous for both; it is, as Daniel Kemmis points out, outmoded: "Cooperation is an indispensable way of doing business if we hope to prosper in this hard country."

Courtney and I know, of course, that some people are going to disagree with his thoughts, as some will disagree with mine. As essayists, we know that the purpose of an essay is not to deliver the final word. An essay's purpose is merely to take part in a conversation. So let the disagreements come. Long live the conversation! —W.B.

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"The only progress that counts is that on the actual landscape of the back forty." —ALDO LEOPOLD

DURING A CONSERVATION TOUR of the well-managed U Bar Ranch near Silver City, New Mexico, I was asked to say a few words about a map given to me recently by a friend.

We were taking a break in the shade of a large piñion tree, and I rose a bit reluctantly (the day being hot and the shade being deep) to explain that the map was commissioned by an alliance of ranchers concerned about the creep of urban sprawl into the 500,000-acre Altar Valley, located south of Tucson, Arizona. The map was important, I told them, for what it measured: indicators of rangeland health.

Drawn up in multiple colors, the map expressed the intersection of three variables: soil stability, biotic integrity, and hydrological function—soil, grass, and water, in other words. The map displayed three conditions for each variable: "Stable," "At Risk," and "Unstable." A color represented a particular intersection. For example, deep red designated an unstable, or unhealthy, condition for soil, grass (vegetation), and water, while deep green represented stable for all three. Other colors represented conditions between these extremes.

In the middle of the map was a privately owned ranch called the Palo Alto, I told them. Visiting it recently, I was shocked by its condition. It had been overgrazed by cattle to the point of being nearly totally "cowburnt," to use author Ed Abbey's famous phrase. As one might expect, the color of the Palo Alto on the map was blood red and there was plenty of it.

I paused briefly—now came the controversial part. This big splotch of deep red continued well below the southern boundary of the Palo Alto, I said. However, this was not a ranch. This was the Buenos Aires National Wildlife Refuge, a large chunk of protected land that had been cattle-free for nearly sixteen years. . . .

That was as far as I got. Taking offense at the suggestion that the refuge

might be ecologically unfit, a combative young environmentalist from Tucson cut me off. She knew the refuge, she explained, having worked hard to help "heal" it from decades of abuse by cows.

I countered by explaining that the map did not blame anyone for current conditions; nor did it offer opinions on any particular remedy. All it did was ask a simple question: Is the land functioning properly at the fundamental level of soil, grass, and water? For a portion of the Buenos Aires National Wildlife Refuge the answer was "no." For portions of the adjacent privately owned ranches, which were deep green on the map, the answer was "yes."

Why was that a problem?

I knew why. I had strayed too closely to a core belief of my fellow conservationists—that "protected" areas, such as national parks, wilderness areas, and wildlife refuges, must always rate, by definition, as being in better ecological condition than adjacent "working" landscapes.

Yet the Altar Valley map challenged this paradigm at a fundamental level, and when the tour commenced again, on a ranch that would undoubtedly encompass more deep greens than deep reds on a similar map, I saw in the reaction of the young activist a need to rethink the conservation movement in the American West.

From the ground up.

Knowledge

My conviction received a boost a few weeks later while sitting around a campfire after a tour of the CS Ranch. I was thinking about ethics. I believed at the time, as many conservationists still do, that the chore of ending overgrazing by cattle in the West was a matter of getting ranchers to adopt an ecological ethic along the lines suggested by Aldo Leopold in his famous "Land Ethic" essay, where he argued that humans had a moral obligation to be good stewards of nature.

The question, it seemed to me, was how to accomplish this lofty goal.

I decided to ask Julia Davis-Stafford, our host, for advice. Years ago, Julia and her sister, Kim, talked their family into switching to progressive ranch

management on the magnificent 100,000-acre CS, located in northeastern New Mexico. It was a decision that over time caused the ranch to flourish economically and ecologically. In fact, the idea for my query came earlier in the day when I couldn't decide which was more impressive: the sight of a new beaver dam on the ranch or Julia's strong support for its presence.

The Davis family, it seemed to me, had embraced Leopold's land ethic big time. So, over the crackle of the campfire, I asked Julia, "How do we get other ranchers to change their ethics, too?"

Her answer altered everything I had been thinking up until that moment.

"We didn't change our ethics," she replied. "We're the same people we were fifteen years ago. What changed was our knowledge. We went back to school, in a sense, and we came back to the ranch with new ideas."

Knowledge, I suddenly realized, more than ethics, is the key to good land stewardship. Her point confirmed what I had observed during many visits to livestock operations across the region: Ranchers *do* have an environmental ethic, as they have claimed for so long. Often their ethic is a powerful one. What many lack, however, is new knowledge.

The same thing is true of many conservationists. In the years since I became an activist, starting as a Sierra Club volunteer and later co-founding a nonprofit organization dedicated to bridge-building between ranchers, environmentalists, and others, I came to the conclusion that it had obviously been a long time since any of us was in school. This is a problem because land management knowledge, like any knowledge, does not sit still for very long.

If conservationists could go back to school, as the Davis family did, what would we learn? Aldo Leopold had an idea: the fundamental principle of land health, which he described as "the capacity of the land for self-renewal." He also described conservation as "our effort to understand and preserve this capacity."

By studying the elements of land health, conservationists could learn that grazing is a natural process. The consumption of grass by ungulates has been going on in North America for at least sixty-six million years—

not by cattle, of course, but because they are domesticated animals they can be managed in a way that mimics the behavior of bison, recreating a relationship between grass and grazer that can be ecologically sustainable.

We could also learn that many landscapes need periodic pulses of energy, in the form of natural disturbance, to keep things vibrant. Many conservationists know that "cool" fires are a beneficial form of disturbance in ecosystems because they reduce tree density, burn up old grass, and aid nutrient cycling in the soil. But many of us don't know that small flood events can be a positive agent of change too, as can drought, wind storms, and even insect infestation. And nearly all of us fail (or refuse) to understand that animal impact caused by grazers, including cattle, can be a natural form of disturbance as well.

We could further learn, as the Davis family did, that the key to proper "disturbance" with cattle is to control the timing, intensity, and frequency of their impact on the land. Too often, western ranchers employ the "Columbus school" of grazing management: Turn the cows out in May and go discover them in October. Left alone, cattle will choose to "hang out" along streams and creeks, causing them to degrade due to excessive trampling and overgrazing. This continuous or unmanaged grazing is not a positive ecological disturbance.

By contrast, the CS, and other progressive ranches, bunch their cattle together and keep them on the move, rotating the animals frequently through numerous pastures. Ideally, under this system no single piece of ground gets grazed by cattle more than once a year, thus ensuring plenty of time for the plants to recover—which is the way nature meant for grass to be grazed. The keys are *control* of the cattle, which can be done with fencing or a herder, and *timing*, in which the herd moves are carefully planned and monitored.

In fact, as many ranchers have learned, overgrazing is much more a function of timing than numbers of cattle.

Conservationists could also learn, as I did, that much of the damage we see today on the land is historical—a legacy of the "Boom Years" of cattle grazing in the West. Between 1880 and 1920 millions of hungry animals

roamed uncontrolled across the range, and the overgrazing they caused was so extensive, and so alarming, that by 1910 the U.S. government was already setting up programs to slow and heal the damage. Today, cattle numbers are down, way down, from historic highs—a fact not commonly voiced in the heat of the cattle debate.

The Davis family had done what was necessary to maintain their ethic and stay in business. New knowledge allowed them to adjust their operation to evolving values, technologies, and ideas. Rather than fight change, they had switched.

As the embers of the campfire burned softly into the night, I wondered if the conservation movement could do the same.

Land Health

My friend Dan Dagget likes to tell a story about a professor of environmental studies he knows who took a group of students for a walk in the woods near Flagstaff, Arizona. Stopping in a meadow, the professor pointed at the ground and asked, not-so-rhetorically, "Can anyone tell me if this land is healthy or not?" After a few moments of awkward silence, one student finally spoke up. "Tell us first if it's grazed by cows or not," he demanded.

Another story comes from a kayaking lawyer in Santa Fe, who told me that a workshop on land monitoring at the boundary between a working ranch and a wildlife refuge south of Albuquerque had completely rearranged his thinking. "I've done a lot of hiking and thought I knew what land health was," he said, "but when we did those transects on the ground on both sides of the fence, I saw that my ideas were all wrong."

These two instances illustrate a recurring theme in my experience as a conservationist. To paraphrase a famous quote by a Supreme Court justice, members of environmental organizations "can't define what healthy land is but they know it when they see it."

The principle problem is that we are "land illiterate." When it comes to "reading" a landscape, we might as well be studying a foreign language. Too many of us don't know our perennials from our annuals, what the signs of

poor water cycling are, what an incised channel means, or, simply by looking, whether a meadow is healthy or not.

For a long time this situation wasn't our fault. What all of us lacked—rancher, conservationist, range professional, curious onlooker—was a common language to describe the common ground below our feet.

That has changed.

In 1994 the National Academy of Sciences published a book entitled *Rangeland Health: New Methods to Classify, Inventory, and Monitor Rangelands*. In it, the authors define health "as the degree to which the integrity of the soil and ecological processes of rangeland ecosystems are sustained."

They go on to say, "The capacity of rangelands to produce commodities and to satisfy values on a sustained basis depends on internal, self-sustaining ecological processes such as soil development, nutrient cycling, energy flow, and the structure and dynamics of plant and animal communities."

It is the language of soil, grass, and water.

The concept behind rangeland health is a simple but powerful one: Before land can sustainably support a value, such as livestock grazing, hunting, recreation, or wildlife protection, it must be functioning properly at a basic ecological level. In other words, before we, as a society, can talk about designating critical habitat for endangered species, or increasing forage for cows, or expanding recreational use, we need to know the answer to a simple question: Is the land healthy at the level of soil, grass, and water?

If the answer is "no," then all our values may be at risk.

Or as Kirk Gadzia, an educator, range expert, and coauthor of the book likes to put it, "It all comes down to soil. If it's stable, there's hope for the future. But if it's moving, then all bets are off for the ecosystem." It is a sentiment echoed by Roger Bowe, an award-winning rancher from eastern New Mexico, who says, "Bare soil is the rancher's number one enemy."

It must become the number one enemy of conservationists as well.

The publication of *Rangeland Health* was the touchstone for a new consensus within the scientific and range professional communities. It paved the way for the debut, in 2000, of a federal publication entitled *Interpreting*

Indicators of Rangeland Health, which provides a seventeen-point checklist for the qualitative assessment of upland health. The indicators include the presence of rills, gullies, bare ground, scouring, pedestaling, litter movement, soil compaction, plant diversity, and invasive species—the vocabulary of land health.

These were the indicators that formed the basis of the Altar Valley map that I described.

The National Riparian Team, a federal interagency team dedicated to stream health, developed a similar approach. Their seventeen-point checklist assesses the physical functioning of riparian and wetland areas through "consideration of hydrology, vegetation, and soil/landform attributes."

The goal of this assessment, which the National Riparian Team calls Proper Functioning Condition, is "to provide information on whether a riparian-wetland area is physically functioning in a manner which will allow the maintenance or recovery of desired values, e.g., fish habitat, neotropical birds, or forage, over time."

Scientists at the USDA's Jornada Experimental Range, near Las Cruces, New Mexico, recently published a peer-reviewed protocol for quantitatively measuring rangeland health, the next step after an assessment. Using a methodology that quantifies a watershed's ability to resist degradation, as well as recover from disturbance, this protocol, according to the manual, "is designed to quantify the potential of the system to function to support a range of societal values rather than to support any particular value."

Healthy land, in other words, supports many values while unhealthy land offers diminishing support over the long run.

At the risk of bending the medical metaphor too far, consider the issue this way: if it is your personal goal to run a marathon, work in a garden, write a novel, or simply survive another busy day, your ability to accomplish these goals depends on whether you are functioning properly, i.e., whether you are healthy.

That's why your doctor evaluates various standard indicators, such as pulse rate and blood pressure, when determining your relative health.

This was the message I tried to communicate to the young activist under the tree that hot summer day—that a rangeland health paradigm, employing standard indicators, allows all land to be evaluated equally and fairly. By adopting it, the conservation movement could begin to heed Aldo Leopold's advice that any activity that degrades an area's "land mechanism," as he called it, should be curtailed or changed, while any activity which maintains, restores, or expands it should be supported.

It should not matter if that activity is ranching or recreation.

Chaco

In an attempt to understand the issues of land health better, I paid a visit to a famous fenceline contrast. This particular fence separated the Navajo Nation, and its cows, from Chaco Culture National Historical Park, a World Heritage site and archaeological preserve located in the high desert of northwest New Mexico.

Cattle-free for over fifty years, Chaco's ecological condition became a pedagogical issue some years back when a controversial biologist used the boundary to highlight the dangers of too much rest from the effects of natural disturbance, including grazing and fire, in the park.

I wanted to see the fenceline contrast for myself, but I knew I would need help with the looking. So I asked Kirk Gadzia to come along.

Both of us were well aware of the park's history—that a century of overgrazing by livestock had badly degraded the land surrounding the famous ruins. We also understood that the era's typical response to this legacy of overuse was to "protect" the land from further degradation, principally with the tools of federal ownership and a barbed wire fence. It was a common, and probably appropriate, scenario played out all across the West at the time.

But Kirk and I didn't go to Chaco to argue with history or pick a fight with the National Park Service. We weren't there to offer solutions to any particular problem either. We simply wanted to take the pulse of the land on both sides of a fence.

Here's what we saw at the eastern boundary of the park: On the Chaco side we saw a great deal of bare ground, as well as many forbs, shrubs, and other woody material, some of it dead. We saw few young plants, few perennial or bunch grasses, lots of wide spaces between plants, lots of oxidized, gray plant matter, and a great deal of poor plant vigor. We saw undisturbed capped soil (bad for seed germination) and abundant evidence of soil movement, including gullies and other signs of erosion.

On the positive, we saw a greater diversity of plant species than on the Navajo side, more birds, more seed production, no sign of manure, and no sign of overgrazing.

On the Navajo side we saw lots of plant cover and litter, lots of perennial grasses, tight spaces between plants, few woody species, a wide age-class distribution among the plants, little evidence of oxidization, and lots of bunch grasses. We saw little evidence of soil movement, no gullies, and far fewer signs of erosion than on the Chaco side.

On the negative, we saw less species diversity, poor plant vigor, a great deal of compacted soil, fewer birds, less seed production, a great deal of manure, and numerous signs of overgrazing.

"So, which side is healthier?" I asked Kirk.

"Neither one is healthy, really," he replied, "not from a watershed perspective anyway." He noted that the impact of livestock grazing on the Navajo side was heavy; plants were not being given enough time to recover before being bitten again (Kirk's definition of overgrazing). As a result, the plants lacked the vigor they would have exhibited in the presence of well-managed grazing.

However, Kirk thought the Chaco side was in greater danger, primarily because it exhibited major soil instability due to gullying, capped soil, and lack of plant litter.

"The major contributing factor to this condition is the lack of tightly spaced perennial plants," he said, "which exposes the soil to the erosive effects of wind and rain. When soil loss is increased, options for the future are reduced."

"But isn't Chaco supposed to be healthier because it's protected from grazing?" I asked.

"That's what people always seem to assume," said Kirk. "In my experience in arid environments around the world, total rest from grazing has predictable results. In the first few years, there is an intense response in the system as the pressure of overgrazing is lifted. Plant vigor, diversity, and abundance often return at once and all appears to be functioning normally. Over the years, however, if the system does not receive periodic natural disturbance, by fire or grazing for example, then the overall health of the land deteriorates. And that's what we are seeing on the Chaco side."

Then Kirk put a caveat in place.

"Maybe land health isn't the issue here," he said. "It may be more about values. Is rest producing what the park wants? Ecologically, the answer is probably 'no.' But from a cultural perspective, the answer might be 'yes.' From the public perspective too. People may not want to see fire or grazing in their park."

But at what price, I wondered? Later in the day we learned that the Park Service was so worried about the threat of erosion to Chaco's world-class ruins that they intended to spend a million dollars constructing an erosion control structure in Chaco Wash. This told us the agency knows it has a "functionality" crisis on its hands.

But how can proper functioning condition be restored if the Park Service's hands are tied by a cultural value that says Chaco must be "protected" from incompatible activities, even those which might have a beneficial role to play in restoring the park to health?

As I drove home, I realized that this tension between "value" and "function" at Chaco was a sign of a new conflict spreading slowly across the West—symbolized by a fence. The cherished "protection" paradigm, embedded in the conservation movement since the days of John Muir, rubbed against something new, something energetic—something on the other side of the fence.

Untrammeled

The passage of the Wilderness Act in 1964 was a seminal event in the history of the American conservation movement. For the first time,

wilderness had a legal status, enabling the process of "wildland" protection, which had been frustrated in that era of environmental exploitation, to become possible. Energized, the conservation movement grabbed the wilderness bull by both horns and has not let go to this day.

But the Act's passage also had an unforeseen consequence—it set in motion the modern struggle between value and function in our western landscapes.

This tension took a while to develop. In 1964, there was intellectual harmony between the social and ecological arguments for the creation of a federal wilderness system. No reconciliation was necessary between the Act's definition of wilderness as a tract of land "untrammeled by man . . . in which man is a visitor who does not remain" and Aldo Leopold's declaration, published in *A Sand County Almanac* fifteen years earlier, that wilderness areas needed protection because they were ecological "base datums of normality."

Leopold asserted that wilderness was "important as a laboratory for the study of land health," insisting that in many cases "we literally do not know how good a performance to expect of healthy land unless we have a wild area for comparison with sick ones."

Author Wallace Stegner extended the medical metaphor when he argued that wilderness was "good for our spiritual health even if we never once in ten years set foot in it."

But a lot has changed in the years since the passage of the Wilderness Act. While most Americans still believe wilderness is necessary for social health, few ecologists now argue that wilderness areas can be considered as "base datums" of ecological health.

For example, in an article published in the journal *Wild Earth* in 2001 entitled "Would Ecological Landscape Restoration Make the Bandelier Wilderness More or Less of a Wilderness?" the authors, including ecologist Craig Allen, who has studied Bandelier National Monument, located in north-central New Mexico, for nearly twenty years, state matter-of-factly that "Most wilderness areas in the continental United States are not

pristine, and ecosystem research has shown that conditions in many are deteriorating."

It is their opinion that the Bandelier Wilderness is suffering from "unnatural change," mostly as a result of historic overuse of the area, which has triggered unprecedented change in the park's ecosystems, resulting in degraded and unsustainable conditions. "Similar changes," they write, "have occurred throughout much of the Southwest."

Specifically, soils in Bandelier are "eroding at net rates of about one-half inch per decade. Given soil depths averaging only one to two feet in many areas, there will be loss of entire soil bodies across extensive areas." This is bad because the loss of topsoil, and the resulting loss of water available for plants, impedes the growth of all-important grass cover, thus reducing the incidence of natural and ecologically necessary fires.

Eliminating grazing is no panacea for Bandelier's functionality crisis, however. Herbivore exclosures established in 1975 show that protection from grazing, by itself, "fails to promote vegetative recovery," they write. Without management intervention, they argue, this human-caused case of accelerated soil erosion will become irreversible. They warn, "To a significant degree the park's biological productivity and cultural resources are literally washing away."

Their summation is provocative: "We have a choice when we know land is 'sick.' We can 'make believe,'" to quote Aldo Leopold, "that everything will turn out alright if Nature is left to take its course in our unhealthy wildernesses, or we can intervene—adaptively and with humility—to facilitate the healing process."

This turns a great deal of conservation thinking on its head.

Wallace Stegner once wrote, "Wildlife sanctuaries, national seashores and lakeshores, wild and scenic rivers, wilderness areas created under the 1964 Wilderness Act, all represent a strengthening of the decision to hold onto land and manage large sections of the public domain rather than dispose of them *or let them deteriorate*." [emphasis added]

But we have let them deteriorate—as the Buenos Aires, Chaco, and

Bandelier examples demonstrate. Whether their deteriorated condition is a result of historical overuse or some more recent activity is not as important as another question: What are we going to do to heal land we know to be sick?

Clearly it's not 1964, or 1946, anymore. The harmony between value and function in the landscape, including our "protected" places, has deteriorated along with the topsoil.

This functionality crisis raises important questions for the conservation community. What, for instance, are the long-term prospects for wildlife populations in the West, including keystone predator species, if the ecological integrity of these special places is being compromised at the level of soil, grass, and water?

Can land be truly "wild" if it is not functioning properly?

Also, does "protection" from human activity preclude intervention, and if so, at what cost to ecosystem health? And on a larger scale, how do we "protect" our parks and wildernesses from the effects of global warming, acid rain, and noxious weed invasion?

And what about private land? Half of the American West is privately owned. What does a newly sprouted housing subdivision indicate about the long-term prospects for the health of the land as a whole?

Healing

The arguments and conditions that paved the way for a national wilderness system, as well as for the expansion of other "protected" areas, including new national parks and wildlife refuges, seem anachronistic today.

It should be clear by now that drawing lines on a map in order to shield chunks of land from threats posed by certain types of human activity without simultaneously confronting the source of those threats in the first place—the way we live as a society—is "fixing the pump without fixing the well," as Leopold put it.

Additionally, the whole concept of "preserving" some places while "sacrificing" others creates a stratification of land quality and land use

that is harmful to land health because it doesn't treat land holistically.

As conservationist Charles Little has written, "Leopold insisted on dealing with land whole: the system of soils, waters, animals, and plants that make up a community called 'the land.' But we insist on discriminating. We apply our money and our energy in behalf of protection on a selective basis."

He goes on to say, "The idea of a hierarchy in land quality is *the* tenet of the conservation and environmental movement."

Since John Muir's day, the conservation movement has based this hierarchy on the concept of "pristineness"—the degree to which an area of land remains untrammeled by humans. As late as 1964, before the maturation of ecology as a discipline, it was still possible to believe in the pristine quality of wilderness as an ecological fact, as Leopold did. Today, however, pristineness must be acknowledged to be a value, something that exists mostly in the eye of the beholder.

Biologist Peter Raven puts it in blunt ecological terms: "There is not a square centimeter anywhere on earth, whether it is in the middle of the Amazon basin or the center of the Greenland ice cap, that does not receive every minute some molecules of a substance made by human beings."

Pristineness can no longer be the bottom line of the conservation movement. In fact, the word should be deleted from the movement's vocabulary.

Many conservation professionals understand this, which is one reason why in recent years there has been a strong movement toward biodiversity as a more appropriate bottom line. This is an important and hopeful development, especially since it is strongly science-based. Unfortunately, much of this work still rests on the preservation/protection model, which means it is still hierarchical and exclusionary.

For example, a recent major land acquisition campaign by the Nature Conservancy, the largest conservation organization in the nation, urged its members to help it save "The Last Best Places" in the country (provoking the iconoclast in me to want to direct a campaign titled "What About the Rest of the West?").

When money and time are short, as they chronically are, this discriminatory approach is pragmatic, especially if biodiversity is under imminent threat. Ultimately, however, it strikes me as still doing more for the pump than for the well.

I believe the new bottom line must be *land health*. By assessing all types of land equally, a land health paradigm enforces an egalitarian approach to land quality, thereby reducing conflicts caused by clashing cultural values. By giving us a target of ecological functionality, it also enables land owners and managers to prioritize their restoration work, if restoration work is required. And by employing a common set of indicators, it creates a road map for living sustainably on the land—starting at the level of soil, grass, and water.

For example, there is a chunk of Bureau of Land Management (BLM) land west of Taos, New Mexico, that will never be a wilderness area, national park, or wildlife refuge. It is modest land, mostly flat, covered with sage, and very dry. In its modesty, however, it is typical of millions of acres of public land across the West.

It is typical in another way too—it exists in a degraded ecological condition, the result of historic overgrazing and modern neglect. A recent qualitative land health assessment revealed its poor condition in stark terms, confronting the BLM with the knowledge that more than forty years of total rest from livestock grazing had not healed the land. Some of it, in fact, teetered on an ecological threshold, threatening to transition to a deeper degraded state.

Fortunately, as humble and unhealthy as this land is, it is not unloved. The wildlife like it, of course, but so do the owners of the private land intermingled with the BLM land, some of whom built homes there. The area's two new ranchers also have great affection for this unassuming land and want to see it healed.

These ranchers are using cattle as agents of ecological restoration. Through the effect of carefully controlled herding, they intend to trample the sage and bare soil, much of which is capped solid, so that native grasses can get reestablished again. The ranchers are calling this act of restoration

a "Poop-and-Stomp," and its effects are being carefully monitored using the new land health protocols.

Using cattle to restore rangelands is not as crazy as it sounds. In fact, in his 1933 classic book *Game Management,* Aldo Leopold wrote that wildlife "can be restored with the same tools that have hithertofore destroyed it: fire, ax, cow, gun, and plow." The difference, of course, is the management of the tool, as well as the goals of the tool user.

Another example of "using nature to heal nature" is the work of Bill Zeedyk, who uses the power of small flood events to restore degraded streams to health. Called "Induced Meandering," Bill's approach is to place simple wood-and-rock structures at carefully calibrated points in incised stream channels so when the flood event comes the water is diverted into the opposite stream bank, thus "remeandering" the channel, which dissipates energy and encourages riparian vegetation to take hold and grow. Bill calls this innovative, yet humble, restoration strategy "thinking like a creek."

Both the Taos project and Bill Zeedyk's efforts are emblematic of a new conservation approach in the West. *In fact, I am convinced that land health and restoration, not wilderness and protection, will become the principle paradigms of a new conservation movement in the not-so-distant future.* Our goal will be a thousand acts of restoration, which I define as achieving full ecological functionality at the level of soil, grass, and water.

Our job as conservationists will be to transform red to green on maps such as that of the Altar Valley, and to do so collaboratively—for without local support (and maintenance) most restoration work will be jeopardized in the long run.

Social Health

If I could wave a magic wand across the American West and instantaneously produce a land health map for the whole region, I think all of us—rancher, conservationist, scientist, private landowner, public landmanager, and public land owner (you)—would be shocked by what we would see.

I have little doubt that we would see a map dominated by reds and oranges across wide stretches, with isolated stretches of deep and pale greens. The reasons for the dominance of reds and oranges across this map would be multiple, widely varied, and often site specific—as would potential restoration strategies.

However, this "land sickness," as Leopold called it, is not the only illness afflicting the rural West. Depressed economies, governmental gridlock, cultural clashes, demographic pressures, political disenfranchisement, and a host of other maladies have descended in force on rural counties, contributing in large measure to the frustration and anger that characterize so much of the region today.

In other words, social health in the West is in as much need of restoration as the physical landscape.

A big step toward restoring both would be to create an economic incentive to restoring land to functionality. The other parts of the puzzle are in place—the restoration toolbox is well developed, as is the scientific understanding of ecological processes that can guide restoration work. We certainly don't know everything, but as ecologist and restoration advocate Craig Allen likes to say, "we know enough now to get started."

And who better to do the job than people with local knowledge and great affection for local land? Long-term, meaningful restoration cannot be accomplished long-distance by well-meaning urban volunteers—the job is too big and too complex. Curing what ails western land will require local doctors, local remedies, local elbow grease—and local paychecks.

The good news is the labor pool is already in place. Ranch families are spread out across the West—at least for the time being.

Additionally, the compensation of ranchers and other rural landowners for producing ecological services to society, in the form of cleaner and more abundant water in these dry times for instance, will become an increasingly important economic engine in the not-so-distant future.

But that's another topic. The issue here is how the conservation movement will adjust to meet, and support, these emerging trends. The adoption of a land health paradigm is the first step, but the concomitant question

of who does the restoration, and how they get paid, requires another major realignment of the movement's philosophy.

If going back to school means reexamining the concept of pristineness, it also means reexamining its historical antithesis—work.

Under the old wilderness paradigm, conservationists traditionally segregated work from nature, thereby creating, according to historian Richard White, "a set of dualisms where work can only mean the absence of nature and nature can only mean human leisure."

White argues that conservationists need to reexamine work or else condemn ourselves to spending most of our lives outside of nature. "Having demonized those whose very lives recognize the tangled complexity of a planet in which we kill, destroy and alter as a condition of living and working," he writes, "we can claim an innocence that in the end is merely irresponsibility."

If the conservation movement could instead focus on work rather than on leisure, White says, then a whole new approach is possible. Focusing on work "links us to each other, and it links us to nature," he writes. "It unites issues as diverse as workplace safety and grazing on public lands; it unites toxic sites and wilderness areas. In taking responsibility for our own lives and work, in unmasking the connections of our labor and nature, in giving up our hopeless fixation on purity, we may ultimately find a way to break the borders that imprison nature as much as ourselves. Work, then, is where we should begin."

Again, we must start with a land health paradigm. Not only does it address the functionality crisis confronting the West, but it also can help chart a path through the region's value crisis as well. Qualitative and quantitative assessments of land health can create a baseline of fact that can guide our fancy, potentially helping us to resolve some of the destructive cultural clashes and dualisms that plague the region—jobs vs. the environment, urban vs. rural, work vs. play—clashes that are undermining our common goal of creating "a society to match its scenery," as Wallace Stegner once lamented.

Equally important, by directing restoration work and encouraging the

economic activity that goes with it, a land health paradigm can help restore social function to communities and economies in the West.

By developing a common language to describe the common ground below our feet, by working collaboratively to heal land and restore rural economies, by monitoring our progress scientifically, and by linking function to value in a constructive manner, a land health paradigm can steer us toward fulfilling Stegner's dream.

The Working Wilderness

Not long ago I had the privilege of riding a horse into the West Elks Wilderness, high in the mountains above Paonia, Colorado. I wanted to see an award-winning cattle-herding operation in action and to learn more about the compatibility between well-managed ranching and wilderness values.

I also wanted to see some pretty country.

So did Steve Allen, who moved his family to Paonia in the early 1970s as part of that era's "back-to-the-land" movement. Switching from farming to ranching in the late 1980s, he went back to school to learn the principles of progressive cattle management. Upon his return he convinced five other ranchers with permits in the West Elks to form a pool and begin herding their cattle as one unit through the mountains. They also convinced the Forest Service to let them give it a try.

Today, pool riders guide the thousand-head herd of cattle through a long arc in the mountains with the aid of border collies and the occasional temporary electric fence. They move the herd every ten days or so, which allows the land plenty of time to recover; and since traditional fences are no longer necessary, the ranchers voluntarily removed hundreds of miles of barbed wire fence in the wilderness, a boon to wildlife and backpackers alike.

In addition, Steve employs a new method of low-stress livestock handling whose gentleness would make John Wayne roll his eyes.

The local Forest Service range conservationist, Dave Bradford, went to school too and came back determined to quantify the effects of this new thinking. He rides the range frequently, reads monitoring transects

constantly, and publishes the results. He has also done quite a bit of historical research, including uncovering "before" photographs of the range, in order to gain new knowledge on the conditions of the land.

Steve and Dave were my hosts for the day, and I was as eager to see the evidence of their labors as they were to show it off.

I couldn't resist an act of bridge-building, though, so I brought along the new director of a Paonia-based conservation organization. The support of her predecessor for the West Elks herding experiment had been crucial to its early success, and I was curious about what she thought as an heir to the project. I also knew she had recently backpacked the very trail we were riding that morning.

What we saw shocked us at first. The herd of cattle had moved along the trail just days before, beating it into a muddy pulp. It looked like a tornado had touched down; shattered brush and trampled grass were ubiquitous, as was the cow poop. It certainly was not your standard Sierra Club calendar image of wilderness.

"This looks great!" yelled Dave as we climbed a steep hill on horseback. "Look at all this disturbance. Come back here in a month and you would never know the cattle went through here, it'll be so lush."

I turned to the director of the conservation organization.

"People call me all the time and complain," she said. "They're hikers. They don't think there should be cows in the wilderness."

"What do you tell them?" I asked.

"I tell them it's a working wilderness," she replied, spurring her horse forward.

Steve led us to a high meadow where we found a small bunch of cattle that had broken off from the main herd. After lunch we spent the rest of the day driving the cattle back down the mountain in a chaotic rush of snapping branches, surging adrenaline, and hard work. It was Steve's sly way—I realized when we reached the bottom of the mountain, exhausted and exhilarated—of teaching us a lesson about values.

Before our education began, however, we all sat in the green meadow and ate lunch among the blooming wildflowers, admiring the view. Each

of us—rancher, federal manager, and activist—shared the same thought: What a treasure this land is! Sitting there, I was reminded of why I became a conservationist—to explore the solace of open spaces; to look and learn, and teach in turn; to celebrate cultural diversity alongside biological diversity; and to revel in nature's model of good health.

And to try to understand, as John Muir did, that every part of the universe is hitched to everything else.